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| SOLICITATION, OFFER, AND AWARD <i>(Construction, Alteration, or Repair)</i> | 1. SOLICITATION NO. N40085-16-R-2800 | 2. TYPE OF SOLICITATION <input type="checkbox"/> SEALED BID (IFB) <input checked="" type="checkbox"/> NEGOTIATED (RFP) | 3. DATE ISSUED 20-Nov-2015 | PAGE OF PAGES 1 OF 51 |
|---|---|--|-------------------------------|--------------------------|

IMPORTANT - The "offer" section on the reverse must be fully completed by offeror.

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|-----------------|-------------------------------------|----------------|
| 4. CONTRACT NO. | 5. REQUISITION/PURCHASE REQUEST NO. | 6. PROJECT NO. |
|-----------------|-------------------------------------|----------------|

| | | |
|--|-------------|--|
| 7. ISSUED BY NAVFAC MID ATLANTIC PWD CRANE FEAD 300 HIGHWAY 361 NSA BLDG 2516 CRANE IN 47522 TEL: _____ FAX: _____ | CODE N40085 | 8. ADDRESS OFFER TO <i>(If Other Than Item 7)</i> CODE _____ See Item 7 TEL: _____ FAX: _____ |
|--|-------------|--|

| | | |
|--------------------------|----------------------------|--|
| 9. FOR INFORMATION CALL: | A. NAME LORNA D. TRIBBY | B. TELEPHONE NO. <i>(Include area code) (NO COLLECT CALLS)</i> 812-854-6021 |
|--------------------------|----------------------------|--|

SOLICITATION

NOTE: In sealed bid solicitations "offer" and "offeror" mean "bid" and "bidder".

10. THE GOVERNMENT REQUIRES PERFORMANCE OF THE WORK DESCRIBED IN THESE DOCUMENTS *(Title, identifying no., date):*

RFP N40085-15-R-7905 UNDERGROUND UTILITIES REPAIRS AND REPLACEMENT AT NSA CRANE, IN.

Work will be performed at the Naval Support Activity (NSA) Crane, Indiana and the Glendora Test Facility, Sullivan, Indiana. The work includes the potential for multiple task orders for the maintenance, repair, and installation of utility system pipelines, primarily domestic water, fire protection water mains, gravity sewers, force mains, and incidental accessories and site restoration. Task order work may also include repair work related to domestic water and wastewater treatment facilities such as lift stations, pumps, water storage tank repairs (cathodic protection system, tank level monitoring, pumps, controls, and piping), controls, electrical and site work commensurate with project scope. This contract does not include major repairs, renovations or new construction projects for the water treatment plant, the waste water treatment plant, and water storage tank facilities or work which is incidental to new building construction and major repairs or renovations to existing buildings.

11. The Contractor shall begin performance within 15 calendar days and complete it within 365 calendar days after receiving award, notice to proceed. This performance period is mandatory, negotiable. (See FAR 52.211-10 _____.)

| | |
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| 12 A. THE CONTRACTOR MUST FURNISH ANY REQUIRED PERFORMANCE AND PAYMENT BONDS? <i>(If "YES," indicate within how many calendar days after award in Item 12B.)</i> <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO | 12B. CALENDAR DAYS 15 |
|--|--------------------------|

13. ADDITIONAL SOLICITATION REQUIREMENTS:

A. Sealed offers in original and 3 copies to perform the work required are due at the place specified in Item 8 by 02:00 PM (hour) local time 21 Dec 2015 (date). If this is a sealed bid solicitation, offers must be publicly opened at that time. Sealed envelopes containing offers shall be marked to show the offeror's name and address, the solicitation number, and the date and time offers are due.

B. An offer guarantee is, is not required.

C. All offers are subject to the (1) work requirements, and (2) other provisions and clauses incorporated in the solicitation in full text or by reference.

D. Offers providing less than 60 calendar days for Government acceptance after the date offers are due will not be considered and will be rejected.

Section 00010 - Solicitation Contract Form

| ITEM NO | SUPPLIES/SERVICES | ESTIMATED QUANTITY | UNIT | UNIT PRICE | ESTIMATED AMOUNT |
|---------|---|--------------------|------|------------|----------------------------|
| 0001 | <p>Underground Utilities Repair & Replaceme FFP The contractor shall provide all labor, supplies, materials, equipment, transportation, supervision and management required for all work specified for Underground Utilities Construction at NSA Crane, IN and Glendora Test Facility, Sullivan, IN. All work shall be in accordance with the Statement of Work and ELINS. Exhibits A, B, C, D, & E contain pre-priced line items that will be utilized when issuing task orders under this CLIN for the Base Year and each option year that is exercised. The contract is a a base year plus 4 option years, and the estimated ceiling for this contract is 60 months or \$5,000,000.00 which ever comes first. FOB: Destination</p> | | Each | | |
| | | | | | <hr/> ESTIMATED NET AMT |

INSPECTION AND ACCEPTANCE TERMS

Supplies/services will be inspected/accepted at:

| CLIN | INSPECT AT | INSPECT BY | ACCEPT AT | ACCEPT BY |
|------|-------------|------------|-------------|------------|
| 0001 | Destination | Government | Destination | Government |

DELIVERY INFORMATION

| CLIN | DELIVERY DATE | QUANTITY | SHIP TO ADDRESS | UIC |
|------|---------------|----------|-----------------|-----|
| | | | | |

0001 31-JAN-2017

NAVFAC MID ATLANTIC
RANDY FLANAGIN
300 HIGHWAY 361
BLDG 2516 NSA
CRANE IN 47522
812-854-1145
FOB: Destination

N61154

Section 00100 - Bidding Schedule/Instructions to Bidders

DIVISION 0

DIVISION O. PRICING AND TECHNICAL PROPOSAL INFORMATION

Section 00100 - INSTRUCTIONS, CONDITIONS, AND NOTICES TO OFFERORS

1.0 GENERAL INFORMATION

NAICS Code: 237110 – Water and Sewer Line and Related Structures – Construction (Size Standard: \$36.5 million)

FSC Code: Z1NE

This procurement is issued as a 100% Small Business Set Aside.

Proposals are due no later than 2:00 p.m. on Monday, December 21, 2015

2.0. REQUIRED DATA SUBMISSIONS

- a. All offerors are required to register in the Central Contractor Registration (CCR) database in accordance with FAR 52.204-7. *LACK OF REGISTRATION IN THE CCR DATABASE WILL MAKE THE OFFEROR INELIGIBLE FOR AWARD.* The website address for the CCR database is www.sam.gov.
- b. In addition, all offerors are required to complete and submit Annual Representations and Certifications via the Online Representations and Certifications Applications (ORCA) in accordance with FAR 52.204-8. The website address for ORCA is www.sam.gov
- c. All offerors are required to complete and submit VETS-4212 Federal Contractor Report on Veterans' Employment in accordance with Public Law 107-288 and FAR 52.222-37. The website address is: <http://www.dol.gov/vets/vets4212.htm>

3.0 PRE-PROPOSAL CONFERENCE/SITE VISIT

A PRE-PROPOSAL CONFERENCE/SITE VISIT HAS NOT BEEN SCHEDULED FOR THIS RFP. THERE IS NO SEED PROJECT.

4.0 QUESTIONS

ALL QUESTIONS MUST BE SUBMITTED IN WRITING. The offeror may submit written questions via e-mail or fax to the address below specifying the section and paragraph of the RFP for which clarification is desired. Inquires should be addressed to:

NAVFAC Mid-Atlantic PWD Crane – Acquisition Department
Attn: Lorna D. Tribby (Code PRX22)

300 Highway 361
Building 2516, NSA
Crane, IN 47522-5082

Phone: (812) 854-6021
Facsimile: (812) 854-3800

E-Mail: lorna.tribby@navy.mil

5.0 PROPOSALS

Offerors are required to submit both technical and price proposals. The Government will award a contract resulting from this solicitation to the responsible offeror whose offer conforming to the solicitation will be most advantageous to the Government, price and other factors considered. For this solicitation, the combinations of the technical submittals are equal in value to the price.

The technical proposal and the price proposal shall be submitted in separate volumes. The technical proposal shall not contain any cost/pricing information except for salary information provide on resumes.

Proposals are due no later than 2:00 p.m. (EST) on Monday, December 21, 2015. Proposals shall be submitted to the following address:

NAVFAC Mid-Atlantic PWD Crane – Acquisition Department
Attn: Lorna D. Tribby (Code PRX22)
NSA, Bldg 2516
300 Hwy 361
Crane, IN 47522-5082

The Government will award this solicitation to the single offeror whose proposal conforming to the solicitation will be the most advantageous to the Government, price and other factors considered:

TECHNICAL PROPOSAL: *Offerors shall submit an original and three (3) copies of the Technical Proposal. Pages must be singled sided 8 ½ " x 11" and may be formatted in landscape or portrait format. Pages may be single-spaced in any font size legible to the naked eye. Pages of print are defined as text, diagrams, pictures, charts, tables, maps, appendices to proposal, or forms. Tabs are required for all sections of the technical proposal.*

In addition, the offeror may submit catalogue cuts, brochures or other pre-printed material as long as the exact item to be incorporated is identified.

To facilitate the evaluation, the technical proposal should be sufficiently detailed and complete to clearly and fully demonstrate that the offeror has a thorough understanding of the requirements.

Extraneous information in the technical proposal may be construed as indicative of the offeror's ignorance of the subject or a casual approach to the RFP. Statements that the prospective offeror understands and can or will comply with all specifications, statements paraphrasing the statement of work or parts thereof, and phrases such as "standard procedures will be employed" or "well known techniques will be used", etc will be considered insufficient.

Elaborate brochures, binding, detailed artwork are unnecessary. The technical proposal shall be clear, concise and shall include sufficient detail for effective evaluation and for substantiating the validity of stated claims. The proposal should not simply rephrase or restate the Government's requirements, but rather shall provide convincing rationale to address how the offeror intends to meet requirements. Offerors shall assume that the Government has no prior knowledge of their experience, and will base its evaluation on the information presented in the offeror's proposal.

Proposals unrealistic in terms of technical or schedule commitments or unrealistically low in price will be considered lacking technical competence or comprehension of the complexity and risks of the contract requirements and may be rated as technically unacceptable.

Technical Evaluation Factors to be addressed in this solicitation are identified below and are listed in descending order of importance:

- Factor 1 – Corporate Experience
- Factor 2 – Safety
- Factor 3 – Past Performance

The distinction between corporate experience and past performance is corporate experience pertains to the types of work and volume of work completed by a contractor that are comparable to the types of work covered by this requirement, in terms of size, scope, and complexity. Past performance pertains to both the relevance of recent efforts and how well a contractor has performed on the contracts.

1. Basis of Evaluation and Submittal Requirements for Each Factor

(a) Technical Factors:

(1) **Factor 1, Corporate Experience:**

(i) Solicitation Submittal Requirements:

Submit a minimum of three (3) and a maximum of five (5) utility and/or infrastructure construction projects, completed within the last three (3) years from the date of receipt of proposals, which demonstrate relevant experience in a diverse range such as new utility construction and demolition as well as maintenance and repair of utility systems and

infrastructure, ranging in price from approximately \$30,000.00 to approximately \$750,000.00, and completed within the past three (3) years from the date of receipt of proposals. A diverse range of construction is defined as at least two (2) different types of construction tasks related to utilities (i.e. repair of infrastructure, alterations of utility systems or infrastructure, demolition, new construction, etc.).

For each project, your proposal shall provide the following minimum information using the Corporate Experience format provided under Attachment E:

Contract Number/Project Title/Location:
 Original Contract Amount:
 Final Contract Amount:
 Award Date:
 Contract completion date:
 Contractor Performed as Prime Contractor or Subcontractor
 Project Description: (describe salient features of the work)
 % of Work Performed by Offeror
 Type of Construction Task(s), i.e. new construction, demolition, renovation, etc
 Construction Trades Performed by Offeror
 Customer POC; Organization; Tel #; Fax #; and Email.

Notes:

- (1) Failure to provide all the above information for each project will result in an unacceptable rating for this Factor.*
- (2) It is the offeror's responsibility to ensure points of contact, telephone numbers and email addresses are accurate.*

Demonstrate experience managing several construction projects simultaneously through submission of the required projects above. A minimum of two of the submitted projects must have been performed simultaneously.

Demonstrate experience performing as a prime contractor through submission of the three (3) required projects above.

Demonstrate experience managing and applying control measures to asbestos transite pipe abatement that adequately assures work will be conducted within all applicable laws and regulations as well as the requirements of this contract.

Demonstrate experience managing warranty issues.

Demonstrate experience responding to unknown/unforeseen conditions

The Government will not evaluate projects performed by parent, affiliate, subsidiary, sister or any other company with a similar relationship to the offeror.

(ii) Basis of Evaluation: An acceptable proposal shall demonstrate the following through the three (3) to five (5) submitted projects:

- Relevant experience in a diverse range of construction trades, such as new utility construction and demolition as well as maintenance and repair of utility systems and infrastructure, ranging in price from approximately \$30,000.00 to approximately \$750,000.00, and completed within the past three (3) years from the date of receipt of proposals. A diverse range of construction is defined as at least two (2) different types of construction tasks related to utilities (i.e. repair of infrastructure, alterations of utility systems or infrastructure, demolition, new construction, etc).
- Experience working simultaneously on several projects.
- Experience performing as a prime contractor.
- Ability to manage and apply control measures to asbestos transite pipe abatement that adequately assure work will be conducted within all applicable laws and regulations as well as the requirements of this contract.
- Ability to manage warranty issues.
- Ability to respond to unknown/unforeseen conditions.

If less than three (3) relevant projects are submitted, or all of the requirements above are not demonstrated, the offeror will receive an “unacceptable” rating.

(2) **Factor 2, Safety:**

(i) Solicitation Submittal Requirements: The Offeror shall submit the following information: (For a partnership or joint venture, the following submittal requirements

are required for each contractor who is part of the partnership or joint venture; however, only one safety narrative is required. EMR and DART Rates shall not be submitted for subcontractors.)

(1) Experience Modification Rate (EMR): For the three previous complete calendar years 2012, 2013, and 2014, submit your EMR (which compares your company's annual losses in insurance claims against its policy premiums over a three year period). EMR's shall be submitted on insurance company letterhead. If you have no EMR, affirmatively state so, and explain why. Any extenuating circumstances that affected the EMR and upward or downward trends should be addressed as part of this element. Lower EMRs will be given greater weight in the evaluation.

(2) OSHA Days Away from Work, Restricted Duty, or Job Transfer (DART) Rate: For the three previous complete calendar years 2012, 2013, and 2014, submit your OSHA Days Away from Work, Restricted Duty, or Job Transfer (DART) Rate, as defined by the U.S. Department of Labor, Occupational Safety and Health Administration. If you cannot submit an OSHA DART Rate, affirmatively state so, and explain why. Any extenuating circumstances that affected the OSHA DART Rate data and upward or downward trends should be addressed as part of this element. Lower OSHA DART Rates will be given greater weight in the evaluation.

(3) Technical Approach for Safety: Describe the plan that the Offeror will implement to evaluate safety performance of potential subcontractors, as a part of the selection process for all levels of subcontractors. Also, describe any innovative methods that the Offeror will employ to ensure and monitor safe work practices at all subcontractor levels. The Safety Narrative shall be limited to two pages.

(ii) Basis of Evaluation: The Government is seeking to determine that the Offeror has consistently demonstrated a commitment to safety and that the Offeror plans to properly manage and implement safety procedures for itself and its subcontractors. The Government will evaluate the Offeror's overall safety record, the Offeror's plan to select and monitor subcontractors, any and innovative safety methods that the Offeror plans to implement for this procurement. The Government's sources of information for evaluating safety may include, but are not limited to, OSHA, NAVFAC's Facility Accident and Incident Reporting (FAIR) database, and other related databases. While the Government may elect to consider data from other sources, the burden of providing detailed, current, accurate and complete safety information regarding these submittal requirements rests with the Offeror. The evaluation will collectively consider the following:

- Experience Modification Rate (EMR)
- OSHA Days Away from Work, Restricted Duty, or Job Transfer (DART) Rate
- Offeror Technical Approach to Safety
- Other sources of information available to the Government

(1) Experience Modification Rate (EMR): The Government will evaluate the EMR to determine if the Offeror has demonstrated a history of safe work practices taking into account any upward or downward trends and extenuating circumstances that impact the rating. Lower EMRs will be given greater weight in the evaluation.

(2) OSHA Days Away from Work, Restricted Duty, or Job Transfer (DART) Rate: The Government will evaluate the OSHA DART Rate to determine if the Offeror has demonstrated a history of safe work practices taking into account any upward or downward trends and extenuating circumstances that impact the rates. Lower OSHA DART Rates will be given greater weight in the evaluation.

(3) Technical Approach to Safety: The Government will evaluate the narrative to determine the degree to which subcontractor safety performance will be considered in the selection of all levels of subcontractors on the upcoming project. The Government will also evaluate the narrative to determine the degree to which innovations are being proposed that may enhance safety on this procurement. Those Offerors whose plan demonstrates a commitment to hire subcontractors with a culture of safety and who propose innovative methods to enhance a safe working environment may be given greater weight in the evaluation.

(3) **Factor 3, Past Performance:**

(i) Solicitation Submittal Requirements:

If a completed CPARS evaluation is available for the project(s) listed under Factor 1, Corporate Experience, it shall be submitted with the proposal. If there is not a completed CPARS evaluation, the Past Performance Questionnaire (PPQ) included in the solicitation is provided for the offeror or its team members to submit to the client for each project the offeror includes in its proposal for Factor 1, Corporate Experience.

AN OFFEROR SHALL NOT SUBMIT A PPQ WHEN A COMPLETED CPARS IS AVAILABLE.

If a CPARS evaluation is not available, ensure correct phone numbers and email addresses are provided for the client point of contact. Completed PPQs should be submitted with your proposal. If the offeror is unable to obtain a completed PPQ from a client for a project(s) before proposal closing date, the offeror should complete and submit with the proposal the first page of the PPQ (Attachment C), which will provide contract and client information for the respective project(s). Offerors should follow-up with clients/references to ensure timely submittal of questionnaires. If the client requests, questionnaires may be submitted directly to Lorna Tribby at lorna.tribby@navy.mil prior to proposal closing date. Offerors shall not incorporate by reference into their proposal PPQs or CPARS previously submitted for other RFPs. However, this does not preclude the Government from utilizing previously submitted PPQ information in the past performance evaluation.

Also include performance recognition documents received within the last three (3) years, such as awards, award fee determinations, customer letters of commendation, and any other forms of performance recognition.

In addition to the above, the Government may review any other sources of information for evaluating past performance. Other sources may include, but are not limited to, past performance information retrieved through the Past Performance Information Retrieval System (PPIRS) using all CAGE/DUNS numbers of team members (partnership, joint venture, teaming arrangement, or parent company/subsidiary/affiliate) identified in the offeror's proposal, inquiries of owner representative(s), and any other known sources not provided by the offeror.

While the Government may elect to consider data from other sources, the burden of providing detailed, current, accurate and complete past performance information rests with the offeror.

Note: The assessment of past performance information is separate from the responsibility determination required under FAR Subpart 9.1.

(ii) Basis of Evaluation:

The degree to which past performance evaluations and all other past performance information reviewed by the Government (e.g., PPIRS, Federal Awardee Performance and Integrity Information System (FAPIIS), Electronic Subcontract Reporting System (eSRS), performance recognition documents, and information obtained from any other source) reflect a trend of satisfactory performance considering:

- A pattern of successful completion of tasks;
- A pattern of deliverables that are timely and of good quality;
- A pattern of cooperativeness and teamwork with the Government at all levels (task managers, contracting officers, auditors, etc.);
- Recency of tasks performed that are identical to, similar to, or related to the task at hand; and
- A respect for stewardship of Government funds

PRICE PROPOSAL: *Offerors shall submit an original Price proposal. No additional copies of the price proposal are required.* The basis of price proposal shall be the exhibit line items (ELINS) for each of the contract periods.

(1) Solicitation Submittal Requirements: Offerors shall submit an one copy of the price proposal. The basis of price proposal shall be the exhibit line items (ELINS) for each of the contract periods. Offerors shall complete and submit the SF1442, SF1442 Continuation Page, and Exhibit Line Items for the entire project. Offerors shall indicate on the proposal that prices are valid for not less than sixty (60) days.

(2) Basis of Evaluation: The Government will evaluate price based on the total price. Total price consists of all line items for the base period plus all line items for both option periods. (The total price of Exhibits A, B, C, D, and E). The Government intends to evaluate all options and has included the provision FAR 52.217-5, Evaluation of Options (JUL 1990) in Section 00100 of the solicitation. In accordance with FAR 52.217-5, evaluation of options will not obligate the Government to exercise the option(s). Analysis will be performed by one or more of the following techniques to ensure a fair and reasonable price:

- (i) Comparison of proposed prices received in response to the RFP.
- (ii) Comparison of proposed prices with the IGCE.
- (iii) Comparison of proposed prices with available historical information.)

Submit the following with the price proposal:

- ... Bid Guarantee, as required by NFAS 5252.228-9302.
- ... In order to show the offeror's ability to obtain adequate financial resources to support this project, the offeror shall submit a statement from a bank or other financial institution stating its available line of credit and that its accounts are in good standing.
- ... The offeror shall demonstrate the capability to bond individual projects valued up to \$1,000,000.00 as well as the capability to bond up to \$2,000,000.00 of projects within a 12-month time period.
- ... The offeror shall provide a letter from its bonding company that describes the contractor's bonding capability.
- ... Representations and certifications shall be completed on-line in accordance with FAR 52.204-8. In addition, complete and submit the information required in Section 00600 of the specifications.

6.0 BASIS FOR AWARD

The Government reserves the right to eliminate from consideration for award any or all offers at any time prior to award of the contract; to negotiate with offerors in the competitive range; and to award the contract to the offeror submitting the lowest priced, technically acceptable offer.

As stated in the solicitation, the Government intends to evaluate proposals and award a contract without discussions with offerors (except clarifications as described in FAR 15.306(a)). The Government reserves the right to conduct discussions if the Contracting Officer later determines them to be necessary. In addition, if the Contracting Officer determines that the number of proposals that would otherwise be in the competitive range exceeds the number at which an efficient competition can be conducted, the Contracting Officer may limit the number of proposals in the competitive range to the greatest number that will permit an efficient competition among the most highly rated proposals.

(c) Submission, modification, revision, and withdrawal of proposals. (1) Unless other methods (e.g., electronic commerce or facsimile) are permitted in the solicitation, proposals and modifications to proposals shall be submitted in paper media in sealed envelopes or packages (i) addressed to the office specified in the solicitation, and (ii) showing the time and date specified for receipt, the solicitation number, and the name and address of the offeror. Offerors using commercial carriers should ensure that the proposal is marked on the outermost wrapper with the information in paragraphs (c)(1)(i) and (c)(1)(ii) of this provision.

(2) The first page of the proposal must show--

(i) The solicitation number;

(ii) The name, address, and telephone and facsimile numbers of the offeror (and electronic address if available);

(iii) A statement specifying the extent of agreement with all terms, conditions, and provisions included in the solicitation and agreement to furnish any or all items upon which prices are offered at the price set opposite each item;

(iv) Names, titles, and telephone and facsimile numbers (and electronic addresses if available) of persons authorized to negotiate on the offeror's behalf with the Government in connection with this solicitation; and

(v) Name, title, and signature of person authorized to sign the proposal. Proposals signed by an agent shall be accompanied by evidence of that agent's authority, unless that evidence has been previously furnished to the issuing office.

(3) Submission, modification, or revision, of proposals.

(i) Offerors are responsible for submitting proposals, and any modifications, or revisions, so as to reach the Government office designated in the solicitation by the time specified in the solicitation. If no time is specified in the solicitation, the time for receipt is 4:30 p.m., local time, for the designated Government office on the date that proposal or revision is due.

(ii)(A) Any proposal, modification, or revision received at the Government office designated in the solicitation after the exact time specified for receipt of offers is "late" and will not be considered unless it is received before award is made, the Contracting Officer determines that accepting the late offer would not unduly delay the acquisition; and--

(1) If it was transmitted through an electronic commerce method authorized by the solicitation, it was received at the initial point of entry to the Government infrastructure not later than 5:00 p.m. one working day prior to the date specified for receipt of proposals; or

(2) There is acceptable evidence to establish that it was received at the Government installation designated for receipt of offers and was under the Government's control prior to the time set for receipt of offers; or

(3) It is the only proposal received.

(B) However, a late modification of an otherwise successful proposal that makes its terms more favorable to the Government, will be considered at any time it is received and may be accepted.

(iii) Acceptable evidence to establish the time of receipt at the Government installation includes the time/date stamp of that installation on the proposal wrapper, other documentary evidence of receipt maintained by the installation, or oral testimony or statements of Government personnel.

(iv) If an emergency or unanticipated event interrupts normal Government processes so that proposals cannot be received at the office designated for receipt of proposals by the exact time specified in the solicitation, and urgent

Government requirements preclude amendment of the solicitation, the time specified for receipt of proposals will be deemed to be extended to the same time of day specified in the solicitation on the first work day on which normal Government processes resume.

(v) Proposals may be withdrawn by written notice received at any time before award. Oral proposals in response to oral solicitations may be withdrawn orally. If the solicitation authorizes facsimile proposals, proposals may be withdrawn via facsimile received at any time before award, subject to the conditions specified in the provision at 52.215-5, Facsimile Proposals. Proposals may be withdrawn in person by an offeror or an authorized representative, if the identity of the person requesting withdrawal is established and the person signs a receipt for the proposal before award.

(4) Unless otherwise specified in the solicitation, the offeror may propose to provide any item or combination of items.

(5) Offerors shall submit proposals in response to this solicitation in English, unless otherwise permitted by the solicitation, and in U.S. dollars, unless the provision at FAR 52.225-17, Evaluation of Foreign Currency Offers, is included in the solicitation.

(6) Offerors may submit modifications to their proposals at any time before the solicitation closing date and time, and may submit modifications in response to an amendment, or to correct a mistake at any time before award.

(7) Offerors may submit revised proposals only if requested or allowed by the Contracting Officer.

(8) Proposals may be withdrawn at any time before award. Withdrawals are effective upon receipt of notice by the Contracting Officer.

(d) Offer expiration date. Proposals in response to this solicitation will be valid for the number of days specified on the solicitation cover sheet (unless a different period is proposed by the offeror).

(e) Restriction on disclosure and use of data. Offerors that include in their proposals data that they do not want disclosed to the public for any purpose, or used by the Government except for evaluation purposes, shall--

(1) Mark the title page with the following legend: This proposal includes data that shall not be disclosed outside the Government and shall not be duplicated, used, or disclosed--in whole or in part--for any purpose other than to evaluate this proposal. If, however, a contract is awarded to this offeror as a result of--or in connection with-- the submission of this data, the Government shall have the right to duplicate, use, or disclose the data to the extent provided in the resulting contract. This restriction does not limit the Government's right to use information contained in this data if it is obtained from another source without restriction. The data subject to this restriction are contained in sheets [insert numbers or other identification of sheets]; and

(2) Mark each sheet of data it wishes to restrict with the following legend: Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal.

(f) Contract award. (1) The Government intends to award a contract or contracts resulting from this solicitation to the responsible offeror(s) whose proposal(s) represents the best value after evaluation in accordance with the factors and subfactors in the solicitation.

(2) The Government may reject any or all proposals if such action is in the Government's interest.

(3) The Government may waive informalities and minor irregularities in proposals received.

(4) The Government intends to evaluate proposals and award a contract without discussions with offerors (except clarifications as described in FAR 15.306(a)). Therefore, the offeror's initial proposal should contain the offeror's best terms from a cost or price and technical standpoint. The Government reserves the right to conduct discussions

if the Contracting Officer later determines them to be necessary. If the Contracting Officer determines that the number of proposals that would otherwise be in the competitive range exceeds the number at which an efficient competition can be conducted, the Contracting Officer may limit the number of proposals in the competitive range to the greatest number that will permit an efficient competition among the most highly rated proposals.

(5) The Government reserves the right to make an award on any item for a quantity less than the quantity offered, at the unit cost or prices offered, unless the offeror specifies otherwise in the proposal.

(6) The Government reserves the right to make multiple awards if, after considering the additional administrative costs, it is in the Government's best interest to do so.

(7) Exchanges with offerors after receipt of a proposal do not constitute a rejection or counteroffer by the Government.

(8) The Government may determine that a proposal is unacceptable if the prices proposed are materially unbalanced between line items or subline items. Unbalanced pricing exists when, despite an acceptable total evaluated price, the price of one or more contract line items is significantly overstated or understated as indicated by the application of cost or price analysis techniques. A proposal may be rejected if the Contracting Officer determines that the lack of balance poses an unacceptable risk to the Government.

(9) If a cost realism analysis is performed, cost realism may be considered by the source selection authority in evaluating performance or schedule risk.

(10) A written award or acceptance of proposal mailed or otherwise furnished to the successful offeror within the time specified in the proposal shall result in a binding contract without further action by either party.

(11) If a post-award debriefing is given to requesting offerors, the Government shall disclose the following information, if applicable:

(i) The agency's evaluation of the significant weak or deficient factors in the debriefed offeror's offer.

(ii) The overall evaluated cost or price and technical rating of the successful and the debriefed offeror and past performance information on the debriefed offeror.

(iii) The overall ranking of all offerors, when any ranking was developed by the agency during source selection.

(iv) A summary of the rationale for award.

(v) For acquisitions of commercial items, the make and model of the item to be delivered by the successful offeror.

(vi) Reasonable responses to relevant questions posed by the debriefed offeror as to whether source-selection procedures set forth in the solicitation, applicable regulations, and other applicable authorities were followed by the agency.

(End of provision)

52.216-1 TYPE OF CONTRACT (APR 1984)

The Government contemplates award of a requirements indefinite delivery/indefinite quantity contract resulting from this solicitation.

(End of provision)

52.222-23 NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY FOR CONSTRUCTION (FEB 1999)

(a) The offeror's attention is called to the Equal Opportunity clause and the Affirmative Action Compliance Requirements for Construction clause of this solicitation.

(b) The goals for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

| Goals for minority participation for each trade | Goals for female participation for each trade |
|---|---|
| 9.7% | 6.9% |

These goals are applicable to all the Contractor's construction work performed in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, the Contractor shall apply the goals established for the geographical area where the work is actually performed. Goals are published periodically in the Federal Register in notice form, and these notices may be obtained from any Office of Federal Contract Compliance Programs office.

(c) The Contractor's compliance with Executive Order 11246, as amended, and the regulations in 41 CFR 60-4 shall be based on (1) its implementation of the Equal Opportunity clause, (2) specific affirmative action obligations required by the clause entitled "Affirmative Action Compliance Requirements for Construction," and (3) its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade. The Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor, or from project to project, for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, Executive Order 11246, as amended, and the regulations in 41 CFR 60-4. Compliance with the goals will be measured against the total work hours performed.

(d) The Contractor shall provide written notification to the Deputy Assistant Secretary for Federal Contract Compliance, U.S. Department of Labor, within 10 working days following award of any construction subcontract in excess of \$10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the --

- (1) Name, address, and telephone number of the subcontractor;
- (2) Employer's identification number of the subcontractor;
- (3) Estimated dollar amount of the subcontract;
- (4) Estimated starting and completion dates of the subcontract; and
- (5) Geographical area in which the subcontract is to be performed.

(e) As used in this Notice, and in any contract resulting from this solicitation, the "covered area" is State of Indiana, Martin County, NSA Crane.

(End of provision)

52.233-2 SERVICE OF PROTEST (SEP 2006)

(a) Protests, as defined in section 33.101 of the Federal Acquisition Regulation, that are filed directly with an agency, and copies of any protests that are filed with the Government Accountability Office (GAO), shall be served on the Contracting Officer (addressed as follows) by obtaining written and dated acknowledgment of receipt from

Contracting Officer
NAVFAC Mid-Atlantic PWD Crane
300 Highway 361, B2516
Crane, IN 47522

(b) The copy of any protest shall be received in the office designated above within one day of filing a protest with the GAO.

(End of provision)

52.236-27 SITE VISIT (CONSTRUCTION) (FEB 1995)

(a) The clauses at 52.236-2, Differing Site Conditions, and 52.236-3, Site Investigations and Conditions Affecting the Work, will be included in any contract awarded as a result of this solicitation. Accordingly, offerors or quoters are urged and expected to inspect the site where the work will be performed.

(b) Site visits may be arranged during normal duty hours by contacting:

Name: Lorna D. Tribby
Address: 300 Hwy 361, B2516, Crane, IN 47522
Telephone: (812)854-6021

(End of provision)

52.236-28 PREPARATION OF PROPOSALS--CONSTRUCTION (OCT 1997)

(a) Proposals must be (1) submitted on the forms furnished by the Government or on copies of those forms, and (2) manually signed. The person signing a proposal must initial each erasure or change appearing on any proposal form.

(b) The proposal form may require offerors to submit proposed prices for one or more items on various bases, including--

(1) Lump sum price;

(2) Alternate prices;

(3) Units of construction; or

(4) Any combination of paragraphs (b)(1) through (b)(3) of this provision.

(c) If the solicitation requires submission of a proposal on all items, failure to do so may result in the proposal being rejected without further consideration. If a proposal on all items is not required, offerors should insert the words “no proposal” in the space provided for any item on which no price is submitted.

(d) Alternate proposals will not be considered unless this solicitation authorizes their submission.

(End of provision)

52.252-1 SOLICITATION PROVISIONS INCORPORATED BY REFERENCE (FEB 1998)

This solicitation incorporates one or more solicitation provisions by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. The offeror is cautioned that the listed provisions may include blocks that must be completed by the offeror and submitted with its quotation or offer. In lieu of submitting the full text of those provisions, the offeror may identify the provision by paragraph identifier and provide the appropriate information with its quotation or offer. Also, the full text of a solicitation provision may be accessed electronically at this/these address(es):

<http://farsite.hill.af.mil/vffara.htm>

(End of provision)

Section 00600 - Representations & Certifications

CLAUSES INCORPORATED BY REFERENCE

| | | |
|--------------|--|----------|
| 52.209-2 | Prohibition on Contracting with Inverted Domestic Corporations--Representation | DEC 2014 |
| 252.247-7022 | Representation Of Extent Of Transportation Of Supplies By Sea | AUG 1992 |

CLAUSES INCORPORATED BY FULL TEXT

52.204-8 ANNUAL REPRESENTATIONS AND CERTIFICATIONS (DEC 2014)

(a)(1) The North American Industry Classification System (NAICS) code for this acquisition is 237110.

(2) The small business size standard is \$36.5M.

(3) The small business size standard for a concern which submits an offer in its own name, other than on a construction or service contract, but which proposes to furnish a product which it did not itself manufacture, is 500 employees.

(b)(1) If the provision at 52.204-7, System for Award Management, is included in this solicitation, paragraph (d) of this provision applies.

(2) If the provision at 52.204-7 is not included in this solicitation, and the offeror is currently registered in System for Award Management (SAM), and has completed the Representations and Certifications section of SAM electronically, the offeror may choose to use paragraph (d) of this provision instead of completing the corresponding individual representations and certifications in the solicitation. The offeror shall indicate which option applies by checking one of the following boxes:

() Paragraph (d) applies.

() Paragraph (d) does not apply and the offeror has completed the individual representations and certifications in the solicitation.

(c) (1) The following representations or certifications in SAM are applicable to this solicitation as indicated:

(i) 52.203-2, Certificate of Independent Price Determination. This provision applies to solicitations when a firm-fixed-price contract or fixed-price contract with economic price adjustment is contemplated, unless—

(A) The acquisition is to be made under the simplified acquisition procedures in Part 13;

(B) The solicitation is a request for technical proposals under two-step sealed bidding procedures; or

(C) The solicitation is for utility services for which rates are set by law or regulation.

(ii) 52.203-11, Certification and Disclosure Regarding Payments to Influence Certain Federal Transactions. This provision applies to solicitations expected to exceed \$150,000.

- (iii) 52.204-3, Taxpayer Identification. This provision applies to solicitations that do not include the provision at 52.204-7, System for Award Management.
- (iv) 52.204-5, Women-Owned Business (Other Than Small Business). This provision applies to solicitations that—
- (A) Are not set aside for small business concerns;
 - (B) Exceed the simplified acquisition threshold; and
 - (C) Are for contracts that will be performed in the United States or its outlying areas.
- (v) 52.209-2; Prohibition on Contracting with Inverted Domestic Corporations--Representation.
- (vi) 52.209-5; Certification Regarding Responsibility Matters. This provision applies to solicitations where the contract value is expected to exceed the simplified acquisition threshold.
- (vii) 52.214-14, Place of Performance--Sealed Bidding. This provision applies to invitations for bids except those in which the place of performance is specified by the Government.
- (viii) 52.215-6, Place of Performance. This provision applies to solicitations unless the place of performance is specified by the Government.
- (ix) 52.219-1, Small Business Program Representations (Basic & Alternate I). This provision applies to solicitations when the contract will be performed in the United States or its outlying areas.
- (A) The basic provision applies when the solicitations are issued by other than DoD, NASA, and the Coast Guard.
 - (B) The provision with its Alternate I applies to solicitations issued by DoD, NASA, or the Coast Guard.
- (x) 52.219-2, Equal Low Bids. This provision applies to solicitations when contracting by sealed bidding and the contract will be performed in the United States or its outlying areas.
- (xi) 52.222-22, Previous Contracts and Compliance Reports. This provision applies to solicitations that include the clause at 52.222-26, Equal Opportunity.
- (xii) 52.222-25, Affirmative Action Compliance. This provision applies to solicitations, other than those for construction, when the solicitation includes the clause at 52.222-26, Equal Opportunity.
- (xiii) 52.222-38, Compliance with Veterans' Employment Reporting Requirements. This provision applies to solicitations when it is anticipated the contract award will exceed the simplified acquisition threshold and the contract is not for acquisition of commercial items.
- (xiv) 52.223-1, Biobased Product Certification. This provision applies to solicitations that require the delivery or specify the use of USDA-designated items; or include the clause at 52.223-2, Affirmative Procurement of Biobased Products Under Service and Construction Contracts.
- (xv) 52.223-4, Recovered Material Certification. This provision applies to solicitations that are for, or specify the use of, EPA- designated items.
- (xvi) 52.225-2, Buy American Certificate. This provision applies to solicitations containing the clause at 52.225-1.

(xvii) 52.225-4, Buy American--Free Trade Agreements--Israeli Trade Act Certificate. (Basic, Alternates I, II, and III.) This provision applies to solicitations containing the clause at 52.225- 3.

(A) If the acquisition value is less than \$25,000, the basic provision applies.

(B) If the acquisition value is \$25,000 or more but is less than \$50,000, the provision with its Alternate I applies.

(C) If the acquisition value is \$50,000 or more but is less than \$79,507, the provision with its Alternate II applies.

(D) If the acquisition value is \$79,507 or more but is less than \$100,000, the provision with its Alternate III applies.

(xviii) 52.225-6, Trade Agreements Certificate. This provision applies to solicitations containing the clause at 52.225-5.

(xix) 52.225-20, Prohibition on Conducting Restricted Business Operations in Sudan--Certification. This provision applies to all solicitations.

(xx) 52.225-25, Prohibition on Contracting with Entities Engaging in Certain Activities or Transactions Relating to Iran—Representation and Certification. This provision applies to all solicitations.

(xxi) 52.226-2, Historically Black College or University and Minority Institution Representation. This provision applies to solicitations for research, studies, supplies, or services of the type normally acquired from higher educational institutions.

(2) The following certifications are applicable as indicated by the Contracting Officer:

[Contracting Officer check as appropriate.]

X (i) 52.204-17, Ownership or Control of Offeror.

(ii) 52.222-18, Certification Regarding Knowledge of Child Labor for Listed End Products.

(iii) 52.222-48, Exemption from Application of the Service Contract Labor Standards to Contracts for Maintenance, Calibration, or Repair of Certain Equipment--Certification.

(iv) 52.222-52 Exemption from Application of the Service Contract Labor Standards to Contracts for Certain Services--Certification.

(v) 52.223-9, with its Alternate I, Estimate of Percentage of Recovered Material Content for EPA-Designated Products (Alternate I only).

(vi) 52.227-6, Royalty Information.

(A) Basic.

(B) Alternate I.

(vii) 52.227-15, Representation of Limited Rights Data and Restricted Computer Software.

(d) The offeror has completed the annual representations and certifications electronically via the SAM website accessed through <https://www.acquisition.gov>. After reviewing the SAM database information, the offeror verifies by submission of the offer that the representations and certifications currently posted electronically that apply to this solicitation as indicated in paragraph (c) of this provision have been entered or updated within the last 12 months, are current, accurate, complete, and applicable to this solicitation (including the business size standard applicable to the NAICS code referenced for this solicitation), as of the date of this offer and are incorporated in this offer by reference (see FAR 4.1201); except for the changes identified below [offeror to insert changes, identifying change by clause number, title, date]. These amended representation(s) and/or certification(s) are also incorporated in this offer and are current, accurate, and complete as of the date of this offer.

| FAR Clause | Title | Date | Change |
|------------|-------|-------|--------|
| ----- | ----- | ----- | ----- |
| ----- | ----- | ----- | ----- |

Any changes provided by the offeror are applicable to this solicitation only, and do not result in an update to the representations and certifications posted on SAM.

(End of provision)

52.209-5 CERTIFICATION REGARDING RESPONSIBILITY MATTERS (OCT 2015)

(a)(1) The Offeror certifies, to the best of its knowledge and belief, that-

(i) The Offeror and/or any of its Principals-

(A) Are () are not () presently debarred, suspended, proposed for debarment, or declared ineligible for the award of contracts by any Federal agency;

(B) Have () have not (), within a three-year period preceding this offer, been convicted of or had a civil judgment rendered against them for: commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) contract or subcontract; violation of Federal or State antitrust statutes relating to the submission of offers; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, tax evasion, violating Federal criminal tax laws, or receiving stolen property (if offeror checks "have", the offeror shall also see 52.209-7, if included in this solicitation); and

(C) Are () are not () presently indicted for, or otherwise criminally or civilly charged by a governmental entity with, commission of any of the offenses enumerated in paragraph (a)(1)(i)(B) of this provision.; and

(D) Have , have not , within a three-year period preceding this offer, been notified of any delinquent Federal taxes in an amount that exceeds \$3,500 for which the liability remains unsatisfied.

(1) Federal taxes are considered delinquent if both of the following criteria apply:

(i) The tax liability is finally determined. The liability is finally determined if it has been assessed. A liability is not finally determined if there is a pending administrative or judicial challenge. In the case of a judicial challenge to the liability, the liability is not finally determined until all judicial appeal rights have been exhausted.

(ii) The taxpayer is delinquent in making payment. A taxpayer is delinquent if the taxpayer has failed to pay the tax liability when full payment was due and required. A taxpayer is not delinquent in cases where enforced collection action is precluded.

(2) Examples. (i) The taxpayer has received a statutory notice of deficiency, under I.R.C. Sec. 6212, which entitles the taxpayer to seek Tax Court review of a proposed tax deficiency. This is not a delinquent tax because it is not a final tax liability. Should the taxpayer seek Tax Court review, this will not be a final tax liability until the taxpayer has exercised all judicial appeal rights.

(ii) The IRS has filed a notice of Federal tax lien with respect to an assessed tax liability, and the taxpayer has been issued a notice under I.R.C. Sec. 6320 entitling the taxpayer to request a hearing with the IRS Office of Appeals contesting the lien filing, and to further appeal to the Tax Court if the IRS determines to sustain the lien filing. In the course of the hearing, the taxpayer is entitled to contest the underlying tax liability because the taxpayer has had no prior opportunity to contest the liability. This is not a delinquent tax because it is not a final tax liability. Should the taxpayer seek tax court review, this will not be a final tax liability until the taxpayer has exercised all judicial appeal rights.

(iii) The taxpayer has entered into an installment agreement pursuant to I.R.C. Sec. 6159. The taxpayer is making timely payments and is in full compliance with the agreement terms. The taxpayer is not delinquent because the taxpayer is not currently required to make full payment.

(iv) The taxpayer has filed for bankruptcy protection. The taxpayer is not delinquent because enforced collection action is stayed under 11 U.S.C. 362 (the Bankruptcy Code).

(ii) The Offeror has () has not (), within a three-year period preceding this offer, had one or more contracts terminated for default by any Federal agency.

(2) Principal, for the purposes of this certification, means an officer, director, owner, partner, or a person having primary management or supervisory responsibilities within a business entity (e.g., general manager; plant manager; head of a division or business segment; and similar positions).

(b) The Offeror shall provide immediate written notice to the Contracting Officer if, at any time prior to contract award, the Offeror learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

(c) A certification that any of the items in paragraph (a) of this provision exists will not necessarily result in withholding of an award under this solicitation. However, the certification will be considered in connection with a determination of the Offeror's responsibility. Failure of the Offeror to furnish a certification or provide such additional information as requested by the Contracting Officer may render the Offeror nonresponsible.

(d) Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render, in good faith, the certification required by paragraph (a) of this provision. The knowledge and information of an Offeror is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

(e) The certification in paragraph (a) of this provision is a material representation of fact upon which reliance was placed when making award. If it is later determined that the Offeror knowingly rendered an erroneous certification, in addition to other remedies available to the Government, the Contracting Officer may terminate the contract resulting from this solicitation for default.

(End of provision)

52.209-7 INFORMATION REGARDING RESPONSIBILITY MATTERS (JULY 2013)

(a) Definitions. As used in this provision--

Administrative proceeding means a non-judicial process that is adjudicatory in nature in order to make a determination of fault or liability (e.g., Securities and Exchange Commission Administrative Proceedings, Civilian Board of Contract Appeals Proceedings, and Armed Services Board of Contract Appeals Proceedings). This includes administrative proceedings at the Federal and State level but only in connection with performance of a Federal contract or grant. It does not include agency actions such as contract audits, site visits, corrective plans, or inspection of deliverables.

Federal contracts and grants with total value greater than \$10,000,000 means--

- (1) The total value of all current, active contracts and grants, including all priced options; and
- (2) The total value of all current, active orders including all priced options under indefinite-delivery, indefinite-quantity, 8(a), or requirements contracts (including task and delivery and multiple-award Schedules).

Principal means an officer, director, owner, partner, or a person having primary management or supervisory responsibilities within a business entity (e.g., general manager; plant manager; head of a division or business segment; and similar positions).

(b) The offeror () has () does not have current active Federal contracts and grants with total value greater than \$10,000,000.

(c) If the offeror checked "has" in paragraph (b) of this provision, the offeror represents, by submission of this offer, that the information it has entered in the Federal Awardee Performance and Integrity Information System (FAPIS) is current, accurate, and complete as of the date of submission of this offer with regard to the following information:

(1) Whether the offeror, and/or any of its principals, has or has not, within the last five years, in connection with the award to or performance by the offeror of a Federal contract or grant, been the subject of a proceeding, at the Federal or State level that resulted in any of the following dispositions:

- (i) In a criminal proceeding, a conviction.
- (ii) In a civil proceeding, a finding of fault and liability that results in the payment of a monetary fine, penalty, reimbursement, restitution, or damages of \$5,000 or more.
- (iii) In an administrative proceeding, a finding of fault and liability that results in--

(A) The payment of a monetary fine or penalty of \$5,000 or more; or

(B) The payment of a reimbursement, restitution, or damages in excess of \$100,000.

(iv) In a criminal, civil, or administrative proceeding, a disposition of the matter by consent or compromise with an acknowledgment of fault by the Contractor if the proceeding could have led to any of the outcomes specified in paragraphs (c)(1)(i), (c)(1)(ii), or (c)(1)(iii) of this provision.

(2) If the offeror has been involved in the last five years in any of the occurrences listed in (c)(1) of this provision, whether the offeror has provided the requested information with regard to each occurrence.

(d) The offeror shall post the information in paragraphs (c)(1)(i) through (c)(1)(iv) of this provision in FAPIIS as required through maintaining an active registration in the System for Award Management database via <https://www.acquisition.gov> (see 52.204-7).

(End of provision)

Section 00700 - Contract Clauses

CLAUSES INCORPORATED BY REFERENCE

| | | |
|-----------------|--|----------|
| 52.202-1 | Definitions | NOV 2013 |
| 52.203-3 | Gratuities | APR 1984 |
| 52.203-5 | Covenant Against Contingent Fees | MAY 2014 |
| 52.203-6 | Restrictions On Subcontractor Sales To The Government | SEP 2006 |
| 52.203-7 | Anti-Kickback Procedures | MAY 2014 |
| 52.203-8 | Cancellation, Rescission, and Recovery of Funds for Illegal or Improper Activity | MAY 2014 |
| 52.203-10 | Price Or Fee Adjustment For Illegal Or Improper Activity | MAY 2014 |
| 52.203-12 | Limitation On Payments To Influence Certain Federal Transactions | OCT 2010 |
| 52.203-17 | Contractor Employee Whistleblower Rights and Requirement To Inform Employees of Whistleblower Rights | APR 2014 |
| 52.204-2 Alt II | Security Requirements (Aug 1996) - Alternate II | APR 1984 |
| 52.204-4 | Printed or Copied Double-Sided on Postconsumer Fiber Content Paper | MAY 2011 |
| 52.204-7 | System for Award Management | JUL 2013 |
| 52.204-9 | Personal Identity Verification of Contractor Personnel | JAN 2011 |
| 52.204-10 | Reporting Executive Compensation and First-Tier Subcontract Awards | OCT 2015 |
| 52.204-13 | System for Award Management Maintenance | JUL 2013 |
| 52.204-15 | Service Contract Reporting Requirements for Indefinite-Delivery Contracts | JAN 2014 |
| 52.209-6 | Protecting the Government's Interest When Subcontracting With Contractors Debarred, Suspended, or Proposed for Debarment | OCT 2015 |
| 52.209-9 | Updates of Publicly Available Information Regarding Responsibility Matters | JUL 2013 |
| 52.209-10 | Prohibition on Contracting With Inverted Domestic Corporations | DEC 2014 |
| 52.211-13 | Time Extensions | SEP 2000 |
| 52.211-15 | Defense Priority And Allocation Requirements | APR 2008 |
| 52.215-2 | Audit and Records--Negotiation | OCT 2010 |
| 52.219-6 | Notice Of Total Small Business Set-Aside | NOV 2011 |
| 52.219-8 | Utilization of Small Business Concerns | OCT 2014 |
| 52.219-14 | Limitations On Subcontracting | NOV 2011 |
| 52.219-28 | Post-Award Small Business Program Rerepresentation | JUL 2013 |
| 52.222-1 | Notice To The Government Of Labor Disputes | FEB 1997 |
| 52.222-3 | Convict Labor | JUN 2003 |
| 52.222-4 | Contract Work Hours and Safety Standards- Overtime Compensation | MAY 2014 |
| 52.222-5 | Construction Wage Rate Requirements--Secondary Site of the Work | MAY 2014 |
| 52.222-6 | Construction Wage Rate Requirements | MAY 2014 |
| 52.222-7 | Withholding of Funds | MAY 2014 |
| 52.222-8 | Payrolls and Basic Records | MAY 2014 |
| 52.222-9 | Apprentices and Trainees | JUL 2005 |
| 52.222-10 | Compliance with Copeland Act Requirements | FEB 1988 |
| 52.222-11 | Subcontracts (Labor Standards) | MAY 2014 |
| 52.222-12 | Contract Termination-Debarment | MAY 2014 |

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|-----------------|---|----------|
| 52.222-13 | Compliance With Construction Wage Rate Requirements and Related Regulations | MAY 2014 |
| 52.222-14 | Disputes Concerning Labor Standards | FEB 1988 |
| 52.222-15 | Certification of Eligibility | MAY 2014 |
| 52.222-21 | Prohibition Of Segregated Facilities | APR 2015 |
| 52.222-26 | Equal Opportunity | APR 2015 |
| 52.222-27 | Affirmative Action Compliance Requirements for Construction | APR 2015 |
| 52.222-35 | Equal Opportunity for Veterans | OCT 2015 |
| 52.222-36 | Equal Opportunity for Workers with Disabilities | JUL 2014 |
| 52.222-37 | Employment Reports on Veterans | OCT 2015 |
| 52.222-50 | Combating Trafficking in Persons | MAR 2015 |
| 52.223-2 | Affirmative Procurement of Biobased Products Under Service and Construction Contracts | SEP 2013 |
| 52.223-3 | Hazardous Material Identification And Material Safety Data | JAN 1997 |
| 52.223-5 | Pollution Prevention and Right-to-Know Information | MAY 2011 |
| 52.223-6 | Drug-Free Workplace | MAY 2001 |
| 52.223-17 | Affirmative Procurement of EPA-Designated Items in Service and Construction Contracts | MAY 2008 |
| 52.223-18 | Encouraging Contractor Policies To Ban Text Messaging While Driving | AUG 2011 |
| 52.224-1 | Privacy Act Notification | APR 1984 |
| 52.224-2 | Privacy Act | APR 1984 |
| 52.225-9 | Buy American--Construction Materials | MAY 2014 |
| 52.225-10 | Notice of Buy American Requirement--Construction Materials | MAY 2014 |
| 52.225-13 | Restrictions on Certain Foreign Purchases | JUN 2008 |
| 52.226-1 | Utilization Of Indian Organizations And Indian-Owned Economic Enterprises | JUN 2000 |
| 52.227-1 | Authorization and Consent | DEC 2007 |
| 52.227-2 | Notice And Assistance Regarding Patent And Copyright Infringement | DEC 2007 |
| 52.227-4 | Patent Indemnity-Construction Contracts | DEC 2007 |
| 52.228-1 | Bid Guarantee | SEP 1996 |
| 52.228-5 | Insurance - Work On A Government Installation | JAN 1997 |
| 52.228-11 | Pledges Of Assets | JAN 2012 |
| 52.228-12 | Prospective Subcontractor Requests for Bonds | MAY 2014 |
| 52.228-14 | Irrevocable Letter of Credit | NOV 2014 |
| 52.229-3 | Federal, State And Local Taxes | FEB 2013 |
| 52.232-5 | Payments under Fixed-Price Construction Contracts | MAY 2014 |
| 52.232-17 | Interest | MAY 2014 |
| 52.232-18 | Availability Of Funds | APR 1984 |
| 52.232-23 Alt I | Assignment of Claims (May 2014) - Alternate I | APR 1984 |
| 52.232-27 | Prompt Payment for Construction Contracts | MAY 2014 |
| 52.232-33 | Payment by Electronic Funds Transfer--System for Award Management | JUL 2013 |
| 52.232-39 | Unenforceability of Unauthorized Obligations | JUN 2013 |
| 52.233-1 Alt I | Disputes (May 2014) - Alternate I | DEC 1991 |
| 52.233-4 | Applicable Law for Breach of Contract Claim | OCT 2004 |
| 52.236-1 | Performance of Work by the Contractor | APR 1984 |
| 52.236-2 | Differing Site Conditions | APR 1984 |
| 52.236-4 | Physical Data | APR 1984 |
| 52.236-5 | Material and Workmanship | APR 1984 |
| 52.236-6 | Superintendence by the Contractor | APR 1984 |

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|--------------------|--|----------|
| 52.236-7 | Permits and Responsibilities | NOV 1991 |
| 52.236-8 | Other Contracts | APR 1984 |
| 52.236-9 | Protection of Existing Vegetation, Structures, Equipment, Utilities, and Improvements | APR 1984 |
| 52.236-10 | Operations and Storage Areas | APR 1984 |
| 52.236-11 | Use and Possession Prior to Completion | APR 1984 |
| 52.236-12 | Cleaning Up | APR 1984 |
| 52.236-13 | Accident Prevention | NOV 1991 |
| 52.236-14 | Availability and Use of Utility Services | APR 1984 |
| 52.236-15 | Schedules for Construction Contracts | APR 1984 |
| 52.236-17 | Layout of Work | APR 1984 |
| 52.236-21 | Specifications and Drawings for Construction | FEB 1997 |
| 52.236-26 | Preconstruction Conference | FEB 1995 |
| 52.242-13 | Bankruptcy | JUL 1995 |
| 52.242-14 | Suspension of Work | APR 1984 |
| 52.243-1 | Changes--Fixed Price | AUG 1987 |
| 52.243-4 | Changes | JUN 2007 |
| 52.244-6 | Subcontracts for Commercial Items | OCT 2015 |
| 52.245-1 | Government Property | APR 2012 |
| 52.245-2 | Government Property Installation Operation Services | APR 2012 |
| 52.246-12 | Inspection of Construction | AUG 1996 |
| 52.246-21 | Warranty of Construction | MAR 1994 |
| 52.248-3 | Value Engineering-Construction | OCT 2015 |
| 52.249-2 Alt I | Termination for Convenience of the Government (Fixed- Price) (Apr 2012) - Alternate I | SEP 1996 |
| 52.249-10 | Default (Fixed-Price Construction) | APR 1984 |
| 52.252-4 | Alterations in Contract | APR 1984 |
| 52.253-1 | Computer Generated Forms | JAN 1991 |
| 252.201-7000 | Contracting Officer's Representative | DEC 1991 |
| 252.203-7000 | Requirements Relating to Compensation of Former DoD Officials | SEP 2011 |
| 252.203-7001 | Prohibition On Persons Convicted of Fraud or Other Defense- Contract-Related Felonies | DEC 2008 |
| 252.203-7002 | Requirement to Inform Employees of Whistleblower Rights | SEP 2013 |
| 252.203-7005 | Representation Relating to Compensation of Former DoD Officials | NOV 2011 |
| 252.203-7998 (Dev) | Prohibition on Contracting with Entities that Require Certain Internal Confidentiality Agreements—Representation. (DEVIATION 2015-O0010) | FEB 2015 |
| 252.203-7999 (Dev) | Prohibition on Contracting with Entities that Require Certain Internal Confidentiality Agreements. (DEVIATION 2015- O0010) | FEB 2015 |
| 252.204-7000 | Disclosure Of Information | AUG 2013 |
| 252.204-7003 | Control Of Government Personnel Work Product | APR 1992 |
| 252.204-7004 Alt A | System for Award Management Alternate A | FEB 2014 |
| 252.204-7005 | Oral Attestation of Security Responsibilities | NOV 2001 |
| 252.204-7012 | Safeguarding Covered Defense Information and Cyber Incident Reporting. | SEP 2015 |
| 252.205-7000 | Provision Of Information To Cooperative Agreement Holders | DEC 1991 |
| 252.209-7004 | Subcontracting With Firms That Are Owned or Controlled By The Government of a Country that is a State Sponsor of Terrorism | OCT 2015 |
| 252.222-7006 | Restrictions on the Use of Mandatory Arbitration Agreements | DEC 2010 |
| 252.223-7001 | Hazard Warning Labels | DEC 1991 |

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| 252.223-7004 | Drug Free Work Force | SEP 1988 |
| 252.223-7006 | Prohibition On Storage, Treatment, and Disposal of Toxic or Hazardous Materials | SEP 2014 |
| 252.225-7012 | Preference For Certain Domestic Commodities | FEB 2013 |
| 252.225-7016 | Restriction On Acquisition Of Ball and Roller Bearings | JUN 2011 |
| 252.225-7030 | Restriction On Acquisition Of Carbon, Alloy, And Armor Steel Plate | DEC 2006 |
| 252.225-7031 | Secondary Arab Boycott Of Israel | JUN 2005 |
| 252.227-7025 | Limitations on the Use or Disclosure of Government-Furnished Information Marked with Restrictive Legends | MAY 2013 |
| 252.227-7033 | Rights in Shop Drawings | APR 1966 |
| 252.231-7000 | Supplemental Cost Principles | DEC 1991 |
| 252.232-7003 | Electronic Submission of Payment Requests and Receiving Reports | JUN 2012 |
| 252.232-7010 | Levies on Contract Payments | DEC 2006 |
| 252.236-7000 | Modification Proposals-Price Breakdown | DEC 1991 |
| 252.243-7001 | Pricing Of Contract Modifications | DEC 1991 |
| 252.243-7002 | Requests for Equitable Adjustment | DEC 2012 |
| 252.244-7000 | Subcontracts for Commercial Items | JUN 2013 |
| 252.247-7023 | Transportation of Supplies by Sea | APR 2014 |
| 252.247-7024 | Notification Of Transportation Of Supplies By Sea | MAR 2000 |

CLAUSES INCORPORATED BY FULL TEXT

52.211-10 COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK (APR 1984)

The Contractor shall be required to (a) commence work under this contract within 15 calendar days after the date the Contractor receives the notice to proceed, (b) prosecute the work diligently, and (c) complete the entire work ready for use not later than 365 calendar days after award/notice to proceed. The time stated for completion shall include final cleanup of the premises.

Completion times for individual task orders will be stated on each task order.

(End of clause)

CLAUSES INCORPORATED BY FULL TEXT

52.211-12 LIQUIDATED DAMAGES--CONSTRUCTION (SEP 2000)

(a) If the Contractor fails to complete the work within the time specified in the contract, the Contractor shall pay liquidated damages to the Government in the amount shown on the task order for each calendar day of delay until the work is completed or accepted.

(b) If the Government terminates the Contractor's right to proceed, liquidated damages will continue to accrue until the work is completed. These liquidated damages are in addition to excess costs of repurchase under the Termination clause.

(End of clause)

CLAUSES INCORPORATED BY FULL TEXT

52.211-14 NOTICE OF PRIORITY RATING FOR NATIONAL DEFENSE, EMERGENCY PREPAREDNESS, AND ENERGY PROGRAM USE (APR 2008)

Any contract awarded as a result of this solicitation will be DO-C2 rated order certified for national defense, emergency preparedness, and energy program use under the Defense Priorities and Allocations System (DPAS) (15 CFR 700), and the Contractor will be required to follow all of the requirements of this regulation. [Contracting Officer check appropriate box.]

(End of provision)

CLAUSES INCORPORATED BY FULL TEXT

52.216-18 ORDERING. (OCT 1995)

(a) Any supplies and services to be furnished under this contract shall be ordered by issuance of delivery orders or task orders by the individuals or activities designated in the Schedule. Such orders may be issued from **date of award of the contract** through **the contract completion date**.

(b) All delivery orders or task orders are subject to the terms and conditions of this contract. In the event of conflict between a delivery order or task order and this contract, the contract shall control.

(c) If mailed, a delivery order or task order is considered "issued" when the Government deposits the order in the mail. Orders may be issued orally, by facsimile, or by electronic commerce methods only if authorized in the Schedule.

(End of clause)

CLAUSES INCORPORATED BY FULL TEXT

52.216-19 ORDER LIMITATIONS. (OCT 1995)

(a) Minimum order. When the Government requires supplies or services covered by this contract in an amount of less than **\$2,000.00**, the Government is not obligated to purchase, nor is the Contractor obligated to furnish, those supplies or services under the contract.

(b) Maximum order. The Contractor is not obligated to honor:

(1) Any order for a single item in excess of **\$1,000,000.00**;

(2) Any order for a combination of items in excess of **\$3,000,000.00**; or

(3) A series of orders from the same ordering office within 30 days that together call for quantities exceeding the limitation in subparagraph (1) or (2) above.

(c) If this is a requirements contract (i.e., includes the Requirements clause at subsection 52.216-21 of the Federal Acquisition Regulation (FAR)), the Government is not required to order a part of any one requirement from the Contractor if that requirement exceeds the maximum-order limitations in paragraph (b) above.

(d) Notwithstanding paragraphs (b) and (c) above, the Contractor shall honor any order exceeding the maximum order limitations in paragraph (b), unless that order (or orders) is returned to the ordering office within 2 days after issuance, with written notice stating the Contractor's intent not to ship the item (or items) called for and the reasons. Upon receiving this notice, the Government may acquire the supplies or services from another source.

(End of clause)

CLAUSES INCORPORATED BY FULL TEXT

52.216-21 REQUIREMENTS (OCT 1995)

(a) This is a requirements contract for the supplies or services specified, and effective for the period stated, in the Schedule. The quantities of supplies or services specified in the Schedule are estimates only and are not purchased by this contract. Except as this contract may otherwise provide, if the Government's requirements do not result in orders in the quantities described as "estimated" or "maximum" in the Schedule, that fact shall not constitute the basis for an equitable price adjustment.

(b) Delivery or performance shall be made only as authorized by orders issued in accordance with the Ordering clause. Subject to any limitations in the Order Limitations clause or elsewhere in this contract, the Contractor shall furnish to the Government all supplies or services specified in the Schedule and called for by orders issued in accordance with the Ordering clause. The Government may issue orders requiring delivery to multiple destinations or performance at multiple locations.

(c) Except as this contract otherwise provides, the Government shall order from the Contractor all the supplies or services specified in the Schedule that are required to be purchased by the Government activity or activities specified in the Schedule.

(d) The Government is not required to purchase from the Contractor requirements in excess of any limit on total orders under this contract.

(e) If the Government urgently requires delivery of any quantity of an item before the earliest date that delivery may be specified under this contract, and if the Contractor will not accept an order providing for the accelerated delivery, the Government may acquire the urgently required goods or services from another source.

(f) Any order issued during the effective period of this contract and not completed within that period shall be completed by the Contractor within the time specified in the order. The contract shall govern the Contractor's and Government's rights and obligations with respect to that order to the same extent as if the order were completed during the contract's effective period; provided, that the Contractor shall not be required to make any deliveries under this contract after **task order completion date**.

(End of clause)

CLAUSES INCORPORATED BY FULL TEXT

52.216-22 INDEFINITE QUANTITY. (OCT 1995)

(a) This is an indefinite-quantity contract for the supplies or services specified, and effective for the period stated, in the Schedule. The quantities of supplies and services specified in the Schedule are estimates only and are not purchased by this contract.

(b) Delivery or performance shall be made only as authorized by orders issued in accordance with the Ordering clause. The Contractor shall furnish to the Government, when and if ordered, the supplies or services specified in the Schedule up to and including the quantity designated in the Schedule as the "maximum". The Government shall order at least the quantity of supplies or services designated in the Schedule as the "minimum".

(c) Except for any limitations on quantities in the Order Limitations clause or in the Schedule, there is no limit on the number of orders that may be issued. The Government may issue orders requiring delivery to multiple destinations or performance at multiple locations.

(d) Any order issued during the effective period of this contract and not completed within that period shall be completed by the Contractor within the time specified in the order. The contract shall govern the Contractor's and Government's rights and obligations with respect to that order to the same extent as if the order were completed during the contract's effective period; provided, that the Contractor shall not be required to make any deliveries under this contract after **the completion date of the final task order**.

(End of clause)

52.217-9 OPTION TO EXTEND THE TERM OF THE CONTRACT (MAR 2000)

(a) The Government may extend the term of this contract by written notice to the Contractor within 365 days from award of basic contract; provided that the Government gives the Contractor a preliminary written notice of its intent to extend at least 30 days before the contract expires. The preliminary notice does not commit the Government to an extension.

(b) If the Government exercises this option, the extended contract shall be considered to include this option clause.

(c) The total duration of this contract, including the exercise of any options under this clause, shall not exceed **60 months**.

(End of clause)

52.222-30 CONSTRUCTION WAGE RATE REQUIREMENTS--PRICE ADJUSTMENT (NONE OR SEPARATELY SPECIFIED METHOD) (MAY 2014)

(a) The wage determination issued under the Construction Wage Rate Requirements statute by the Administrator, Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, that is effective for an option to extend the term of the contract, will apply to that option period.

(b) The Contracting Officer will make no adjustment in contract price, other than provided for elsewhere in this contract, to cover any increases or decreases in wages and benefits as a result of-- (1) Incorporation of the Department of Labor's wage determination applicable at the exercise of the option to extend the term of the contract;

- (2) Incorporation of a wage determination otherwise applied to the contract by operation of law; or
- (3) An increase in wages and benefits resulting from any other requirement applicable to workers subject to the Construction Wage Rate Requirements statute.

(End of clause)

52.222-54 EMPLOYMENT ELIGIBILITY VERIFICATION (OCT 2015)

(a) Definitions. As used in this clause--Commercially available off-the-shelf (COTS) item—

(1) Means any item of supply that is--

(i) A commercial item (as defined in paragraph (1) of the definition at 2.101);

(ii) Sold in substantial quantities in the commercial marketplace; and

(iii) Offered to the Government, without modification, in the same form in which it is sold in the commercial marketplace; and

(2) Does not include bulk cargo, as defined in 46 U.S.C. 40102(4), such as agricultural products and petroleum products. Per 46 CFR 525.1(c)(2), "bulk cargo" means cargo that is loaded and carried in bulk onboard ship without mark or count, in a loose unpackaged form, having homogenous characteristics. Bulk cargo loaded into intermodal equipment, except LASH or Seabee barges, is subject to mark and count and, therefore, ceases to be bulk cargo.

Employee assigned to the contract means an employee who was hired after November 6, 1986 (after November 27, 2009, in the Commonwealth of the Northern Mariana Islands), who is directly performing work, in the United States, under a contract that is required to include the clause prescribed at 22.1803. An employee is not considered to be directly performing work under a contract if the employee--

(1) Normally performs support work, such as indirect or overhead functions; and

(2) Does not perform any substantial duties applicable to the contract.

Subcontract means any contract, as defined in 2.101, entered into by a subcontractor to furnish supplies or services for performance of a prime contract or a subcontract. It includes but is not limited to purchase orders, and changes and modifications to purchase orders.

Subcontractor means any supplier, distributor, vendor, or firm that furnishes supplies or services to or for a prime Contractor or another subcontractor.

United States, as defined in 8 U.S.C. 1101(a)(38), means the 50 States, the District of Columbia, Puerto Rico, Guam, the Commonwealth of the Northern Mariana Islands, and the U.S. Virgin Islands.

(b) Enrollment and verification requirements.

(1) If the Contractor is not enrolled as a Federal Contractor in E-Verify at time of contract award, the Contractor shall--

- (i) Enroll. Enroll as a Federal Contractor in the E-Verify program within 30 calendar days of contract award;
 - (ii) Verify all new employees. Within 90 calendar days of enrollment in the E-Verify program, begin to use E-Verify to initiate verification of employment eligibility of all new hires of the Contractor, who are working in the United States, whether or not assigned to the contract, within 3 business days after the date of hire (but see paragraph (b)(3) of this section); and
 - (iii) Verify employees assigned to the contract. For each employee assigned to the contract, initiate verification within 90 calendar days after date of enrollment or within 30 calendar days of the employee's assignment to the contract, whichever date is later (but see paragraph (b)(4) of this section).
- (2) If the Contractor is enrolled as a Federal Contractor in E-Verify at time of contract award, the Contractor shall use E-Verify to initiate verification of employment eligibility of--
- (i) All new employees. (A) Enrolled 90 calendar days or more. The Contractor shall initiate verification of all new hires of the Contractor, who are working in the United States, whether or not assigned to the contract, within 3 business days after the date of hire (but see paragraph (b)(3) of this section); or
 - (B) Enrolled less than 90 calendar days. Within 90 calendar days after enrollment as a Federal Contractor in E-Verify, the Contractor shall initiate verification of all new hires of the Contractor, who are working in the United States, whether or not assigned to the contract, within 3 business days after the date of hire (but see paragraph (b)(3) of this section); or
 - (ii) Employees assigned to the contract. For each employee assigned to the contract, the Contractor shall initiate verification within 90 calendar days after date of contract award or within 30 days after assignment to the contract, whichever date is later (but see paragraph (b)(4) of this section).
- (3) If the Contractor is an institution of higher education (as defined at 20 U.S.C. 1001(a)); a State or local government or the government of a Federally recognized Indian tribe; or a surety performing under a takeover agreement entered into with a Federal agency pursuant to a performance bond, the Contractor may choose to verify only employees assigned to the contract, whether existing employees or new hires. The Contractor shall follow the applicable verification requirements at (b)(1) or (b)(2), respectively, except that any requirement for verification of new employees applies only to new employees assigned to the contract.
- (4) Option to verify employment eligibility of all employees. The Contractor may elect to verify all existing employees hired after November 6, 1986 (after November 27, 2009, in the Commonwealth of the Northern Mariana Islands), rather than just those employees assigned to the contract. The Contractor shall initiate verification for each existing employee working in the United States who was hired after November 6, 1986 (after November 27, 2009, in the Commonwealth of the Northern Mariana Islands), within 180 calendar days of--
- (i) Enrollment in the E-Verify program; or
 - (ii) Notification to E-Verify Operations of the Contractor's decision to exercise this option, using the contact information provided in the E-Verify program Memorandum of Understanding (MOU).
- (5) The Contractor shall comply, for the period of performance of this contract, with the requirements of the E-Verify program MOU.
- (i) The Department of Homeland Security (DHS) or the Social Security Administration (SSA) may terminate the Contractor's MOU and deny access to the E-Verify system in accordance with the terms of the MOU. In such case, the Contractor will be referred to a suspension or debarment official.
 - (ii) During the period between termination of the MOU and a decision by the suspension or debarment official whether to suspend or debar, the Contractor is excused from its obligations under paragraph (b) of this clause. If the

suspension or debarment official determines not to suspend or debar the Contractor, then the Contractor must reenroll in E-Verify.

(c) Web site. Information on registration for and use of the E-Verify program can be obtained via the Internet at the Department of Homeland Security Web site: <http://www.dhs.gov/E-Verify>.

(d) Individuals previously verified. The Contractor is not required by this clause to perform additional employment verification using E-Verify for any employee--

(1) Whose employment eligibility was previously verified by the Contractor through the E-Verify program;

(2) Who has been granted and holds an active U.S. Government security clearance for access to confidential, secret, or top secret information in accordance with the National Industrial Security Program Operating Manual; or

(3) Who has undergone a completed background investigation and been issued credentials pursuant to Homeland Security Presidential Directive (HSPD)-12, Policy for a Common Identification Standard for Federal Employees and Contractors.

(e) Subcontracts. The Contractor shall include the requirements of this clause, including this paragraph (e) (appropriately modified for identification of the parties), in each subcontract that--

(1) Is for--(i) Commercial or noncommercial services (except for commercial services that are part of the purchase of a COTS item (or an item that would be a COTS item, but for minor modifications), performed by the COTS provider, and are normally provided for that COTS item); or

(ii) Construction;

(2) Has a value of more than \$3,500; and

(3) Includes work performed in the United States.

(End of clause)

52.222-55 MINIMUM WAGES UNDER EXECUTIVE ORDER 13658 (DEC 2014)

(a) Definitions. As used in this clause--

``United States" means the 50 states and the District of Columbia.

``Worker"--

(1) Means any person engaged in performing work on, or in connection with, a contract covered by Executive Order 13658, and

(i) Whose wages under such contract are governed by the Fair Labor Standards Act (29 U.S.C. chapter 8), the Service Contract Labor Standards statute (41 U.S.C. chapter 67), or the Wage Rate Requirements (Construction) statute (40 U.S.C. chapter 31, subchapter IV),

(ii) Other than individuals employed in a bona fide executive, administrative, or professional capacity, as those terms are defined in 29 CFR part 541,

(iii) Regardless of the contractual relationship alleged to exist between the individual and the employer.

(2) Includes workers performing on, or in connection with, the contract whose wages are calculated pursuant to special certificates issued under 29 U.S.C. 214(c).

(3) Also includes any person working on, or in connection with, the contract and individually registered in a bona fide apprenticeship or training program registered with the Department of Labor's Employment and Training Administration, Office of Apprenticeship, or with a State Apprenticeship Agency recognized by the Office of Apprenticeship.

(b) Executive Order Minimum Wage rate. (1) The Contractor shall pay to workers, while performing in the United States, and performing on, or in connection with, this contract, a minimum hourly wage rate of \$10.10 per hour beginning January 1, 2015.

(2) The Contractor shall adjust the minimum wage paid, if necessary, beginning January 1, 2016 and annually thereafter, to meet the Secretary of Labor's annual E.O. minimum wage. The Administrator of the Department of Labor's Wage and Hour Division (the Administrator) will publish annual determinations in the Federal Register no later than 90 days before the effective date of the new E.O. minimum wage rate. The Administrator will also publish the applicable E.O. minimum wage on www.wdol.gov (or any successor Web site) and on all wage determinations issued under the Service Contract Labor Standards statute or the Wage Rate Requirements (Construction) statute. The applicable published E.O. minimum wage is incorporated by reference into this contract.

(3)(i) The Contractor may request a price adjustment only after the effective date of the new annual E.O. minimum wage determination. Prices will be adjusted only if labor costs increase as a result of an increase in the annual E.O. minimum wage, and for associated labor costs and relevant subcontract costs. Associated labor costs shall include increases or decreases that result from changes in social security and unemployment taxes and workers' compensation insurance, but will not otherwise include any amount for general and administrative costs, overhead, or profit.

(ii) Subcontractors may be entitled to adjustments due to the new minimum wage, pursuant to paragraph (b)(2). Contractors shall consider any subcontractor requests for such price adjustment.

(iii) The Contracting Officer will not adjust the contract price under this clause for any costs other than those identified in paragraph (b)(3)(i) of this clause, and will not provideduplicate price adjustments with any price adjustment under clauses implementing the Service Contract Labor Standards statute or the Wage Rate Requirements (Construction) statute.

(4) The Contractor warrants that the prices in this contract do not include allowance for any contingency to cover increased costs for which adjustment is provided under this clause.

(5) A pay period under this clause may not be longer than semi-monthly, but may be shorter to comply with any applicable law or other requirement under this contract establishing a shorter pay period. Workers shall be paid no later than one pay period following the end of the regular pay period in which such wages were earned or accrued.

(6) The Contractor shall pay, unconditionally to each worker, all wages due free and clear without subsequent rebate or kickback. The Contractor may make deductions that reduce a worker's wages below the E.O. minimum wage rate only if done in accordance with 29 CFR 10.23, Deductions.

(7) The Contractor shall not discharge any part of its minimum wage obligation under this clause by furnishing fringe benefits or, with respect to workers whose wages are governed by the Service Contract Labor Standards statute, the cash equivalent thereof.

(8) Nothing in this clause shall excuse the Contractor from compliance with any applicable Federal or State prevailing wage law or any applicable law or municipal ordinance establishing a minimum wage higher than the E.O. minimum wage. However, wage increases under such other laws or municipal ordinances are not subject to price adjustment under this subpart.

(9) The Contractor shall pay the E.O. minimum wage rate whenever it is higher than any applicable collective bargaining agreement(s) wage rate.

(10) The Contractor shall follow the policies and procedures in 29 CFR 10.24(b) and 10.28 for treatment of workers engaged in an occupation in which they customarily and regularly receive more than \$30 a month in tips.

(c)(1) This clause applies to workers as defined in paragraph (a). As provided in that definition--

(i) Workers are covered regardless of the contractual relationship alleged to exist between the contractor or subcontractor and the worker;

(ii) Workers with disabilities whose wages are calculated pursuant to special certificates issued under 29 U.S.C. 214(c) are covered; and

(iii) Workers who are registered in a bona fide apprenticeship program or training program registered with the Department of Labor's Employment and Training Administration, Office of Apprenticeship, or with a State Apprenticeship Agency recognized by the Office of Apprenticeship, are covered.

(2) This clause does not apply to--

(i) Fair Labor Standards Act (FLSA)-covered individuals performing in connection with contracts covered by the E.O., i.e. those individuals who perform duties necessary to the performance of the contract, but who are not directly engaged in performing the specific work called for by the contract, and who spend less than 20 percent of their hours worked in a particular workweek performing in connection with such contracts;

(ii) Individuals exempted from the minimum wage requirements of the FLSA under 29 U.S.C. 213(a) and 214(a) and (b), unless otherwise covered by the Service Contract Labor Standards statute, or the Wage Rate Requirements (Construction) statute. These individuals include but are not limited to--

(A) Learners, apprentices, or messengers whose wages are calculated pursuant to special certificates issued under 29 U.S.C. 214(a).

(B) Students whose wages are calculated pursuant to special certificates issued under 29 U.S.C. 214(b).

(C) Those employed in a bona fide executive, administrative, or professional capacity (29 U.S.C. 213(a)(1) and 29 CFR part 541).

(d) Notice. The Contractor shall notify all workers performing work on, or in connection with, this contract of the applicable E.O. minimum wage rate under this clause. With respect to workers covered by the Service Contract Labor Standards statute or the Wage Rate Requirements (Construction) statute, the Contractor may meet this requirement by posting, in a prominent and accessible place at the worksite, the applicable wage determination under those statutes. With respect to workers whose wages are governed by the FLSA, the Contractor shall post notice, utilizing the poster provided by the Administrator, which can be obtained at www.dol.gov/whd/govcontracts, in a prominent and accessible place at the worksite. Contractors that customarily post notices to workers electronically may post the notice electronically provided the electronic posting is displayed prominently on any Web site that is maintained by the contractor, whether external or internal, and customarily used for notices to workers about terms and conditions of employment.

(e) Payroll Records. (1) The Contractor shall make and maintain records, for three years after completion of the work, containing the following information for each worker:

- (i) Name, address, and social security number;
- (ii) The worker's occupation(s) or classification(s);
- (iii) The rate or rates of wages paid;
- (iv) The number of daily and weekly hours worked by each worker;
- (v) Any deductions made; and
- (vi) Total wages paid.

(2) The Contractor shall make records pursuant to paragraph (e)(1) of this clause available for inspection and transcription by authorized representatives of the Administrator. The Contractor shall also make such records available upon request of the Contracting Officer.

(3) The Contractor shall make a copy of the contract available, as applicable, for inspection or transcription by authorized representatives of the Administrator.

(4) Failure to comply with this paragraph (e) shall be a violation of 29 CFR 10.26 and this contract. Upon direction of the Administrator or upon the Contracting Officer's own action, payment shall be withheld until such time as the noncompliance is corrected.

(5) Nothing in this clause limits or otherwise modifies the Contractor's payroll and recordkeeping obligations, if any, under the Service Contract Labor Standards statute, the Wage Rate Requirements (Construction) statute, the Fair Labor Standards Act, or any other applicable law.

(f) Access. The Contractor shall permit authorized representatives of the Administrator to conduct investigations, including interviewing workers at the worksite during normal working hours.

(g) Withholding. The Contracting Officer, upon his or her own action or upon written request of the Administrator, will withhold funds or cause funds to be withheld, from the Contractor under this or any other Federal contract with the same Contractor, sufficient to pay workers the full amount of wages required by this clause.

(h) Disputes. Department of Labor has set forth in 29 CFR 10.51, Disputes concerning contractor compliance, the procedures for resolving disputes concerning a contractor's compliance with Department of Labor regulations at 29 CFR part 10. Such disputes shall be resolved in accordance with those procedures and not the Disputes clause of this contract. These disputes include disputes between the Contractor (or any of its subcontractors) and the contracting agency, the Department of Labor, or the workers or their representatives.

(i) Antiretaliation. The Contractor shall not discharge or in any other manner discriminate against any worker because such worker has filed any complaint or instituted or caused to be instituted any proceeding under or related to compliance with the E.O. or this clause, or has testified or is about to testify in any such proceeding.

(j) Subcontractor compliance. The Contractor is responsible for subcontractor compliance with the requirements of this clause and may be held liable for unpaid wages due subcontractor workers.

(k) Subcontracts. The Contractor shall include the substance of this clause, including this paragraph (k) in all subcontracts, regardless of dollar value, that are subject to the Service Contract Labor Standards statute or the Wage Rate Requirements (Construction) statute, and are to be performed in whole or in part in the United States.

(End of clause)

52.228-2 ADDITIONAL BOND SECURITY (OCT 1997)

The Contractor shall promptly furnish additional security required to protect the Government and persons supplying labor or materials under this contract if--

- (a) Any surety upon any bond, or issuing financial institution for other security, furnished with this contract becomes unacceptable to the Government.
- (b) Any surety fails to furnish reports on its financial condition as required by the Government;
- (c) The contract price is increased so that the penal sum of any bond becomes inadequate in the opinion of the Contracting Officer; or
- (d) An irrevocable letter of credit (ILC) used as security will expire before the end of the period of required security. If the Contractor does not furnish an acceptable extension or replacement ILC, or other acceptable substitute, at least 30 days before an ILC's scheduled expiration, the Contracting officer has the right to immediately draw on the ILC.

(End of clause)

52.233-3 PROTEST AFTER AWARD (AUG. 1996)

(a) Upon receipt of a notice of protest (as defined in FAR 33.101) or a determination that a protest is likely (see FAR 33.102(d)), the Contracting Officer may, by written order to the Contractor, direct the Contractor to stop performance of the work called for by this contract. The order shall be specifically identified as a stop-work order issued under this clause. Upon receipt of the order, the Contractor shall immediately comply with its terms and take all reasonable steps to minimize the incurrence of costs allocable to the work covered by the order during the period of work stoppage. Upon receipt of the final decision in the protest, the Contracting Officer shall either--

- (1) Cancel the stop-work order; or
 - (2) Terminate the work covered by the order as provided in the Default, or the Termination for Convenience of the Government, clause of this contract.
- (b) If a stop-work order issued under this clause is canceled either before or after a final decision in the protest, the Contractor shall resume work. The Contracting Officer shall make an equitable adjustment in the delivery schedule or contract price, or both, and the contract shall be modified, in writing, accordingly, if--
- (1) The stop-work order results in an increase in the time required for, or in the Contractor's cost properly allocable to, the performance of any part of this contract; and
 - (2) The Contractor asserts its right to an adjustment within 30 days after the end of the period of work stoppage; provided, that if the Contracting Officer decides the facts justify the action, the Contracting Officer may receive and act upon a proposal at any time before final payment under this contract.
- (c) If a stop-work order is not canceled and the work covered by the order is terminated for the convenience of the

Government, the Contracting Officer shall allow reasonable costs resulting from the stop-work order in arriving at the termination settlement.

(d) If a stop-work order is not canceled and the work covered by the order is terminated for default, the Contracting Officer shall allow, by equitable adjustment or otherwise, reasonable costs resulting from the stop-work order.

(e) The Government's rights to terminate this contract at any time are not affected by action taken under this clause.

(f) If, as the result of the Contractor's intentional or negligent misstatement, misrepresentation, or miscertification, a protest related to this contract is sustained, and the Government pays costs, as provided in FAR 33.102(b)(2) or 33.104(h)(1), the Government may require the Contractor to reimburse the Government the amount of such costs. In addition to any other remedy available, and pursuant to the requirements of Subpart 32.6, the Government may collect this debt by offsetting the amount against any payment due the Contractor under any contract between the Contractor and the Government.

(End of clause)

52.236-3 SITE INVESTIGATION AND CONDITIONS AFFECTING THE WORK (APR 1984)

(a) The Contractor acknowledges that it has taken steps reasonably necessary to ascertain the nature and location of the work, and that it has investigated and satisfied itself as to the general and local conditions which can affect the work or its cost, including but not limited to

(1) conditions bearing upon transportation, disposal, handling, and storage of materials;

(2) the availability of labor, water, electric power, and roads;

(3) uncertainties of weather, river stages, tides, or similar physical conditions at the site;

(4) the conformation and conditions of the ground; and (5) the character of equipment and facilities needed preliminary to and during work performance. The Contractor also acknowledges that it has satisfied itself as to the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including all exploratory work done by the Government, as well as from the drawings and specifications made a part of this contract. Any failure of the Contractor to take the actions described and acknowledged in this paragraph will not relieve the Contractor from responsibility for estimating properly the difficulty and cost of successfully performing the work, or for proceeding to successfully perform the work without additional expense to the Government.

(b) The Government assumes no responsibility for any conclusions or interpretations made by the Contractor based on the information made available by the Government. Nor does the Government assume responsibility for any understanding reached or representation made concerning conditions which can affect the work by any of its officers or agents before the execution of this contract, unless that understanding or representation is expressly stated in this contract.

(End of clause)

52.236-26 PRECONSTRUCTION CONFERENCE (FEB 1995)

If the Contracting Officer decides to conduct a preconstruction conference, the successful offeror will be notified and will be required to attend. The Contracting Officer's notification will include specific details regarding the date,

time, and location of the conference, any need for attendance by subcontractors, and information regarding the items to be discussed.

(End of clause)

52.252-2 CLAUSES INCORPORATED BY REFERENCE (FEB 1998)

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this/these address(es):

<http://farsite.hill.af.mil/vffara.htm>

(End of clause)

52.252-6 AUTHORIZED DEVIATIONS IN CLAUSES (APR 1984)

(a) The use in this solicitation or contract of any Federal Acquisition Regulation (48 CFR Chapter 1) clause with an authorized deviation is indicated by the addition of "(DEVIATION)" after the date of the clause.

(b) The use in this solicitation or contract of any [Defense Federal Acquisition Regulation Supplement](#) (48 CFR [Chapter 1](#)) clause with an authorized deviation is indicated by the addition of "(DEVIATION)" after the name of the regulation.

(End of clause)

252.232-7006 WIDE AREA WORKFLOW PAYMENT INSTRUCTIONS (MAY 2013)

(a) Definitions. As used in this clause--

Department of Defense Activity Address Code (DoDAAC) is a six position code that uniquely identifies a unit, activity, or organization.

Document type means the type of payment request or receiving report available for creation in Wide Area WorkFlow (WAWF).

Local processing office (LPO) is the office responsible for payment certification when payment certification is done external to the entitlement system.

(b) Electronic invoicing. The WAWF system is the method to electronically process vendor payment requests and receiving reports, as authorized by DFARS 252.232-7003, Electronic Submission of Payment Requests and Receiving Reports.

(c) WAWF access. To access WAWF, the Contractor shall--

(1) Have a designated electronic business point of contact in the System for Award Management at <https://www.acquisition.gov>; and

(2) Be registered to use WAWF at <https://wawf.eb.mil/> following the step-by-step procedures for self-registration available at this Web site.

(d) WAWF training. The Contractor should follow the training instructions of the WAWF Web-Based Training Course and use the Practice Training Site before submitting payment requests through WAWF. Both can be accessed by selecting the “Web Based Training” link on the WAWF home page at <https://wawf.eb.mil/>.

(e) WAWF methods of document submission. Document submissions may be via Web entry, Electronic Data Interchange, or File Transfer Protocol.

(f) WAWF payment instructions. The Contractor must use the following information when submitting payment requests and receiving reports in WAWF for this contract/order:

(1) Document type. The Contractor shall use the following document type(s).

Navy Construction/Facilities Management Invoice

(2) Inspection/acceptance location. The Contractor shall select the following inspection/acceptance location(s) in WAWF, as specified by the contracting officer.

N61154

(3) Document routing. The Contractor shall use the information in the Routing Data Table below only to fill in applicable fields in WAWF when creating payment requests and receiving reports in the system.

Routing Data Table*

| Field Name in WAWF | Data to be entered in WAWF |
|---------------------------|----------------------------|
| Pay Official DoDAAC | N68732 |
| Issue By DoDAAC | N40085 |
| Admin DoDAAC | N40085 |
| Inspect By DoDAAC | N61154 |
| Ship To Code | N61154 |
| Ship From Code | Not Applicable |
| Mark For Code | Not Applicable |
| Service Approver (DoDAAC) | Not Applicable |
| Service Acceptor (DoDAAC) | N61154 |
| Accept at Other DoDAAC | Not Applicable |
| LPO DoDAAC | N61154 |
| DCAA Auditor DoDAAC | Not Applicable |
| Other DoDAAC(s) | Not Applicable |

(4) Payment request and supporting documentation. The Contractor shall ensure a payment request includes appropriate contract line item and subline item descriptions of the work performed or supplies delivered, unit price/cost per unit, fee (if applicable), and all relevant back-up documentation, as defined in DFARS Appendix F, (e.g. timesheets) in support of each payment request.

(5) WAWF email notifications. The Contractor shall enter the email address identified below in the “Send Additional Email Notifications” field of WAWF once a document is submitted in the system.

**Lorna Tribby, e-mail: lorna.tribby@navy.mil
TBD**

(g) WAWF point of contact. (1) The Contractor may obtain clarification regarding invoicing in WAWF from the following contracting activity's WAWF point of contact.

Lorna Tribby, phone: 812-854-6021 or e-mail: lorna.tribby@navy.mil

(2) For technical WAWF help, contact the WAWF helpdesk at 866-618-5988.

(End of clause)

252.236-7001 CONTRACT DRAWINGS 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.

(e) The work shall conform to the specifications and the contract drawings identified on the following index of drawings:

Drawings, as needed or required, will be provided with each task order.

(End of clause)

5252.201-9300 CONTRACTING OFFICER AUTHORITY (JUN 1994)

In no event shall any understanding or agreement between the Contractor and any Government employee other than the Contracting Officer on any contract, modification, change order, letter or verbal direction to the Contractor be effective or binding upon the Government. All such actions must be formalized by a proper contractual document executed by an appointed Contracting Officer. The Contractor is hereby put on notice that in the event a Government employee other than the Contracting Officer directs a change in the work to be performed, it is the Contractor's responsibility to make inquiry of the Contracting Officer before making the deviation. Payments will not be made without being authorized by an appointed Contracting Officer with the legal authority to bind the Government.

5252.209-9300 ORGANIZATIONAL CONFLICTS OF INTEREST (JUN 1994)

The restrictions described herein shall apply to the Contractor and its affiliates, consultants and subcontracts under this contract. If the Contractor under this contract prepares or assists in preparing a statement of work, specifications and plans, the Contractor and its affiliates shall be ineligible to bid or participate, in any capacity, in any contractual effort which is based on such statement of work or specifications and plans as a prime contractor, subcontractor, consultant or in any similar capacity. The Contractor shall not incorporate its products or services in such statement of work or specification unless so directed in writing by the Contracting Officer, in which case the restriction shall not apply. This contract shall include this clause in its subcontractor's or consultants' agreements concerning the performance of this contract.

5252.216-9302 INDEFINITE QUANTITY (JUN 1994)

This is an indefinite-quantity contract for the services specified, and effective for the period stated previously.

Delivery or performance shall be made only as authorized by orders issued in accordance with the Ordering clause. The Contractor shall furnish to the Government, when and if ordered, the services specified in the Schedule up to an including the "maximum" fee total designated previously.

There is no limit on the number of orders that may be issued subject only to the maximum annual value of the contract.

Any order issued during the effective period of this contract and not completed within that period shall be completed by the Contractor within the time specified in the order. The contract shall govern the Contractor's and Government's rights and obligations with respect to that order to the same extent as if the order were completed during the contract's effective period.

5252.216-9306, PROCEDURES FOR ISSUING ORDERS (NOV 2009)

(a) Services to be furnished under this contract shall be furnished at such times as ordered by the issuance of task orders by the Ordering Officer designated by the Contracting Officer. All orders issued hereunder are subject to the terms and conditions of this contract. This contract shall control in the event of conflict with any order. A task order will be considered "issued" for the purpose of this contract at the time the Government deposits the order in the mail or, if transmitted by other means, when physically delivered to the Contractor.

(b) Except in emergency situations, only a Contracting Officer may modify task/delivery orders. An Ordering Officer, when authorized by the designation official (Contracting Officer), may issue modifications to task/delivery orders only during an emergency. Modifications to task/delivery orders will be issued on a Standard Form (SF 30).

Task orders may be modified orally by the Ordering Officer in emergency circumstances.

Oral modifications will be confirmed in writing by issuance of a SF 30 within two (2) working days from the time the oral direction is issued.

(End of clause)

5252.217-9301 OPTION TO EXTEND THE TERM OF THE CONTRACT – SERVICES (JUN 1994)

(a) The Government may extend the term of this contract for a term of one (1) to twelve (12) months by written notice to the Contractor within the performance period specified in the Schedule; provided that the Government shall give the Contractor a preliminary written notice of its intent to extend before the contract expires. The preliminary notice does not commit the Government to an extension.

b. If the Government exercises this option, the extended contract shall be considered to include this option provision.

(c) The total duration of this contract, including the exercise of any options under this clause, shall not exceed 60 months. (End of Clause)

5252.228-9302 BID GUARANTEE ALTERNATE II (OCT 2004)

To assure the execution of the contract and the performance and payment bonds, each bidder/offeror shall submit with its bid/offer a guarantee bond (SF 24) executed by a surety company holding a certificate of authority from the Secretary of the Treasury as an acceptable surety, or other security provided in FAR Clause 52.228-1, "Bid Guarantee". Security shall be in a penal sum equal to at least 20 percent of price payable for estimated quantity under the bid submitted, but in no case to exceed \$3,000,000. A copy of the agent's authority to sign bonds for the surety company shall accompany the bid guarantee bond. (End of provision)

5252.228-9305 NOTICE OF BONDING REQUIREMENTS (ALT I) (DEC 2000)

Within 15 days of receipt of award, the bidder/offeror to whom the award is made shall furnish the following bond(s) each with satisfactory security:

X A Performance Bond (Standard Form 25). The performance bond shall be in a penal sum equal to 100% percent of the price payable for the task order price of each subsequent task order award.

X A Payment Bond (Standard Form 25A). The payment bond shall be in a penal sum equal to 100% percent of the price payable for the task order price of each subsequent task order award.

Any surety company holding a certificate of authority from the Secretary of Treasury as an acceptable Surety on Federal bonds will be accepted. Individual sureties will be permitted as prescribed in FAR 28.203 and FAC 5252.228-9300. Alternative types of security in lieu of furnishing sureties on performance and/or payment bonds will be permitted as prescribed in FAR 28.204, and will be held for at least one year after the completion of the contract. Additional bond security may be required as prescribed in FAR 52.228-2. Bonds shall be accompanied by a document authenticating the agent's authority to sign bonds for the surety company.

The contract time for purposes of fixing the completion date, default and liquidated damages shall begin to run 15 days from the date of award, regardless of when performance and payment bonds or deposits in lieu of surety are executed.

5252.236-9301 SPECIAL WORKING CONDITIONS AND ENTRY TO WORK AREA (OCT 2004)

The Government under certain circumstances may require denial of entry to the work areas under this contract where the Contractor's work or presence would constitute a safety or security hazard to ordnance storage or handling operations. Restrictions covering entry to and availability of the work areas are as follows:

(a) Entry. Entry to work areas located within the special Security Limited areas, defined as those work areas located within the existing security fence, can be granted subject to special personnel requirements as specified herein and to other normal security and safety requirements. Complete denial of entry to the Limited Area may be required during brief periods of one to two hours (normally) and on rare occasions of two to four hours. For bidding purposes, the Contractor shall assume denial of entry to the work areas in the Limited Area of six 2-hour denials and one 4-hour denial per month.

(b) Vehicle Delay. The Contractor shall also assume for bidding purposes that, in addition to site denial, each vehicle and/or unit of construction equipment will be delayed during each movement through the security gate, both entering and leaving the limited area. Delays will average 30 minutes.

(b) Operational Considerations. To reduce delay time while preserving required security, the following points should be considered in operational planning:

(1) Vehicle Search. Security regulations required that all vehicles, when authorized to enter the Limited Area be thoroughly searched by guard force personnel. Such a search will be required for all vehicle/construction equipment. Accordingly, once a vehicle or unit of construction equipment has been cleared, it may be left in the Limited Area after initial entry has been made. For the period of time authorized the vehicle/equipment left in the Limited Area will be assigned parking areas by the Contracting Officer. The vehicle/equipment must be secured as specified in paragraph entitled "SECURITY REQUIREMENTS." The intent is to reduce the Contractor loss of time at the security gate. No private vehicles will be allowed to enter the Limited Area.

(2) Delivery Vehicles. Guard force personnel will inspect vehicles delivering construction materials while the driver is being processed for entry into the Limited Area.. A Security Escort will then escort the driver and vehicle in the Limited Area. To provide this service, delivery schedules should be promulgated in advance and vendors made aware that a reasonable delay can be expected if delivery is other than the time specified. Deliveries

after 1600 hours will not be allowed entry into the Limited Area without prior approval of the Physical Security Officer.

NOTE: ALL COMMERCIAL VEHICLES, INCLUDING DELIVERIES, ARE REQUIRED TO ENTER AND EXIT THE CENTER VIA THE CRANE GATE (GATE 4). (End of Clause)

5252.236-9303 ACCIDENT PREVENTION (NOV 1998)

- (a) The Contractor will maintain an accurate record of, and will report to the Contracting Officer in the manner and on the forms prescribed by the Contracting Officer, all accidents resulting in death, traumatic injury, occupational disease, and damage to property, materials, supplies and equipment incident to work performed under this contract.
- (b) Compliance with the provisions of this article by subcontractors will be the responsibility of the Contractor.
- (c) Prior to commencement of the work, the Contractor may be required to:
 - (1) submit in writing his proposals for effectuating provision for accident prevention;
 - (2) meet in conference with representatives of the Contracting Officer to discuss and develop mutual understandings relative to administration of the overall safety program.

5252.236-9305 AVAILABILITY OF UTILITIES (JUN 1994)

When available, the government will furnish reasonable amounts of the following utilities for the work to be performed under this contract at no cost to the Contractor. Information concerning the location of existing outlets may be secured from the OIC. The Contractor shall provide and maintain, at his expense, the necessary service lines from existing Government outlets to the site of work.

Electric - Water - Compressed Air

Contractor Furnished Utilities: In the event that the Government is unable to provide the required types of utilities, the Contractor shall, at his expense, arrange for the required utilities.

Contractor Energy Conservation: The Contractor shall be directly responsible for instructing employees in utilities conservation practices. The Contractor shall be responsible for operating under conditions which preclude the waste of utilities, which shall include:

- a. Lights shall be used only in areas where and at the time when work is actually performed.
- b. Mechanical equipment controls for heating, ventilation and air conditioning systems will not be adjusted by the workers.
- c. Water faucets or valves shall be turned off after the required usage has been accomplished.

Telephone Lines. Telephone lines for the sole use of the Contractor will not be available. Government telephones shall not be used for personal reasons.

Contractor Availability. The Contractor shall maintain a telephone at which he or his representative may be reached 24 hours daily. The telephone shall be listed in the contractor's name. If the Contractor does not have a local

telephone, he shall maintain a toll free emergency telephone (or accept collect calls from authorized Government personnel) at which he or his representative may be reached at night, weekends and holidays. It is mandatory that the Contractor or his representative be available to a toll-free telephone 24 hours per day, seven days per week, including holidays. He shall notify the OIC in writing of the mailing address and telephone number within three days after award of this contract and immediately thereafter in the event of change.

5252.236-9310 RECORD DRAWINGS (Oct 2004)

The Contractor shall maintain at the job site two sets of full-size prints of the contract drawings, accurately marked in red with adequate dimensions, to show all variations between the construction actually provided and that indicated or specified in the contract documents, including buried or concealed construction. Special attention shall be given to recording the horizontal and vertical location of all buried utilities that differ from the final government-accepted drawings. Existing utility lines and features revealed during the course of construction, shall also be accurately located and dimensioned. Variations in the interior utility systems shall be clearly defined and dimensioned; and coordinated with exterior utility connections at the building five-foot line, where applicable. Existing topographic features which differ from those shown on the contract drawings shall also be accurately located and recorded. Where a choice of materials or methods is permitted herein, or where variations in scope or character of methods is permitted herein, or where variations in scope or character of work from that of the original contract are authorized, the drawings shall be marked to define the construction actually provided. The representations of such changes shall conform to standard drafting practice and shall include such supplementary notes, legends and details as necessary to clearly portray the as-built construction. These drawings shall be available for review by the Contracting Officer at all times. Upon completion of the work, both sets of the marked up prints shall be certified as correct, signed by the Contractor, and delivered to the Contracting Officer for his approval before acceptance. Requests for partial payments will not be approved if the marked prints are not kept current, and request for final payment will not be approved until the market prints are delivered to the Contracting Officer.

5252.242-9300 GOVERNMENT REPRESENTATIVES (OCT 1996)

a. The contract will be administered by an authorized representative of the Contracting Officer. In no event, however, will any understanding or agreement, modification, change order, or other matter deviating from the terms of the contract between the contractor and any person other than the Contracting Officer be effective or binding upon the Government, unless formalized by proper contractual documents executed by the Contracting Officer prior to completion of this contract. The authorized representative as indicated hereinafter:

X 1. The Contracting Officer's Representative (COR) will be designated by the Contracting Officer as the authorized representative of the Contracting Officer. The COR is responsible for monitoring performance and the technical management of the effort required hereunder, and should be contacted regarding questions or problems of a technical nature.

X 2. The designated Contract Specialist will be the Administrative Contracting Officer's representative on all other contract administrative matters. The Contract Specialist should be contacted regarding all matters pertaining to the contract or delivery orders.

 3. The designated Property Administrator is the Administrative contracting Officer's representative on property matters. The Property Administrator should be contacted regarding all matters pertaining to property administration.

Section 00800 - Special Contract Requirements

General Decision Number: IN150006 11/13/2015 IN6

Superseded General Decision Number: IN20140006

State: Indiana

Construction Types: Heavy and Highway

Counties: Adams, Allen, Bartholomew, Benton, Blackford, Boone, Brown, Carroll, Cass, Clark, Clay, Clinton, Crawford, Daviess, Dearborn, Decatur, DeKalb, Delaware, Dubois, Elkhart, Fayette, Floyd, Fountain, Franklin, Fulton, Gibson, Grant, Greene, Hamilton, Hancock, Harrison, Hendricks, Henry, Howard, Huntington, Jackson, Jasper, Jay, Jefferson, Jennings, Johnson, Knox, Kosciusko, Lagrange, Lawrence, Madison, Marion, Marshall, Martin, Miami, Monroe, Montgomery, Morgan, Newton, Noble, Ohio, Orange, Owen, Parke, Perry, Pike, Posey, Pulaski, Putnam, Randolph, Ripley, Rush, Scott, Shelby, Spencer, Starke, Steuben, Sullivan, Switzerland, Tippecanoe, Tipton, Union, Vanderburgh, Vermillion, Vigo, Wabash, Warren, Warrick, Washington, Wayne, Wells, White and Whitley Counties in Indiana.

* EXCEPT LAKE, LAPORTE, PORTER AND ST. JOSEPH COUNTIES HEAVY AND HIGHWAY CONSTRUCTION PROJECTS

Note: Executive Order (EO) 13658 establishes an hourly minimum wage of \$10.10 for 2015 that applies to all contracts subject to the Davis-Bacon Act for which the solicitation is issued on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.10 (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract. The EO minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

| Modification Number | Publication Date |
|---------------------|------------------|
| 0 | 01/02/2015 |
| 1 | 01/23/2015 |
| 2 | 01/30/2015 |
| 3 | 02/06/2015 |
| 4 | 03/06/2015 |
| 5 | 04/10/2015 |
| 6 | 04/17/2015 |
| 7 | 05/29/2015 |
| 8 | 06/19/2015 |
| 9 | 07/10/2015 |
| 10 | 08/14/2015 |
| 11 | 08/21/2015 |
| 12 | 09/04/2015 |
| 13 | 09/11/2015 |
| 14 | 10/16/2015 |
| 15 | 11/13/2015 |

ASBE0008-004 07/01/2015

DEARBORN, FAYETTE, FRANKLIN, OHIO, RIPLEY SWITZERLAND AND UNION COUNTIES

| | Rates | Fringes |
|---|----------|---------|
| Asbestos Workers/Insulator (Includes application of all insulating materials, protective coverings, coatings & finishings to all types of mechanical systems)..... | \$ 29.40 | 14.77 |
| HAZARDOUS MATERIAL HANDLER (Includes preparation, wettings, stripping, removal, scrapping, vacuuming, bagging & disposing of all insulation materials, whether they contain asbestos or not, from mechanical systems)..... | \$ 24.50 | 12.45 |

ASBE0018-004 06/01/2015

BARTHOLOMEW, BENTON, BOONE, CARROLL, CLINTON, DELAWARE, FOUNTAIN, HAMILTON, HANCOCK, HENDRICKS, HOWARD, JOHNSON, MADISON, MARION, MONROE, MONTGOMERY, MORGAN, SHELBY, TIPPECANOE, TIPTON, AND WARREN COUNTIES:

| | Rates | Fringes |
|---|----------|---------|
| ASBESTOS WORKER/HEAT & FROST INSULATOR (includes application of all insulating materials, protective coverings, coatings and finishings to all types of mechanical systems)..... | \$ 31.23 | 17.88 |
| HAZARDOUS MATERIAL HANDLER (includes preparation, wettings, stripping, removal, scrapping, vacuuming, bagging & disposing of all insulation materials, whether they contain asbestos or not, from mechanical systems)..... | \$ 19.49 | 10.95 |

ASBE0037-004 06/01/2015

DAVISS, DUBOIS, GIBSON, KNOX, MARTIN, PIKE, POSEY, SPENCER, SULLIVAN, VANDERBURGH AND WARRICK COUNTIES

| | Rates | Fringes |
|--|-------|---------|
| ASBESTOS WORKER/HEAT & FROST INSULATOR (includes application of all insulating materials protective coverings, coatings an | | |

finishes to all types of mechanical systems. Also the application of firestopping, material openings and penetrations in walls, floors, ceilings, curtain walls and all lead abatement.)...\$ 29.99 16.32
 HAZARDOUS MATERIAL HANDLER (Includes preparation, wetting, stripping, removal, scrapping, vacuuming, bagging and disposing of all insulation materials, whether they contain asbestos or not, from mechanical systems).....\$ 19.49 10.95

 ASBE0041-002 07/01/2015

ADAMS, ALLEN, BLACKFORD, DE KALB, GRANT, HUNTINGTON, JAY, MIAMI, NOBLE, STEUBEN, WABASH, WELLS AND WHITLEY COUNTIES:

| | Rates | Fringes |
|--|----------|---------|
| ASBESTOS WORKER/HEAT & FROST INSULATOR (includes application of all insulating materials, protective coverings, coatings and finishings to all types of mechanical systems)..... | \$ 29.82 | 14.26 |
| HAZARDOUS MATERIAL HANDLER (includes preparation, wettings, stripping, removal, scrapping, vaccuming, bagging & disposing of all insulation materials, whether they contain asbestos or not, from mechanical systems)..... | \$ 19.49 | 10.95 |

 ASBE0051-003 06/01/2015

CLARK, FLOYD, HARRISON and JENNINGS COUNTIES

| | Rates | Fringes |
|---|----------|---------|
| ASBESTOS WORKER/HEAT & FROST INSULATOR (Includes application of all insulating materials, protective coverings, coatings and finishings to all types of mechanical systems)..... | \$ 25.11 | 13.16 |
| HAZARDOUS MATERIAL HANDLER (includes preparation, wettings, stripping, removal, scrapping, vaccuming, bagging & disposing of all insulation materials, whether they contain asbestos or not, from | | |

mechanical systems).....\$ 19.00 12.75

ASBE0079-002 07/01/2008

RANDOLPH AND WAYNE COUNTIES

| | Rates | Fringes |
|--|----------|---------|
| ASBESTOS WORKER/HEAT & FROST INSULATOR (Includes application of all insulating materials, protective coverings, coatings & finishings to all types of mechanical systems)..... | \$ 22.25 | 8.89 |
| HAZARDOUS MATERIAL HANDLER (Includes preparation, wetting, stripping, removal, scrapping, vacuuming, bagging & disposing of all insulation materials, whether they contain asbestos or not, from mechanical systems)..... | \$ 22.60 | 9.40 |

BRIN0003-001 06/01/2015

INDIANAPOLIS

BOONE, HANCOCK, HENDRICKS, JOHNSON, MARION, MONTGOMERY, MORGAN
and SHELBY COUNTIES

| | Rates | Fringes |
|--|----------|---------|
| Bricklayer, Stone Mason, Pointer, Caulking..... | \$ 30.06 | 11.72 |
| TERRAZZO FINISHER..... | \$ 19.07 | 7.06 |
| TERRAZZO WORKER/SETTER..... | \$ 29.57 | 10.96 |
| Tile & Marble Finisher..... | \$ 19.96 | 7.07 |
| Tile, Marble Setter..... | \$ 28.98 | 10.85 |

BRIN0004-004 06/01/2015

FORT WAYNE

ADAMS, ALLEN, DEKALB, HUNTINGTON, NOBLE, STEUBEN, WELLS AND
WHITLEY COUNTIES:

| | Rates | Fringes |
|---|----------|---------|
| BRICKLAYER (STONE MASON, MARBLE MASONS, POINTER, CLEANER, AND CAULKER)..... | \$ 29.21 | 12.49 |
| Terrazzo Grinder Finisher..... | \$ 25.19 | 9.10 |
| Terrazzo Worker Mechanic..... | \$ 29.22 | 11.69 |
| Tile Setter & Marble Mason Mechanic..... | \$ 26.94 | 10.97 |
| Tile, Marble & Terrazzo Finisher..... | \$ 21.94 | 9.10 |

BRIN0004-009 06/01/2014

BARTHOLOMEW, BROWN, DEARBORN, DECATUR, JENNINGS, MONROE, OHIO,
OWENS, RIPLEY and SWITZERLAND COUNTIES

| | Rates | Fringes |
|-----------------------------|----------|---------|
| Bricklayer, Stonemason..... | \$ 27.50 | 11.18 |
| TERRAZZO FINISHER..... | \$ 19.07 | 7.06 |
| TERRAZZO WORKER/SETTER..... | \$ 29.57 | 10.96 |
| Tile & Marble Finisher..... | \$ 19.96 | 7.07 |
| Tile, Marble Setter..... | \$ 28.98 | 10.85 |

BRIN0004-010 06/01/2014

| | Rates | Fringes |
|--|----------|---------|
| BRICKLAYER CLARK, FLOYD, & HARRISON COUNTIES BRICKLAYERS, STONEMASONS AND CEMENT MASONS..... | \$ 25.37 | 10.50 |
| TILE, MARBLE AND TERRAZZO WORKERS..... | \$ 22.64 | 6.05 |
| POSEY, VANDERBURGH AND WARRICK COUNTIES BRICKLAYERS, MASONS..... | \$ 29.02 | 13.37 |
| TILE, MARBLE AND TERRAZZO WORKERS..... | \$ 25.72 | 11.34 |

BRIN0004-015 06/01/2014

TERRE HAUTE
CLAY, DAVIESS, GIBSON, GREENE, KNOX, MARTIN, PARKE, PIKE,
PUTNAM, SULLIVAN, VERMILLION and VIGO COUNTIES

| | Rates | Fringes |
|---|----------|---------|
| BRICKLAYER BRICKLAYERS, STONE MASONS and POINTER/ CLEANER/CAULKER..... | \$ 28.68 | 13.72 |
| CEMENT MASON (GREENE and SULLIVAN COUNTIES)..... | \$ 27.78 | 11.02 |
| CEMENT MASON (REMAINING COUNTIES)..... | \$ 27.93 | 11.02 |
| TERRAZZO FINISHERS..... | \$ 19.07 | 7.05 |
| TERRAZZO WORKER..... | \$ 25.54 | 11.64 |
| TILE AND MARBLE FINISHERS...\$ | 19.83 | 6.32 |
| TILE LAYER, MARBLE MASON, MOSAIC WORKER..... | \$ 25.54 | 11.64 |

BRIN0004-016 06/01/2015

MUNCIE
BLACKFORD, DELAWARE, FAYETTE, FRANKLIN, HAMILTON, HENRY, JAY,
MADISON, RANDOLPH, RUSH, TIPTON, UNION and WAYNE COUNTIES

| | Rates | Fringes |
|--|----------|---------|
| Bricklayer, Stonemason, Pointer, Caulker & Cleaner..... | \$ 29.50 | 12.60 |
| TERRAZZO FINISHER..... | \$ 19.07 | 7.06 |
| TERRAZZO WORKER/SETTER..... | \$ 29.57 | 10.96 |
| Tile & Marble Finisher..... | \$ 19.96 | 7.07 |
| Tile & Marble Setter; Mosaic Worker..... | \$ 28.98 | 10.85 |

BRIN0006-001 06/01/2015

JASPER, NEWTON & STARKE COUNTIES

| | Rates | Fringes |
|--|----------|---------|
| BRICKLAYER (Including Stonemason, and Pointer, Caulker & Cleaner)..... | \$ 36.80 | 20.37 |
| Tile, Marble & Terrazzo Worker... | \$ 36.80 | 20.37 |

BRIN0011-001 06/01/2015

LAFAYETTE

BENTON, CARROLL, CLINTON, FOUNTAIN, TIPPECANOE, WARREN and
WHITE COUNTIES

| | Rates | Fringes |
|--|----------|---------|
| Bricklayer, Stonemason, Pointer, Caulker & Cleaner..... | \$ 27.59 | 14.34 |
| TERRAZZO FINISHER..... | \$ 19.07 | 7.06 |
| TERRAZZO WORKER/SETTER..... | \$ 29.57 | 10.96 |
| Tile & Marble Finisher..... | \$ 19.96 | 7.07 |
| Tile & Marble Setter; Mosaic Worker..... | \$ 28.98 | 10.85 |

BRIN0018-002 06/01/2014

CASS, ELKHART, FULTON, GRANT, HOWARD, KOSCUISKO, LAGRANGE,
MARSHALL, MIAMI, PULASKI, WABASH

| | Rates | Fringes |
|---|----------|---------|
| Bricklayer, Caulker, Cleaner, Pointer..... | \$ 27.61 | 13.55 |

CARP0107-010 04/01/2015

ADAMS, CASS, ELKHART, FULTON, GRANT, HOWARD, HUNTINGTON,
KOSCIUSKO, MARSHALL, MIAMI, TIPTON, WABASH AND WELLS COUNTIES:

| | Rates | Fringes |
|----------------|----------|---------|
| CARPENTER..... | \$ 25.75 | 16.87 |

CARP0108-002 04/01/2015

BENTON, CARROLL, CLINTON, PULASKI, TIPPECANOE, WARREN AND WHITE
COUNTIES

| | Rates | Fringes |
|----------------|----------|---------|
| CARPENTER..... | \$ 26.39 | 16.74 |

CARP0109-002 04/01/2015

DAVIESS, GIBSON, GREENE, KNOX, LAWRENCE, MARTIN, ORANGE AND
SULLIVAN COUNTIES:

| | Rates | Fringes |
|----------------|----------|---------|
| CARPENTER..... | \$ 24.68 | 18.13 |

CARP0111-002 04/01/2015

BOONE, CLAY, FOUNTAIN, MONROE, MONTGOMERY, MORGAN, OWEN,
PARKE, PUTNAM, VERMILLION AND VIGO COUNTIES

| | Rates | Fringes |
|----------------|----------|---------|
| CARPENTER..... | \$ 25.63 | 17.54 |

CARP0111-003 04/01/2015

BARTHOLOMEW, BROWN, (Camp Atterbury south of Hospital Road),
DECATUR, FRANKLIN, JOHNSON (Townships of Blue River, Franklin,
Hensley, Needham, Nineveh, Union) , RUSH AND SHELBY COUNTIES

| | Rates | Fringes |
|----------------|----------|---------|
| CARPENTER..... | \$ 25.19 | 17.54 |

CARP0111-004 04/01/2015

MARION COUNTY

| | Rates | Fringes |
|----------------|----------|---------|
| CARPENTER..... | \$ 26.74 | 17.54 |

CARP0111-005 04/01/2015

BLACKFORD, DELAWARE, FAYETTE, HENRY, JAY, MADISON, RANDOLPH,
UNION AND WAYNE COUNTIES

| | Rates | Fringes |
|----------------|----------|---------|
| CARPENTER..... | \$ 25.49 | 17.54 |

CARP0111-006 04/01/2015

HAMILTON, HANCOCK, HENDRICKS, JOHNSON (Townships of Clark, Camp
Atterbury north of Hospital Road, Pleasant, White River)

| | Rates | Fringes |
|----------------|----------|---------|
| CARPENTER..... | \$ 26.74 | 17.54 |

CARP0232-003 04/01/2015

ALLEN, DEKALB, LAGRANGE, NOBLE, STEUBEN and WHITLEY COUNTIES

| | Rates | Fringes |
|----------------|----------|---------|
| CARPENTER..... | \$ 25.43 | 17.04 |

CARP0999-001 06/01/2015

JASPER, NEWTON AND STARKE COUNTIES:

| | Rates | Fringes |
|----------------|----------|---------|
| CARPENTER..... | \$ 37.42 | 25.56 |

CARP0999-002 04/01/2015

CRAWFORD, DUBOIS, PERRY, PIKE, POSEY, SPENCER, VANDERBURGH AND
WARRICK COUNTIES:

| | Rates | Fringes |
|----------------|----------|---------|
| CARPENTER..... | \$ 24.38 | 18.13 |

CARP0999-004 04/01/2015

DEARBORN, JACKSON, JENNINGS, OHIO, RIPLEY AND SWITZERLAND
COUNTIES

| | Rates | Fringes |
|----------------|----------|---------|
| CARPENTER..... | \$ 24.88 | 17.63 |

CARP0999-005 04/01/2015

CLARK, FLOYD, HARRISON, JEFFERSON, SCOTT AND WASHINGTON COUNTIES

| | Rates | Fringes |
|----------------|----------|---------|
| CARPENTER..... | \$ 24.23 | 18.21 |

CARP1031-012 06/01/2014

CLARK, FLOYD, HARRISION AND WASHINGTON COUNTIES

| | Rates | Fringes |
|-----------------|----------|---------|
| MILLWRIGHT..... | \$ 25.90 | 19.47 |

ELEC0016-003 06/01/2015

CRAWFORD, DAVIESS, DUBOIS, GIBSON, LAWRENCE, MARTIN, ORANGE,
PERRY, PIKE, POSEY, SPENCER, VANDERBURGH, WARRICK

| | Rates | Fringes |
|------------------|----------|---------|
| ELECTRICIAN..... | \$ 35.34 | 16.01 |

ELEC0071-006 12/29/2014

DEARBORN, OHIO, and SWITZERLAND COUNTIES

| | Rates | Fringes |
|------------------------------|----------|---------|
| Line Construction: | | |
| Equipment Operator..... | \$ 31.52 | 12.00 |
| Groundman..... | \$ 22.76 | 10.07 |
| Lineman & Cable Splicers.... | \$ 35.02 | 12.76 |

* ELEC0153-003 09/01/2015

ELKHART, KOSCIUSKO and MARSHALL COUNTIES

| | Rates | Fringes |
|-------------------------------|----------|---------|
| Communication Technician..... | \$ 25.00 | 14.17 |
| ELECTRICIAN..... | \$ 31.75 | 19.19 |

Includes the installation, operation, inspection, modification, maintenance and repair of systems used for the transmission and reception of signals of any nature, for any purpose, including but not limited to , sound and voice transmission/transference systems, communication systems that transmit or receive information and /or control systems, television and video systems, micro-processor controlled fire alarm systems, and security systems and the performance of any task directly related to such installation or service. The scope of work shall exclude the installation of electrical power wiring and the installation of conduit raceways exceeding fifteen (15) feet in length.

ELEC0212-009 06/01/2015

DEARBORN, OHIO, and SWITZERLAND COUNTIES

| | Rates | Fringes |
|------------------|----------|---------|
| ELECTRICIAN..... | \$ 27.03 | 17.02 |

ELEC0305-003 01/01/2015ADAMS, ALLEN, DE KALB, HUNTINGTON, NOBLE, STEUBEN, WELLS, and
WHITLEY COUNTIES

| | Rates | Fringes |
|--|-------|---------|
|--|-------|---------|

| | | |
|------------------|----------|-------|
| ELECTRICIAN..... | \$ 30.45 | 15.29 |
|------------------|----------|-------|

ELEC0369-005 05/28/2014

CLARK, FLOYD, and HARRISON COUNTIES

| | Rates | Fringes |
|------------------------------|----------|---------|
| ELECTRICIAN..... | \$ 29.88 | 14.78 |
| Line Construction: | | |
| Groundman..... | \$ 13.83 | 6.35 |
| Lineman; Equipment Operator. | \$ 22.25 | 6.35 |

ELEC0481-003 06/01/2014

BARTHOLOMEW, BOONE, DECATUR, HAMILTON, HANCOCK, HENDRICKS, JENNINGS, JOHNSON, MADISON, MARION, MONTGOMERY, MORGAN, PUTNAM, RIPLEY, RUSH AND SHELBY COUNTIES

| | Rates | Fringes |
|------------------|----------|---------|
| ELECTRICIAN..... | \$ 33.80 | 17.35 |

ELEC0668-002 06/01/2015

BENTON, CARROLL, CASS, FULTON, TIPPECANOE and WHITE COUNTIES

| | Rates | Fringes |
|------------------|----------|---------|
| ELECTRICIAN..... | \$ 31.75 | 16.77 |

FOOTNOTE: a. PAID HOLIDAYS: New Years Day, Memorial Day, July 4th, Labor Day, Veterans Day Thanksgiving Day and Christmas Day

ELEC0702-003 06/29/2015

DUBOIS, GIBSON, PERRY, PIKE, POSEY, SPENCER AND VANDERBURGH COUNTIES

| | Rates | Fringes |
|---|----------|---------|
| Line Construction: | | |
| GROUNDMAN, Class A..... | \$ 24.93 | 12.99 |
| GROUNDMAN-EQUIPMENT OPERATOR (All other equipment)..... | \$ 31.56 | 14.91 |
| HEAVY-EQUIPMENT OPERATOR (All crawler type equipment D-4 and larger)... | \$ 35.97 | 16.19 |
| LINEMAN..... | \$ 45.09 | 19.18 |

ELEC0725-003 01/01/2015

CLAY, GREENE, OWEN, PARKE, SULLIVAN AND VIGO COUNTIES

| | Rates | Fringes |
|------------------|----------|---------|
| ELECTRICIAN..... | \$ 35.02 | 16.71 |

ELEC0725-007 09/01/2015

CLAY, GREENE, OWEN, PARKE, SULLIVAN AND VIGO COUNTIES

| | Rates | Fringes |
|-------------------------------|----------|---------|
| Communication Technician..... | \$ 27.35 | 12.11 |

Includes the installation, operation, inspection, maintenance, repair and service of radio, television, recording, voice sound and vision production and reproduction apparatus, equipment and appliances used for domestic, commercial, education, entertainment and private telephone systems.

ELEC0855-001 06/01/2014

FAYETTE, FRANKLIN, HENRY, RANDOLPH, UNION AND WAYNE COUNTIES

| | Rates | Fringes |
|------------------|----------|---------|
| ELECTRICIAN..... | \$ 31.80 | 13.68 |

ELEC0873-002 03/01/2013

CLINTON, GRANT, HOWARD, MIAMI, TIPTON AND WABASH COUNTIES:

| | Rates | Fringes |
|------------------|----------|---------|
| ELECTRICIAN..... | \$ 32.43 | 12.33 |

ELEC1393-001 12/01/2014

REMAINING COUNTIES

| | Rates | Fringes |
|------------------------------|----------|---------|
| Line Construction: | | |
| EQUIPMENT OPERATOR 1: | | |
| Diggers, 5th wheel type | | |
| trucks, crawler type, D-4 | | |
| and smaller, bucket trucks | | |
| and live boom type line | | |
| trucks..... | \$ 27.53 | 13.13 |
| EQUIPMENT OPERATOR 3 | | |
| (Backhoes over 1/2 yard | | |
| bucket capacity, cranes | | |
| rated at 15 ton or more | | |
| capacity) 95% J.L. rate..... | \$ 33.75 | 14.94 |
| GROUNDMAN TRUCK DRIVER..... | \$ 19.12 | 10.70 |
| GROUNDMAN..... | \$ 16.36 | 9.89 |
| LINEMAN..... | \$ 35.76 | 15.52 |

ELEC1393-002 12/01/2014

NEWTON COUNTY

| | Rates | Fringes |
|------------------------------|----------|---------|
| Line Construction: | | |
| EQUIPMENT OPERATOR 1: | | |
| Diggers, 5th wheel type | | |
| trucks, crawler type, D-4 | | |
| and smaller, bucket trucks | | |
| and live boom type line | | |
| trucks..... | \$ 27.53 | 13.13 |
| EQUIPMENT OPERATOR 3 | | |
| (Backhoes over 1/2 yard | | |
| bucket capacity, cranes | | |
| rated at 15 ton or more | | |
| capacity) 95% J.L. rate..... | \$ 33.75 | 14.94 |
| GROUNDMAN TRUCK DRIVER..... | \$ 19.12 | 10.70 |
| GROUNDMAN..... | \$ 16.36 | 9.89 |
| LINEMAN..... | \$ 35.76 | 15.52 |

ENGI0103-003 04/01/2013

INCLUDING UNDERGROUND AND UTILITY CONSTRUCTION

REMAINING COUNITIES

| | Rates | Fringes |
|----------------------------|----------|---------|
| Power equipment operators: | | |
| GROUP 1..... | \$ 31.25 | 14.65 |
| GROUP 2..... | \$ 29.53 | 14.65 |
| GROUP 3..... | \$ 28.61 | 14.65 |
| GROUP 4..... | \$ 27.11 | 14.65 |

POWER EQUIPMENT OPERATOR CLASSIFICATIONS

GROUP 1: Air compressors in manifold with throttle valve; Asphalt plant engineer; Auto grade or similar type machine; Auto patrol; Backhoe or farm-type tractor, 45 hp and over; Ballast regulator (RR); Bituminous mixer; Bituminous paver; Bituminous plant engineer; Bulldozer; Caisson drilling machine; Cherry picker, 15 ton or over; Chip spreader; Concrete mixer 21 cu. ft. or over; Core drilling machine; Crane or derrick with any attachment (including clamshell, dragline, shovel, backhoe, etc.); Dredge engineer; Dredge operator; Drilling machine on which the drill is an integral part; Earth mover, rubber-tired (paddle wheel, 616, 631, TS-24 or similar type); Earth mover, rubber-tired, tandem (\$0.50 per hour additional for each bowl); Elevating grader; Fork lift, 10 ton or over; P.C.C. formless paver post driver; Highlift shovel, 1 1/2 cu. yd. or over; Hoist, 2 drums and over; Helicopter, crew; Hydraulic boom truck; keystone, skimmer scoop; Loader, self-propelled (belt, chain, wheel); Locomotive operator; Mechanic; Mucking machine; Panel board concrete plant, central mix type; Paver, Hetherington; Pile driver, skid or crawler; Road paving mixer; Rock breaking plant; Rock crushing plant, portable; Roller (asphalt, waterbound macadam, bituminous macadam, brick surface); Roller with dozer blade; Root rake, tractor-mounted; Self-propelled widener; Stump

remover, tractor-mounted; Surface heater and planer; Tandem push tractor (\$0.50 per hour additional); Tractor, boom; Winch or hoe head; Tractor, push; Tractor with scoop; Tractor-mounted spreader; Tree mover; Trench machine, over 24"; Tug boat operator; Well drilling machine; Winch truck with A-frame

GROUP 2: Air compressor with throttle valve or clever brooks-type combination; Backfiller; Backhoe on farm-type tractor, under 45 hp; Bull float; Cherry picker under 15 ton; Chip spreader, self-propelled; Concrete pump; Concrete mesh depressor, independently operated; Concrete spreader, power-driven; End loader under 1 1/2 cu. yd.; Excavating loader, portable; Finishing machine and bull float; Guniting machine; Head greaser; Mesh or steel placer; Multiple tamping machine (RR); P.C.C. concrete belt placer; Pull grader, power control; Refrigerating machine, freezing operation; Ross carrier; Sheepfoot roller (self-propelled); Tamper (multiple vibrating, asphalt, waterbound macadam, bituminous macadam, brick surface); Trench machine, 24" and under; Tube float; Welder

GROUP 3: Assistant plant engineer; Base paver (Jersey or similar type machine); Concrete finishing machine; Concrete mixer, less than 21 cu. ft.; Curb machine; Farm tractor, including farm tractor with all attachments except backhoe and including high lift end loaders of 1 cu. yd. capacity or less; Fire tender on boiler; Hoist, 1 drum; Operator, 5 pieces of minor equipment; Paving breaker; Power broom, self-propelled; Roller, earth and sub-base material; Slurry seal machine; Spike machine (RR); Tamper (multiple vibrating, earth and sub-base material); Throttle valve and fire tender combination on horizontal or upright boiler; Tractaire with drill; Tractor, 50 h.p. or over; Well point system; Widener, APSCO or similar type

GROUP 4: Air compressor; Assistant to engineer, oiler; Automatic dry batch plant; Bituminous distributor; Bituminous patching tamper; Belt spreader; Broom and belt machine; Chair cart, self-propelled; Coleman-type screen; Conveyor, portable; Digger post hole, power-driven; Fork lift, under 10 ton; Form grader; Form tamper, motor-driven; Generator; Hetherington driver; Hydra seeder; Operator, 1 through 4 pieces of minor equipment; Outboard or inboard motor boat; Power curing spraying machine; Power saw, concrete, power-driven; Pug mill; Pull broom, power-type; Seaman tiller; Straw blower or brush mulcher; Striping machine paint, motor-driven; Sub grader; Tractaire, tractor, below 50 h.p.; Truck crane oiler, driver; Spreader; Water pump; Welding machine, 2 of 300 amps or over

ENGI0150-009 04/01/2015

HEAVY, HIGHWAY AND RAILROAD CONSTRUCTION

ELKHART, FULTON, JASPER, KOSCIUSKO, LAGRANGE, MARSHALL, NEWTON, NOBLE, PULASKI, and STARKE COUNTIES

| | Rates | Fringes |
|--------------------------|----------|---------|
| POWER EQUIPMENT OPERATOR | | |
| GROUP 1..... | \$ 29.50 | 23.45 |
| GROUP 2..... | \$ 27.90 | 23.45 |
| GROUP 3..... | \$ 26.60 | 23.45 |
| GROUP 4..... | \$ 25.20 | 23.45 |
| GROUP 5..... | \$ 21.95 | 23.45 |

POWER EQUIPMENT OPERATOR CLASSIFICATIONS

GROUP 1: Air compressors in manifold with throttle valve; Asphalt plant engineer; Auto grade or similar type machine; Auto patrol; Automatic Sub-Grade; Backhoe or farm type tractor, 45 hp and over; Ballast regulator (RR); Barrier Wall Machine; Batch Plants (Concrete & Asphalt); Bituminous mixer; Bituminous paver; Bituminous plant engineer; Boring Machine; Bulldozer; Caisson drilling machine; Cherry picker, 15 ton or over; Chip spreader; Concrete mixer, 21 cu. ft. or over; Concrete Belt Placer; Concrete Paver; Concrete Pump (Truck Mounted); Concrete Saw (track mounted); Concrete Spreader (power driven); Core drilling machine; Crane or derrick with any attachment (including clamshell, dragline, shovel, backhoe, etc.); Curb Machine; Gutter Machine; Dredge engineer; Dredge operator; Drilling machine on which the drill is an integral part; Earthmover, rubber-tired (paddle wheel, 616, 631, TS-24 or similar type); Earthmover, rubber-tired, tandem (.50 per hr. additional for each bowl); Elevating Grader; Forklift (10 ton or over); P.C.C. Formless Paver; Gradall; Gravel Processing Plant (portable); Operator of Guard Rail Post Driver; Highlift Shovel 1-1/2 cu.yd. or over) Frame; Hoist (2 drum & over); Helicopter crew; Hydraulic boom truck; Hydraulic Excavator; Loaded-Self propelled (belt chain wheel); Laser Screed; Locomotive operator; Mechanic; Mucking machine; P.C.C. Concrete Belt Placer; Panel board concrete plant (central mix type); Paver (Hetherington); Pavement Breaker; Pile driver, skid or crawler; Road paving mixer; Rock breaking plant; Rock crushing plant (portable); Roller (asphalt, waterbound macadam, bituminous macadam, brick surface); Roller with dozer blade; Road Widener; Root rake (tractor-mounted); Roto Mill Grinder; Self-propelled widener; Stump remover; Surface heater and planer; Tandem push tractor (\$0.50 per hour additional); Tractor, boom; Winch or hoe head; Tractor (push); Tractor with scoop; Tractor-mounted spreader; Tree mover; Trench machine, over 24"; Tug boat operator; Well drilling machine; Widener (Apsco or similar type); Winch truck with A-frame

GROUP 2: Air compressor with throttle valve or Clever Brooks type combination; Backfiller; Farm type tractor (under 45 H.P.); Cherry picker under 15 ton; Chip spreader (self-propelled); Concrete pump (trailer type); Concrete mesh depressor, independently operated; End loader under 1 1/2 cu. yd.; Excavating loader (portable); Finishing machine and bull float; Guniting machine; Hydraulic Power unit; Head greaser; Mesh or steel placer; Multiple tamping backhoe on machine (RR); Bull float (bidwell Machine); Refrigerating machine-operation;

Ross Carrier; Sheepfoot roller (self-propelled);
 Tamper-Multiple Vibrating (Asphalt, Waterbound, Macadam,
 Bituminous Macadam, Brick Surface); Trench machine (24" and
 under); Tube float; Water Pull/Wagon; Welder

GROUP 3: Plant engineer; Base paver (Jersey or similar type
 machine); Concrete finishing machine; Concrete mixer, less
 than 21 cu. ft.; Curb machine; Farm tractor, including farm
 tractor with all attachments except backhoe and including
 high lift end loaders of 1 cu. yd. capacity or less;
 Fireman, on boiler; Hoist, 1 drum; Operator, 3-5 pieces of
 minor equipment; Paving breaker; Power broom,
 self-propelled; Roller, earth and sub-base material; Power
 Saw-Concrete (Power Driven); Slurry seal machine; Spike
 machine (RR); Sub-surface Material Distributor; Tamper
 (multiple vibrating, earth and sub-base material); Throttle
 valve; Throttle Valve and fireman combination on horizontal
 or upright boiler; Tractaire with drill; Well Point

GROUP 4: Air compressor; Assistant to engineer, oiler;
 Bituminous patching tamper; Belt spreader; Broom and belt
 machine; Chair cart, self-propelled; Coleman-type screen;
 Conveyor, portable; Deck-hand Digger post hole,
 power-driven; Forklift, under 10 ton; Form grader; Form
 tamper, motor-driven; Generator; Hetherington driver; Hydra
 seeder; Mechanic heater; Operator, 2 pieces of minor
 equipment; Outboard or inboard motor boat; Power curing
 spraying machine; Pug mill; Pull broom, power type; Seaman
 tiller; Skid steer loader over 3/4 cu. yd.; Straw blower or
 brush mulcher; Striping machine paint, motor-driven;
 Sub-grader; Tractaire; Tractor, below 50 h.p.; Truck crane
 oiler; Spreader; Water pump

GROUP 5: Skid steer loader under 3/4 cu. yds

 ENGI0150-039 06/01/2015

UNDERGROUND & UTILITY CONSTRUCTION:

JASPER, NEWTON, PULASKI AND STARKE COUNTIES:

| | Rates | Fringes |
|--------------------------|----------|---------|
| POWER EQUIPMENT OPERATOR | | |
| GROUP 1..... | \$ 39.40 | 30.53 |
| GROUP 2..... | \$ 38.60 | 30.53 |
| GROUP 3..... | \$ 34.30 | 30.53 |
| GROUP 4..... | \$ 32.10 | 30.53 |

POWER EQUIPMENT OPERATOR CLASSIFICATIONS

GROUP 1: Mechanic; Asphalt plant; Autograde; Batch plant;
 Benoto (requires 2 engineers); Boiler and throttle valve;
 Boring machine (mining machine); Caisson rigs; Central
 Redi-mix plant; Combination backhoe-endloader with backhoe
 bucket over 1/2 cu. yd.; Combination tugger hoist and air
 compressor; Compressor and throttle; Concrete breaker
 (truck-mounted); Concrete conveyor; Concrete paver over 27E
 cu. ft.; Concrete paver 27E cu. ft. and under; Concrete

pump with boom (truck-mounted); Concrete tower; Cranes and backhoes, all attachments; Cranes, Hammerhead tower; Creter cranes; Derricks, all; Derricks, traveling; Forklift, lull type; Forklift, 10 ton and over; Hoists, 1, 2 and 3 drum; Hoist, 2 tigger - one floor; Hydraulic boom truck; Locomotives, all; Motor patrol; Mucking machine; Pile driving and skid rig; Pit machines; Pre-stress machines; Pumpcrete and similar types; Rock drill, self-propelled; Rock drill, truck-mounted; Slip form paver; Straddle buggies; Tractor with boom and side boom; Trenching machine; Winch tractors

GROUP 2: Asphalt spreader; Boilers; Bulldozers; Combination backhoe-endloader with backhoe bucket 1/2 cu. yd. and under; Engineer acting as conductor in charge of crew; Grader, elevating; Greaser engineer; Grouting machines; Highlift shovels or front endloader; Hoists, automatic; Corboy drilling machines; Hoists, all elevators; Hoists, tigger, single drums; Post hole digger; Roller, all; Scoops, tractor-drawn; Stone crushers; Tournapull; Winch trucks

GROUP 3: Concrete mixer (2 bag and over); Conveyor, portable; Steam generators; Tractor, farm and similar type; Air compressor, small, 150 and under, 1 to 5 not to exceed a total of 300 ft.; Air compressor, large, over 150; Combination, small equipment operator; Forklift, under 10 ton; Generator; Pump, 1 to 3 not to exceed a total of 325 ft.; Pumps; Well points; Welding machines (2 through 5); Winches, 4 electric drill winches

GROUP 4: Heater, mechanical (1 to 5); Oilers; Switchmen

 ENGI0181-014 04/01/2015

HEAVY AND HIGHWAY CONSTRUCTION:

BARTHOLOMEW, BROWN, CLARK, CRAWFORD, DEARBORN, DECATUR, DUBOIS, FLOYD, FRANKLIN, GIBSON, HARRISON, JACKSON, JEFFERSON, JENNINGS, LAWRENCE, MARTIN, OHIO, ORANGE, PERRY, PIKE, POSEY, RIPLEY, SCOTT, SPENCER, SWITZERLAND, VANDERBURGH, WARRICK, and WASHINGTON COUNTIES

| | Rates | Fringes |
|----------------------------|----------|---------|
| Power equipment operators: | | |
| GROUP A..... | \$ 32.65 | 14.40 |
| GROUP B..... | \$ 30.00 | 14.40 |
| GROUP C..... | \$ 27.87 | 14.40 |

POWER EQUIPMENT OPERATOR CLASSIFICATIONS

GROUP A: Air compressor in manifold with throttle valve; Asphalt plant engineer; Auto grade or similar type machine; Bituminous mixer; Bituminous paver; Bituminous plant engineer; Bulldozer; Caisson drilling machine; Cherry picker, all; Ballast regulator (RR); Chip spreader, self-propelled; Cold grinder or similar type equipment;

Concrete mixer, 21 cu. ft. or over; Concrete pump, truck-mounted; Core drilling machine; Crane or derrick with any attachment (including clamshell, dragline, shovel, backhoe, etc.); Dredge operator; Drilling machine on which the drill is an integral part; Earth mover, rubber-tired, tandem 0.50 per hour additional; Elevating grader; Endloader, Hi- lift shovel; P.C.C. formless paver; Gradall; Gravel processing plant, portable; Guardrail post driver operator; Head greaser; Hi-lift shovel, endloader; Hoist (2 drums and over); Helicopter crew; Hydraulic boom truck, Keystone, Skimmer Scoop; Loader, self-propelled (belt, chain wheel); Locomotive operator; Mechanic; Mucking machine; Multi-bank drill operator; Panel board concrete plant, central mix type; Paver, Hetherington; Pile driver, skid or crawler; Road paving mixer; Rock breaking plant; Rock crushing plant, portable; Roller (asphalt, waterbound, macadam, bituminous macadam, brick surface); Roller, with dozer blade; Root rake, tractor-mounted; Stump remover, tractor-mounted; Surface heater and planer; Tandem push tractor, \$0.50 per hour additional; Tractor, boom winch or hoe head; Tractor, push; Tractor with scoop; Tractor-mounted spreader; Tree mover; Trench machine, over 24"; Tug boat operator; Welder; Well drilling machine; Self-propelled widener.

GROUP B: Air compressor with throttle valve or clever brooks-type combination; Backfiller, base paver, Jersey or similar type machine; Bull float; Concrete finishing machine; Concrete mesh depressor, independently operated; Concrete spreader, power-driven; Dredge engineer; Excavator loader, portable; Fire tender on boiler; Forklift, regardless of ton; Hoists, 1 drum; Mesh or steel placer; Minor equipment operator, 5 pieces; Multiple tamping machine (RR); P.C.C. concrete placer; Paving breaker; Power broom, self-propelled; Pull grader, power-controlled; Refrigerating machine, freezing operation; Roller, earth and sub- base material; Ross carrier (Straddle buggy); Sheepfoot roller, self-propelled without blade; Tamper, multiple vibrating (asphalt, waterbound macadam, bituminous macadam, brick surface); Tamper, multiple vibrating (earth and sub-base material); Trench machine, 24" and under; Tube float; Well point system; Widener, Apsco or similar type; Winch truck with A-frame.

GROUP C: Air compressor, oiler; Automatic dry batch plant; Bituminous distributor; Bituminous patching tamper; Belt spreader; Broom and belt machine; Brush burner; Chair cart, self-propelled; Coleman-type screen; Cold grinder oiler; Concrete mixer, less than 21 cu. ft.; Conveyor, portable; Curb machine; Deckhand; Digger (post hole, power-driven); Farm tractor, including farm tractor with all attachments (except backhoe, Hi- lift endloaders); Form grader; Form tamper, motor-driven; Generator; Gunite machine; Hetherington driver; Hydra seeder; Mechanical heater; Minor equipment operator, 1 through 4 pieces; Curing spraying machine; Power saw, concrete (power-driven); Pug mill pull broom, power type; Seaman tiller; Slurry seal machine; Spike machine; Straw blower or brush mulcher; Stripping machine (paint, motor-driven); Sub grader; Throttle valve;

Tractaire with drill; Truck crane and multi-drill oiler,
driver; Spreader; Water pump.

ENGI0181-015 04/01/2015

SEWER WATERLINE & UTILITY CONSTRUCTION:

BARTHOLOMEW, BROWN, CLARK, CRAWFORD, DEARBORN, DECATUR, DUBOIS,
FLOYD, FRANKLIN, GIBSON, HARRISON, JACKSON, JEFFERSON,
JENNINGS, LAWRENCE, MARTIN, OHIO, ORANGE, PERRY, PIKE, POSEY,
RIPLEY, SCOTT, SPENCER, SWITZERLAND, VANDERBURGH, WARRICK, and
WASHINGTON COUNTIES

| | Rates | Fringes |
|----------------------------|----------|---------|
| Power equipment operators: | | |
| GROUP A..... | \$ 31.88 | 14.40 |
| GROUP B..... | \$ 23.75 | 14.40 |

SEWER WATERLINE & UTILITY CONSTRUCTION

GROUP A: A-frame winch truck; Air compressor 900 cu. ft. and
over; Air tugger; Autograde (CMI); Auto patrol; Backhoe;
Ballast regulator (RR); Batch plant (electrical control
concrete); Bending machine (pipe); Bituminous plant
(engineer); Bituminous plant; Bituminous mixer travel
plant; Bituminous paver; Bituminous roller; Buck hoist;
Bulldozer; Cableway; Chicago boom; Clamshell; Concrete
mixer, 21 cu. ft. or over; Concrete paver, concrete pump,
crete; Crane; Craneman; Crusher plant; Derrick; Derrick
boat; Dinky; Dope pots (pipeline); Dragline; Dredge
operator; Dredge engineer; Drill operator; Elevator grader;
Elevator; Ford hoe, or similar type equipment; Forklift;
Formless paver; Gantry crane; Gradall; Grademan; Hopto;
Hough loader or similar type; Hydro crane; Motor crane;
Mucking machine; Multiple tamping machine (RR); Overhead
crane; Pile driver; Pulls; Push dozer; Push boats; Roller
(sheep foot); Ross Carrier; Scoop; Shovel; Side boom; Swing
crane; Trench machine; Welder (heavy duty; Truck-mounted
concrete pump; Truck-mounted drill; Well point; Whirleys.

GROUP B: Air compressor, up to 900 cu. ft.; Brakeman; Bull
float; Concrete mixer, over 10S and under 21S; Concrete
spreader or puddler; Deck engine; Electric vibrator
compactor (earth or rock); Finishing machine; Fireman;
Greaser, on grease facilities servicing heavy equipment;
Material pump; Motor boats; Portable loader; Post hole
digger; Power broom; Rock roller; Roller, wobble wheel
(earth and rock); Spike machine (RR); Seaman tiller;
Spreader rock; Sub grader; Tamping machine; Welding
machine; Widener, Apsco or similar type: Bituminous
distributor; Cement gun; Concrete saw; Conveyor; Deckhand
oiler; Earth roller; Form grader; Generator; Guard rail
driver; Heater; JLG lifts; Oiler; Paving joint machine;
Power traffic signal; Scissor lift; Steam Jenny; Truck
crane oiler; Vibrator; Water pump.

ENGI0841-011 04/01/2013

HEAVY, HIGHWAY AND UTILITY CONSTRUCTION

BOONE, CLAY, DAVIESS, FOUNTAIN, GREENE, HENDRICKS, KNOX,
 MONROE, MONTGOMERY, MORGAN OWEN, PARKE, PUTNAM, SULLIVAN,
 VERMILLIAN, VIGO, and WARREN COUNTIES

| | Rates | Fringes |
|----------------------------|----------|---------|
| Power equipment operators: | | |
| GROUP 1..... | \$ 29.75 | 16.75+a |
| GROUP 2..... | \$ 23.50 | 16.75+a |

POWER EQUIPMENT OPERATOR CLASSIFICATIONS

GROUP 1: Air Compressor Over 600 CU FT, Air Compressors (2), Compressors hooked in Manifold, Asphalt Plant Engineer, Auto Grade and/or C.M.I. or similar type Machine, Auto Patrol, Motor Patrol, Power Blade, Aspco Paver, Asphalt Planer, Asphalt Rollers, Asphalt Paver Operator, Concrete or Asphalt Milling Machine, Self Propelled Widener, Backhoe and/or Pavement Breaker Attachment, Self Propelled Pavement Breaker, Ballast Regulator (R.R), Bituminous Mixer, Bituminous Paver, Bituminous Plant Engineer, Bulk Cement Plant Engineer, Bulldozer, One Drum Hoist with Tower or Boom, Cableways, Tower Machines, Back Filler, Boom Tractor, Boom or Winch Truck, Winch or Hydraulic Boom Truck, Boring Machine, Bolier Operator, Brush Mulcher, Bull Float, Finishing Machine, Power Cranes, Overhead Cranes, Truck cranes, Piledriver, Skid or Crawler, Guard Rail Post Driver, Tower Cranes, Hydro Crane, Cherry Picker, Draglines, Derricks, Shovels, Clam, Gradalls, Two Drum Machine, Concrete or Asphalt Curb Machine, Self Propelled, Concrete Mixers with Skid, Tournamixer, Concrete Pump (Truck or Skid Mounted), Concrete Plant Engineer, Soil Cement Machine, Formless Paver, Concrete Spreader, Span Saw (and similar types), Chip Spreader, Mesh Placer, Dredging Equipment or Dredge Engineer or Dredge Operator, Tug Boat Operator, Marine Scoops, Ditching Machine with Dual Attachment, Standard or Dinkey Locomotives, Drilling Machine, including Well Testing, Caissons, Shaft or any similar type Drilling Machine (Well Point Systems), 4 Point Life System (Power Lift or similar type), Mud Cat, Mucking Machine, Sull-Air, Mechanics, Welder, Head Equipment Greaser, Tournapull, Tractor Operating Scoops, Push Tractors, Large Rollers on Earth, Loaders (Track or Rubber Mounted), or similar type Machine, Lull, Tournadozer, Scoopmobiles, Elevating Machines, Power Broom (Self Propelled), Power Sub Grader, Hydra Ax, Farm Tractor with Attachments, Soil Stabilizer (Seaman Tiller, Bo mag, Rago Gator and similar types of equipment), Tree Mover, Stump Remover, Root Rake, Hydra Seeder, Straw Blower, Refrigerating Machine, Freezing Operator, Chair Cart-Self Propelled, Helicopter Crew (3), Ross Carrier or Straddle Buggy or similar Machine, Rock Crusher Plant, Gravel Processing Machine, Pipe Cleaning Machine, Pipe Wrapping Machine, Pipe Bending Machine, Pug Mill, Concrete Bump Grinder Machine, Power Curing Spray Machine, Forklift

(except when used for landscaping), Snooper Truck Operator.

GROUP 2: Air Compressor 600 cu. ft. and under, Air Tugger, Air Valves, Assistant Concrete Plant Engineer, Assistant Asphalt Plant Engineer, Asphalt Plant Fireman, Bulk Cement Plant Equipment Greaser, Concrete Mixers without Skips, Curbing Machine, Concrete Saw (Self Propelled), Conveyors, Cement Blimps, Ditching Machine under 6", Distributor Operator On trucks, Deck Hands, Elevators when used for hoisting material, Engine Tenders, Fork Lift (when used for landscaping), Farm Tractor, Fireman, Fireman on Paint or Dope Pots, Form Tamper, Form Grader, Flex Plane, Generators (two to four), or Welding Machines or Water Pumps, within 400 feet, Guniting Machine, Machine Mounted Post Hole Digger, Mude Jack, One Drum Machines without Tower or Boom, One Water Pump, One Welding Machine, Outboard or Inboard Motor Boat, Pull Broom (Power Type, Siphons and Pulsometer, Switchman, Striping and or Painting Machine (motor driven), Slurry Seal Machine, Track Jack, Temporary Heat, Throttle Valve, Tube Float, Tractaire, Wagon Drill, Multiple Tamping Machine (R.R.), Spike Machine (R.R.), Mechanical Heaters, Brush Burner, Vacuum Truck (Super Sucker and similar types).

FOOTNOTES:

- A. Employees operating booms from 149Ft. to 199 Ft. including jib, shall receive an additional seventy-five Cents (.75) per hour above the rate. Employees operating booms over 199 Ft. including jib, shall receive an additional one dollar and twenty-five cents (\$1.25) per hour above the regular rate.
- B. Employees operating scoops, pulls, or tractors hooked in tandem shall receive an additional one dollar (\$1.00) per hour above the regular rate.
- C. Employees operating scoops, pulls, or tractors pulling any other hauling unit in tandem shall receive an additional one dollar (\$1.00) per hour above the regular rate.
- D. Underground work - Employees working in tunnels, shafts, etc. shall be paid a thirty percent (30%) premium above the wage rate.

IRON0022-001 06/01/2015

BARTHOLOMEW, BENTON, BOONE, BROWN, CARROLL, CASS, CLAY, CLINTON, DAVIESS (REMAINDER OF COUNTY), DECATUR (W 3/4), DELAWARE (REMAINDER OF COUNTY), FAYETTE (W 1/3), FOUNTAIN, FRANKLIN (NW TIP), FULTON (REMAINDER OF COUNTY), GRANT (REMAINDER OF COUNTY), GREENE, HAMILTON, HANCOCK, HENDRICKS, HENRY, HOWARD, JACKSON, JASPER (SOUTHEASTERN 1/2), JENNINGS (NORTHWEST 2/3), JOHNSON, KNOX (REMAINDER OF COUNTY), LAWRENCE, MADISON, MARTIN (NW 2/3), MIAMI (REMAINDER OF COUNTY), MONROE, MONTGOMERY, MORGAN, NEWTON (SOUTHERN 1/2), OWEN, PARKE, PULASKI (REMAINDER OF COUNTY), PUTNAM, RANDOLPH (SW TIP), RUSH (REMAINDER OF COUNTY), SHELBY, SULLIVAN, TIPPECANOE, TIPTON,

VERMILLION, VIGO, WAYNE, WARREN AND WHITE COUNTIES:

| | Rates | Fringes |
|-----------------|----------|---------|
| IRONWORKER..... | \$ 30.39 | 19.75 |

The following holidays shall be observed: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and the day after Thanksgiving and Christmas Day. Any holiday which occurs on a Sunday shall be observed the following Monday, unless the legal observance of these holidays is changed by law.

IRON0044-010 06/01/2015

DEARBORN, DECATUR (REMAINDER OF COUNTY), FAYETTE (REMAINDER OF COUNTY), FRANKLIN (REMAINDER OF COUNTY), JEFFERSON (REMAINDER OF COUNTY), JENNINGS (REMAINDER OF COUNTY), OHIO, RIPLEY, RUSH (SOUTHEASTERN TIP), SWITZERLAND, AND UNION (SOUTHERN 1/3)

| | Rates | Fringes |
|---|----------|---------|
| Ironworkers: | | |
| FENCE ERECTORS..... | \$ 23.64 | 18.80 |
| ORNAMENTAL..... | \$ 26.27 | 18.80 |
| STRUCTURAL, MACHINERY MOVERS, RIGGERS..... | \$ 26.27 | 18.80 |

IRON0070-002 06/01/2015

CLARK, CRAWFORD, FLOYD, HARRISON, JACKSON (SOUTHERN 3/4); JEFFERSON (EXCLUDING NORTHEASTERN TIP); JENNINGS (SOUTHERN 3/4), LAWRENCE (SOUTHERN 2/3), MARTIN (SOUTHEASTERN 2/3), ORANGE, PERRY (EASTERN 3/4); SCOTT AND WASHINGTON COUNTIES:

| | Rates | Fringes |
|-----------------|----------|---------|
| IRONWORKER..... | \$ 27.56 | 20.30 |

IRON0103-001 08/01/2015

DAVIESS (S 1/2), DUBOIS, GIBSON, KNOX (S 1/2), MARTIN (SW 1/3), PERRY (W 1/4), PIKE, POSEY, SPENCER, VANDERBURGH, AND WARRICK

| | Rates | Fringes |
|-----------------|----------|---------|
| IRONWORKER..... | \$ 28.14 | 18.68 |

IRON0147-004 06/01/2015

ADAMS, ALLEN, BLACKFORD, DEKALB, DELAWARE (NORTHEAST THIRD OF COUNTY), FULTON (EASTERN PART), GRANT (EXCLUDING SOUTHWEST PORTION), HUNTINGTON, JAY, MIAMI (NORTHEAST HALF), NOBLE (EXCLUDING NORTHEAST TIP), STEUBEN, WABASH, WELLS, and WHITLEY COUNTIES

| | Rates | Fringes |
|-----------------|----------|---------|
| IRONWORKER..... | \$ 25.39 | 20.12 |

IRON0290-004 06/01/2015

FAYETTE (NE 1/4), RANDOLPH (S. PART OF COUNTY EXCLUDING WINCHESTER BUT INCLUDING UNION CITY) UNION (NORTHERN 2/3) AND WAYNE (REMAINDER OF COUNTY) COUNTIES

| | Rates | Fringes |
|-------------------|----------|---------|
| Ironworkers:..... | \$ 27.00 | 19.98 |

IRON0292-005 06/01/2015

ELKHART, FULTON (North 2/3), KOSCIUSKO (Remainder of County), LAGRANGE (West 1/3), MARSHALL, MIAMI (Northwestern Tip), NOBLE (Northwestern Tip), PULASKI (Northeast Half), and STARKE COUNTIES

| | Rates | Fringes |
|-----------------|----------|---------|
| IRONWORKER..... | \$ 28.31 | 19.36 |

IRON0372-007 06/15/2015

DEARBORN, DECATUR (REMAINDER OF COUNTY), FAYETTE (SE CORNER), FRANKLIN (S 3/4), OHIO, RIPLEY (REM. OF COUNTY), SWITZERLAND (REMAINDER OF COUNTY) and JENNINGS (NE TIP) COUNTIES

| | Rates | Fringes |
|--------------------------|----------|---------|
| IRONWORKER (Reinforcing) | | |
| Beyond 30 miles of | | |
| Hamilton County, Ohio | | |
| Court House..... | \$ 27.25 | 19.00 |
| Within 30 miles of | | |
| Hamilton County, Ohio | | |
| Court House..... | \$ 27.00 | 19.00 |

IRON0395-002 06/01/2015

JASPER (NORTHERN 1/2), NEWTON (NORTHERN 1/2), PULASKI (NORTHWESTERN TIP) COUNTIES

| | Rates | Fringes |
|------------------|----------|---------|
| IRONWORKER | | |
| IRONWORKERS..... | \$ 39.50 | 27.77 |
| SHEETER..... | \$ 39.75 | 27.77 |

LABO0041-005 04/01/2014

UTILITY CONSTRUCTION

JASPER AND NEWTON COUNTY

| | Rates | Fringes |
|--------------|----------|---------|
| Laborers: | | |
| GROUP 1..... | \$ 30.57 | 13.30 |
| GROUP 2..... | \$ 30.87 | 13.30 |
| GROUP 3..... | \$ 31.57 | 13.30 |

LABORERS CLASSIFICATIONS (UTILITY CONSTRUCTION)

GROUP 1: Construction laborer; Fence erector; Flagger; Grade checker; Guard rail erector; Wire mesh layer; Joint man (mortar, mastic and all other types); Lighting installer (permanent or temporary); Lineman for automatic grade maker on paving machines; Mortar man; Multi-plate erector; Rip-rap installer (all products and materials); Road marking and delineation laborer; Setting and placing of all precast concrete products; Sign installation including supporting structure; Spraying of all epoxy, curing compound, or like material; sod layer; Air tool, power tool, and power equipment operator; Asphalt lute man; Asphalt raker man; Batch truck dumper; Bridge handrail erector; Handler (bulk or bag cement); Chain saw man; concrete puddler; concrete rubber; Concrete saw operator; Core drill operator, eye level; Hand blade operator; Hydro seeder man; Motor-driven Georgia buggy operator; Power-driven compactor or tamper operator; Power saw operator; Pumpcrete assembly man; Screed man or screw man on asphalt paver; Rebar installer; Sandblaster man; Sealer applicator for asphalt (toxic); Setting and placing prestressed or precast concrete structural members; Side rail setter (for sidewalks, side ditches, radii, and pavements); Spreader box tender (manual or power-driven); Straw blower man; Subsurface drain and culvert pipe layer; Transverse and longitudinal hand bull float man; Concrete conveyor assembly man; Horizontal boring and jacking man; Jackman and sheetman; Pipe grade man; Winch and windlass operator

GROUP 2: Cutting torch burner; Laser beam aligner; Manhole erector; Sewer pipe layer; Water line installer, temporary or permanent; Welder (electric or oxy-acetylene) in connection with waterline and sewer work, Hod Carrier (tending bricklayers); TVing and associated grouting of utility lines

GROUP 3: Air track and wagon drillman; Concrete barrier rail form setter; Dynamite and powder man; General leadman; Concrete Saw Joint Control cutting

LABO0081-003 04/01/2015

UTILITY CONSTRUCTION

STARKE COUNTY

| | Rates | Fringes |
|--------------|----------|---------|
| Laborers: | | |
| GROUP 1..... | \$ 30.22 | 13.30 |
| GROUP 2..... | \$ 30.52 | 13.30 |
| GROUP 3..... | \$ 31.22 | 13.30 |

LABORERS CLASSIFICATIONS (UTILITY CONSTRUCTION)

GROUP 1: Construction laborer; Fence erector; Flagger; Grade checker; Guard rail erector; Wire mesh layer; Joint man (mortar, mastic and all other types); Lighting installer (permanent or temporary); Lineman for automatic grade maker on paving machines; Mortar man; Multi-plate erector; Rip-rap installer (all products and materials); Road marking and delineation laborer; Setting and placing of all precast concrete products; Sign installation including supporting structure; Spraying of all epoxy, curing compound, or like material; sod layer; Air tool, power tool, and power equipment operator; Asphalt lute man; Asphalt raker man; Batch truck dumper; Bridge handrail erector; Handler (bulk or bag cement); Chain saw man; concrete puddler; concrete rubber; Concrete saw operator; Core drill operator, eye level; Hand blade operator; Hydro seeder man; Motor-driven Georgia buggy operator; Power-driven compactor or tamper operator; Power saw operator; Pumpcrete assembly man; Screed man or screw man on asphalt paver; Rebar installer; Sandblaster man; Sealer applicator for asphalt (toxic); Setting and placing prestressed or precast concrete structural members; Side rail setter (for sidewalks, side ditches, radii, and pavements); Spreader box tender (manual or power-driven); Straw blower man; Subsurface drain and culvert pipe layer; Transverse and longitudinal hand bull float man; Concrete conveyor assembly man; Horizontal boring and jacking man; Jackman and sheetman; Pipe grade man; Winch and windlass operator

GROUP 2: Cutting torch burner; Laser beam aligner; Manhole erector; Sewer pipe layer; Water line installer, temporary or permanent; Welder (electric or oxy-acetylene) in connection with waterline and sewer work, Hod Carrier (tending bricklayers); TVing and associated grouting of utility lines

GROUP 3: Air track and wagon drillman; Concrete barrier rail form setter; Dynamite and powder man; General leadman; Concrete Saw Joint Control cutting

LABO0081-007 04/01/2015

UTILITY CONSTRUCTION

ALL REMAINING COUNTIES

| | Rates | Fringes |
|--------------|----------|---------|
| Laborers: | | |
| GROUP 1..... | \$ 22.62 | 13.30 |

| | | |
|--------------|----------|-------|
| GROUP 2..... | \$ 22.92 | 13.30 |
| GROUP 3..... | \$ 23.62 | 13.30 |

LABORERS CLASSIFICATIONS (UTILITY CONSTRUCTION)

GROUP 1: Construction laborer; Fence erector; Flagger; Grade checker; Guard rail erector; Wire mesh layer; Joint man (mortar, mastic and all other types); Lighting installer (permanent or temporary); Lineman for automatic grade maker on paving machines; Mortar man; Multi-plate erector; Rip-rap installer (all products and materials); Road marking and delineation laborer; Setting and placing of all precast concrete products; Sign installation including supporting structure; Spraying of all epoxy, curing compound, or like material; sod layer; Air tool, power tool, and power equipment operator; Asphalt lute man; Asphalt raker man; Batch truck dumper; Bridge handrail erector; Handler (bulk or bag cement); Chain saw man; concrete puddler; concrete rubber; Concrete saw operator; Core drill operator, eye level; Hand blade operator; Hydro seeder man; Motor-driven Georgia buggy operator; Power-driven compactor or tamper operator; Power saw operator; Pumpcrete assembly man; Screed man or screw man on asphalt paver; Rebar installer; Sandblaster man; Sealer applicator for asphalt (toxic); Setting and placing prestressed or precast concrete structural members; Side rail setter (for sidewalks, side ditches, radii, and pavements); Spreader box tender (manual or power-driven); Straw blower man; Subsurface drain and culvert pipe layer; Transverse and longitudinal hand bull float man; Concrete conveyor assembly man; Horizontal boring and jacking man; Jackman and sheetman; Pipe grade man; Winch and windlass operator

GROUP 2: Cutting torch burner; Laser beam aligner; Manhole erector; Sewer pipe layer; Water line installer, temporary or permanent; Welder (electric or oxy-acetylene) in connection with waterline and sewer work, Hod Carrier (tending bricklayers); TVing and associated grouting of utility lines

GROUP 3: Air track and wagon drillman; Concrete barrier rail form setter; Dynamite and powder man; General leadman; Concrete Saw Joint Control cutting

LABO0999-001 04/01/2014

HEAVY AND HIGHWAY CONSTRUCTION

| | Rates | Fringes |
|--------------|----------|---------|
| Laborers: | | |
| GROUP 1..... | \$ 22.62 | 12.80 |
| GROUP 2..... | \$ 22.92 | 12.80 |
| GROUP 3..... | \$ 23.62 | 12.80 |

LABORERS CLASSIFICATIONS

GROUP 1: Building and Construction Laborers; Scaffold

Builders (other than for Plasterers); Mechanic Tenders; Window Washers and cleaners; Waterboys and Toolhousemen; Roofers Tenders; Railroad Workers; Masonry Wall Washers (interior and exterior); Cement Finisher Tenders; Carpenter Tenders; All Portable Water pumps with discharge up to (3) inches; Plaster Tenders; Mason Tenders; Flag & Signal Person.

GROUP 2: Waterproofing; Handling of Creosot Lumber or like treated material (excluding railroad material); Asphalt Rakers and Lutemen; Kettlemen; Air Tool Operators and all Pneumatic Tool Operators; Air and Electric Vibrators and Chipping Hammer Operators; Earth Compactors Jackmen and Sheetmen working Ditches deeper than (6) ft.in depth; Laborers working in ditches (6) ft.in depth or deeper; Assembly of Unicrete Pump; Tile Layers (sewer or field) and Sewer Pipe Layer (metallic or non-metallic); Motor driven Wheelbarrows and Concrete Buggies; Hyster Operators; Pump Crete Assemblers; Core Drill Operators; Cement, Lime or Silica Clay Handlers (bulk or bag); Handling of Toxic Materials damaging to clothing; Pneumatic Spikers; Deck Engine and Winch Operators; Water Main and Cable Ducking (metallic and non-metallic); Screed Man or Screw Operator on Asphalt Paver; Chain and Demolition Saw Operators; Concrete Conveyor Assemblers.

GROUP 3: Water Blast Machine Operator; Mortar Mixers; Welders (Acetylene or electric); Cutting Torch or Burner; Cement Nozzle. Laborers; Cement Gun Operator; Scaffold Builders when Working for Plasterers. Dynamite Men; Drillers - Air Track or Wagon Drilling for explosives Hazardous and Toxic material handler, asbestos removal or handler.

 PAIN0012-006 05/01/2015

COMMERCIAL AND INDUSTRIAL

DEARBORN, OHIO, RIPLEY AND SWITZERLAND COUNTIES:

| | Rates | Fringes |
|--------------------------------|----------|---------|
| PAINTER | | |
| Bridges, Lead Abatement..... | \$ 24.39 | 9.06 |
| Brush & Roller, | | |
| Paperhanger, Drywall Taping.\$ | 23.39 | 9.06 |
| Sandblasting, Waterblasting.\$ | 24.14 | 9.06 |
| Spray..... | \$ 23.89 | 9.06 |

 PAIN0027-005 06/01/2014

NEWTON COUNTY, West of Highway #41

| | Rates | Fringes |
|--------------|----------|---------|
| GLAZIER..... | \$ 40.50 | 31.07 |

 PAIN0047-005 06/01/2014

BARTHOLOMEW, BOONE, BROWN, DECATUR, HAMILTON, HANCOCK,

HENDRICKS, JACKSON, JENNINGS, JOHNSON, LAWRENCE, MARION,
MARTIN, MONROE, MORGAN, ORANGE, AND SHELBY COUNTIES

| | Rates | Fringes |
|---|----------|---------|
| PAINTER | | |
| BRIDGE WORK | | |
| Brush & Roller..... | \$ 29.70 | 12.30 |
| Spray, Sandblaster, Waterblaster, Lead Based Paint Abatement..... | \$ 29.70 | 12.30 |
| Brush, Roller..... | \$ 24.43 | 12.35 |
| Spray and Sand-Blasting..... | \$ 25.43 | 12.35 |

PAIN0080-001 06/01/2014

BENTON, CARROLL, CASS, CLINTON, FOUNTAIN, MONTGOMERY TIPPECANOE
AND WARREN COUNTIES

| | Rates | Fringes |
|-----------------------------|----------|---------|
| PAINTER | | |
| Brush and Roller..... | \$ 23.85 | 13.80 |
| Spray and Sandblasting..... | \$ 24.85 | 13.80 |

PAIN0091-007 06/01/2014

ELKHART, FULTON, KOSCIUSKO AND MARSHALL COUNTIES

| | Rates | Fringes |
|--|----------|---------|
| PAINTER | | |
| Brush & Roller, Drywall Taping & Finishing, Vinyl/Paper Hanging..... | | |
| | \$ 26.32 | 12.75 |
| Spray..... | \$ 26.82 | 12.75 |

PAIN0118-005 06/01/2014

CLARK, CRAWFORD, FLOYD, HARRISON JEFFERSON, SCOTT AND
WASHINGTON COUNTIES

| | Rates | Fringes |
|---------------------------------------|----------|---------|
| Painters: | | |
| Brush, Roller & Paperhanger. | \$ 22.93 | 12.02 |
| Spray, Sandblast & Waterblast..... | \$ 23.93 | 12.02 |

PAIN0156-001 04/01/2015

DAVISS, DUBOIS, GIBZSON, KNOX, PERRY, PIKE, POSSEY, SPENCER,
VANDERBURGH, AND WARRICK COUNTIES

| Rates | Fringes |
|-------|---------|
|-------|---------|

Painters:

| | | |
|--|----------|-------|
| BRUSH & ROLLER OF MASTICS, CREOSOTES, KEWINCH KOATE, & COAL TAR EPOXY..... | \$ 28.60 | 12.95 |
| BRUSH & ROLLER..... | \$ 27.60 | 12.95 |
| DRYWALL FINISHERS..... | \$ 27.85 | 12.95 |
| SPRAY of MASTICS CREOSOTES, KWINCH KOATE, COAL TAR EPOXY..... | \$ 29.60 | 12.95 |
| SPRAY, SANDBLAST, POWER TOOLS, WATERBLAST & STEAM CLEANING..... | \$ 28.60 | 12.95 |

PAIN0197-001 06/01/2013CLAY, GREENE, OWEN, PARKE, PUTNAM, SULLIVAN, VERMILLION AND
VIGO COUNTIES:

Rates Fringes

Painters:

| | | |
|----------------------|----------|-------|
| Brush & Roller..... | \$ 24.95 | 11.51 |
| Sandblasting..... | \$ 26.95 | 11.51 |
| Spray & Pot Man..... | \$ 25.45 | 11.51 |
| Steel up to 30'..... | \$ 25.95 | 11.51 |

PAIN0387-004 11/01/2014

DEARBORN, FRANKLIN, OHIO, RIPLEY, and SWITZERLAND COUNTIES

Rates Fringes

| | | |
|--------------|----------|-------|
| GLAZIER..... | \$ 25.00 | 12.60 |
|--------------|----------|-------|

PAIN0460-004 06/01/2014

JASPER, NEWTON, PULASKI, STARKE AND WHITE COUNTIES

Rates Fringes

Painters:

| | | |
|------------------------------|----------|-------|
| Brush & Roller..... | \$ 33.99 | 21.28 |
| Drywall Taping & Finishing.. | \$ 34.79 | 21.28 |

PAIN0469-002 07/01/2013ADAMS, ALLEN, DEKALB, GRANT, HUNTINGTON, LAGRANGE, NOBLE,
STEUBEN, WABASH, WELLS, and WHITLEY COUNTIES

Rates Fringes

Painters:

| | | |
|--|----------|-------|
| 101' & over..... | \$ 22.31 | 11.57 |
| 31' - 60'..... | \$ 21.71 | 11.57 |
| 61' - 100'..... | \$ 22.11 | 11.57 |
| Brush, Roller, Paperhanger, & Drywall Finishing..... | \$ 20.86 | 11.57 |

| | | |
|--|----------|-------|
| Lead Abatement..... | \$ 25.86 | 11.57 |
| Spray & Sandblast Pot Tenders and Ground Personnel..... | \$ 21.76 | 11.57 |
| Spray, Sandblast, Power Tools, Waterblast, & Steam Cleaning..... | \$ 21.86 | 11.57 |

PAIN0669-001 04/01/2015

BLACKFORD, DELAWARE, FAYETTE, FRANKLIN, HENRY, HOWARD, JAY,
MADISON, MIAMI, RANDOLPH, RUSH, TIPTON, UNION and WAYNE COUNTIES

| | Rates | Fringes |
|--|-------|---------|
|--|-------|---------|

Painters:

| | | |
|---|----------|-------|
| Brush; Roller; Paperhanging; Drywall Finishers..... | \$ 20.50 | 11.39 |
| Spray/Waterblasting; Sandblasting..... | \$ 21.50 | 11.39 |

PAIN1165-014 07/01/2015

CLARK, CRAWFORD, DAVIESS, DUBOIS, FLOYD, GIBSON, HARRISION,
JEFFERSON, KNOX, MARTIN, ORANGE, PERRY, PIKE, POSEY, SCOTT,
SPENCER, VANDERBURGH, WARRICK AND WASHINGTON

| | Rates | Fringes |
|--|-------|---------|
|--|-------|---------|

| | | |
|--------------|----------|-------|
| GLAZIER..... | \$ 27.23 | 13.67 |
|--------------|----------|-------|

PAIN1165-017 07/01/2015

ADAMS, ALLEN, BLACKFORD, DE KALB, GRANT, HUNTINGTON, JAY,
NOBLE, STEUBEN, WABASH, WELLS AND WHITLEY COUNTIES

| | Rates | Fringes |
|--|-------|---------|
|--|-------|---------|

| | | |
|--------------|----------|-------|
| GLAZIER..... | \$ 22.90 | 12.47 |
|--------------|----------|-------|

PAIN1165-018 07/01/2015

JASPER and NEWTON (East of Highway #41) COUNTIES

| | Rates | Fringes |
|--|-------|---------|
|--|-------|---------|

| | | |
|--------------|----------|-------|
| GLAZIER..... | \$ 33.25 | 19.84 |
|--------------|----------|-------|

PAIN1165-019 07/01/2015

ELKHART, FULTON, KOSCIUSKO, LAGRANGE, MARSHALL, PULASKI, and
STARKE COUNTY

| | Rates | Fringes |
|--|-------|---------|
|--|-------|---------|

GLAZIER.....\$ 25.66 14.40

 PAIN1165-022 07/01/2015

BARTHOLOMEW, BENTON, BOONE, BROWN, CARROLL, CASS, CLAY,
 CLINTON, DECATUR, DELEWARE, FAYETTE, FOUNTAIN, GREENE, HAMILTON,
 HANCOCK, HENDRICKS, HENRY, HOWARD, JACKSON, JENNINGS, JOHNSON,
 LAWRENCE, MADISON, MARION, MIAMI, MONROE, MONTGOMERY, MORGAN,
 OWEN, PARKE, PUTNAM, RANDOLPH, RUSH, SHELBY, SULLIVAN,
 TIPPECANOE, TIPTON, UNION, VIGO, VERMILLION, WARREN, WAYNE, and
 WHITE COUNTIES

Rates Fringes

GLAZIER.....\$ 26.26 14.52

 PLAS0075-001 06/01/2014

CLAY, OWEN, PARKE, PUTNAM, VERMILLION AND VIGO COUNTIES:

Rates Fringes

CEMENT MASON/CONCRETE FINISHER...\$ 25.25 11.75

 PLAS0101-001 06/01/2014

FULTON AND MARSHALL COUNTIES; PULASKI COUNTY (SOUTHERN 1/2):

Rates Fringes

CEMENT MASON/CONCRETE FINISHER...\$ 30.57 11.50

 PLAS0101-003 06/01/2014

ADAMS, ALLEN, DEKALB, HUNTINGTON, NOBLE, STEUBEN, WELLS AND
 WHITLEY COUNTIES

Rates Fringes

CEMENT MASON/CONCRETE FINISHER...\$ 23.38 11.94

PLASTERER.....\$ 25.69 11.75

 PLAS0438-003 06/01/2014

PULASKI (NORTHERN 2/3), JASPER (N. EASTERN PORTION OF WEST TO
 BUT NOT INCLUDING WHEATFIELD), ALL OF STARKE COUNTY

Rates Fringes

CEMENT MASON/CONCRETE FINISHER...\$ 36.01 22.15

 PLAS0692-002 06/01/2014

AREA #46

BARTHOLOMEW, BOONE, BROWN, CLARK, CLAY, CRAWFORD, DAVIESS,
 DUBOIS, GIBSON, HENDRICKS, JACKSON, JEFFERSON, JENNINGS,

JOHNSON, KNOX, LAWRENCE, MARION, MARTIN, MONROE, MORGAN,
ORANGE, OWEN, PARKE, PERRY, PIKE, POSEY, PUTNAM, SCOTT, SHELBY,
SPENCER, VANDERBURGH, VERMILLION, VIGO and WARRICK COUNTIES

| | Rates | Fringes |
|----------------|----------|---------|
| PLASTERER..... | \$ 25.04 | 12.98 |

PLAS0692-009 07/01/2014

AREA #83

BLACKFORD, DELAWARE, GRANT, HAMILTON (Northern Part), HANCOCK
(Northern Part), JAY, MADISON and WABASH COUNTIES

| | Rates | Fringes |
|-----------------------------------|----------|---------|
| CEMENT MASON/CONCRETE FINISHER... | \$ 25.00 | 12.44 |
| PLASTERER..... | \$ 25.69 | 11.75 |

PLAS0692-011 07/01/2014

AREA #83

DECATUR, FAYETTE, FRANKLIN, HENRY, RANDOLPH, RUSH, UNION and
WAYNE COUNTIES

| | Rates | Fringes |
|-----------------------------------|----------|---------|
| CEMENT MASON/CONCRETE FINISHER... | \$ 25.00 | 12.44 |
| PLASTERER..... | \$ 25.69 | 11.75 |

PLAS0692-015 06/01/2014

AREA #121

BENTON, CARROLL, CASS, CLINTON, FOUNTAIN, HOWARD, MIAMI,
MONTGOMERY, TIPPECANOE, WARREN, WHITE and VERMILLION (Northern
Part) COUNTIES

| | Rates | Fringes |
|-----------------------------------|----------|---------|
| CEMENT MASON/CONCRETE FINISHER... | \$ 25.85 | 14.60 |
| PLASTERER..... | \$ 26.66 | 14.50 |

PLAS0692-018 06/01/2013

AREA #165

NEWTON COUNTY

| | Rates | Fringes |
|-----------------------------------|----------|---------|
| CEMENT MASON/CONCRETE FINISHER... | \$ 38.33 | 20.18 |

PLAS0692-022 06/01/2013

Southward on Rt. No. 49 to the JASPER, BENTON and WHITE County lines, including the City Limits of Wheatfield, Rensselaer and Remington, Indiana. To the West, the boundary of NEWTON County

| | Rates | Fringes |
|--------------------------------|----------|---------|
| CEMENT MASON/CONCRETE FINISHER | | |
| AREA #406..... | \$ 36.16 | 22.35 |

PLAS0692-023 06/01/2013

AREA #532

BOONE, HAMILTON (SOUTH HALF OF COUNTY NORTH TO NEW ROUTE INDIANA #32 INCLUDING NOBLESVILLE); HANCOCK COUNTY (SOUTHERN AND WESTERN PART OF HANCOCK COUNTY, NORTH TO BUT NOT INCLUDING FORTVILLE); HENDRICKS, JOHNSON, MARION and MORGAN COUNTIES

| | Rates | Fringes |
|-----------------------------------|----------|---------|
| CEMENT MASON/CONCRETE FINISHER... | \$ 26.00 | 14.00 |

PLAS0692-027 04/01/2013

AREA #566

CRAWFORD, DAVIESS, DUBOIS, GIBSON, HARRISON, KNOX, MARTIN, PERRY, PIKE, POSEY, SPENCER, VANDERBURGH and WARRICK COUNTIES

| | Rates | Fringes |
|-----------------------------------|----------|---------|
| CEMENT MASON/CONCRETE FINISHER... | \$ 24.75 | 14.41 |

PLAS0692-033 05/01/2013

BROWN, CLARKE, DEARBORN, FLOYD, FRANKLIN (SOUTHERN 1/2), JENNINGS, OHIO, RIPLEY AND SWITZERLAND COUNTIES

| | Rates | Fringes |
|--------------------------------|----------|---------|
| CEMENT MASON/CONCRETE FINISHER | | |
| AREA #821..... | \$ 23.58 | 11.64 |

PLUM0136-003 07/01/2015

DAVIESS, DUBOIS, GIBSON, JACKSON, LAWRENCE, MARTIN, MONROE, ORANGE, OWEN, PERRY, PIKE, POSEY, SPENCER, VANDERBURGH, and WARRICK COUNTIES

| | Rates | Fringes |
|-------------------------------|----------|---------|
| Plumbers and Pipefitters..... | \$ 35.11 | 16.17 |

PLUM0157-002 07/01/2015

BENTON, CARROLL, CLINTON, FOUNTAIN, MONTGOMERY, TIPPECANOE,
WARREN AND WHITE COUNTIES:

| | Rates | Fringes |
|-------------------------------|----------|---------|
| Plumbers and Pipefitters..... | \$ 36.73 | 14.48 |

PLUM0166-001 07/01/2013

ADAMS, ALLEN, BLACKFORD, DE KALB, GRANT, HUNTINGTON, NOBLE,
STEUBEN, WABASH, WELLS, and WHITLEY COUNTIES

| | Rates | Fringes |
|------------------------------|----------|---------|
| Plumber and Steamfitter..... | \$ 29.86 | 14.91 |

PLUM0166-002 07/01/2013

ELKHART, KOSCIUSKO, and LAGRANGE COUNTIES

| | Rates | Fringes |
|--------------|----------|---------|
| PLUMBER..... | \$ 29.86 | 14.91 |

PLUM0172-001 06/03/2013

JASPER (S of the N. Side of the City of Rensselaer), MARSHALL,
PULASKI and STARKE COUNTIES

| | Rates | Fringes |
|--|----------|---------|
| Plumber, Pipefitter, Steamfitter..... | \$ 30.50 | 17.53 |

PLUM0210-003 06/01/2015

JASPER (to the City of Rensselaer) and NEWTON COUNTIES

| | Rates | Fringes |
|--------------|----------|---------|
| PLUMBER..... | \$ 38.37 | 21.36 |

PLUM0392-006 06/01/2014

DEARBORN, RIPLEY, OHIO AND SWITZERLAND COUNTIES

| | Rates | Fringes |
|-------------------------------|----------|---------|
| Plumbers and Pipefitters..... | \$ 29.80 | 17.79 |

PLUM0440-002 12/01/2013

BARTHOLOMEW, BOONE, HAMILTON, HANCOCK, HENDRICKS, HOWARD,
JOHNSON AND MARION COUNTIES; MIAMI COUNTY (SOUTH OF A STRAIGHT
LINE WHERE ROUTE 218 ENTERS W. BOUNDARY); MORGAN, SHELBY and
TIPTON COUNTIES

| | Rates | Fringes |
|-------------------------------|----------|---------|
| Plumbers and Pipefitters..... | \$ 34.07 | 15.34 |

PLUM0440-004 12/01/2013

FAYETTE, FRANKLIN, HENRY, RANDOLPH, RUSH, UNION and WAYNE
COUNTIES

| | Rates | Fringes |
|------------------------------|----------|---------|
| Plumber and Steamfitter..... | \$ 34.07 | 15.34 |

PLUM0502-001 08/01/2013

CLARK, FLOYD AND HARRISON COUNTIES

| | Rates | Fringes |
|-------------------------|----------|---------|
| PLUMBER/PIPEFITTER..... | \$ 32.00 | 17.17 |

PLUM0597-004 06/01/2015

JASPER (Excluding the city limits of Rensselear), AND NEWTON
(Entire County)

| | Rates | Fringes |
|-----------------|----------|---------|
| PIPEFITTER..... | \$ 47.00 | 28.19 |

ROOF0023-004 06/01/2015

ELKHART, FULTON, KOSCIUSKO, LAGRANGE, MARSHALL, PULASKI, and
STARKE COUNTIES

| | Rates | Fringes |
|-------------------|----------|---------|
| ROOFER | | |
| COMPOSITION..... | \$ 27.61 | 13.60 |
| SLATE & TILE..... | \$ 28.11 | 13.60 |

ROOF0023-008 06/01/2015

ALLEN, DEKALB, NOBLE, STEUBEN, and WHITLEY COUNTIES

| | Rates | Fringes |
|-------------------|----------|---------|
| ROOFER | | |
| COMPOSITION..... | \$ 20.33 | 8.76 |
| SLATE & TILE..... | \$ 20.83 | 8.76 |

ROOF0106-006 07/01/2012

CRAWFORD, DAVIESS, DUBOIS, GIBSON KNOX, MARTIN, ORANGE PERRY,
PIKE, POSEY, SPENCER, VANDERBURGH AND WARRICK

| | Rates | Fringes |
|-------------------|----------|---------|
| Roofers: | | |
| COMPOSITION..... | \$ 26.96 | 13.01 |
| SLATE & TILE..... | \$ 27.46 | 13.01 |

ROOF0150-002 07/01/2012

CLAY, GREENE, OWEN, PARKE, SULLIVAN, VERMILLION AND VIGO
COUNTIES

| | Rates | Fringes |
|-------------|----------|---------|
| ROOFER..... | \$ 26.50 | 10.07 |

SHEE0020-003 07/01/2015

ADAMS, ALLEN, BLACKFORD, CASS, DEKALB, GRANT, HOWARD,
HUNTINGTON, JAY, MIAMI, NOBLE, STEUBEN, WABASH, WELLS, and
WHITLEY COUNTIES

| | Rates | Fringes |
|---|----------|---------|
| Sheet metal worker (HVAC Duct Work)..... | \$ 29.92 | 21.97 |

SHEE0020-010 07/01/2015

BARTHOLOMEW, BOONE, BROWN, DECATUR, DELAWARE, FAYETTE,
FRANKLIN, HAMILTON, HANCOCK, HENDRICKS, HENRY, JACKSON,
JENNINGS, JOHNSON, LAWRENCE, MADISON, MARION, MONROE, MORGAN,
ORANGE, RIPLEY, RUSH, SHELBY, TIPTON, UNION AND WASHINGTON
COUNTIES

| | Rates | Fringes |
|-------------------------|----------|---------|
| Sheet metal worker..... | \$ 32.72 | 20.62 |

SHEE0020-024 07/01/2015

CLAY, GREENE, MARTIN, OWEN, PARKE, PUTNAM, SULLIVAN,
VERMILLION, and VIGO COUNTIES

| | Rates | Fringes |
|-------------------------|----------|---------|
| Sheet metal worker..... | \$ 32.40 | 19.92 |

TEAM0135-003 04/01/2015

REMAINING COUNTIES

| | Rates | Fringes |
|--------------|-------|---------|
| TRUCK DRIVER | | |

| | | |
|--------------|----------|-------|
| GROUP 1..... | \$ 27.41 | 13.99 |
| GROUP 2..... | \$ 27.46 | 13.99 |
| GROUP 3..... | \$ 27.51 | 13.99 |
| GROUP 4..... | \$ 27.56 | 13.99 |
| GROUP 5..... | \$ 27.61 | 13.99 |
| GROUP 6..... | \$ 27.66 | 13.99 |
| GROUP 7..... | \$ 27.71 | 13.99 |
| GROUP 8..... | \$ 27.76 | 13.99 |
| GROUP 9..... | \$ 27.81 | 13.99 |
| GROUP10..... | \$ 27.26 | 13.99 |
| GROUP11..... | \$ 27.81 | 13.99 |
| GROUP12..... | \$ 27.91 | 13.99 |

TRUCK DRIVER CLASSIFICATIONS

GROUP 1: Single/batches axle straight trucks; Batch trucks, wet or dry 3 (34E) axle or less; Single axle Grease and maintenance truck

GROUP 2: Single axle fuel and water trucks

GROUP 3: Single axle "dog-legs", and tandem truck or dog-legs; Winch trucks or A-frames when used for transportation purposes; Drivers on batch trucks, wet or dry over 3 (34E) batches and tandem axle grease and maintenance truck

GROUP 4: Tandem axle fuel trucks; tandem axle water trucks; butuminous distributors (two-man)

GROUP 5: Tandem trucks over 15 tons payload; Single axle semi trucks; Farm tractors hauling material; Mixer trucks (all types); Trucks pulling tilt-top trailer single axle; Single axle low- boys; Truck-mounted pavement breakers

GROUP 6: Tandem trucks or "dog-legs"; Semi-water Truck; Sprinkler Truck; Heavy equipment-type water wagons, 5,000 gallons and under; butuminous distributors (one-man)

GROUP 7: Tri-axle trucks; Tandem axle semi trucks; Equipment when not self-loaded or pusher loaded, such as Koehring or similar dumpsters, track trucks, Euclid bottom dump and hug bottom dump, tournatrailers, tournarockers, Acey wagons or for similar equipment (12 cu yds or less); Mobile mixer truck; Tandem Axle trucks pulling tilt-top trailer; Tandem - Axle lowboy; Tri- Axle batch Truck; Tri-Axle grease and maintenance truck

GROUP 8: Tandem-tandem semi trucks; Truck mechanics and welders; Heavy equipment-type water wagon over 5,000 gallons; Tri-Axle Trucks pulling tilt-top trailer; Low-boys, tandem-tandem axle

GROUP 9: Low-boys, tandem tri-axle; Acey wagons up to and including 3 buckets; Equipment when not self-loaded or pusher loaded, such as koehring or similar dumpsters, Track Trucks, Euclid bottom dump and hug bottom dump, Tournatrailers, Tournarockers, Acey wagons or for similar equipment (over 12 cu yds.)

GROUP 10: Pick-up trucks

GROUP 11: Helpers; Greasers; Tire men; Batch board tenders;
Warehouseman

GROUP 12: Acey wagon (over 3 buckets); Quad Axle Trucks;
Articulating Dump

WELDERS - Receive rate prescribed for craft performing
operation to which welding is incidental.

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Unlisted classifications needed for work not included within
the scope of the classifications listed may be added after
award only as provided in the labor standards contract clauses
(29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification
and wage rates that have been found to be prevailing for the
cited type(s) of construction in the area covered by the wage
determination. The classifications are listed in alphabetical
order of "identifiers" that indicate whether the particular
rate is a union rate (current union negotiated rate for local),
a survey rate (weighted average rate) or a union average rate
(weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed
in dotted lines beginning with characters other than "SU" or
"UAVG" denotes that the union classification and rate were
prevailing for that classification in the survey. Example:
PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of
the union which prevailed in the survey for this
classification, which in this example would be Plumbers. 0198
indicates the local union number or district council number
where applicable, i.e., Plumbers Local 0198. The next number,
005 in the example, is an internal number used in processing
the wage determination. 07/01/2014 is the effective date of the
most current negotiated rate, which in this example is July 1,
2014.

Union prevailing wage rates are updated to reflect all rate
changes in the collective bargaining agreement (CBA) governing
this classification and rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that
no one rate prevailed for this classification in the survey and
the published rate is derived by computing a weighted average
rate based on all the rates reported in the survey for that
classification. As this weighted average rate includes all

rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor

200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

=====

END OF GENERAL DECISION



2015 UTILITIES MAINTENANCE & REPAIR CONTRACT

N40085-15-R-7905

FINAL

PREPARED BY:

**NAVFAC MIDLANT PWD CRANE
CODE PRX21**

PRE-AWARD PROJECT MANAGER: JEFFREY H. SUMMERS, P.E.

DATE: 24 JULY 2015

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| 33 34 00 | FORCE MAINS; SEWER |

-- End of Project Table of Contents --

SECTION 01 11 00

SUMMARY OF WORK

08/11

PART 1 GENERAL

1.1 REFERENCES

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

ASTM INTERNATIONAL (ASTM)

ASTM E2114 (2008) Standard Terminology for Sustainability Relative to the Performance of Buildings

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

Energy Star (1992; R 2006) Energy Star Energy Efficiency Labeling System (FEMP)

1.2 DEFINITIONS

Definitions pertaining to sustainable development are as defined in ASTM E2114, Section 01 57 19.00 20 TEMPORARY ENVIRONMENTAL CONTROLS, and as specified.

- a. "Environmentally preferable products" have a lesser or reduced effect on the environment in comparison to conventional products and services. This comparison may consider raw materials acquisition, production, manufacturing, packaging, distribution, reuse, operation, maintenance, or disposal of the product.
- b. "Sustainability" is the balance of environmental, economic, and societal considerations.

1.2.1 GENERAL DEFINITIONS

As used throughout this contract, the following terms shall have the meaning set forth below. Where "as directed,@ "as required,@ "as permitted,@ "approval,@ "acceptance" or words of similar import are used, it shall be understood that direction, requirement, permission, approval or acceptance by the Contracting Officer is intended unless stated otherwise. Where "as shown,@ "as indicated,@ "as detailed" or words of similar import are used, it shall be understood that reference is made to this specification and the drawings accompanying this specification unless stated otherwise.

1.2.1.1 Administrative Contracting Officer

The individual designated by the Contracting Officer to administer the contract. Throughout this contract, the term ACO will be used to refer to the individual designated to administer the contract or his/her designated representative.

1.2.1.2 Activity

The Naval Support Activity (NSA), Crane Division, Crane IN, NAVFAC Contracts office and sites within their area of responsibility. This includes the Lake Glendora Test Facility (Sullivan, IN).

1.2.1.3 Beneficial Occupancy Date (BOD)

BOD is the date the customer can expect to receive useful occupancy of the facility or construction work. Although all construction efforts at the construction site may not be completed (for example, punch-list items and other minor construction activities may still be required for construction to be considered complete), and the Government may need to continue administering the final stages of the project construction contract until such completion, the user may begin to occupy all or agreed upon parts of the facility and use it for its intended purpose. Liquidated damages no longer will be assessed and the warranty period begins on the contract. BOD may occur with or without deficiencies. This term is synonymous with the term "Substantial Completion." BOD occurs before the completion date.

1.2.1.4 Construction Representative

Government personnel assigned as Contracting Officer's Representatives to perform Quality Assurance evaluation, coordinate construction, and to record and document their findings.

1.2.1.5 Contract Completion Date (CCD)

This is a calculated date using the Award or Notice to Proceed Date plus the original (awarded) duration as stated in the specifications. This is the date where the contractor has completed all of the contractual requirements including finishing all physical contract work including punch list deficiencies, commissioning and testing, as well as submission of all required documents including but not limited to as-builts and O&M Manuals. Final payment may be prepared.

1.2.1.6 Contract Discrepancy Reports (CDRs)

Contract Discrepancy Reports (CDRs) may be issued by the ACO to identify and document cases of poor Contractor performance. The CDR requires the Contractor to explain in writing why performance is unsatisfactory, how performance will be returned to satisfactory levels, and how recurrence of the problem will be prevented in the future.

1.2.1.7 Contracting Officer(KO)

"Contracting Officer" means a person with the authority to enter into, administer, and/or terminate contracts and make related determination and findings.

1.2.1.8 Contracting Officer's Representative (KOR)

Person(s) designated by the Contracting Officer to be his/her authorized representative, such as the Contract Specialist, TOC Project Manager, or Construction Representative. As Contracting Officer's representatives, their authority is limited to specific actions.

1.2.1.9 Contractor

The term contractor as used herein refers to both the prime contractor and any subcontractors. The prime contractor will be responsible for insuring that his subcontractors comply with the provisions of this contract.

1.2.1.10 Contractor Representative

The Contractor Representative is a foreman, superintendent, manager, or subcontractor who has authority to act for the prime contractor for matters of quality, production, and safety. The Contractor must designate in writing one or more Contractor Representatives. A contractors representative must be present at the work site if work is in progress.

1.2.1.11 Contract Specialist

The individual assigned by the Contracting Officer to conduct negotiations with the Contractor.

1.2.1.12 Crane Army Ammunition Activity (CAAA)

The Crane Army Ammunition Activity (CAAA) is a tenant command on the Activity. CAAA operates in a semi-autonomous manner, having their own Information Technology, facilities, safety, and Environmental department.

The CAAA mission statement is: CAAA's mission is to receive, store, ship, produce, renovate, and demilitarize conventional ammunition, missiles and related components to meet contingency requirements in support of the warfighter.

Many of the CAAA buildings are involved in explosive operations; operations and construction in these facilities require adherence to OP-5, 'AMMUNITION AND EXPLOSIVES SAFETY ASHORE' and 'NSACRANEINST 8020.1 Explosive Safety Program at NSA Crane'.

1.2.1.13 Customer

The customer is the functional element at a Government activity which benefits from the services provided by the Contractor. A customer may be any of the divisions within the Public Works Center or another component at the Activity. Customer responsibilities include establishing requirements and assisting specification development prior to the Delivery order being issued. The customer has no authority to direct the contractor. If the contractor takes direction from the customer, the contractor does so at his own risk with full knowledge that the Government is under no obligation to pay for work so directed.

1.2.1.14 Government-Furnished Property (GFP)

Government Furnished Property includes all property in the possession of, or directly acquired by the Government and subsequently made available to the Contractor.

1.2.1.15 Government Representative

The person(s) whom the ACO will designate by name and/or position title to conduct liaison between the Contractor and the ACO on matters pertinent to this contract and be his/her authorized representative.

1.2.1.16 Naval Surface Warfare Center (NSWC)

The Naval Surface Warfare Center, Crane Division (NSWC) is a tenant command on the center. NSWC operates in a semi-autonomous manner, having their own facilities, safety, and Environmental department.

Some of the NSWC buildings are involved in explosive operations; operations and construction in these facilities require adherence to OP-5, 'AMMUNITION AND EXPLOSIVES SAFETY ASHORE' and 'and NSACRANEINST 8020.1 Explosive Safety Program at NSA Crane'.

1.2.1.17 Quality Assurance (QA)

A program undertaken by the Government to evaluate certain attributes of products and services it procures (based on the application of pre-specified standards to pre-identified performance indicators), to record such evaluations, and to recommend or effect remedial contract administrative action.

1.2.1.18 Quality Control (QC)

A method used by the Contractor to control quality of goods and/or services provided.

1.2.1.19 RFP

Request for Proposal issued by the Government to the Contractor under this contract.

1.2.1.20 Delivery Order

A Delivery Order is a document (DD Form 1155) prepared by the Contracting Officer that is issued to the contractor and unilaterally orders work to be performed. Delivery Orders will be issued as necessary and may be modified on DD Form SF 30.

1.2.1.21 Contract Construction Compliance Notice

Contract Construction Compliance Notice Reports (CCCNR's) may be issued by the Construction Representative to identify and document deficiencies in workmanship, material, quality control, and supervision that result in poor contractor performance. The (CCCNR) requires the Contractor to explain in writing what corrective actions have been accomplished, and how poor performance will be prevented in the future.

1.2.1.22 PROJECT SITE

Refers to the location where construction is accomplished under a specific Delivery Order. Also referred to as the construction site.

1.3 SUBMITTALS

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

SD-07 Certificates

Energy Performance Rating

1.4 WORK COVERED BY CONTRACT DOCUMENTS

1.4.1 Project Description

The work includes the potential for multiple Delivery Orders for the: maintenance, repair, and installation of utility pipelines; demolition and installation of insulation/jacketing on aboveground steam and condensate piping; Supervisory Control and Data Acquisition (SCADA) and Advanced Metering Infrastructure (AMI) service calls; SCADA and AMI service technician labor rates, sanitary sewer system smoke testing services, sanitary sewer system CCTV inspection services and incidental related work.

1.4.2 Location

The work shall be located at the Naval Support Activity, Crane, IN, and the Lake Glendora Test Facility in Sullivan IN, hereafter referred to as the Activity, approximately as indicated. For each Delivery Order, the exact location will be shown by the Contracting Officer.

1.5 PROJECT ENVIRONMENTAL GOALS

Contractor shall distribute copies of the Environmental Goals to each subcontractor and the Contracting Officer. The overall goal for the construction is to minimize environmental impact on the construction site. Specifically:

- a. Preserve and restore the site ecosystem and biodiversity; avoid site degradation and erosion. Minimize offsite environmental impact.
- b. Use the minimum amount of energy, water, and materials feasible to meet the design intent. Select energy and water efficient equipment and strategies.
- c. Use environmentally preferable products and decrease toxicity level of materials used.
- d. Optimize operational performance (through commissioning efforts) in order to ensure energy efficient equipment operates as intended. Consider the durability, maintainability, and flexibility of building systems.
- f. Manage construction site and storage of materials to ensure no negative impact on the indoor environmental quality of the building.
- g. Reduce construction waste through reuse, recycling, and supplier take-back.

1.5.1 Independent Verification

1.5.1.1 EPA Energy Performance Rating

Provide work consistent with drawings in order to meet **Energy Star** in accordance with design.

1.6 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.

1.7 LOCATION OF UNDERGROUND UTILITIES

Obtain digging permits prior to start of excavation by contacting: Indiana's 811 service either by calling 811 or toll-free at 1-800-382-5544 or visiting 811now.com. Indiana811 requires a minimum of 24 hours notification. Due to possible delays in processing the request and to allow adequate time to mark any utilities, contractors are required to contact Indiana 811 at least five working days in advance of digging. If the contractor does not submit the request a minimum of five working days before digging and hits an unmarked utility, it will be the contractor's responsibility to repair the damage at no cost to the Government. Provide a copy of the request submitted to Indiana 811 to the contracting officer. Verify the elevations of existing piping, utilities, and any type of underground or encased obstruction not indicated by means of hand excavation 5 feet either side of the marking where new work may interfere with existing. Verify elevations before installing new work closer than nearest manhole or other structure at which an adjustment in grade can be made.

1.7.1 Notification Prior to Excavation

Notify the Contracting Officer at least five working days prior to starting excavation work and provide a copy of the request submitted to Indiana 811.

1.8 GOVERNMENT-FURNISHED MATERIAL AND EQUIPMENT

If used, Government furnished materials will be identified on the individual Delivery Orders.

1.8.1 Delivery Schedule

Notify the Contracting Officer in writing at least 30 calendar days in advance of the date on which the materials and equipment are required. Pick up materials and equipment no later than 30 calendar days after such date.

1.8.2 Delivery Location

Depending on the Delivery Order, the materials and equipment, delivery locations for GFM could be designated anywhere within the boundaries of NSA Crane, or at the Glendora facility.

1.9 GOVERNMENT-INSTALLED WORK

Government installed work, if any, will be specified in the individual

Delivery Order.

1.10 SALVAGE MATERIAL AND EQUIPMENT

Items designated by the Contracting Officer to be salvaged shall remain the property of the Government.

The salvaged property shall be segregated, itemized, delivered, and off-loaded at the Government designated as designated in the individual Delivery Orders.

Contractor shall maintain property control records for material or equipment designated as salvage. Contractor's system of property control may be used if approved by the Contracting Officer. Contractor shall be responsible for storage and protection of salvaged materials and equipment until disposition by the Contracting Officer.

1.11 HAZWOPER Training

Crane has approximately 30 known solid waste management units (SWMUs) which may present the potential for exposure to contaminated substances. It is possible that a tasking under this contract may require work within the boundary of a SWMU, or that work may uncover a previously unknown SWMU. All Personnel performing duties with potential for exposure to onsite contaminants (i.e., at the jobsite where earthwork has occurred) must meet and maintain the training requirements provided under 29 CFR 1910.120/29 CFR 1926.65 (e).

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 14 00

WORK RESTRICTIONS

11/11

PART 1 GENERAL

1.1 SPECIAL SCHEDULING REQUIREMENTS

- a. Special Scheduling, if any, associated with the individual Delivery Orders will be specified in the Delivery Order Statements of Work.
- b. Special Scheduling may require that materials, equipment, and personnel required to perform the work be at the site prior to the commencement of the work.
- c. Special Scheduling may require that effected facilities remain in operation during some or all of the construction period. The Contractor shall conduct his operations so as to cause the least possible interference with normal operations of base activities.
- d. Permission to interrupt any Activity roads, railroads, and/or utility service shall be requested in writing a minimum of 15 working days prior to the desired date of interruption.

1.2 CONTRACTOR ACCESS AND USE OF PREMISES

1.2.1 Activity Regulations

Ensure that Contractor personnel employed on the Activity become familiar with and obey Activity regulations. Keep within the limits of the work and avenues of ingress and egress. Wear hard hats in designated areas and at all times in construction zones. 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.

1.2.1.1 Subcontractors and Personnel Contacts

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

1.2.1.2 Passes and Badgess

- a. All Contractor employees shall obtain the required employee passes. All Contract employees who will be working on-center at NSA Crane are required to be badged through the Navy Commercial Access Control System (NCACS) Contractors/Vendors Program (i.e. RapidGate). Each employee shall retain their badge on their person at all times while at the NSA Crane.
- b. Employee identification shall not be substituted for the station required badge. Other badge or identification requirements may be spelled out in the Task Orders.
- c. Rapid Gate information can be found at the following web site:
<http://www.rapidgate.com/>

d. All contractors and subcontractors including suppliers and delivery companies are required to get RapidGate passes or obtain a daily pass by stopping at the visitor's center each day to undergo a background check and obtain a pass which could take a minimum of 30 minutes each day. Passes of a duration longer than one day will not be issued. Please do not request passes of a duration longer than one day from the project manager, engineering tech, or contract specialist.

e. An exception to paragraph (d) above is that the visitor's center will issue a 28-day pass after the employee enrolls in RapidGate, undergoes a background check, and is waiting for their RapidGate pass to be processed.

f. To request 1 day visitor passes:

- A SECNAV 5512-1 Access Form will need to be filled out and SIGNED by the individual needing a pass. (see part 6 of the contract documents under 'forms' for this.)

- Base Sponsor will be your contract's assigned Construction Manager (CM), Design Manager (DM), or Engineer Technician (ET).

- Forms missing information including but not limited to the Base Sponsor information will not be processed but will be returned for completion and resubmission.

- Forms for subcontractors shall be forwarded to the CM/DM/ET by the prime contractor.

- Forms must be received by the CM/DM/ET FIVE WORKING days ahead of the requested visit date so security can conduct a background check.

- A completed SECNAV 5512-1 Access Form is only valid for 90 days. If it has been over 90 days a new signed SECNAV 5512-1 Form will need to be submitted by the individual.

g. Due to the requirement to conduct background checks, requests for one day passes that are not submitted at least 5 working days prior may not be granted.

h. Personnel requiring access for more than 10 working days in a 12-month period, regardless if it's for work on one or multiple contracts, will enroll in RapidGate. Requests for one day passes for the same individual exceeding 10 working days won't be processed.

i. If entry of any individual is denied, the Contractor will be immediately notified. Failure to obtain entry approval will not affect the contract price or time of completion.

j. When an employee leaves the Contractor's service or is removed from the contractor by request of the Contracting Officer, the employee's badge shall be returned to the contractor the same day. That same day, the contractor shall inform NSA Crane Security (Mr. Mark Zehnder 854-8393) that the employee is no longer allowed access to NSA Crane.

k. If an employee's badge is lost or stolen, it must be reported to the Government security Office immediately.

l. Be advised that the RapidGate process and the temporary badge process both involve a background check. Persons with any felony conviction, persons listed on the terrorist watch list, persons who are registered sex offenders, persons with any outstanding criminal warrants, and persons with certain misdemeanors will not be issued badges or passes.

1.2.1.3 No Smoking Policy

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

1.2.2 Working Hours

Regular working hours vary from tenant command to command. Nominally, they shall consist of a 10 hour period, Monday through Friday, 7:00 AM to 5:00 PM, excluding Government holidays.

Depending on customer and operational needs, normal working hours may also be specified in the individual Delivery Orders. Working hours, other than those noted above, which are specified in an individual Delivery Order shall take precedence.

1.2.3 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.

1.2.4 Occupied Buildings

The individual Delivery Orders may require the contractor to be working in and around existing buildings which are occupied. Do not enter buildings without prior approval of the Contracting Officer.

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

1.2.5 Utility Cutovers and Interruptions

- a. Make utility cutovers and interruptions after normal working hours or on Saturdays, Sundays, and Government holidays. Conform to procedures required in the paragraph "Work Outside Regular Hours."
- b. Ensure that new utility lines are complete, except for the connection, before interrupting existing service.
- c. Interruption to water, sanitary sewer, storm sewer, telephone

service, electric service, air conditioning, heating, fire alarm, or compressed air shall be considered utility cutovers pursuant to the paragraph entitled "Work Outside Regular Hours."

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

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 01 20 00.00 20

PRICE AND PAYMENT PROCEDURES

11/11

PART 1 GENERAL

1.1 REFERENCES

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

U.S. ARMY CORPS OF ENGINEERS (USACE)

EP-1110-1-8

(2009) Construction Equipment Ownership
and Operating Expense Schedule

1.2 SUBMITTALS

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

SD-01 Preconstruction Submittals

Schedule of Prices; G

1.3 SCHEDULE OF PRICES

1.3.1 Data Required

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

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.

1.4 CONTRACT MODIFICATIONS

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

1.5 CONTRACTOR'S INVOICE AND CONTRACT PERFORMANCE STATEMENT

1.5.1 Content of Invoice

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

requests for payment shall include the documents listed below.

- a. The Contractor's invoice, on NAVFAC Form 7300/30 furnished by the Government, showing in summary form, the basis for arriving at the amount of the invoice. Form 7300/30 shall include certification by Quality Control (QC) Manager as required by the contract.
- b. The Estimate for Voucher, showing in detail: the estimated cost, percentage of completion, and value of completed performance. Use NAVFAC LANT Form 4-330/110 (New 7/84) on NAVFAC LANT contracts when a Monthly Estimate for Voucher is required.
- c. Updated Project Schedule and reports required by the contract.
- d. Contractor Safety Self Evaluation Checklist.
- e. Other supporting documents as requested.
- f. Updated copy of submittal register.
- g. Invoices not completed in accordance with contract requirements will be returned to the Contractor for correction of the deficiencies.

1.5.2 Submission of Invoices

If NFAS Clause 5252.232-9301 is included in the contract, the documents listed in paragraph "CONTENT OF INVOICE" shall be provided in their entirety as attachments in Wide Area Work Flow (WAWF) for each invoice submitted. The maximum size of each WAWF attachment is two megabytes, but there are no limits on the number of attachments. If a document cannot be attached in WAWF due to system or size restriction it shall be provided as instructed by the Contracting Officer.

1.5.3 Final Invoice

- a. A final invoice shall be accompanied by the Contractor's Final Release. If the Contractor is incorporated, the Final Release shall contain the corporate seal. An officer of the corporation shall sign and the corporate secretary shall certify the Final Release.
- b. For final invoices being submitted via WAWF, the original Contractor's Final Release Form must be provided directly to the respective Contracting Officer prior to submission of the final invoice. Once receipt of the original Final Release Form has been confirmed by the Contracting Officer, the Contractor shall then submit final invoice and attach a copy of the Final Release Form in WAWF.
- c. Final invoices not accompanied by the Contractor's Final Release will be considered incomplete and will be returned to the Contractor.

1.6 PAYMENTS TO THE CONTRACTOR

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

1.6.1 Obligation of Government Payments

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

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

1.6.2 Payment for Onsite and Offsite Materials

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

- a. FAR 52.232-5(b) Payments Under Fixed Price Construction Contracts.
- b. Materials delivered on the site but not installed, including completed preparatory work, and off-site materials to be considered for progress payment shall be major high cost, long lead, special order, or specialty items, not susceptible to deterioration or physical damage in storage or in transit to the construction site. Examples of materials acceptable for payment consideration include, but are not limited to, structural steel, non-magnetic steel, non-magnetic aggregate, equipment, machinery, large pipe and fittings, precast/prestressed concrete products, plastic lumber (e.g., fender piles/curbs), and high-voltage electrical cable. Materials not acceptable for payment include consumable materials such as nails, fasteners, conduits, gypsum board, glass, insulation, and wall coverings.
- c. Materials to be considered for progress payment prior to installation shall be specifically and separately identified in the Contractor's estimates of work submitted for the Contracting Officer's approval in accordance with Schedule of Prices requirement of this contract. Requests for progress payment consideration for such items shall be supported by documents establishing their value and that the title requirements of the clause at FAR 52.232-5 have been met.
- d. Materials are adequately insured and protected from theft and exposure.
- e. Provide a written consent from the surety company with each payment request for offsite materials.
- f. Materials to be considered for progress payments prior to installation shall be stored either in the Continental United States. Other locations are subject to written approval by the Contracting Officer.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 01 22 00.00 10

MEASUREMENT AND PAYMENT
04/06

PART 1 GENERAL

1.1 SUBMITTALS

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

SD-03 Product Data

Weight Certificates

Submit certified weight certificates for R 200 Riprap.

1.2 LUMP SUM PAYMENT ITEMS

Payment items for the work of this contract for which contract lump sum payments will be made are listed in the BIDDING SCHEDULE and described below. All costs for items of work, which are not specifically mentioned to be included in a particular lump sum or unit price payment item, shall be included in the listed lump sum item most closely associated with the work involved. The lump sum price and payment made for each item listed shall constitute full compensation for furnishing all plant, labor, materials, and equipment, and performing any associated Contractor quality control, environmental protection, meeting safety requirements, tests and reports, and for performing all work required for which separate payment is not otherwise provided.

1.2.1 **Mobilization and Demobilization**

1.2.1.1 Payment

Mobilization and demobilization shall be included in the linear foot line item bid price for the various sizes as specified.

1.2.2 Not Used

1.2.3 Not Used

1.2.4 **MATERIALS AND EQUIPMENT NOT IN LINE ITEMS**

1.2.4.1 Payment

This line item is for providing materials and equipment such as but not limited to fittings, couplings, pumps, controls, conduit, disconnects, panels, breakers, and equipment costs associated with installation of these items in-place at designated work sites (that is not specifically listed within other exhibit line items). The amount listed in the exhibit is for proposal evaluation purposes only and does not necessarily indicate any

quantity of material/equipment required by the Government. These items will be ordered on Delivery Orders as determined by the Contracting Officer.

This work shall meet all specification requirements. Contractor shall provide at least 2 quotes for these items. Contractor shall provide markup rate for these items found under line items E670 & E671. Labor installation of these items are covered under line items E655.

1.2.4.2 Unit Of Measure

Unit of measure: Lump Sum.

1.3 UNIT PRICE PAYMENT ITEMS

Payment items for the work of this contract on which the contract unit price payments will be made are listed in the BIDDING SCHEDULE and described below. The unit price and payment made for each item listed shall constitute full compensation for furnishing all plant, labor, materials, and equipment, and performing any associated Contractor quality control, environmental protection, meeting safety requirements, tests and reports, and for performing all work required for each of the unit price items.

1.3.1 Pipeline

1.3.1.1 Payment

All unit prices shall include all supervision, quality control, required testing, labor, equipment, vehicles, materials, supplies, dewatering, as-built surveying, as-built drawings, and direct and indirect overhead. In addition, pipeline unit prices shall include tracer wire, warning tape, plant costs, trenching, excavation, backfilling, shoring & sheeting, bracing, compaction, seeding & mulching, and incidentals necessary to complete the work as specified and as shown on the drawings.

1.3.1.2 Measurement

The length of utility pipelines to be paid for will be determined by measuring along the centerlines of the various sizes of pipe furnished and installed. Pipe will be measured from center of fitting to center of fitting, from center of water distribution line to end of service connection, and from center of water distribution line to center of hydrant. No deduction will be made for the space occupied by valves or fittings.

Depth shall be measured from the crown of pipe to existing grade.

If the depth to the crown of the pipe from the existing grade is greater than 5 vertical feet, an additional price for each vertical foot of depth per lineal foot of pipe shall be paid.

1.3.1.3 Unit Of Measure

Unit of measure: Lineal Foot.

1.3.2 Pipeline Accessories

1.3.2.1 Payment

Fire hydrants, valves, valve boxes, valve indicator posts, curb stops, thrust blocks, couplings, tee's, 45's and 90's shall be installed in conjunction with "pipeline" line items.

These line items shall include tracer wire, warning tape, plant costs, trenching, excavation, backfilling, shoring & sheeting, bracing, compaction, seeding & mulching, dewatering, and incidentals necessary to complete the work as specified and as shown in drawings. This work shall meet all specifications in this contract for 33 11 00 WATER DISTRIBUTION and 33 30 00 SANITARY SEWERS, as applicable.

1.3.2.2 Unit of Measure

Unit of measure: Each.

1.3.3 CURED-IN-PLACE PIPE (CIPP) FOR MAINLINE AND LATERAL RENEWAL

1.3.3.1 Payment

RUNS OF LESS THAN 100 FEET: CIPP runs of less than 100 feet shall be paid for individually.

Lateral reinstatement shall be paid per appropriate line item bid price.

Bypass pumping shall be included in the line item bid price for each diameter pipe and shall include all incidentals required for the pumping efforts.

All other incidental costs such as sample testing shall be included in the lump sum bid price.

RUNS OF GREATER THAN 100 FEET: For each additional foot beyond 100 feet in length, CIPP shall be paid per lineal foot of each diameter rehabilitated as measured with no deduction made for space occupied by manholes.

Lateral reinstatement shall be paid per appropriate line item bid price.

Bypass pumping shall be included in the line item linear foot bid price for each diameter pipe and shall include all incidentals required for the pumping efforts.

All other incidental costs such as sample testing shall be included in the linear foot bid price.

1.3.3.2 Unit Of Measure

Unit of measure:

RUNS OF LESS THAN 100 FEET: Each.

RUNS OF GREATER THAN 100 FEET: Lineal Foot.

1.3.4 PRECAST CONCRETE MANHOLES**1.3.4.1 Payment**

Unit price shall be per each manhole depending on the manhole depth and diameter as defined in the line items.

For manholes over 8 feet in depth, an additional price per vertical foot of manhole over and above lump-sum price will be paid.

Line item for pre-cast concrete manholes will be full compensation for all gaskets, sealants, pipe boots, frames and grates/covers, and joints complete in place. Payment will include the furnishing of all supervision, quality control, testing, plant, labor, equipment, traffic, vehicles, material, tracer wire, warning tape, frame and grates, pre-cast concrete manholes, excavation, backfilling, shoring and sheeting, bracing, compaction, seeding, mulching, dewatering and incidentals necessary to complete the work, as specified and as shown.

1.3.4.2 Unit Of Measure

Unit of measure: Each plus additional cost for each vertical linear foot above 8 feet in depth.

1.3.5 SAWCUTTING OF PAVEMENT**1.3.5.1 Payment**

Line item for "saw cutting" shall include all labor, materials, supplies, certifications, testing, monitoring, quality control, overhead, transportation & supervision required to perform work.

1.3.5.2 Unit Of Measure

Unit of measure: Linear foot

1.3.6 HORIZONTAL BORING & CASING

Line item for "horizontal Boring and Casing shall include all labor, materials, supplies, certifications, testing, monitoring, quality control, traffic control, excavations, overhead, transportation & supervision required to perform work of installing the casing as shown..

1.3.6.1 Unit Of Measure

For boring less than 100 feet, one lump sum shall be paid for the boring and installation.

For boring greater than 100 feet, each additional linear foot over 100 feet shall be paid per linear foot.

For borings in rock, an additional cost per lineal foot shall be paid.

1.3.7 FLOWABLE FILL

Price for all labor, materials, supplies, certifications, testing,

monitoring, quality control, overhead, transportation & supervision required to perform work shall be included in the line item price. These line items will be installed in conjunction with "pipe" line items.

1.3.7.1 Unit Of Measure

Unit of measure shall be the Cubic Yard (CY). Cubic yard price to vary by the overall quantity, as defined by the line items schedule (0-9 CY, 10-19 CY, > 20 CY)

1.3.8 EXCAVATION OF ROCK

Solid homogeneous interlocking crystalline material with firmly cemented, laminated, or foliated masses or conglomerate deposits, neither of which can be removed without 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. Material identified in the soil boring logs as having a standard penetration resistance as determined by ASTM D 1586 and INDOT Sec 203 greater than 600 blows per foot is arbitrarily defined herein as "Rock."

1.3.8.1 Payment

Payment will be made for costs associated with excavation which includes performing required excavation and other operations incidental thereto, Contractor-furnished disposal area(s) and disposition of excess excavated material and unsuitable and frozen materials.

1.3.8.2 Measurement

Measure and pay for rock excavation by the number of cubic yards of acceptably excavated rock material. Measure the material in place, but base volume on a maximum 30 inch width for pipes 12 inch in diameter or less, and a maximum width of 16 inch greater than the outside diameter of the pipe for pipes over 12 inch in diameter. Provide the measurement to include all authorized overdepth rock excavation as determined by the Contracting Officer. For manholes and other appurtenances, compute volumes of rock excavation on the basis of 1 foot outside of the wall lines of the structures.

1.3.8.3 Unit of Measure

Unit of measure: cubic yard.

1.3.9 DELIVERED FILL

1.3.9.1 Payment

Fill shall conform to the general requirements for soil materials and shall be an unclassified soil material possessing the characteristics required for compaction to the specified values of soil density specified for the location of intended use. Maximum particle size shall be 2 inches and shall meet INDOT Standard Specifications.

1.3.9.2 Measurement

Delivered fill will be measured for payment by the ton (2,000 pounds) by weighing each truckload to the nearest 0.1 ton, and the final quantity of each truckload will be rounded to the nearest whole ton. The fill will be measured for payment by being weighed on approved scales before being placed in the work. If commercial scales are readily available in close proximity 10 miles of site of work, the Contracting Officer may approve the use of the scales. The Contracting Officer may elect to accept certified weight certificates furnished by a public weighmaster (quarry ticket).

1.3.9.3 Unit of Measure

Unit of measure: Ton.

1.3.10 DELIVERED TOPSOIL

1.3.10.1 Payment

Delivered Topsoil shall conform to the requirements of SECTION 32 92 19, SEEDING AND SODDING. Topsoil shall be a neutral, friable soil representative of productive soils in the vicinity. If borrow areas are not indicated, topsoil shall be furnished by the Contractor.

1.3.10.2 Measurement

Delivered Topsoil will be measured for payment by the ton (2,000 pounds) by weighing each truckload to the nearest 0.1 ton, and the final quantity of each truckload will be rounded to the nearest whole ton. The topsoil will be measured for payment by being weighed on approved scales before being placed in the work. If commercial scales are readily available in close proximity 10 miles of site of work, the Contracting Officer may approve the use of the scales. The Contracting Officer may elect to accept certified weight certificates furnished by a public weighmaster.

1.3.10.3 Unit of Measure

Unit of measure: Ton.

1.3.11 REMOVE REINFORCED CONCRETE

1.3.11.1 Payment

This line item shall be for the removal of reinforced concrete up to 8 inches thick and disposing of it at a designated site in close proximity to construction site on Center. All seed and mulch or grading shall be paid for by other line items.

Line item for "remove reinforced concrete" shall include all labor, materials, supplies, certifications, testing, monitoring, quality control, overhead, transportation & supervision required to perform work.

1.3.11.2 Unit Of Measure

Unit of measure: Square foot

1.3.12 6" PIPE BOLLARDS, CONCRETE FILLED

1.3.12.1 Payment

This line item shall be for providing and installing 6 inch diameter, schedule 40 steel pipe, placed 3 feet in the ground and 4 feet above the surface, filled with concrete, and installed in a 24" diameter dug or augured hole filled with concrete. Prime and paint as directed by the delivery order. The top of the pipe shall have the concrete crowned to promote drainage of moisture.

Line item for "pipe bollards, concrete filled" shall include all labor, materials, supplies, certifications, testing, monitoring, quality control, overhead, transportation & supervision required to perform work.

1.3.12.2 Unit Of Measure

Unit of measure: each.

1.3.13 LABOR HOUR UNIT PRICE

1.3.13.1 Payment

A labor hour unit price is the unit price bid by the Contractor to provide one performance standard hour of work-in-place. The unit price includes all direct and indirect costs associated with performing one standard hour of work.

The unit price would typically include the Contractor's hourly craft wage, adjusted to allow for the bidder's workforce productivity i.e., the Contractor's estimate of how his/her workforce will perform in relation to the applicable performance standard(s); and all costs for pre-expended materials and supplies, profit, tools, equipment, off station travel time, field and home office overhead, clerical support, supervision, overtime, inspection, fees, taxes, licenses, permits, insurance, etc. In short, all costs associated with providing a specific standard hour of effort.

1.3.13.2 Unit Of Measure

Unit of measure: Hour.

1.3.14 LABOR OVERIME UNIT PRICE (Burden Rate) IF REQUIRED

1.3.14.1 Payment

Labor hours shall not be included in the scope of work as mark-ups or add-ons for work time associated with union agreements, overhead, profit, material markups, supervision, clerical support, transportation (travel time), or material handling. These items shall be included in the labor hour unit price and fixed burden rate bid by the Contractor.

For those tasks that are not exactly defined by Means, or other estimating methods, work content comparison (comparing a task that is not specifically defined to a very similar task that is defined) will be performed.

Establishing Total Labor Costs. The total labor cost will be determined by totaling the number of performance standard labor hours and then

multiplying by the labor hour unit price from the Schedule of Indefinite Quantity Work - Unit Priced Labor.

1.3.14.2 Unit Of Measure

Unit of measure: Hour.

1.3.15 **MAINTENANCE OF TRAFFIC**

1.3.15.1 Payment

This line item is for providing personnel to direct traffic at designated work sites. It will be ordered on certain Delivery Orders as determined by the Contract Officer. This work shall meet all INDOT and MUTC requirements. Note this does not include any signs or other traffic control devices.

This line item is for Flagging man Hours only.

1.3.15.2 Unit Of Measure

Unit of measure: Hour.

1.3.16 **PERFORMANCE AND PAYMENT BONDS**

1.3.16.1 Payment

Unit price for ELINS A657, B657, C657, D657 and E657 - Bond Cost For Payment And Performance Bonds - Payment and Performance Bonds shall be the premium (percentage cost) to provide both payment and performance bonds on each task order. This bond premium will be used to calculate the bond cost on each task order. The bond cost for each task order will be computed by multiplying the bond premium times the total of the applicable exhibit lines items 000 through 822. The bond cost will then be added to the applicable exhibit line item total to obtain the final task order amount.

1.3.16.2 Unit Of Measure

Unit of measure: Each.

1.3.17 **CLEARING AND GRUBBING, GENERAL**

1.3.17.1 Payment

This line item is for providing clearing and grubbing of brush and trees up to 8" DBH (diameter at breast height) at designated work sites. It will be ordered on certain delivery orders as determined by the Contracting Officer. This work shall meet the specification requirements for Clearing and Grubbing and include brush and trees up to 8" DBH. For trees greater than 8" DBH see the line item for "Clearing and Grubbing - Removal of trees over 8-inch DBH".

1.3.17.2 Unit Of Measure

Unit of measure: per .182 acre (a strip 15 feet wide by 528 feet long).

1.3.18 CLEARING AND GRUBBING, REMOVAL OF TREES LARGER THAN 8"

1.3.18.1 Payment

This line item is for providing clearing, grubbing and removal of trees over 8" DBH (diameter at breast height) at designated work sites. It will be ordered on certain delivery orders as determined by the Contracting Officer.

1.3.18.2 Unit Of Measure

Unit of measure: Each

1.3.19 EXCAVATION TO DEPTH OF 5'

1.3.19.1 Payment

This line item is for providing excavation that is not included in any other line items to a depth of 5 feet at designated work sites. It will be ordered on certain Delivery Orders as determined by the Contracting Officer. This work shall meet all specifications in this contract for 31 00 00 EARTHWORK. For excavation that is not included in any other line items to a depth greater than 5 feet see the line item for Excavation greater than 5 feet depth.

1.3.19.2 Unit Of Measure

Unit of measure: Cubic Yard.

1.3.20 EXCAVATION GREATER THAN 5' DEPTH

1.3.20.1 Payment

This line item is for providing excavation that is not included in any other line items to a depth of greater than 5 feet at designated work sites. It will be ordered on certain Delivery Orders as determined by the Contracting Officer. This work shall meet all specifications in this contract for 31 00 00 EARTHWORK.

1.3.20.2 Unit Of Measure

Unit of measure: Cubic Yard.

1.3.21 BACKFILL AND COMPACTION TO DEPTH OF 5'

1.3.21.1 Payment

This line item is for backfilling and compaction that is not included in any other line items to a depth of 5 feet at designated work sites. It will be ordered on certain Delivery Orders as determined by the Contracting Officer. This work shall meet all specifications in this contract for 31 00 00 Earthwork. For excavation that is not included in any other line items to a depth greater than 5 feet see the line item for backfill and compaction greater than 5 feet depth.

1.3.21.2 Unit Of Measure

Unit of measure: Cubic Yard.

1.3.22 **BACKFILL AND COMPACTION GREATER THAN 5' DEPTH**

1.3.22.1 Payment

This line item is for providing Backfilling and compaction that is not included in any other line items to a depth of greater than 5 feet at designated work sites. It will be ordered on certain Delivery Orders as determined by the Contracting Officer. This work shall meet all specifications in this contract for 31 00 00 Earthwork.

1.3.22.2 Unit Of Measure

Unit of measure: Cubic Yard.

1.3.23 **EROSION CONTROL SILT FENCE IN PLACE**

1.3.23.1 Payment

This line item is for providing erosion control in the form of erosion control silt fence installed in-place at designated work sites. It will be ordered on certain Delivery Orders as determined by the Contracting Officer. This work shall meet all specification requirements for SECTION 01 57 23 TEMPORARY STORM WATER POLLUTION CONTROL.

1.3.23.2 Unit Of Measure

Unit of measure: Linear foot.

1.3.24 **EROSION CONTROL STAW BALES IN PLACE**

1.3.24.1 Payment

TThis line item is for providing erosion control in the form of erosion control straw bales installed in-place at designated work sites. It will be ordered on certain Delivery Orders as determined by the Contracting Officer and as per the specifications on erosion control. This work shall meet all specification requirements for SECTION 01 57 23 TEMPORARY STORM WATER POLLUTION CONTROL.

1.3.24.2 Unit Of Measure

Unit of measure: Each.

1.3.25 **INDOT #53 STONE**

1.3.25.1 Payment

This line item is for providing Indiana Department of Transportation (INDOT) No. 53 Stone installed in-place at designated work sites. It will be ordered on certain Delivery Orders as determined by the Contracting

Officer. This work shall meet all specification requirements for SECTION 31 00 00 EARTHWORK.

#53 stone will be measured for payment by the ton (2,000 pounds) by weighing each truckload to the nearest 0.1 ton, and the final quantity of each truckload will be rounded to the nearest whole ton. The stone will be measured for payment by being weighed on approved scales before being placed in the work. If commercial scales are readily available in close proximity 10 miles of site of work, the Contracting Officer may approve the use of the scales.

The Contracting Officer may elect to accept certified weight certificates furnished by a public weighmaster.

1.3.25.2 Unit Of Measure

Unit of measure: Ton.

1.3.26 INDOT #24 WASHED SAND

1.3.26.1 Payment

This line item is for providing Indiana Department of Transportation (INDOT) No. 24 Stone installed in-place at designated work sites. It will be ordered on certain Delivery Orders as determined by the Contracting Officer. This work shall meet all specification requirements for SECTION 31 00 00 EARTHWORK.

#24 washed sand will be measured for payment by the ton (2,000 pounds) by weighing each truckload to the nearest 0.1 ton, and the final quantity of each truckload will be rounded to the nearest whole ton. The sand will be measured for payment by being weighed on approved scales before being placed in the work. If commercial scales are readily available in close proximity 10 miles of site of work, the Contracting Officer may approve the use of the scales.

The Contracting Officer may elect to accept certified weight certificates furnished by a public weighmaster.

1.3.26.2 Unit Of Measure

Unit of measure: Ton.

1.3.27 REHABILITATION OF MANHOLES OR UNDERGROUND VAULTS WITH A PROTECTIVE COATING

1.3.27.1 Payment

Unit price shall be per each manhole rehabilitated depending on the manhole depth and diameter.

For manholes over 8 feet in depth, an additional price per vertical foot of manhole over and above lump-sum price will be paid.

The price shall include all incidentals such as bypass pumping, mobilization and demobilization, and sample testing in the line item price.

1.3.27.2 Unit Of Measure

Unit of measure: Each plus additional cost for vertical linear feet above 8 feet in depth.

1.3.28 **LIFT STATION PUMP PICKUP, COST ESTIMATE, REPAIR OR REPLACE**

1.3.28.1 Payment

Unit price shall be service as described in SECTION 33 32 13.14 GRINDER PUMP REPAIR/REPLACEMENT.

Payment will be made for each pickup and delivery, cost estimate, pump repair and pump replacement.

The price shall include all incidentals, labor and material in the line item price.

1.3.28.2 Unit Of Measure

Unit of measure: Each.

1.3.29 **SURVEY DATA AND DRAWING**

1.3.29.1 Payment

SURVEY DATA AND DRAWING

If required by the individual task Order, provide surveying and survey data as described in attachment A. The intent for this item is to record by survey the actual Global Positioning System (GPS) location of the newly-installed pipelines and accessories. Surveys for Utility line installations shall be done in accordance with the current version of the "Minimum Standard Detail Requirements for ALTA/ACSM Land Title Surveys" as adopted by American Land Title Association and National Society of Professional Surveyors.

The price shall include all incidentals, labor and material in the line item price.

1.3.29.2 Unit Of Measure

Unit of measure: Each for pipelines of < 100 lineal feet, plus additional cost for each horizontal linear foot above 100 feet in length.

1.3.30 **HOT-MIX ASPHALT (HMA) FOR PATCHING**

1.3.30.1 Method of Measurement

The amount paid for will be the number of short tons of hot-mix asphalt mixture used in the accepted work. Weigh hot-mix asphalt mixture after mixing, and no separate payment will be made for weight of asphalt cement material incorporated herein.

1.3.30.2 Basis of Payment

Quantities of hot-mix asphalt mixtures, determined as specified above, will be paid for at respective contract unit prices. Payment will constitute full compensation for furnishing all materials, equipment, plant, and tools; and for all labor and other incidentals necessary to complete work required by this section of the specification.

1.3.31 SERVICE CALLS

Service Calls shall consist of pre-priced efforts for Supervisory Control And Data Acquisition (SCADA) Service Calls and Advanced Metering Infrastructure (AMI) Service Calls as denoted in the following descriptions:

1.3.31.1 SCADA SERVICE CALLS

Designated Government personnel will place orders for service calls as needs arise throughout the life of the contract. Service calls are for diagnosis of specified problems and/or for maintenance and repair that results from that diagnosis, or otherwise, as specified. Each service call order will usually have a brief scope of work and may require up to four hours of labor at the job site and/or a maximum of \$250.00 parts/material cost to the Contractor to complete. The service call rates will include travel time to and from the work site for labor and all associated transportation expenses for that travel.

Contractor shall respond to AMI service calls with a technician qualified and knowledgeable in industrial SCADA and process control system service calls. The major SCADA systems utilized on the installation are located at the Water Treatment Plant (WTP) and the Waste Water Treatment Plant (WWTP), and utilize GE Intellution iFix HMI/SCADA software. Personnel responding shall be experienced and capable in working with GE Intellution iFix HMI/SCADA software systems, which are installed at both the WTP (Version 3.5) and WWTP (Version 5.5, which will soon be upgraded to Version 5.8).

Service Personnel Requirement: SCADA service personnel shall be employed by a company that regularly provides services for installation, repair, troubleshooting and modification of industrial process controls systems to include SCADA systems.

Contractor shall provide a list of personnel and/or subcontractors to be utilized for such service calls so as to demonstrate familiarity and experience with the SCADA systems noted above as well as the GE Intellution iFix software application.

1.3.31.1.1 SCADA Service Calls accomplished during Normal working hours

The contractor shall provide a total unit price. Upon receiving a call from the Government, the contractor shall arrive at the job site within 48 hours.

This requirement does not relieve the Contractor of any Fair Labor Standards Act or negotiated wage contract requirement. Also, this is not construed to represent an overtime requirement.

Note: Upon arrival at the job site, the contractor will meet with a designated Government Representative for review of the work requirement(s) prior to the commencement of work.

Note: The maximum number of service calls the contractor is required to respond to simultaneously will be two during normal working hours. Additional service calls will be prioritized by the Government and forwarded to the contractor in the order of importance.

1.3.31.1.2 SCADA Service Call Submittal Requirements

The contractor shall submit a Service Report as part of each service call, detailing a synopsis of the problem and the work accomplished. In addition, the report shall also include a lump sum for the material, labor and equipment cost required to complete the job. Additional information such as an itemized list of material and equipment, including the cost of each item, may be required.

1.3.31.2 AMI SERVICE CALLS

Designated Government personnel will place orders for AMI service calls as needs arise. AMI Service calls are for diagnosis of specified problems that pertain to advanced metering infrastructure equipment utilized at numerous NSA Crane facilities. Each service call order will usually have a brief scope of work and may require up to four hours of labor at the job site and/or a maximum of \$250.00 parts/material cost to the Contractor to complete. The service call rates will include travel time to and from the work site for labor and all associated transportation expenses for that travel.

Contractor shall respond to AMI service calls with a technician qualified and knowledgeable in the brand of AMI identified in the DDC service calls. Note that the AMI supplier installed at the Activity, Schneider Electric, was the original installer of the base-wide system.

Service Personnel Requirement: AMI service personnel shall be employed by a company that manufactures AMI systems, by a subsidiary of a company that manufactures AMI systems, or else be certified by the original equipment manufacturer, Schneider Electric, to repair, troubleshoot, program and/or modify AMI systems.

Contractor shall provide a list of personnel and/or subcontractors to be utilized for such service calls so as to demonstrate familiarity with the AMI system noted.

1.3.31.2.1 AMI service calls accomplished during Normal working hours

The contractor shall provide a total unit price. Upon receiving a call from the Government, the contractor shall arrive at the job site within 48 hours.

This requirement does not relieve the Contractor of any Fair Labor Standards Act or negotiated wage contract requirement. Also, this is not construed to represent an overtime requirement.

Note: Upon arrival at the job site, the contractor will meet with a designated Government Representative for review of the work requirement(s) prior to the commencement of work.

Note: The maximum number of service calls the contractor is required to respond to simultaneously will be two during normal working hours.

Additional service calls will be prioritized by the Government and forwarded to the contractor in the order of importance.

1.3.31.2.2 AMI Service Call Submittal Requirements

The contractor shall submit a Service Report as part of each service call, detailing a synopsis of the problem and the work accomplished. In addition, the report shall also include a lump sum for the material, labor and equipment cost required to complete the job. Additional information such as an itemized list of material and equipment, including the cost of each item, may be required.

1.3.32 SCADA SERVICE TECHNICIAN

Delivery Orders for construction, alteration, maintenance, testing and repairs to existing SCADA systems may be ordered as needs arise throughout the life of the contract. These projects are for execution of specified construction, alterations, maintenance, testing and repairs as indicated in the scope of work to be provided on the individual Delivery Orders.

Contractor shall provide a technician qualified and knowledgeable in industrial SCADA and process control system service calls. The major SCADA systems utilized on the installation are located at the Water Treatment Plant (WTP) and the Waste Water Treatment Plant (WWTP), and utilize GE Intellution iFix HMI/SCADA software. Personnel responding shall be experienced and capable in working with GE Intellution iFix HMI/SCADA software systems, which are installed at both the WTP (Version 3.5) and WWTP (Version 5.5, which will soon be upgraded to Version 5.8).

SCADA service technicians shall be employed by a company that regularly provides services for installation, repair, troubleshooting and modification of industrial process controls systems to include SCADA systems.

The Contractor shall provide separate costs for the projected labor hours (utilizing the Labor Hour Unit Price referred to in Paragraph 1.3.32.1) as well as the material costs including the material markup rate to be added to the actual material costs incurred on the project (refer to Paragraph 1.3.5).

1.3.32.1 Labor Hour Unit Price

A labor hour unit price is the unit price bid by the Contractor to provide one performance standard hour of work-in-place. The unit price includes all direct and indirect costs associated with performing one standard hour of work.

The unit price would typically include the Contractor's hourly craft wage, adjusted to allow for the bidder's workforce productivity i.e., the Contractor's estimate of how his/her workforce will perform in relation to the applicable performance standard(s); and all costs for pre-expended materials and supplies, profit, tools, equipment, off station travel time, field and home office overhead, clerical support, supervision, overtime, inspection, fees, taxes, licenses, permits, insurance, etc. In short, all costs associated with providing a specific standard hour of effort.

1.3.33 AMI SERVICE TECHNICIAN

Delivery Orders for construction, alteration, maintenance, testing and repairs to existing AMI systems may be ordered as needs arise throughout the life of the contract. These projects are for execution of specified construction, alterations, maintenance, testing and repairs as indicated in the scope of work to be provided on the individual Delivery Orders.

Contractor provide a technician qualified and knowledgeable in the brand of AMI identified in the DDC service calls. Note that the AMI supplier installed at the Activity, Schneider Electric, was the original installer of the base-wide system.

AMI service technician personnel shall be employed by a company that manufactures AMI systems, by a subsidiary of a company that manufactures AMI systems, or else be certified by the original equipment manufacturer, Schneider Electric, to repair, troubleshoot, program and/or modify AMI systems.

The Contractor shall provide separate costs for the projected labor hours (utilizing the Labor Hour Unit Price referred to in Paragraph 1.3.33.1) as well as the material costs including the material markup rate to be added to the actual material costs incurred on the project (refer to Paragraph 1.3.5).

1.3.33.1 Labor Hour Unit Price

A labor hour unit price is the unit price bid by the Contractor to provide one performance standard hour of work-in-place. The unit price includes all direct and indirect costs associated with performing one standard hour of work.

The unit price would typically include the Contractor's hourly craft wage, adjusted to allow for the bidder's workforce productivity i.e., the Contractor's estimate of how his/her workforce will perform in relation to the applicable performance standard(s); and all costs for pre-expended materials and supplies, profit, tools, equipment, off station travel time, field and home office overhead, clerical support, supervision, overtime, inspection, fees, taxes, licenses, permits, insurance, etc. In short, all costs associated with providing a specific standard hour of effort.

1.3.34 STEAM AND CONDENSATE LINE INSULATION AND ALUMINUM JACKETING - PIPELINE**1.3.34.1 Payment**

All unit prices shall include all supervision, quality control, required testing, labor, equipment, vehicles, materials, supplies, as-built drawings, and direct and indirect overhead. In addition, insulation and jacketing unit prices shall include any incidentals necessary to complete the work as specified. This work shall meet all specifications in this contract for 23 07 00 THERMAL INSULATION FOR MECHANICAL SYSTEMS, as applicable.

1.3.34.2 Measurement

The length of steam and condensate pipeline insulation and jacketing to be paid for will be determined by measuring along the centerlines of the

various sizes of pipe on which the insulation and jacketing is installed. Pipe will be measured from end of fitting to end of fitting, and from the start of the specified insulation and jacketing installation to end of the specified insulation and jacketing installation. Insulation and jacketing for fittings and accessories shall not be included in this line item cost.

1.3.34.3 Unit Of Measure

Unit of measure: Lineal Foot.

1.3.35 **STEAM AND CONDENSATE LINE INSULATION AND ALUMINUM JACKETING - FITTINGS AND ACCESSORIES**

1.3.35.1 Payment

This shall include insulation and jacketing for steam and condensate line fittings and accessories to include, but not be limited to: valves, couplings, tees, strainers, unions, expansion loops, elbows (45's and 90's).

All unit prices shall include all supervision, quality control, required testing, labor, equipment, vehicles, materials, supplies, as-built drawings, and direct and indirect overhead. Insulation and jacketing unit prices shall include any incidentals necessary to complete the work as specified. This work shall meet all specifications in this contract for 23 07 00 THERMAL INSULATION FOR MECHANICAL SYSTEMS, as applicable.

1.3.35.2 Unit of Measure

Unit of measure: Each.

1.3.36 **SANITARY SEWER SMOKE TESTING**

1.3.36.1 Payment

This shall include smoke testing of sanitary sewer lines to determine points of inflow and infiltration in that system. The service shall include the following items as indicated in the scope of work, materials, preparations, methods and inspection portions below:

SMOKE TESTING SCOPE OF WORK: Sanitary sewer line sections, at locations designated by the Contract Officer, shall be smoke tested to locate significant defects which are causing or could cause infiltration/inflow, soil erosion, and degradation to the existing sanitary sewer system or other underground utilities and surface structures.

PRODUCTS:

a. Nontoxic, odorless, non-hazardous, and non-staining smoke generators (bombs or liquid smoke) shall be used to produce smoke for testing. Provide an MSDS sheet to the Contract Officer for approval prior to bringing onto the installation.

b. Smoke shall be blown by a "squirrel cage" or other approved blower located on top of a central manhole. Blower pressure should be adequate to force smoke throughout the isolated line section and to the ground surface through cracks, channels, improper jointing, etc. Minimum blower free fan delivery is 1,500 cfm.

c. Sand bags and/or plugs with permanently attached identification tags shall be placed at each end of the test section to prevent smoke from escaping through the manholes and adjacent sewer lines.

d. Color, digital photographs with a minimum resolution of four (4) mega pixels or greater shall be taken of all locations where smoke is observed at the ground surface. The camera shall record a date and time directly onto the photo. Each photographic file generated shall be saved in a .JPEG file format using the manhole reference number, distance to the upstream manhole, and the GPS coordinates as the naming convention. These files will be recorded on a computer compact disk (CD) or digital video disk (DVD) and delivered to the Contract Officer. A sample of a file name in the proper format is:

253-00012_299_12345_Maple.jpeg
Manhole No _ Dist_GPScoord _ .file ext.

e. All data pertinent to the smoke testing will be recorded on a smoke testing log form to be provided by the contractor. This form shall be submitted to and remain in the possession of the Owner after a section of line has been tested.

PREPARATION:

a. Contractor's testing schedule shall consider the unique conditions of the test site such as (but not limited to):

1. Cross connected storm/sanitary sewers
2. Heavy flow sections
3. Traffic patterns

b. If work is to be performed in a roadway, the Contractor shall perform necessary traffic control, conform to installation rules and regulations, and the latest edition of the Manual of Uniform Traffic Control Devices (MUTCD). Lane closures will require a minimum of a 5 business day coordination and approval from the Contract Officer.

METHODS:

a. Only sewer line segments on the upstream and downstream side of the blower shall be tested on a single set-up.

b. Smoke shall be introduced into a manhole and then blown into the connecting sewer lines.

c. All visible leaks, including those from collection lines, service laterals, drainage structures, and manholes within the road right-of-way or servitude, shall be recorded on the smoke testing log form. The information listed below shall be included on the log form:

1. Upstream and downstream manhole numbers
2. Manhole depths
3. Direction of flows
4. Location of sandbags and plugs
5. Sketch showing leak location and distance and offset from the upstream manhole
6. GPS coordinates at the detected leak
7. Leak type that clearly describes the leak
8. Smoke quantification
9. Surface cover

10. Properly identified color photograph of inflow source shall be attached to reporting form.

d. Public notification and coordination with the NSA Crane Security and Fire Departments shall be accomplished according to the following:

1. At least 7 days prior to the test of any line segment and prior to beginning the testing, the Contractor shall confirm the testing with the Contract Officer. The Contract Officer will coordinate with the NAVFAC Project Manager and the NAVFAC UEM Utilities group to provide notification of the testing to affected government facilities and occupants.
2. On the day of test, prior to commencing operations, Contractor shall notify the appropriate authorities prior to the beginning of any smoke testing and will be responsible for maintaining close coordination with the NSA Crane Security and Fire Departments regarding the smoke tests.
3. Contractor shall maintain multiple copies of the MSDS sheets of smoke products on site for to respond to all inquiries.

e. Smoke tests shall not be performed when the smoke coming out of the ground may be blown away so quickly as to escape visual detection.

f. Smoke testing shall not be performed during wet weather or saturated ground conditions.

INSPECTION: The NAVFAC Contract officer or designated representative shall witness all smoke testing, and review smoke testing log forms. The log forms shall be available on the next work day following the performance of the test.

MEASUREMENT: A labor hour unit price is the unit price bid by the Contractor to provide one performance standard hour of work-in-place. The unit price includes all direct and indirect costs associated with performing one standard hour of work.

The unit price would typically include the Contractor's hourly craft wage, adjusted to allow for the bidder's workforce productivity i.e., the Contractor's estimate of how his/her workforce will perform in relation to the applicable performance standard(s); and all costs for pre-expended materials and supplies, profit, tools, equipment, off station travel time, field and home office overhead, clerical support, supervision, overtime, inspection, fees, taxes, licenses, permits, insurance, etc. In short, all costs associated with providing a specific standard hour of effort.

Mobilization and travel costs shall be accounted for in MOBILIZATION described in Paragraph 1.3.39.

Reporting costs including any applicable drawing or survey requirements shall be accounted for in REPORTING described in Paragraph 1.3.40. or under the SURVEY DATA AND DRAWING in Paragraph 1.3.29.

Video inspection results shall be accounted for under VIDEO INSPECTION RESULTS in Paragraph 1.3.40.

PAYMENT: Payment for smoke testing will be full compensation for smoke bombs, liquid smoke, blower usage, sand bagging, plugging, smoke test logs, and photos in accordance with the Specifications.

1.3.36.2 Unit of Measure

Unit of measure: Labor Hour.

1.3.37 **CCTV INSPECTION OF SANITARY SEWER AND STORM WATER PIPELINE**

1.3.37.1 Payment

This shall include CCTV Inspection of sanitary sewer and storm water pipe lines to determine condition, branch connections, pipeline failures, and possible points of inflow and infiltration in that system. The service shall include the following items as indicated in the scope of work, materials, preparations, methods and inspection portions below:

CCTV INSPECTION SCOPE OF WORK: Provide CCTV Inspection services in accordance with the guidelines set forth in the PERFORMANCE SPECIFICATION GUIDELINE FOR PIPE CONDITION ASSESSMENT USING CCTV document, "CCTV_Spec_27June2015.pdf", included in Attachment D of this contract document.

INSPECTION: The NAVFAC Contract officer or designated representative shall be provided the opportunity to witness all CCTV inspections during execution, and to review all inspections results.

MEASUREMENT: A labor hour unit price is the unit price bid by the Contractor to provide one performance standard hour of work-in-place. The unit price includes all direct and indirect costs associated with performing one standard hour of work.

The unit price would typically include the Contractor's hourly craft wage, adjusted to allow for the bidder's workforce productivity i.e., the Contractor's estimate of how his/her workforce will perform in relation to the applicable performance standard(s); and all costs for pre-expended materials and supplies, profit, tools, equipment, off station travel time, field and home office overhead, clerical support, supervision, overtime, inspection, fees, taxes, licenses, permits, insurance, etc. In short, all costs associated with providing a specific standard hour of effort.

Mobilization and travel costs shall be accounted for in MOBILIZATION described in Paragraph 1.3.39.

Reporting costs including any applicable drawing or survey requirements shall be accounted for in REPORTING described in Paragraph 1.3.40. or under the SURVEY DATA AND DRAWING in Paragraph 1.3.29.

Video inspection results shall be accounted for under VIDEO INSPECTION RESULTS in Paragraph 1.3.40.

1.3.37.2 Unit of Measure

Unit of measure: Labor Hour.

1.3.38 **UNDERGROUND UTILITY LINE LOCATES**

1.3.38.1 Payment

This shall include locating services of sanitary sewer, storm water, water

and other underground utility line types to be indicated in the scope of work to be provided in an individual Delivery Order. Locates shall include feature coordinates and shall be in accordance with the guidance included in Attachment A - NAVFAC MIDLANT MINIMUM STANDARDS FOR UTILITY LINE SURVEYS.

MEASUREMENT: A labor hour unit price is the unit price bid by the Contractor to provide one performance standard hour of work-in-place. The unit price includes all direct and indirect costs associated with performing one standard hour of work.

The unit price would typically include the Contractor's hourly craft wage, adjusted to allow for the bidder's workforce productivity i.e., the Contractor's estimate of how his/her workforce will perform in relation to the applicable performance standard(s); and all costs for pre-expended materials and supplies, profit, tools, equipment, off station travel time, field and home office overhead, clerical support, supervision, overtime, inspection, fees, taxes, licenses, permits, insurance, etc. In short, all costs associated with providing a specific standard hour of effort.

Mobilization and travel costs shall be accounted for in MOBILIZATION described in Paragraph 1.3.39.

Reporting costs including any applicable drawing or survey requirements shall be accounted for in REPORTING described in Paragraph 1.3.40. or under the SURVEY DATA AND DRAWING in Paragraph 1.3.29.

1.3.38.2 Unit of Measure

Unit of measure: Labor Hour.

1.3.39 MOBILIZATION FOR SMOKE TESTING, CCTV INSPECTION OR LINE LOCATES

1.3.39.1 Payment

This shall include the costs required to mobilize to the installation to provide smoke testing, CCTV Inspection of sanitary sewer and storm water pipe lines and line locating services described in Paragraphs 1.3.36, 1.3.37 and 1.3.38, respectively.

MEASUREMENT: A labor hour unit price is the unit price bid by the Contractor to provide one performance standard hour of work-in-place. The unit price includes all direct and indirect costs associated with performing one standard hour of work.

The unit price would typically include the Contractor's hourly craft wage, adjusted to allow for the bidder's workforce productivity i.e., the Contractor's estimate of how his/her workforce will perform in relation to the applicable performance standard(s); and all costs for pre-expended materials and supplies, profit, tools, equipment, off station travel time, field and home office overhead, clerical support, supervision, overtime, inspection, fees, taxes, licenses, permits, insurance, etc. In short, all costs associated with providing a specific standard hour of effort.

1.3.39.2 Unit of Measure

Unit of measure: Labor Hour.

1.3.40 REPORTING OF SMOKE TEST, CCTV INSPECTION OR UNDERGROUND UTILITY LINE LOCATES RESULTS**1.3.40.1 Payment**

This shall include reporting of results of smoke testing, CCTV Inspection of sanitary sewer and storm water pipe lines and underground utility line locating services described in Paragraphs 1.3.36, 1.3.37 and 1.3.38, respectively. The service shall include preparation of written reports, photographs, marked up maps or similar services as required to accurately report the results of the contracted services. The exact reporting requirements will be determined on a Delivery Order basis and will be documented in a scope of work to be provided by the NAVFAC Contract Officer.

MEASUREMENT: A labor hour unit price is the unit price bid by the Contractor to provide one performance standard hour of work-in-place. The unit price includes all direct and indirect costs associated with performing one standard hour of work.

The unit price would typically include the Contractor's hourly craft wage, adjusted to allow for the bidder's workforce productivity i.e., the Contractor's estimate of how his/her workforce will perform in relation to the applicable performance standard(s); and all costs for pre-expended materials and supplies, profit, tools, equipment, field and home office overhead, clerical support, supervision, overtime, inspection, fees, taxes, licenses, permits, insurance, etc. In short, all costs associated with providing a specific standard hour of effort.

Mobilization and travel costs shall be accounted for in MOBILIZATION described in Paragraph 1.3.39.

Reporting costs including drawing or survey requirements shall be accounted for under the SURVEY DATA AND DRAWING in Paragraph 1.3.29.

Video inspection results shall be accounted for under VIDEO INSPECTION RESULTS in Paragraph 1.3.40.

1.3.40.2 Unit of Measure

Unit of measure: Labor Hour.

1.3.41 VIDEO INSPECTION RESULTS**1.3.41.1 Payment**

This shall include one electronic copy (CD or DVD ROM) of the CCTV video inspection services provided under Paragraphs 1.3.36 and 1.3.37. The exact reporting requirements will be determined on a Delivery Order basis and will be documented in a scope of work to be provided by the NAVFAC Contract Officer.

MEASUREMENT: The price shall include all incidentals, labor and material in the line item price.

Mobilization and travel costs shall be accounted for in MOBILIZATION described in Paragraph 1.3.39.

Reporting costs including drawing or survey requirements shall be accounted

for under the SURVEY DATA AND DRAWING in Paragraph 1.3.29.

1.3.41.2 Unit of Measure

Unit of measure: Each.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

-- End of Section --

SECTION 01 30 00

ADMINISTRATIVE REQUIREMENTS

11/11

PART 1 GENERAL

1.1 SUBMITTALS

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

SD-01 Preconstruction Submittals

View location map; G

(If required by an individual Delivery Order)

Progress and completion pictures; G

(If required by an individual Delivery Order)

1.2 VIEW LOCATION MAP

If required in an individual Delivery Order: submit to the Contracting Officer, prior to or with the first digital photograph submittals, a sketch or drawing indicating the required photographic locations. Update as required if the locations are moved.

1.3 PROGRESS AND COMPLETION PICTURES

If required in an individual Delivery Order: photographically document site conditions prior to start of construction operations. Provide monthly, and within one month of the completion of work, digital photographs, 1600x1200x24 bit true color, in JPEG file format, showing the sequence and progress of work. Take a minimum of 20 digital photographs each week throughout the entire project from a minimum of ten views from points located by the Contracting Officer. Submit a view location sketch indicating points of view. Submit with the monthly invoice two sets of digital photographs each set on a separate CD-R or DVD-R, cumulative of all photos to date. Indicate photographs demonstrating environmental procedures. Photographs for each month shall be in a separate monthly directory and each file shall be named to indicate its location on the view location sketch. The view location sketch shall also be provided on the CD/DVD as digital file. All file names shall include a date designator. Cross reference submittals in the appropriate daily report. Photographs shall be provided for unrestricted use by the Government.

1.4 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 State of Indiana law.

1.5 CONTRACTOR SPECIAL REQUIREMENTS

1.5.1 Asbestos Containing Material

All contract requirements of Section 02 82 16.00 20, "Engineering Control of Asbestos Containing Materials" assigned to the Private Qualified Person (PQP) shall be accomplished directly by a first tier subcontractor.

1.6 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.

1.7 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 of prices or earned value report, shop drawings, and other submittals, scheduling programming, prosecution of the work, and clear expectations of the "Interim DD Form 1354" Submittal. Major subcontractors who will engage in the work shall also attend.

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

Key personnel will meet to identify strategies to ensure the project is carried to expeditious closure and turnover to the Client. Start the turnover process at the Pre Construction Conference meeting and convene at the Facility Turnover Meetings once the project has reached approximately 75 percent completion or three to six months prior to Beneficial Occupancy Date (BOD), whichever comes first. The Contracting Officer's Representative will lead the meetings and guide discussions based on an agenda provided by the Government. The facility Turnover effort shall include the following:

- a. Pre Construction Meeting - Contracting Officer's Technical Representative (COTR) will provide the NRZ Checklist and the Contractor, Client, and NAVFAC Representatives will compare Contractor's schedule to NRZ Checklist items.
- b. Facility Turnover Meetings
 - 1. Fill in the NRZ Checklist including Contractor, Client, and NAVFAC Checklist Items and assign a person responsible for each item and a due date. The Contractor's Representative will facilitate the assignment of responsibilities, fill out the NRZ Checklist, and

discuss "Interim DD Form 1354" requirements.

2. Review the Contractor's updated schedule. The Contractor shall develop a POAM for the completion of all Contractor, Client, and NAVFAC Checklist items.
3. Confirm that all NRZ Checklist items will be completed on time for the scheduled Facility Turnover.

1.9 PARTNERING

To most effectively accomplish this contract, the Government requires the formation of a cohesive partnership within the Project Team whose members are from the Government, the Contractor and their Subcontractors. Key personnel from the Supported Command, the End User (who will occupy the facility), NAVFAC (Echelon III and IV), the Navy Region/Installation, the Contractor and Subcontractors, and the Designer of Record will be invited to participate in the Partnering process. The Partnership will draw on the strength of each organization in an effort to achieve a project that is without any safety mishaps, conforms to the Contract, and stays within budget and on schedule.

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

1.9.1 Informal Partnering

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

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

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

1.10 AVAILABILITY OF CADD DRAWING FILES

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

Data contained on these electronic files shall not be used for any purpose other than as a convenience in the preparation of construction data for the referenced project. Any other use or reuse shall be at the sole risk of the Contractor and without liability or legal exposure to the Government. The Contractor shall make no claim and waives to the fullest extent permitted by law, any claim or cause of action of any nature against the Government, its agents or sub consultants that may arise out of or in connection with the use of these electronic files. The Contractor shall, to the fullest extent permitted by law, indemnify and hold the Government harmless against all damages, liabilities or costs, including reasonable attorney's fees and defense costs, arising out of or resulting from the use of these electronic files.

These electronic CADD drawing files are not construction documents. Differences may exist between the CADD files and the corresponding construction documents. The Government makes no representation regarding the accuracy or completeness of the electronic CADD files, nor does it make representation to the compatibility of these files with the Contractors hardware or software. In the event that a conflict arises between the signed and sealed construction documents prepared by the Government and the furnished CADD files, the signed and sealed construction documents shall govern. The Contractor is responsible for determining if any conflict exists. Use of these CADD files does not relieve the Contractor of duty to fully comply with the contract documents, including and without limitation, the need to check, confirm and coordinate the work of all contractors for the project.

If the Contractor uses, duplicates and/or modifies these electronic CADD files for use in producing construction drawings and data related to this contract, all previous indicia of ownership (seals, logos, signatures, initials and dates) shall be removed.

1.11 ELECTRONIC MAIL (E-MAIL) ADDRESS

The Contractor shall establish and maintain electronic mail (e-mail) capability along with the capability to open various electronic attachments in Microsoft, Adobe Acrobat, and other similar formats. Within 10 days after contract award, the Contractor shall provide the Contracting Officer a single (only one) e-mail address for electronic communications from the Contracting Officer related to this contract including, but not limited to contract documents, invoice information, request for proposals, and other correspondence. The Contracting Officer may also use email to notify the Contractor of base access conditions when emergency conditions warrant, such as tornadoes, terrorist threats, etc. Multiple email address 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 field office(s). The Contractor shall promptly notify the Contracting Officer, in writing, of any changes to this email address.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 01 33 00

SUBMITTAL PROCEDURES

05/11

PART 1 GENERAL

1.1 DEFINITIONS

1.1.1 Submittal Descriptions (SD)

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

SD-01 Preconstruction Submittals

Submittals which are required **ONLY with the initial proposal.**

- Certificates of insurance
- Health and safety plan
- Quality Control (QC) plan
- Environmental protection plan

Submittals which are required **for individual Delivery Orders** prior to commencing work on site.

- Surety bonds
- List of proposed Subcontractors (if required by the Delivery Order)
- List of proposed products (if required by the Delivery Order)
- Construction progress schedule
- Submittal register
- Schedule of prices
- Work plan

Delivery Order Specific Special Conditions: Modifications for existing submittals specific to the individual Delivery Orders that are required prior to commencing work on site:

- Attachment to the Health and safety plan
- Attachment to the Quality Control (QC) plan
- Attachment to the 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-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. Unless specified in another section, testing must have been within three years of date of contract award for the project.

Report which includes findings of a test required to be performed 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 document purpose is to further promote the orderly progression of a portion of the work by

documenting procedures, acceptability of methods or personnel qualifications.

Confined space entry permits.

Text of posted operating instructions.

SD-08 Manufacturer's Instructions

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

SD-10 Operation and Maintenance Data

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

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

SD-11 Closeout Submittals

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

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

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

If required on an individual Delivery Order: Interim "DD Form 1354" with cost breakout for all assets 30 days prior to facility turnover.

1.1.2 Approving Authority

Office or designated person authorized to approve submittal.

1.1.3 Work

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

1.2 SUBMITTALS

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

SD-01 Preconstruction Submittals

Submittal Register; G

1.3 SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

1.3.1 Government Approved (G)

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

1.4 FORWARDING SUBMITTALS REQUIRING GOVERNMENT APPROVAL

1.4.1 Submittals Required from the Contractor

As soon as practicable after award of contract, and before procurement of fabrication, forward to the Contracting Officer, submittals required in the technical sections of this specification, including shop drawings, product data and samples. Forward one copy of the transmittal form for all submittals to the Resident Officer in Charge of Construction.

The NAVFAC Project Manager will review and approve for the Contracting Officer those submittals reserved for Contracting Officer approval to verify submittals comply with the contract requirements.

1.4.1.1 O&M Data

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

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.

1.5 PREPARATION

1.5.1 Transmittal Form

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

1.5.2 Identifying Submittals

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

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

- a. Project title and location.
- b. Construction contract number.
- c. Date of the drawings and revisions.
- d. Name, address, and telephone number of subcontractor, supplier, manufacturer and any other subcontractor associated with the submittal.
- e. Section number of the specification section by which submittal is required.
- f. Submittal description (SD) number of each component of submittal.
- g. When a resubmission, add alphabetic suffix on submittal description, for example, submittal 18 would become 18A, to indicate resubmission.
- h. Product identification and location in project.

1.5.3 Format for SD-02 Shop Drawings

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

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

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

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

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

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

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

Submit drawings PDF format.

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

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

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

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

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

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

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

Submit manufacturer's instructions prior to installation.

1.5.5 Format of SD-04 Samples

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

- a. Sample of Equipment or Device: Full size.
- b. Sample of Materials Less Than 2 by 3 inches: Built up to 8 1/2 by 11 inches.
- c. Sample of Materials Exceeding 8 1/2 by 11 inches: Cut down to 8 1/2 by 11 inches and adequate to indicate color, texture, and material variations.
- d. Sample of Linear Devices or Materials: 10 inch length or length to be supplied, if less than 10 inches. Examples of linear devices or

materials are conduit and handrails.

- e. Sample of Non-Solid Materials: Pint. Examples of non-solid materials are sand and paint.
- f. Color Selection Samples: 2 by 4 inches. Where samples are specified for selection of color, finish, pattern, or texture, submit the full set of available choices for the material or product specified. Sizes and quantities of samples are to represent their respective standard unit.
- g. Sample Panel: 4 by 4 feet.
- h. Sample Installation: 100 square feet.

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

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

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

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

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

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

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

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

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

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

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

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

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

1.6 QUANTITY OF SUBMITTALS

1.6.1 Number of Copies of SD-02 Shop Drawings

Submit two copies of submittals of shop drawings requiring review and approval only by QC organization and three 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, or two sets of samples showing range of variation, of each required item.
- b. Submit one sample panel or provide one sample installation where directed. Include components listed in technical section or as directed.
- c. Submit one sample installation, where directed.
- d. Submit one sample of non-solid materials.

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

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

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

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

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

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

Unless otherwise specified, submit three sets of administrative submittals.

1.7 VARIATIONS

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

1.7.1 Considering Variations

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

(VECP).

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

1.7.2 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 savings. In addition to documentation required for variation, include the submittals required for the item. Clearly mark the proposed variation in all documentation.

1.7.3 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.

1.7.4 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.

1.8 SUBMITTAL REGISTER

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

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

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

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

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

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

1.8.1 Use of Submittal Register

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

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

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

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

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

1.8.2 Contractor Use of Submittal Register

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

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

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

Column (l) List date of submittal transmission.

Column (q) List date approval received.

1.8.3 Approving Authority Use of Submittal Register

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

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

Column (l) List date of submittal receipt.

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

Column (q) List date returned to Contractor.

1.8.4 Action Codes

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

1.8.4.1 Government Review Action Codes

A - Approved as submitted

AN - Approved as noted, resubmission not required

AR - Approved as noted, resubmission required

D - Disapproved

E - Will be returned by separate cover

F - Receipt acknowledged

FX - Receipt acknowledged, does not comply with contract requirements

G - Other

NR - Not Reviewed

1.8.5 Copies Delivered to the Government

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

1.9 SCHEDULING

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

- a. Coordinate scheduling, sequencing, preparing and processing of submittals with performance of work so that work will not be delayed by submittal processing. Allow for potential resubmittal of requirements.
- b. Submittals called for by the contract documents will be listed on the register. If a submittal is called for but does not pertain to the contract work, the Contractor is to include the submittal in the register and annotate it "N/A" with a brief explanation. Approval by the Contracting Officer does not relieve the Contractor of supplying submittals required by the contract documents but which have been omitted from the register or marked "N/A."
- c. Re-submit register and annotate monthly by the Contractor with actual submission and approval dates. When all items on the register have been fully approved, no further re-submittal is required.
- d. Carefully control procurement operations to ensure that each individual submittal is made on or before the Contractor scheduled submittal date shown on the approved "Submittal Register."
- e. Period of review for each resubmittal is the same as for initial submittal.

1.9.1 Reviewing, Certifying, Approving Authority

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

indicates Contracting Officer is approving authority for that submittal item.

1.9.2 Constraints

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

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

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

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

1.9.3 QC Organization Responsibilities

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

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

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

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

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

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

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

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

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

1.10 GOVERNMENT APPROVING AUTHORITY

When approving authority is Contracting Officer, the Government will:

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

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

1.10.1 Review Notations

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

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

- b. Submittals marked "approved as noted" "or approved, except as noted, resubmittal not required," authorize the Contractor to proceed with the work covered provided he takes no exception to the corrections.
- c. Submittals marked "not approved" or "disapproved," or "revise and resubmit," indicate noncompliance with the contract requirements or design concept, or that submittal is incomplete. Resubmit with appropriate changes. No work shall proceed for this item until resubmittal is approved.
- d. Submittals marked "not reviewed" will indicate submittal has been previously reviewed and approved, is not required, does not have evidence of being reviewed and approved by Contractor, or is not complete. A submittal marked "not reviewed" will be returned with an explanation of the reason it is not reviewed. Resubmit submittals returned for lack of review by Contractor or for being incomplete, with appropriate action, coordination, or change.

1.11 DISAPPROVED OR REJECTED SUBMITTALS

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

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

1.12 APPROVED/ACCEPTED SUBMITTALS

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

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

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

1.13 APPROVED SAMPLES

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

been approved.

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

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

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

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

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 01 35 26

GOVERNMENTAL SAFETY REQUIREMENTS

02/12

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN SOCIETY OF SAFETY ENGINEERS (ASSE/SAFE)

- ASSE/SAFE A10.32 (2012) Fall Protection
- ASSE/SAFE Z359.1 (2007) Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components

ASME INTERNATIONAL (ASME)

- ASME B30.22 (2010) Articulating Boom Cranes
- ASME B30.3 (2012) Tower Cranes
- ASME B30.5 (2011) Mobile and Locomotive Cranes
- ASME B30.8 (2010) Floating Cranes and Floating Derricks

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

- NFPA 10 (2013) Standard for Portable Fire Extinguishers
- NFPA 241 (2013) Standard for Safeguarding Construction, Alteration, and Demolition Operations
- NFPA 70 (2014) National Electrical Code
- NFPA 70E (2012; Errata 2012) Standard for Electrical Safety in the Workplace

U.S. ARMY CORPS OF ENGINEERS (USACE)

- EM 385-1-1 (2014) Safety and Health Requirements Manual, 30 November 2014

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

- 10 CFR 20 Standards for Protection Against Radiation
- 29 CFR 1910 Occupational Safety and Health Standards
- 29 CFR 1910.146 Permit-required Confined Spaces

| | |
|------------------|---|
| 29 CFR 1926 | Safety and Health Regulations for Construction |
| 29 CFR 1926.1400 | Cranes & Derricks in Construction |
| 29 CFR 1926.16 | Rules of Construction |
| 29 CFR 1926.500 | Fall Protection |
| CPL 2.100 | (1995) Application of the Permit-Required Confined Spaces (PRCS) Standards, 29 CFR 1910.146 |

U.S. NAVAL FACILITIES ENGINEERING COMMAND (NAVFAC)

| | |
|--------------|--|
| NAVFAC P-307 | (2009; Change 1 Mar 2011; Change 2 Aug 2011) Management of Weight Handling Equipment |
|--------------|--|

1.2 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 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. 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.

- f. "USACE" property and equipment specified in USACE EM 385-1-1 should be interpreted as Government property and equipment.
- g. Weight Handling Equipment (WHE) Accident. A WHE accident occurs when any one or more of the eight elements in the operating envelope fails to perform correctly during operation, including operation during maintenance or testing resulting in personnel injury or death; material or equipment damage; dropped load; derailment; two-blocking; overload; or collision, including unplanned contact between the load, crane, or other objects. A dropped load, derailment, two-blocking, overload and collision are considered accidents even though no material damage or injury occurs. A component failure (e.g., motor burnout, gear tooth failure, bearing failure) is not considered an accident solely due to material or equipment damage unless the component failure results in damage to other components (e.g., dropped boom, dropped load, roll over, etc.) Any mishap meeting the criteria described above shall be documented in both the Contractor Significant Incident Report (CSIR) and using the NAVFAC prescribed Navy Crane Center (NCC) form submitted within five days both as provided by the Contracting Officer. Comply with additional requirements and procedures for accidents in accordance with NAVFAC P-307, Section 12.

1.3 SUBMITTALS

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

SD-01 Preconstruction Submittals

ACCIDENT PREVENTION PLAN GENERAL (APP); G
 Accident Prevention Plan - ADDENDUM; G **Delivery Order Specific**
 Activity Hazard Analysis (AHA); G
 Crane Critical Lift Plan; G
 Proof of qualification for Crane Operators; G
 qualifications for all site safety and health personnel; G
 Radiography Operations Planning Worksheet; G

SD-06 Test Reports

Accident Notifications**
 Accident Reports**

** Submit reports as their incidence occurs, in accordance with the requirements of the paragraphs, "Accident Notifications" and "Accident and Reports."

Crane Reports

SD-07 Certificates

Confined Space Entry Permit

Hot work permit

License Certificates

Weight Handling Equipment Certificate of Compliance

Contractor Safety Self-Evaluation Checklist; G
(Obtain copy from Contrating Officer)

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

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. Complete the checklist monthly and submit with each request for payment voucher. An acceptable score of 90 or greater is required. Failure to submit the completed safety self-evaluation checklist or achieve a score of at least 90 may result in retention of up to 10 percent of the voucher. Additionally, provide a Monthly Exposure Report and attach to the monthly billing request. This report is a compilation of employee-hours worked each month for all site workers, both prime and subcontractor. Failure to submit the report may result in retention of up to 10 percent of the voucher. The Contracting Officer will submit a copy of the Contractor Safety Self-Evaluation and Monthly Exposure Report to the local safety and occupational health office.

1.5 REGULATORY REQUIREMENTS

In addition to the detailed requirements included in the provisions of this contract, comply with the most recent edition of USACE EM 385-1-1, and applicable OSHA, federal, Indiana state laws, ordinances, criteria, rules and regulations concerning workplace safety. Submit matters of interpretation of standards to the appropriate administrative agency for resolution before starting work. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements govern.

1.6 SITE QUALIFICATIONS, DUTIES AND MEETINGS

1.6.1 Personnel Qualifications

1.6.1.1 Site Safety and Health Officer (SSHO)

The SSHO must meet the requirements of EM 385-1-1 section 1 and ensure that the requirements of 29 CFR 1926.16 are met for the project. Provide a Safety oversight team that includes a minimum of one (1) person at each project site to function as the Site Safety and Health Officer (SSHO). The SSHO or an equally-qualified Designated Representative/alternate shall be at the work site at all times to implement and administer the Contractor's

safety program and government-accepted Accident Prevention Plan. The SSHO's training, experience, and qualifications shall be as required by EM 385-1-1 paragraph 01.A.17, entitled SITE SAFETY AND HEALTH OFFICER (SSHO), and all associated sub-paragraphs.

A Competent Person shall be provided for all of the hazards identified in the Contractor's Safety and Health Program in accordance with the accepted Accident Prevention Plan, and shall be on-site at all times when the work that presents the hazards associated with their professional expertise is being performed. Provide the credentials of the Competent Persons(s) to the the Contracting Officer for acceptance in consultation with the Safety Office.

Depending upon the language in the individual Delivery Order RFP, the Contractor Quality Control (QC) person **MAY or MAY NOT** be allowed to be the SSHO on a Delivery Order.

1.6.1.2 Competent Person for Confined Space Entry

Provide a "Competent Person" to supervise the entry into each confined space. That individual must meet the requirements and definition of Competent Person as contained in EM 385-1-1.

1.6.1.3 Crane Operators

Meet the crane operators requirements in USACE EM 385-1-1, Section 16 and Appendix I. In addition, for mobile cranes with Original Equipment Manufacturer (OEM) rated capacities of 50,000 pounds or greater, designate crane operators as qualified by a source that qualifies crane operators (i.e., union, a government agency, or an organization that tests and qualifies crane operators). Provide proof of current qualification. In addition, the Contractor shall comply with Contractor Operated Crane Requirements included in the latest revision of document NAVFAC P-307 Section 1.7.2 "Contractor Operated Cranes," and Appendix P, Figure P-1 and with 29 CFR 1926, Subpart CC.

1.6.1.4 1.6.1.4 HAZWOPER Training

Crane has approximately 30 known solid waste management units (SWMUs) which may present the potential for exposure to contaminated substances. It is possible that a tasking under this contract may require work within the boundary of a SWMU, or that work may uncover a previously unknown SWMU. All Personnel performing duties with potential for exposure to onsite contaminants (i.e., at the jobsite where earthwork has occurred) must meet and maintain the training requirements provided under 29 CFR 1910.120/29 CFR 1926.65 (e).

1.6.2 Personnel Duties

1.6.2.1 Site Safety and Health Officer (SSHO)

The SSHO shall:

- a. Conduct daily safety and health inspections and maintain a written log which includes area/operation inspected, date of inspection, identified hazards, recommended corrective actions, estimated and actual dates of corrections. Attach safety inspection logs to the Contractors' daily production report.

- b. Conduct mishap investigations and complete required 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. Post a list of unresolved safety and health deficiencies on the safety bulletin board.
- g. Ensure sub-contractor compliance with safety and health requirements.
- h. Maintain a list of hazardous chemicals on site and their material safety data sheets.
- i. Within one calendar day after commencement of work, erect a safety bulletin board at the job site. Where size, duration, or logistics of project do not facilitate a bulletin board, an alternative method, acceptable to the Contracting Officer, that is accessible and includes all mandatory information for employee and visitor review, shall be deemed as meeting the requirement for a bulletin board. Include and maintain information on safety bulletin board as required by EM 385-1-1, section 01.A.06. Additional items required to be posted include:
 - 1) [Confined space entry permit](#).
 - 2) [Hot work permit](#).
 - 3) If applicable, Digging Permit.
 - 4) If applicable, Explosive Safety Permit and Building Permit.

Failure to perform the above duties will result in dismissal of the superintendent, QC Manager, 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. 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, establish a schedule for the preparation, submittal, review, and acceptance of AHAs 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. Do not begin work until there is an accepted APP.

1.6.3.2 Safety Meetings

Conduct and document meetings as required by EM 385-1-1. Attach minutes showing contract title, signatures of attendees and a list of topics discussed to the Contractors' daily production report.

1.7 ACCIDENT PREVENTION PLAN GENERAL (APP)

The APP for this contract is meant to be a 'living document' covering general hazards and situations as defined by EM-385-1-1 (Haz. Energy Control Plan, respirator protection plan, confined space, hazardous communications plan, etc) typically found at construction activities for the duration of the contract, but flexible enough to incorporate individual Delivery Order specific hazards as the projects are awarded.

Use a qualified person to prepare the written General APP. Prepare the APP in accordance with the format and requirements of USACE EM 385-1-1 30 November 2014 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 interface with the Contractor's overall safety and health program. Include any portions of the Contractor's overall safety and health program referenced in the APP in the applicable APP element and made site-specific. 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, the Contractor Quality control Manager, and any designated CSP and/or CIH.

Submit the General APP to the Contracting Officer 15 calendar days prior to the date of overall contract Notice of Award or the Prework conference for acceptance. Work cannot proceed without an accepted General APP. Once accepted by the Contracting Officer, the General APP and attachments will be enforced as part of the contract. Disregarding the provisions of this contract or the accepted General 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, SSHO and quality control manager. Should any severe hazard exposure, i.e. imminent danger, become evident, stop work in the area, secure the area, and develop a plan to remove the exposure and control the hazard. Notify the Contracting Officer within 24 hours of discovery. Eliminate/remove the hazard. In the interim, take all necessary action to restore and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public (as defined by ASSE/SAFE A10.34,) and the environment.

Copies of the accepted plan will be maintained at the Contracting Officer's office and at the job site. Continuously review and amend the APP, as necessary, throughout the life of the contract. Incorporate unusual or high-hazard activities not identified in the original APP as they are discovered.

1.7.1 DELIVERY ORDER SPECIFIC AMENDMENTS TO THE [Accident Prevention Plan - ADDENDUM](#)

Use a qualified person to prepare the written Delivery Order Specific addendums the contract approved APP. Addendums will cover unusual or high-hazard activities specific to the individual Delivery Orders not identified in the original APP.

The APP addendums shall be signed by the person and firm (senior person) preparing the APP, the Contractor, and (as applicable to the Delivery Order), the on-site superintendent, the designated site safety and health officer, and the Contractor Quality control Manager. These APP amendments shall be submitted and approved prior to the start of construction.

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

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

1.7.2 EM 385-1-1 CONTENTS

In addition to the requirements outlined in 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. Specify the duties of each position.
- b. Qualifications of competent and of qualified persons. As a minimum, designate and submit qualifications of competent persons for each of

the following major areas: excavation; scaffolding; fall protection; hazardous energy; confined space; health hazard recognition, evaluation and control of chemical, physical and biological agents; personal protective equipment and clothing to include selection, use and maintenance.

- c. Confined Space Entry Plan. Develop a confined and/or enclosed space entry plan in accordance with USACE EM 385-1-1, applicable OSHA standards 29 CFR 1910, 29 CFR 1915, and 29 CFR 1926, OSHA Directive 2.100, and any other federal, state and local regulatory requirements identified in this contract. Identify the qualified person's name and qualifications, training, and experience. Delineate the qualified person's authority to direct work stoppage in the event of hazardous conditions. Include procedure for rescue by contractor personnel and the coordination with emergency responders. (If there is no confined space work, include a statement that no confined space work exists and none will be created.)
- d. Fall Protection and Prevention (FP&P) Program Documentation. The program documentation shall be site specific and address all fall hazards in the work place and during different phases of construction. Address how to protect and prevent workers from falling to lower levels when they are exposed to fall hazards above 1.8 m 6 feet. A qualified person for fall protection shall prepare and sign the program documentation. Include fall protection and prevention systems, equipment and methods employed for every phase of work, responsibilities, assisted rescue, self-rescue and evacuation procedures, training requirements, and monitoring methods. Revise the Fall Protection and Prevention Program documentation every six months for lengthy projects, reflecting any changes during the course of construction due to changes in personnel, equipment, systems or work habits. Keep and maintain the accepted Fall Protection and Prevention Program documentation at the job site for the duration of the project. Include the Fall Protection and Prevention Program documentation in the Accident Prevention Plan.

The FP&P Plan shall include a Rescue and Evacuation Plan in accordance with USACE EM 385-1-1, Section 21.M. The plan shall include a detailed discussion of the following: methods of rescue; methods of self-rescue; equipment used; training requirement; specialized training for the rescuers; procedures for requesting rescue and medical assistance; and transportation routes to a medical facility. Include the Rescue and Evacuation Plan in the Fall Protection and Prevention (FP&P) Plan, and as part of the Accident Prevention Plan (APP).

- e. Weight Handling Equipment [Certificate of Compliance](#). Provide a Certificate of Compliance for each crane when entering an activity under this contract (see Contracting Officer for a blank certificate). State within the certificate that the crane and rigging gear meet applicable OSHA regulations (with the Contractor citing which OSHA regulations are applicable, e.g., cranes used in construction demolition, or maintenance comply with 29 CFR 1926 and USACE EM 385-1-1. Certify on the Certificate of Compliance that the crane operator(s) is qualified and trained in the operation of the crane to be used. For cranes at DOD activities in foreign countries, certify that the crane and rigging gear conform to the appropriate host country safety standards. 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). Post certifications on the crane.

f. **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. Submit 15 calendar days prior to on-site work and include the requirements of USACE EM 385-1-1, and the following:

(1) For lifts of personnel, demonstrate compliance with the requirements of 29 CFR 1926.1400.

g. **Severe Storm Plan.** In the event of a severe storm warning, the Contractor must:

(1). Secure outside equipment and materials and place materials that could be damaged in protected areas.

(2). Check surrounding area, including roof, for loose material, equipment, debris, and other objects that could be blown away or against existing facilities.

(3). Ensure that temporary erosion controls are adequate.

If appropriate to an individual Delivery Order, include the following:

h. **Occupant Protection Plan.** The safety and health aspects of lead-based paint removal, prepared in accordance with Section 02 82 33.13 20 REMOVAL/CONTROL AND DISPOSAL OF PAINT WITH LEAD.

i. **Lead Compliance Plan.** The safety and health aspects of lead work, prepared in accordance with Section 02 83 13.00 20 LEAD IN CONSTRUCTION.

j. **Asbestos Hazard Abatement Plan.** The safety and health aspects of asbestos work, prepared in accordance with Section 02 82 16.00 20 ENGINEERING CONTROL OF ASBESTOS CONTAINING MATERIALS.

m. **Site Demolition Plan.** The safety and health aspects prepared in accordance with Section 02 41 00 DEMOLITION AND DECONSTRUCTION and referenced sources. Include engineering survey as applicable.

n. **Excavation Plan.** If significant excavation is included in an individual Delivery Order: The safety and health aspects shall be prepared in accordance with the Delivery Order supplied 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 and as provided by the Contracting Officer at the pre work meeting. Submit the AHA for review at least 15 calendar days prior to the start of each phase.

The AHA is Delivery Order specific and should be submitted for each awarded Delivery Order to cover task-specific (crane critical lift, scaffolding, fall protection, PPE, etc) safety items.

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 and reviewed with all employees involved in the work.

The AHA list will be reviewed at the Delivery Order Preconstruction meeting and periodically (at least monthly) at the Contractor supervisory safety meeting and updated as necessary when procedures, scheduling, or hazards change. Develop the activity hazard analyses using the project schedule as the basis for the activities performed.

Any activities listed on the project schedule will require an AHA. Competent persons required for phases involving such things as fall protection, excavations, scaffold, and electrical work shall be identified. AHAs should be developed by the contractor, supplier, or subcontractor performing the work and provided to the prime contractor for review and submitted to the Contracting Officer for acceptance after prime contractor approval.

1.9 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.

1.10 EMERGENCY MEDICAL TREATMENT

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

1.11 NOTIFICATIONS and REPORTS

1.11.1 Accident Notifications

- a. Notify the Contracting Officer as soon as practical, but no more 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. Within notification include contractor name; contract title; type of contract; name of activity, installation or location where accident occurred; date and time of accident; names of personnel injured; extent of property damage, if any; extent of injury, if known, and brief description of accident (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.

1.11.2 Accident Reports

- a. Conduct an accident investigation for recordable injuries and illnesses, as defined in "Article - Definitions" property damage accidents resulting in at least \$20,000 in damages, and near misses as defined in "Article - Definitions" to establish the root cause(s) of the accident, complete the applicable NAVFAC Contractor Incident Reporting System (CIRS) and electronically submit via the NAVFAC Enterprise Safety Applications Management System (ESAMS) The Contracting Officer will provide copies of any required or special forms.
- b. Near Misses: Require the completion of the applicable NAVFAC Contractor Incident Reporting System (CIRS) and electronically submit via the

NAVFAC Enterprise Safety Applications Management System (ESAMS).

- c. Conduct an accident investigation for any weight handling equipment accident (including rigging gear accidents) 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. Do not proceed with crane operations until cause is determined and corrective actions have been implemented to the satisfaction of the contracting officer. The Contracting Officer will provide a blank copy of the accident report form.

1.11.3 Crane Reports

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

1.12 HOT WORK

To the greatest extent possible, situations that could require hot work permits (welding, cutting, etc.) will be called out in the individual Task Order Scopes of Work.

If the contractor intends to employ means or methods that will involve hot work, or spark producing tools, state so in the Delivery Order proposal and conform to the hot work permit rules below.

For hot work in CAAA buildings, submit and obtain a written permit prior to performing "Hot Work" (welding, cutting, etc.) or operating other flame-producing/spark producing devices, from the Fire Division.

For hot work in NSWC explosive operations buildings, submit and obtain a written permit prior to performing "Hot Work" (welding, cutting, etc.) or operating other flame-producing/spark producing devices, from the Fire Division and the NSWC Explosive Safety Office. See 01 11 00 SUMMARY OF WORK for further details on Explosive Safety Permits.

For hot work in all other buildings, submit and obtain a written permit prior to performing "Hot Work" (welding, cutting, etc.) or operating other flame-producing/spark producing devices, from the Contracting Officer.

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, require 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.

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

etc.) that have the potential for flammable or explosive atmospheres.

1.13 RADIATION SAFETY REQUIREMENTS

Work shall be performed in accordance with NAVFACINST 5104.1. See attachments for instructions and worksheet.

If work involving a radiography source is proposed, submit the attached [Radiography Operations Planning Worksheet](#) 60 days in advance of the proposed source being brought onto the Activity.

[License Certificates](#) for radiation materials and equipment shall be submitted to the Contracting Officer and Radiation Safety Office (RSO), and Contracting Oversight Technician (COT) for all specialized and licensed material and equipment that could cause fatal harm to construction personnel or to the construction project.

Workers shall be protected from radiation exposure in accordance with [10 CFR 20](#). Standards for Protection Against Radiation

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

Protect workers from radiation exposure in accordance with [10 CFR 20](#). Standards for Protection against radiation, ensuring any personnel exposures are maintained As Low As Reasonably Achievable.

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

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

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

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

Actual exposure of the radiographic film or unshielding the source must not be initiated until after 5 p.m. on weekdays.

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, giving the specific dates, hours, location, type of work to be performed, contract number and project title.

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

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

Properly secure the radiological material and ionizing radiation equipment at all times, including keeping the devices in a properly marked and locked container, and secondarily locking the container to a secure point in the Contractor's vehicle or other approved storage location during transportation and while not in use. While in use, maintain a continuous visual observation on the radiological material and ionizing radiation equipment.

In instances where radiography is scheduled near or adjacent to buildings or areas having limited access or one-way doors, no assumptions shall be made as to building occupancy. Where necessary, the Contracting Officer will direct the Contractor to conduct an actual building entry, search, and alert. Where removal of personnel from such a building cannot be accomplished and it is otherwise safe to proceed with the radiography, a fully instructed employee shall be positioned inside such building or area to prevent exiting while external radiographic operations are in process.

Transportation of Regulated Amounts of Radioactive Material will comply with 49 CFR, Subchapter C, Hazardous Material Regulations. Notify Local Fire authorities and the site Radiation Safety Officer (RSO) of any Radioactive Material use.

1.14 HAZARDS OF ELECTROMEGNETIC RADIATION TO ORDNANCE (HERO) ANALYSIS TRANSMITTER REQUEST

Transmitter Requirements: The base policy (NSACRANEINST 8020.1, Explosives Safety Program at NSA Crane, chapter 11, found in part 6) concerning the use of transmitters such as radios, cell phones, etc., must be adhered to by all Contractor personnel. Requests to do shall be accompanied by the HAZARDS OF ELECTROMAGNETIC RADIATION TO ORDNANCE (HERO) PROGRAM transmitter form, found in part 6 of this contract. No transmitting device shall be brought onto center without written consent of the Contracting Officer."

1.15 FACILITY OCCUPANCY CLOSURE

Streets, walks, and other facilities occupied and used by the Government shall not be closed or obstructed without written permission from the Contracting Officer.

1.16 SEVERE STORM PLAN

In the event of a severe storm warning, the Contractor must:

- a. Secure outside equipment and materials and place materials that could be damaged in protected areas.
- b. Check surrounding area, including roof, for loose material, equipment, debris, and other objects that could be blown away or against existing facilities.

- c. Ensure that temporary erosion controls are adequate.

1.17 CONFINED SPACE ENTRY REQUIREMENTS.

Contractors entering and working in confined spaces while performing general industry work are required to follow the requirements of OSHA 29 CFR 1926 and comply with the requirements in Section 34 of EM 385-1-1, OSHA 29 CFR 1910, and OSHA 29 CFR 1910.146.

PART 2 PRODUCTS

2.1 CONFINED SPACE SIGNAGE

Provide permanent signs integral to or securely attached to access covers for new permit-required confined spaces. Signs wording:

"DANGER--PERMIT-REQUIRED CONFINED SPACE - DO NOT ENTER -"

in bold letters a minimum of one inch in height and constructed to be clearly legible with all paint removed. The signal word "DANGER" shall be red and readable from 5 feet.

PART 3 EXECUTION

3.1 CONSTRUCTION AND OTHER WORK

Comply with USACE EM 385-1-1, NFPA 70, NFPA 70E, NFPA 241, the APP, the AHA, Federal and State OSHA regulations, and other related submittals and activity fire and safety regulations. The most stringent standard prevails.

PPE is governed in all areas by the nature of the work the employee is performing. Use personal hearing protection at all times in designated noise hazardous areas or when performing noise hazardous tasks. Safety glasses must be carried/available on each person.

Mandatory PPE includes:

- a. Hard Hat
- b. Appropriate Safety Shoes
- c. Reflective Vests

3.1.1 Hazardous Material Use

Each hazardous material must receive approval from the Contracting Office or their designated representative prior to being brought onto the job site or prior to any other use in connection with this contract. Allow a minimum of 10 working days for processing of the request for use of a hazardous material.

3.1.2 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. Low mercury lamps used within fluorescent lighting fixtures are allowed as an exception without further Contracting Officer approval. Notify the Radiation Safety Officer (RSO) prior to excepted items of radioactive material and devices being brought on base.

3.1.3 Unforeseen Hazardous Material

The design should have identified materials such as PCB, lead paint, and friable and non-friable asbestos and other OSHA regulated chemicals (i.e. 29 CFR Part 1910.1000). If material, 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. For electrical work positive cable/circuit identification must be made prior to submitting any outage request. 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. Following the application of lockout/tag out devices to all hazardous energy sources, applicable AHA should outline equipment restart methods to ensure "zero energy" state has been accomplished.

3.3 CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT)

Ensure that each employee is familiar with and complies with these procedures and USACE EM 385-1-1, Section 12, Control of Hazardous Energy.

3.4 FALL HAZARD PROTECTION AND PREVENTION PROGRAM

Establish a fall protection and prevention program, for the protection of all employees exposed to fall hazards. Within the program 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 in accordance with ASSE/SAFE Z359.1.

3.4.1 Training

Institute a fall protection training program. As part of the Fall Hazard Protection and Prevention Program, provide training for each employee who might be exposed to fall hazards. Provide training by a competent person for fall protection in accordance with USACE EM 385-1-1, Section 21.B.

3.4.2 Fall Protection Equipment and Systems

Enforce use of the fall protection equipment and systems designated for each specific work activity in the Fall Protection and Prevention Plan and/or AHA at all times when an employee is exposed to a fall hazard. Protect employees from fall hazards as specified in EM 385-1-1, 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 21.N through 21.N.04. 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 ASSE/SAFE A10.32.

3.4.2.1 Personal Fall Arrest Equipment

Personal fall arrest equipment, systems, subsystems, and components shall meet ASSE/SAFE 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 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.

3.4.3 Fall Protection for Roofing Work

Implement fall protection controls based on the type of roof being constructed and work being performed. Evaluate the roof area to be accessed for its structural integrity including weight-bearing capabilities for the projected loading.

a. Low Sloped Roofs:

- (1) For work within 6 feet of an edge, on low-slope roofs, protect personnel 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 6 feet from an edge, erect and install warning lines 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.

3.4.4 Horizontal Lifelines

Design, install, certify and use under the supervision of a qualified person horizontal lifelines for fall protection as part of a complete fall arrest system which maintains a safety factor of 2 (29 CFR 1926.500).

3.4.5 Guardrails and Safety Nets

Design, install and use guardrails and safety nets in accordance with EM 385-1-1 and 29 CFR 1926 Subpart M.

3.4.6 Rescue and Evacuation Procedures

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

3.5 SCAFFOLDING

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

3.6 EQUIPMENT

3.6.1 Material Handling Equipment

- a. Material handling equipment such as forklifts shall not be modified with work platform attachments for supporting employees unless specifically delineated in the manufacturer's printed operating instructions.
- b. The use of hooks on equipment for lifting of material must be in accordance with manufacturer's printed instructions. Additionally, when material handling equipment is used as a crane it must meet NAVFAC P-307 requirements in Sections 1.7.2, "Contractor Operated Cranes," and 12, "Investigation and Reporting of Crane and Rigging Gear Accidents."
- c. Operators of forklifts or power industrial trucks shall be licensed in accordance with OSHA.

3.6.2 Weight Handling Equipment

- a. Equip cranes and derricks as specified in EM 385-1-1, section 16.
- b. Notify the Contracting Officer 15 days in advance of any cranes entering the activity so that necessary quality assurance spot checks can be coordinated. Contractor's operator shall remain with the crane during the spot check.
- c. Comply with the crane manufacturer's specifications and limitations for erection and operation of cranes and hoists used in support of the work. Perform erection under the supervision of a designated person (as defined in ASME B30.5). Perform all testing in accordance with the manufacturer's recommended procedures.
- d. Comply with ASME B30.5 for mobile and locomotive cranes, ASME B30.22 for articulating boom cranes, ASME B30.3 for construction tower cranes, and ASME B30.8 for floating cranes and floating derricks.
- e. Under no circumstance shall a Contractor make a lift at or above 90 percent of the cranes rated capacity in any configuration.
- f. When operating in the vicinity of overhead transmission lines, operators and riggers shall be alert to this special hazard and follow the requirements of USACE EM 385-1-1 Section 11, NAVFAC P-307 Figure 10-3 and ASME B30.5 or ASME B30.22 as applicable.
- g. Do not crane suspended personnel work platforms (baskets) unless the Contractor proves that using any other access to the work location would provide a greater hazard to the workers or is impossible. Do not lift personnel with a line hoist or friction crane.
- h. Inspect, maintain, and recharge portable fire extinguishers as specified in NFPA 10, Standard for Portable Fire Extinguishers.
- i. All employees must keep clear of loads about to be lifted and of suspended loads.
- j. Use cribbing when performing lifts on outriggers.

- k. The crane hook/block must be positioned directly over the load. Side loading of the crane is prohibited.
- l. A physical barricade must be positioned to prevent personnel 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 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.

3.6.3 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. Incorporate such additional safety precautions or requirements into the AHAs.

3.6.4 USE OF EXPLOSIVES

Explosives shall not be used or brought to the Activity.

3.7 EXCAVATIONS

Soil classification must be performed by a competent person in accordance with 29 CFR 1926 and EM 385-1-1.

3.7.1 Utility Locations

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

3.7.2 Utility Location Verification

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

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

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

3.8 ELECTRICAL

3.8.1 Conduct of Electrical Work

As delineated in USACE EM 385-1-1 electrical work is to be conducted in a de-energized state unless there is no alternative method for accomplishing the work. In those cases an energized work permit shall be obtained from the contracting officer.

The energized work permit application shall be accompanied by the AHA and a summary of why the equipment/circuit needs to be worked energized.

NOTE: the energized work permits require written justification and approval from Headquarters. Cost savings are not sufficient justification, nor is approval likely. Make requests in writing to the Contracting Officer no less than 45 days prior to the proposed 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. Attachment of temporary grounds shall be in accordance with ASTM F855 and IEEE 1048.

Perform all high voltage cable cutting remotely using hydraulic cutting tool. When racking in or live switching of circuit breakers, no additional person other than the switch operator will be allowed in the space during the actual operation. Plan so that work near energized parts is minimized to the fullest extent possible. Use of electrical outages clear of any energized electrical sources is the preferred method.

When working in energized substations, only qualified electrical workers shall be permitted to enter. When work requires Contractor to work near energized circuits as defined by the NFPA 70, high voltage personnel must use personal protective equipment that includes, as a minimum, electrical hard hat, safety shoes, insulating gloves and electrical arc flash protection for personnel as required by NFPA 70E. Insulating blankets, hearing protection, and switching suits may also be required, depending on the specific job and as delineated in the Contractor's AHA. Contractor shall ensure that each employee is familiar with and complies with these procedures and 29 CFR 1910.147.

3.9.1 Portable Extension Cords

Size portable extension cords in accordance with manufacturer ratings for the tool to be powered and protected from damage. Immediately removed from service all damaged extension cords. Portable extension cords shall meet the requirements of EM 385-1-1, NFPA 70E, and OSHA electrical standards.

3.9 WORK IN CONFINED SPACES

Comply with the requirements in Section 34 of USACE EM 385-1-1, OSHA 29 CFR 1910, OSHA 29 CFR 1910.146, OSHA Directive CPL 2.100 and OSHA 29 CFR 1926. Any potential for a hazard in the confined space requires a permit system to be used.

- a. Entry Procedures. Prohibit entry into a confined space by personnel for any purpose, including hot work, until the qualified person has conducted appropriate tests to ensure the confined or enclosed space is safe for the work intended and that all potential hazards are controlled or eliminated and documented. (See Section 34 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 --

SECTION 01 42 00

SOURCES FOR REFERENCE PUBLICATIONS
08/10

PART 1 GENERAL

1.1 REFERENCES

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

1.2 ORDERING INFORMATION

The addresses of the standards publishing organizations whose documents are referenced in other sections of these specifications are listed below, and if the source of the publications is different from the address of the sponsoring organization, that information is also provided. Documents listed in the specifications with numbers which were not assigned by the standards producing organization should be ordered from the source by title rather than by number.

AMERICAN CONCRETE INSTITUTE INTERNATIONAL (ACI)
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Fax: 248-848-3701
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Internet: <http://www.concrete.org>

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Ph: 703-524-8800
Fax: 703-528-3816
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Internet: <http://www.ahrinet.org>

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Internet: <http://www.aashto.org>

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Fax: 610-832-9555
E-mail: service@astm.org
Internet: <http://www.astm.org>

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Ph: 416 747 4000
Internet: <http://www.csagroup.org>

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Birmingham, AL 35244
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E-mail: info@dipra.org
Internet: <http://www.dipra.org>

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270 Central Avenue
P.O. Box 7500
Johnston, RI 02919
Ph: 401-275-3000 ext. 1945
Fax: 401-275-3029
E-mail: servicedesk.myrisk@fmglobal.com
Internet: <http://www.fmglobal.com>

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1001 Connecticut Avenue, NW

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Washington, DC 20036-5525
Ph: 202-872-6400
Fax: 202-872-4324
E-mail: green seal@green seal.org
Internet: <http://www.green seal.org>

MANUFACTURERS STANDARDIZATION SOCIETY OF THE VALVE AND FITTINGS
INDUSTRY (MSS)
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Vienna, VA 22180
Ph: 703-281-6613
Fax: 703-281-6671
E-mail: info@mss-hq.com
Internet: <http://www.mss-hq.com>

MIDWEST INSULATION CONTRACTORS ASSOCIATION (MICA)
16712 Elm Circle
Omaha, NE 68130
Ph: 800-747-6422
Fax: 402-330-9702
E-mail: mica@tconl.com
Internet: <http://www.micainsulation.org>

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)
1300 North 17th Street, Suite 1752
Rosslyn, VA 22209
Ph: 703-841-3200
Fax: 703-841-5900
Internet: <http://www.nema.org/>

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
1 Batterymarch Park
Quincy, MA 02169-7471
Ph: 617-770-3000 or 800-344-3555
Fax: 617-770-0700
E-mail: webmaster@nfpa.org
Internet: <http://www.nfpa.org>

NATIONAL PRECAST CONCRETE ASSOCIATION (NPCA)
10333 N. Meridian Street, Suite 272
Indianapolis, Indiana 46290
Ph: 317-571-9500 or 800 366 7731
Fax: 317-571-0041
E-mail: npca@precast.org
Internet: www.precast.org

NATIONAL SANITATION FOUNDATION, INTERNATIONAL (NSF)
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Internet: <http://www.turfgrasssod.org>

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Ph: 215-697-6396 - for account/password issues
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Obtain Unified Facilities Criteria (UFC) from:
Whole Building Design Guide (WBDG)
National Institute of Building Sciences (NIBS)
1090 Vermont Avenue NW, Suite 700
Washington, CD 20005
Ph: 202-289-7800
Fax: 202-289-1092
Internet: http://www.wbdg.org/references/docs_refs.php

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E-mail: contactcenter@gpo.gov
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U.S. NAVAL FACILITIES ENGINEERING COMMAND (NAVFAC)
1322 Patterson Ave. SE, Suite 1000
Washington Navy Yard, DC 20374
Ph: 757-322-4200
Fax: 757-322-4416
Internet: <http://www.navfac.navy.mil>

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

-- End of Section --

SECTION 01 45 00.10 20

QUALITY CONTROL FOR MINOR CONSTRUCTION

02/10

PART 1 GENERAL

1.1 REFERENCES

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

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1

(2014) Safety and Health Requirements
Manual, 30 November 2014

1.2 SUBMITTALS

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

SD-01 Preconstruction Submittals

QC Plan; G

Submit a QC plan within 15 calendar days after receipt of Notice of Award.

1.3 INFORMATION FOR THE CONTRACTING OFFICER (KO)

Prior to commencing work on construction, the Contractor can obtain a single copy set of the current report forms from the KO. The report forms will consist of the Contractor Production Report, Contractor Production Report (Continuation Sheet), Contractor Quality Control (CQC) Report, CQC Report (Continuation Sheet), Preparatory Phase Checklist, Initial Phase Checklist, Rework Items List, and Testing Plan and Log.

Deliver the following to the KO:

- a. CQC Report: Original and one copy, by 10:00 AM the next working week after each week that work is performed;
- b. Contractor Production Report: Original and one copy by 10:00 AM the next working day after each day that work is performed;
- c. Preparatory Phase Checklist: Original attached to the original CQC Report and one copy attached to each copy;
- d. Initial Phase Checklist: Original attached to the original CQC Report and one copy attached to each copy;
- e. Field Test Reports: One copy, within two working days after the test is performed, attached to the CQC Report;

f. QC Meeting Minutes: One copy, within the week after the meeting; and

g. 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. The QC program consists of a QC Manager, a QC plan, a Coordination and Mutual Understanding Meeting, QC meetings, three phases of control, submittal review and approval, testing, 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 work or testing may be performed unless the QC Manager is on the work site.

1.4.1 Preliminary Work Authorized Prior to Acceptance

The only 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 Acceptance

Acceptance of the QC plan is required prior to the start of construction. The KO 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 KO reserves the right to interview any member of the QC organization at any time in order to verify the submitted qualifications.

1.4.3 Notification of Changes

Notify the KO, in writing, of any proposed change, including changes in the QC organization personnel, a minimum of seven calendar days prior to a proposed change. Proposed changes shall be subject to the acceptance by the KO.

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. The QC Manager is required to attend the Coordination and Mutual Understanding Meeting, conduct the QC meetings, perform the three phases of control, perform submittal review and approval, ensure testing is performed and provide QC certifications and documentation required in this contract. The QC Manager is responsible for managing and coordinating the three phases of control and documentation performed by others.

1.5.1.2 Qualifications

An individual with a minimum of 5 years combined experience as a superintendent, inspector, QC Manager, project manager, or construction

manager on similar size and type construction contracts which included the major trades that are part of this contract. The individual must be familiar with the requirements of the EM 385-1-1 and have experience in the areas of hazard identification and safety compliance.

1.5.1.3 Construction Quality Management Training

In addition to the above experience and education requirements, the QC Manager shall have completed the course Construction Quality Management for Contractors and will have a current certificate.

1.5.2 Alternate QC Manager Duties and Qualifications

Designate an alternate for the QC Manager to serve in the event of the designated QC Manager's absence. The period of absence may not exceed two weeks at one time, and not more than 30 workdays during a calendar year. The qualification requirements for the Alternate QC Manager shall be the same as for the QC Manager.

1.6 QC PLAN

1.6.1 Requirements

Provide, for acceptance by the KO, a QC plan submitted in a three-ring binder that covers both on-site and off-site work and includes the following with a table of contents listing the major sections identified with tabs.

- I. QC ORGANIZATION: A chart showing the QC organizational structure and its relationship to the production side of the organization.
- II. NAMES AND QUALIFICATIONS: In resume format, for each person in the QC organization. Include the CQM for Contractors course certification required by the paragraph entitled "Construction Quality Management Training".
- III. DUTIES, RESPONSIBILITY AND AUTHORITY OF QC PERSONAL: 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 managing and implementing the QC program as described in this contract. Include in this letter the QC Manager's authority to direct the removal and replacement of non-conforming work.
- 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.
- VII. TESTING LABORATORY INFORMATION: Testing laboratory information required by the paragraphs "Accredited Laboratories" or "Testing Laboratory 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, record, track and complete rework items.
- X. DOCUMENTATION PROCEDURES: Use Government formats.
- XI. LIST OF DEFINABLE FEATURES: A Definable Feature of Work (DFOW) is a task, which is separate and distinct from other tasks, has the same control requirements and work crews. The list shall be cross-referenced to the Contractor's Construction Schedule and the specification sections. For projects requiring a Progress Chart, the list of definable features of work shall include but not be limited to all items of work on the schedule. For projects requiring a Network Analysis Schedule, the list of definable features of work shall include but not be limited to all critical path activities.
- XII. PROCEDURES FOR PERFORMING THREE PHASES OF CONTROL: For each DFOW provide Preparatory and Initial Phase Checklists. Each list shall include a breakdown of quality checks that will be used when performing the quality control functions, inspections, and tests required by the contract documents. The preparatory and initial phases shall be conducted with a view towards obtaining quality construction by planning ahead and identifying potential problems.
- XIII. PERSONNEL MATRIX: Not Applicable.
- XIV. PROCEDURES FOR COMPLETION INSPECTION: See the paragraph entitled "COMPLETION INSPECTIONS".
- XV. TRAINING PROCEDURES AND TRAINING LOG: Not Applicable.

1.7 COORDINATION AND MUTUAL UNDERSTANDING MEETING

During the Pre-Construction conference and prior to the start of construction, discuss the QC program required by this contract. The purpose of this meeting is to develop a mutual understanding of the QC details, including documentation, administration for on-site and off-site work, and the coordination of the Contractor's management, production and the QC personnel. At the meeting, the Contractor will be required to explain how three phases of control will be implemented for each DFOW. Contractor's personnel required to attend shall include the QC Manager, project manager, and superintendent. Minutes of the meeting will be prepared by the QC Manager and signed by both the Contractor and the KO. The Contractor shall provide a copy of the signed minutes to all attendees. Repeat the coordination and mutual understanding meeting when a new QC Manager is appointed.

1.8 QC MEETINGS

After the start of construction, the QC Manager shall conduct QC meetings once every one week at the work site with the superintendent and the foreman responsible for the ongoing and upcoming work. The QC Manager shall prepare the minutes of the meeting and provide a copy to the KO

within two working days after the meeting. As a minimum, the following shall be accomplished at each meeting:

- a. Review the minutes of the previous meeting;
- b. Review the schedule and the status of work 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 (RFIs, etc.);
- f. Address items that may require revising the QC plan; and
- g. Review Accident Prevention Plan (APP).

1.9 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 DFOV.

1.9.1 Preparatory Phase

Notify the KO at least two work days in advance of each preparatory phase. Conduct the preparatory phase with the superintendent and the foreman responsible for the definable feature of work. Document the results of the preparatory phase actions in the daily CQC Report and in the QC checklist. Perform the following prior to beginning work on each definable feature of work:

- a. Review each paragraph of the applicable specification sections;
- b. Review the contract drawings;
- c. Verify that appropriate shop drawings and submittals for materials and equipment have been submitted and approved. Verify receipt of approved factory test results, when required;
- d. Review the testing plan and ensure that provisions have been made to provide the required QC testing;
- e. Examine the work area to ensure that the required preliminary work has been completed;
- f. Examine the required materials, equipment and sample work to ensure that they are on hand and conform to the approved shop drawings and submitted data;
- g. 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
- h. Discuss specific controls used and the construction methods and the approach that will be used to provide quality construction by planning ahead and identifying potential problems for each DFOV.

1.9.2 Initial Phase

Notify the KO 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 foreman responsible for that DFOW. Observe the initial segment of the work to ensure that it complies with contract requirements. Document the results of the Initial Phase in the daily CQC Report and in the QC checklist. Perform the following for each DFOW:

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

1.9.3 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 and in the QC checklist:

- a. Ensure the work is in compliance with contract requirements;
- b. Maintain the quality of workmanship required;
- c. Ensure that testing is performed by the approved laboratory;
- d. Ensure that rework items are being corrected; and
- e. Assure manufacturers representatives have performed necessary inspections, if required.

1.9.4 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.

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

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

1.10 SUBMITTAL REVIEW AND APPROVAL

Procedures for submission, review, and approval of submittals are described in the submittal section of the specification.

1.11 TESTING

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

1.11.1 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 (i.e.; 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."

1.11.2 Laboratory Accreditation Authorities

Laboratory Accreditation Authorities include the National Voluntary Laboratory Accreditation Program (NVLAP) administered by the National Institute of Standards and Technology, the American Association of State Highway and Transportation Officials (AASHTO), International Accreditation Services, Inc. (IAS), U. S. Army Corps of Engineers Materials Testing Center (MTC), the American Association for Laboratory Accreditation (A2LA), the Washington Association of Building Officials (WABO) (Approval authority for WABO is limited to projects within Washington State), and the Washington Area Council of Engineering Laboratories (WACEL) (Approval authority by WACEL is limited to projects within the NAVFAC WASH and Public Works Center Washington geographical area).

1.11.3 Capability Check

The KO 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.

1.11.4 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 KO 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 KO.

1.12 QC CERTIFICATIONS

1.12.1 Contractor Quality Control 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."

1.12.2 Invoice Certification

Furnish a certificate to the KO with each payment request, signed by the QC Manager, attesting that as-built drawings are current and attesting that

the work for which payment is requested, including stored material, is in compliance with contract requirements.

1.12.3 Completion Certification

Upon completion of work under this contract, the QC Manager shall furnish a certificate to the KO attesting that "the work has been completed, inspected, tested and is in compliance with the contract."

1.13 COMPLETION INSPECTIONS

1.13.1 Punch-Out Inspection

Near the completion of all work or any increment thereof established by a completion time stated in the Contract clause "Commencement, Prosecution, and Completion of Work," or stated elsewhere in the specifications, the QC Manager shall conduct an inspection of the work and develop a punch list of items which do not conform to the approved drawings and specifications. Include in the punch list any remaining items of 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 KO. 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".

1.13.2 Pre-Final Inspection

The Government and QC manager will perform this inspection to verify that the facility is complete and ready to be occupied. A Government pre-final punch list may be developed as a result of this inspection. The QC Manager shall ensure that all items on this list are corrected prior to notifying the Government that a "Final" inspection with the customer can be scheduled. Any items noted on the "Pre-Final" inspection shall be corrected in 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.

1.13.3 Final Acceptance Inspection

The QC Manager, the superintendent, or other Contractor management personnel and the KO will be in attendance at this inspection. Additional Government personnel may be in attendance. The final acceptance inspection will be formally scheduled by the KO based upon results of the "Pre-Final Inspection". Notice shall be given to the KO at least 14 days prior to the final inspection. The notice shall state that all specific items previously identified to the Contractor as being unacceptable will be complete by the date scheduled for the final acceptance inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the KO to bill the Contractor for the Government's additional inspection cost in accordance with the contract clause "Inspection of Construction".

1.14 DOCUMENTATION

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 (KO)" 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 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" section in this report which will contain pertinent information including directions received, problems encountered during construction, work progress and delays, conflicts or errors in the drawings or specifications, field changes, safety hazards encountered, instructions given and corrective actions taken, delays encountered and a record of visitors to the work site. For each remark given, identify the Schedule Activity No. that is associated with the remark.

1.14.1 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 Government's Quality Assurance Team during all business hours.

- a. All completed Preparatory and Initial Phase Checklists, arranged by specification section.
- b. All milestone inspections, arranged by Activity/Event Number.
- c. A current up-to-date copy of the Testing and Plan Log with supporting field test reports, arranged by specification section.
- d. Copies of all contract modifications, arranged in numerical order. Also include documentation that modified work was accomplished.
- e. A current up-to-date copy of the Rework Items List.
- f. Maintain up-to-date copies of all punch lists issued by the QC Staff on the Contractor and Sub-Contractors and all punch lists issued by the Government.

1.14.2 As-Built Drawings

The QC Manager is required to review the as-built drawings, required by Section 01 78 00 CLOSEOUT SUBMITTALS, are kept current on a daily basis and marked to show deviations, which have been made from the Contract drawings. Ensure each deviation has been identified with the appropriate modifying documentation, e.g. PC number, modification number, RFI number, etc. The QC Manager shall initial each deviation or revision. Upon completion of work, the QC Manager shall submit a certificate attesting to the accuracy of the as-built drawings prior to submission to the KO.

1.15 NOTIFICATION ON NON-COMPLIANCE

The KO will notify the Contractor of any detected non-compliance with the foregoing requirements. The Contractor shall take immediate corrective action. If the contractor fails or refuses to correct the non-compliant work, the KO will issue a non compliance 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 KO may issue an order stopping all or part of the work

until satisfactory corrective action has been taken. The Contractor shall make no part of the time lost due to such stop orders the subject of claim for extension of time, for excess costs, or damages.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 01 57 19.00 20

TEMPORARY ENVIRONMENTAL CONTROLS

11/11

PART 1 GENERAL

1.1 REFERENCES

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

U.S. 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 833-R-060-04 (2007) Developing Your Storm Water Pollution Prevention Plan, a Guide for Construction Sites

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

- 29 CFR 1910 Occupational Safety and Health Standards
- 29 CFR 1910.120 Hazardous Waste Operations and Emergency Response
- 40 CFR 112 Oil Pollution Prevention
- 40 CFR 112.7 General Requirements for Spill Prevention, Control, and Countermeasure Plans
- 40 CFR 122.26 Storm Water Discharges (Applicable to State NPDES Programs, see section 123.25)
- 40 CFR 241 Guidelines for Disposal of Solid Waste
- 40 CFR 243 Guidelines for the Storage and Collection of Residential, Commercial, and Institutional Solid Waste
- 40 CFR 258 Subtitle D Landfill Requirements
- 40 CFR 260 Hazardous Waste Management System: General
- 40 CFR 261 Identification and Listing of Hazardous Waste
- 40 CFR 262 Standards Applicable to Generators of Hazardous Waste
- 40 CFR 263 Standards Applicable to Transporters of Hazardous Waste

| | |
|----------------------|--|
| 40 CFR 264 | Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities |
| 40 CFR 265 | Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities |
| 40 CFR 266 | Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities |
| 40 CFR 268 | Land Disposal Restrictions |
| 40 CFR 270 | EPA Administered Permit Programs: The Hazardous Waste Permit Program |
| 40 CFR 271 | Requirements for Authorization of State Hazardous Waste Programs |
| 40 CFR 272 | Approved State Hazardous Waste Management Programs |
| 40 CFR 273 | Standards For Universal Waste Management |
| 40 CFR 279 | Standards for the Management of Used Oil |
| 40 CFR 280 | Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks (UST) |
| 40 CFR 300 | National Oil and Hazardous Substances Pollution Contingency Plan |
| 40 CFR 355 | Emergency Planning and Notification |
| 40 CFR 372-SUBPART D | Specific Toxic Chemical Listings |
| 40 CFR 60 | Standards of Performance for New Stationary Sources |
| 40 CFR 63 | National Emission Standards for Hazardous Air Pollutants for Source Categories |
| 40 CFR 761 | Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions |
| 40 CFR 82 | Protection of Stratospheric Ozone |
| 49 CFR 171 | General Information, Regulations, and Definitions |
| 49 CFR 172 | Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements |
| 49 CFR 173 | Shippers - General Requirements for |

Shipments and Packagings

49 CFR 178

Specifications for Packagings

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 or may not be reinforced with or contain ferrous wire, rods, accessories and weldments. A mixture of debris and other material such as soil or sludge is also subject to regulation as debris if the mixture is comprised primarily of debris by volume, based on visual inspection.
- d. Wood: Dimension and non-dimension lumber, plywood, chipboard, hardboard. Treated and/or painted wood that meets the definition of lead contaminated or lead based contaminated paint is not included.
- e. Scrap metal: Scrap and excess ferrous and non-ferrous metals such as reinforcing steel, structural shapes, pipe and wire that are recovered or collected and disposed of as scrap. Scrap metal meeting the definition of hazardous material or hazardous waste is not included.
- f. Paint cans: Metal cans that are empty of paints, solvents, thinners and adhesives. If permitted by the paint can label, a thin dry film may remain in the can.
- 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

Any discarded material, liquid, solid, or gas, which meets the definition of hazardous material or is designated hazardous waste by the Environmental Protection Agency or State Hazardous Control Authority as defined in 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, 40 CFR 265, 40 CFR 266, 40 CFR 268, 40 CFR 270, 40 CFR 271, 40 CFR 272, 40 CFR 273, 40 CFR 279, and 40 CFR 280.

1.2.7 Hazardous Materials

Hazardous materials as defined in 49 CFR 171 and listed in 49 CFR 172.

Hazardous material is any material that:

- a. Is regulated as a hazardous material per 49 CFR 173, or
- b. Requires a 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 (WHM)

Any waste material which because of its quantity, concentration, or physical, chemical, or infectious characteristics may pose a substantial hazard to human health or the environment and which has been so designated. Used oil not containing any hazardous waste, as defined above, falls under this definition.

1.2.9 Oily Waste

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

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

- a. It is not prohibited in other State regulations or local ordinances
- b. The amount generated is "de minimus" (a small amount)
- c. It is the result of minor leaks or spills resulting from normal process operations
- 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 and II Ozone Depleting Substance (ODS)

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

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|--------------------------------|
| chlorofluorocarbon-11 (CFC-11) |
|--------------------------------|

| |
|-------------------------------------|
| chlorofluorocarbon-12 (CFC-12) |
| chlorofluorocarbon-13 (CFC-13) |
| chlorofluorocarbon-111 (CFC-111) |
| chlorofluorocarbon-112 (CFC-112) |
| chlorofluorocarbon-113 (CFC-113) |
| chlorofluorocarbon-114 (CFC-114) |
| chlorofluorocarbon-115 (CFC-115) |
| chlorofluorocarbon-211 (CFC-211) |
| chlorofluorocarbon-212 (CFC-212) |
| chlorofluorocarbon-213 (CFC-213) |
| chlorofluorocarbon-214 (CFC-214) |
| chlorofluorocarbon-215 (CFC-215) |
| chlorofluorocarbon-216 (CFC-216) |
| chlorofluorocarbon-217 (CFC-217) |
| chlorofluorocarbon-500 (CFC-500) |
| chlorofluorocarbon-502 (CFC-502) |
| chlorofluorocarbon-503 (CFC-503) |
| halon-1211 |
| halon-1301 |
| halon-2402 |
| carbon tetrachloride |
| methyl bromide |
| methyl chloroform |

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

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|--------------------------------------|
| hydrochlorofluorocarbon-21 (HCFC-21) |
| hydrochlorofluorocarbon-22 (HCFC-22) |

| |
|--|
| hydrochlorofluorocarbon-31 (HCFC-31) |
| hydrochlorofluorocarbon-121 (HCFC-121) |
| hydrochlorofluorocarbon-122 (HCFC-122) |
| hydrochlorofluorocarbon-123 (HCFC-123) |
| hydrochlorofluorocarbon-124 (HCFC-124) |
| hydrochlorofluorocarbon-131 (HCFC-131) |
| hydrochlorofluorocarbon-132 (HCFC-132) |
| hydrochlorofluorocarbon-133 (HCFC-133) |
| hydrochlorofluorocarbon-141 (HCFC-141) |
| hydrochlorofluorocarbon-142 (HCFC-142) |
| hydrochlorofluorocarbon-221 (HCFC-221) |
| hydrochlorofluorocarbon-222 (HCFC-222) |
| hydrochlorofluorocarbon-223 (HCFC-223) |
| hydrochlorofluorocarbon-224 (HCFC-224) |
| hydrochlorofluorocarbon-225 (HCFC-225) |
| hydrochlorofluorocarbon-226 (HCFC-226) |
| hydrochlorofluorocarbon-231 (HCFC-231) |
| hydrochlorofluorocarbon-232 (HCFC-232) |
| hydrochlorofluorocarbon-233 (HCFC-233) |
| hydrochlorofluorocarbon-234 (HCFC-234) |
| hydrochlorofluorocarbon-235 (HCFC-235) |
| hydrochlorofluorocarbon-251 (HCFC-251) |
| hydrochlorofluorocarbon-252 (HCFC-252) |
| hydrochlorofluorocarbon-253 (HCFC-253) |
| hydrochlorofluorocarbon-261 (HCFC-261) |
| hydrochlorofluorocarbon-262 (HCFC-262) |
| hydrochlorofluorocarbon-271 (HCFC-271) |

1.2.12 Universal Waste

The universal waste regulations streamline collection requirements for certain hazardous wastes in the following categories: batteries, pesticides, mercury-containing equipment (e.g., thermostats) and lamps (e.g., fluorescent bulbs). The rule is designed to reduce hazardous waste in the municipal solid waste (MSW) stream by making it easier for universal waste handlers to collect these items and send them for recycling or proper disposal. These regulations can be found at [40 CFR 273](#).

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. 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 Notifications; G

Environmental Management Plan; G

Storm Water Pollution Prevention Plan; G

Storm Water Notice of Intent (for NPDES coverage under the general permit for construction activities); G

Dirt and Dust Control Plan; G

As required on a Delivery Order basis

Contractor Hazardous Material Inventory Log; G

SD-06 Test Reports

Laboratory Analysis

Disposal Requirements

Erosion and Sediment Control Inspection Reports

Storm Water Inspection Reports for General Permit

Solid Waste Management Report; G

SD-07 Certificates

Contractor 40 CFR employee training records

ECATTS certificate of completion

SD-11 Closeout Submittals

Some of the records listed below are also required as part of other submittals. For the "Records" submittal, maintain on-site a

separate three-ring Environmental Records binder and submit at the completion of the project. Make separate parts to the binder corresponding to each of the applicable sub items listed below.

Storm Water Pollution Prevention Plan compliance notebook; G

Waste Determination Documentation

Disposal Documentation for Hazardous and Regulated Waste

Contractor 40 CFR Employee Training Records

Solid Waste Management Permit

Solid Waste Management Report

Contractor Hazardous Material Inventory Log; G

Hazardous Waste/Debris Management

Regulatory Notifications

1.4 ENVIRONMENTAL PROTECTION REQUIREMENTS

Provide and maintain, during the life of the contract over the active Delivery Orders, 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.

The Contractor may be required to promptly conduct tests and procedures for the purpose of assessing whether construction operations are in compliance with Applicable Environmental Laws. Analytical work shall be done by qualified laboratories; and where required by law, the laboratories shall be certified.

1.4.1 Environmental Compliance Assessment Training and Tracking System (ECATTS)

The QC Manager is responsible for environmental compliance on projects unless an Environmental Manager is named. The QC Manager (and Alternate QC Manager) or Environmental Manager must complete ECATTS training prior to starting respective portions of on-site work under this contract. If personnel changes occur for any of these positions after starting work, replacement personnel must complete ECATTS training within 14 days of assignment to the project

Submit an [ECATTS certificate of completion](#) for personnel who have completed the required "Environmental Compliance Assessment Training and Tracking System (ECATTS)" training. This training is web-based and can be accessed from any computer with Internet access using the following instructions.

Register for NAVFAC Environmental Compliance Training and Tracking System, by logging on to <http://navfac.ecatts.com/>. Obtain the password for registration from the Contracting Officer.

This training has been structured to allow contractor personnel to receive credit under this contract and also to carry forward credit to future contracts. Contractors shall ensure that the QC Manager (and alternate QC Manager) or Environmental Manager review their training plans for new modules or updated training requirements prior to beginning work. Some training modules are tailored for specific State regulatory requirements; therefore, Contractors working in multiple states will be required to re-take modules tailored to the state where the contract work is being performed.

ECATTS is available for use by all contractor and subcontractor personnel associated with this project. These other personnel are encouraged (but not required) to take the training and may do so at their discretion.

1.4.2 Conformance with the Environmental Management System

Perform work under this contract consistent with the policy and objectives identified in the installation's Environmental Management System (EMS). Perform work in a manner that conforms to objectives and targets, environmental programs and operational controls identified by the EMS. Provide monitoring and measurement information as necessary to address environmental performance relative to environmental, energy, and transportation management goals. In the event an EMS nonconformance or environmental noncompliance associated with the contracted services, tasks, or actions occurs, take corrective and/or preventative actions. In addition, ensure that employees are aware of their roles and responsibilities under the EMS and how these EMS roles and responsibilities affect work performed under the contract.

Ensure that employees receive applicable environmental and occupational health and safety training, and keep up to date on regulatory required specific training for the type of work to be conducted onsite. All on-site Contractor personnel, and their subcontractor personnel, performing tasks that have the potential to cause a significant environmental impact shall be competent on the basis of appropriate education, training or experience. Upon contract award, the Contracting Officer's Representative will notify the installation's EMS coordinator to arrange EMS training. Refer to individual Delivery Order specific Section 01 57 19.01 20, SUPPLEMENTAL TEMPORARY ENVIRONMENTAL CONTROLS for additional site specific EMS requirements related to construction. The Contractor shall provide training documentation to the Contracting Officer and shall retain associated records.

1.5 QUALITY ASSURANCE

1.5.1 Preconstruction Survey

For Delivery Orders that involve dirt work greater than 200 square feet, stream crossings, or grubbing and clearing work: Perform a [Preconstruction Survey](#) of the project site with the Contracting Officer, and take photographs showing existing environmental conditions in and adjacent to the site. Submit a report for the record.

1.5.2 [Regulatory Notifications](#)

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), coordinate with the Contracting Officer. 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 Management Plan. Develop a mutual understanding relative to the details of environmental protection, including measures for protecting natural resources, required reports, required permits, permit requirements, and other measures to be taken.

1.5.4 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.

1.6 ENVIRONMENTAL MANAGEMENT PLAN (EMP)

Prior to initiating any Delivery Order work on the Activity, the Contractor shall meet with the Contracting Officer to discuss the proposed Environmental Management Plan and develop a mutual understanding relative to the details of environmental protection, including measures for protecting natural resources, required reports, and other measures to be taken. The Environmental Management Plan must incorporate construction related objectives and targets from the installation's Environmental Management System. Submit the Environmental Management Plan in the following format and include the elements specified below.

a. Description of the Environmental Management Plan

(1) General overview and purpose (for the contract)

(a) A brief description of each specific plan required by environmental permit or elsewhere in this contract. The Permit Record of decision (PROD) form found in UFC 3-201-01 may be used to help accomplish this task.

(b) The duties and level of authority assigned to the person(s) on the job site that oversee environmental compliance.

(c) A copy of any standard or project specific operating procedures that will be used to effectively manage and protect the environment on the project site.

(d) Communication and training procedures that will be used to convey environmental management requirements to contractor

employees and subcontractors.

(e) Emergency contact information contact information (office phone number, cell phone number, and e-mail address).

- (2) General site information (**THIS WILL BE NEEDED AS AN ATTACHMENT FOR THE INDIVIDUAL DELIVERY ORDERS AS THEY ARE EXECUTED**)
- (3) A letter signed by an officer of the firm appointing the Environmental Manager and stating that he/she is responsible for managing and implementing the Environmental Program as described in this contract. Include in this letter the Environmental Manager's authority to direct the removal and replacement of non-conforming work.

b. Management of Natural Resources

- (1) Land resources
- (2) Tree protection
- (3) Replacement of damaged landscape features
- (4) Temporary construction
- (5) Stream crossings
- (6) Fish and wildlife resources
- (7) Wetland areas

c. Protection of Historical and Archaeological Resources

- (1) Objectives
- (2) Methods

d. Storm Water Management and Control

- (1) Ground cover
- (2) Erodible soils
- (3) Temporary measures
 - (a) Mechanical retardation and control of runoff
 - (b) Vegetation and mulch
- (4) Effective selection, implementation and maintenance of Best Management Practices (BMPs).

e. Protection of the Environment from Waste Derived from Contractor Operations

- (1) Control and disposal of solid and sanitary waste. Refer to Section 01 74 19 CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT.
- (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:

- (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

List what notifications and permit applications must be made. Some permits require up to 90 days to obtain. Demonstrate that those permits have been obtained or applied for by including copies of all applicable, environmental permits. The Plan will not be approved until all permits have been obtained.

h. Clean Air Act Compliance

- (1) Identify air pollution generating equipment or processes that may require federal, state, or local permits under the clean air act.

- (2) Identify portable and stationary internal combustion engines (ICE's) that will be supplied, utilized or serviced. Address compliance with 40 CFR 60 Subpart IIII, 40 CFR 63 Subpart ZZZZ, and local regulations as applicable. At minimum, include the make, model, serial number, manufacture date, size (engine bhp), and EPA emission certification status of each engine.
- (3) Identify management practices to ensure that HVAC work involving refrigerants complies with 40 CFR 82 requirements.
- (4) Identify planned air pollution generating processes and management control measures (including but not limited to spray painting, abrasive blasting, demolition, material handling, fugitive dust, and fugitive emissions)

1.6.1 Environmental Protection Plan Review

Within thirty days after the Contract award date, submit the proposed Environmental Management Plan for review and approval. Commencement of work will not begin until the environmental management plan has been approved.

1.6.2 Licenses and Permits

Requirements for permits will be called out in individual Delivery Orders.

Obtain licenses and permits pursuant to the "Permits and Responsibilities" FAR Clause 52.236-7.

The following permits will be obtained by the Contracting Officer:

a. IDEM Title V Air Permits

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.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 PROTECTION OF NATURAL RESOURCES

Preserve the natural resources within the project boundaries and outside the limits of permanent work. Restore to an equivalent or improved condition upon completion of work. Confine construction activities to within the limits of the work indicated or specified. If the work is near streams, lakes, or other waterways, conform to the national permitting requirements of the Clean Water Act.

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

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 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.

An IDEM 401 Water Quality Regional General Permit will be required for any work in streams and waters of the U.S.

Obtain Contracting Officer's approval prior to installation. Remove temporary culverts or bridges upon completion of work, and repair the area to its original condition unless otherwise required by the Contracting Officer.

3.1.1 Erosion and Sediment Control Measures

3.1.1.1 Burnoff

Burnoff of the ground cover is not permitted.

3.1.1.2 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.

3.1.1.3 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. Vegetation and Mulch

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

combination of these and other methods necessary for effective erosion control.

- (2) Seeding: Provide new seeding where ground is disturbed. Include topsoil or nutriment during the seeding operation necessary to establish or reestablish a suitable stand of grass.

3.1.2 Erosion and Sediment Control Inspection Reports

If an individual Delivery Order includes activities for clearing, grading and excavation result in the disturbance of 1 or more acres of total land area (storm water permit required), submit "[Erosion and Sediment Control Inspection Reports](#)" (E&S) (form provided at the pre-construction conference) and [Storm Water Inspection Reports for General Permit](#) for General Permit to the Contracting Officer once every 7 calendar days and within 24 hours of a storm event that produces 0.5 inch or more of rain.

Note erosion control inspection reports may be compiled as part of a stormwater pollution prevention plan inspection reports if applicable.

3.1.2.1 Storm Water Notice of Intent for Construction Activities and [Storm Water Pollution Prevention Plan](#)

If an individual Delivery Order includes activities for clearing, grading and excavation result in the disturbance of 1 or more acres of total land area, submit a [Storm Water Notice of Intent \(for NPDES coverage under the general permit for construction activities\)](#) and a [Storm Water Pollution Prevention Plan](#) (SWPPP) to be filed with the state of Indiana 45 days prior to the anticipated start of the work, the entire Rule 5 NOI package needs to be submitted to NAVFAC MIDLANT PWD Crane Environmental Division for review and any comments addressed before submission to Martin County Soil & Water Conservation District. After NAVFAC MIDLANT PWD Crane Commander signs the NOI as "Project Owner", (2) copies (including 11"x17" size drawings) and an electronic copy of entire Rule 5 NOI package shall be delivered to NAVFAC MW PWD Environmental Division for their files. Contractors need to follow the guidance for developing the plan and submitting the permit fees as laid out in the following link. <http://www.state.in.us/idem/4909.htm> The Contractor shall maintain an approved copy of the SWPPP at the construction on-site office, and continually update as regulations require, reflecting current site conditions.

Coverage under this permit requires the contractor prepare a Storm Water Pollution Prevention Plan (SWPPP), prepare and submit a Registration Statement as a co-permittee with the Construction Officer, and provide the permit fee to the responsible state agency before any land disturbing activities begin. The contractor shall file for permit coverage on behalf of both the Construction Officer and themselves, and file a Notice of Termination once construction is complete and the site is stabilized with a final sustainable cover.

Under the terms and conditions of the permit, the Contractor may be required to install, inspect, maintain best management practices (BMPs), and submit stormwater BMP inspection reports and stormwater pollution prevention plan inspection reports. The Contractor shall ensure construction operations and management are constantly in compliance with the terms and conditions of the general permit for storm water discharges from construction activities.

- a. The SWPPP shall:

- (1) Identify potential sources of pollution which may be reasonably expected to affect the quality of storm water discharge from the site.
- (2) Describe and ensure implementation of practices which will be used to reduce the pollutants in storm water discharge from the site.
- (3) Ensure compliance with terms of the EPA or State general permit for storm water discharge.
- (4) Select applicable best management practices from EPA 833-R-060-04.
- (5) Include a completed copy of the Registration Statement, BMP Inspection Report Template and Notice of Termination except for the effective date.
- (6) Storm Water Pollution Prevention Measures and Notice of Intent 40 CFR 122.26, EPA 833-R-060-04. Provide a "Storm Water Pollution Prevention Plan" (SWPPP) for the project. The SWPPP will meet the requirements of the EPA or State general permit for storm water discharges from construction sites. Submit the SWPPP along with any required Notice of Intent, Notice of Termination, and appropriate permit fees, via the Contracting Officer, to the appropriate Federal or State agency for approval, a minimum of 14 calendar days prior to the start of construction. A copy of the approved SWPPP will be kept at the construction on-site office, and continually updated as regulations require reflecting current site conditions.

3.1.2.2 Storm Water Pollution Prevention Plan Compliance Notebook

For an individual Delivery Order that requires a Storm Water Prevention Plan, The contractor shall create and maintain a three binder of documents that demonstrate compliance with the Stormwater Construction Activity permit. The binder shall include a copy of the permit Registration Statement, proof of permit fee payment, SWPPP and SWPPP update amendments, inspection reports, copies of related correspondence with all local, State, and Federal Agencies, and a copy of the permit Notice of Termination. At the completion of the project the folder shall become the property of the Government. The compliance notebook shall be provided to Contracting Officer. An advance copy of the Registration Statement shall be provided to the Contracting Officer immediately after the form is presented to the permitting agency.

3.1.3 Stormwater Drainage and Construction Dewatering

There will be no discharge of excavation ground water to the sanitary sewer, storm drains, or to the river without prior specific authorization of the Environmental Division in writing. Discharge of hazardous substances will not be permitted under any circumstances.

Construction site runoff will be prevented from entering any storm drain or the river directly by the use of straw bales or other method suitable to the Environmental Division. Contractor will provide erosion protection of the surrounding soils.

Construction Dewatering shall not be discharged to the sanitary sewer. If the construction dewatering is noted or suspected of being contaminated, it

may only be released to the storm drain system if the discharge is specifically permitted. Authorization for any contaminated groundwater release shall be obtained in advance from the base Environmental Officer. Discharge of hazardous substances will not be permitted under any circumstances.

3.2 HISTORICAL AND ARCHAEOLOGICAL RESOURCES

Carefully protect in-place and report immediately to the Contracting Officer historical and archaeological items or human skeletal remains discovered in the course of work. 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.

3.3 SOLID WASTE MANAGEMENT PLAN and PERMIT

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

3.3.1 Solid Waste Management Report

Monthly, while individual Delivery Orders are being executed, 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 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.

3.3.2 Control and Management of Solid Wastes

Pick up solid wastes, and place in covered containers which are regularly emptied. Do not prepare or cook food on the project site. Prevent contamination of the site or other areas when handling and disposing of wastes. At project completion, leave the areas clean. Recycling is encouraged and 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.

Manage spent hazardous material used in construction, including but not limited to, aerosol cans, waste paint, cleaning solvents, contaminated brushes, and used rags, as per environmental law.

3.3.2.1 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 or State permit(s), manifest(s), or license(s) for transportation, treatment, storage, and disposal of hazardous and regulated waste by permitted facilities. Hazardous or toxic waste manifest must be reviewed, signed, and approved by the Navy before the Contractor may ship waste. To obtain specific disposal instructions coordinate with the Activity Environmental office. Refer to Section 01 57 19.01 20 SUPPLEMENTAL TEMPORARY ENVIRONMENTAL CONTROLS for the Activity Point of Contact information.

3.3.2.2 Dumpsters

Equip dumpsters with a secure cover and paint the standard base color. Keep cover closed at all times, except when being loaded with trash and debris. Locate dumpsters behind the construction fence or out of the public view. Empty site dumpsters at least once a week, or as needed to keep the site free of debris and trash. If necessary, provide 55 gallon trash containers painted the darker base color to collect debris in the construction site area. Locate the trash containers behind the construction fence or out of the public view. Empty trash containers at least once a day. For large demolitions, large dumpsters without lids are acceptable but should not have debris higher than the sides before emptying.

3.4 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 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.

3.6 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.

3.7 HAZARDOUS MATERIAL MANAGEMENT

Include hazardous material control procedures in the Safety Plan. Address procedures and proper handling of hazardous materials, including the appropriate transportation requirements. No hazardous material shall be brought onto government property that does not directly relate to requirements for the performance of this contract. 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 each individual Delivery Order, provide the Contract 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.

3.7.1 Contractor Hazardous Material Inventory Log

For individual Delivery Orders that involve the disposal of Hazardous Waste, submit the "Contractor Hazardous Material Inventory Log" (found at: <http://www.wbdg.org/ccb/NAVGRAPH/graphdoc.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.

3.8 PETROLEUM PRODUCTS AND REFUELING

Conduct the fueling and lubricating of equipment and motor vehicles in a manner that protects against spills and evaporation. Manage all used oil generated on site in accordance with 40 CFR 279. Determine if any used oil generated while on-site exhibits a characteristic of hazardous waste. Used oil containing 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.

3.8.1 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. Provide general secondary containment for oil transfer operations as required by 40 CFR 112.7.

3.8.2 Inadvertent Discovery of Petroleum Contaminated Soil or Hazardous Wastes

If petroleum contaminated soil or suspected hazardous waste is found during construction that was not identified in the contract documents, the contractor shall immediately notify the contracting officer. The contractor shall not disturb this material until authorized by the contracting officer.

3.9 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.

3.10 RELEASES/SPILLS OF OIL AND HAZARDOUS SUBSTANCES

Exercise due diligence to prevent, contain, and respond to spills of hazardous material, hazardous substances, hazardous waste, sewage, regulated gas, petroleum, lubrication oil, and other substances regulated by environmental law. Maintain spill cleanup equipment and materials at the work site. In the event of a spill, take prompt, effective action to stop, contain, curtail, or otherwise limit the amount, duration, and severity of the spill/release.

In the event of any releases of oil and hazardous substances, chemicals, or gases; immediately (within 15 minutes) notify the 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.

3.11 CONTROL AND MANAGEMENT OF ASBESTOS CONTAINING MATERIAL (ACM)

Items, components, or materials disturbed by or included in work under individual Delivery Orders **MAY** involve asbestos. Other materials in the general area around where work will be performed may contain asbestos. All thermal insulation, in all work areas, should be considered to be asbestos unless positively identified by conspicuous tags or previous laboratory analysis certifying them as asbestos free.

Inadvertent discovery of non-disclosed asbestos that will result in an abatement action requires a change in scope before proceeding. Upon discovery of asbestos containing material not identified in the contract documents, the Contractor shall immediately stop all work that would generate further damage to the material, evacuate the asbestos exposed area, and notify the Contracting Officer for resolution of the situation prior to resuming normal work activities in the affected area.

Do not remove or perform work on any asbestos containing materials without the prior approval of the Contracting Officer. Do not engage in any activity, which would remove or damage such materials or cause the generation of fibers from such materials.

Manage and dispose of asbestos containing waste in accordance with applicable environmental law. Asbestos containing waste shall be manifested and the manifest provided to the Contracting Officer.

3.12 CONTROL AND MANAGEMENT OF HAZARDOUS WASTES

3.12.1 Facility Hazardous Waste Generator Status

NSA Crane 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. Comply with all provisions of Federal, State and local regulatory requirements applicable to this generator status regarding training and storage, handling, and disposal of all construction derived wastes.

3.12.2 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 must be brought onto Government property. Provide to the Contracting Officer a copy of waste determination documentation for any solid waste streams that have any potential to be hazardous waste or contain any chemical constituents listed in 40 CFR 372-SUBPART D. For hazardous wastes spills, verbally notify the Contracting Officer immediately.

3.12.2.1 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. The designated area where waste is being stored shall be barricaded and a sign identifying as follows:

"DANGER - UNAUTHORIZED PERSONNEL KEEP OUT"

3.12.2.2 Sampling and Analysis of HW

a. Waste Sampling

Sample waste in accordance with EPA 530/F-93/004. Each sampled drum or container will be clearly marked with the Contractor's identification number and cross referenced to the chemical analysis performed.

b. Laboratory Analysis

Follow the analytical procedure and methods in accordance with the 40 CFR 261. The Contractor will provide all analytical results and reports performed to the Contracting Officer

c. Analysis Type

Identify waste hazardous material/hazardous waste by analyzing for the following properties as a minimum: ignitability, corrosiveness, total chlorides, BTU value, PCBs, TCLP for heavy metals, and cyanide.

3.12.2.3 Hazardous Waste Disposal

No hazardous, toxic, or universal waste shall be disposed or hazardous material abandoned on government property. And unless otherwise other wise noted in this contract, the government is not responsible for disposal of Contractor generated waste material.

The disposal of incidental materials used to accomplish the work including, but not limited to aerosol cans, waste paint, cleaning solvents, contaminated brushes, rags, clothing, etc. are the responsibility of the Contractor. The list is illustrative rather than inclusive.

The Contractor is not authorized to discharge any materials to sanitary sewer, storm drain, or water way or conduct waste treatment or disposal on government property without written approval of the Contracting Officer.

Control of stored waste, packaging, sampling, analysis, and disposal will be determined by the details in the contract. The requirements for jobs in the following paragraphs will be used as the guidelines for disposal of any hazardous waste generated.

a. Responsibilities for Contractor's Disposal

Contractor responsibilities include any generation of WHM/HW requiring Contractor disposal of solid waste or liquid.

- (1) Provide all service necessary for the final treatment/disposal of the hazardous material/waste in accordance with all local, State and Federal laws and regulations, and the terms and conditions of the contract within sixty (60) days after the materials have been generated. These services will include all necessary personnel, labor, transportation, packaging, detailed analysis (if required for disposal, and/or transportation, including manifesting or completing waste profile sheets, equipment, and the compilation of all documentation is required).
- (2) Contain all waste in accordance with 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, 40 CFR 265, 40 CFR 266, 40 CFR 268, 40 CFR 270, 40 CFR 272, 40 CFR 273, 40 CFR 279, 40 CFR 280, and 40 CFR 761.
- (3) Obtain a representative sample of the material generated for each job done to provide waste stream determination.
- (4) Analyze each sample taken and providing analytical results to the Contracting Officer. Provide two copies of the results.
- (5) Determine the DOT proper shipping names for all waste (each container requiring disposal) and will demonstrate how this determination is developed and supported by the sampling and analysis requirements contained herein to the Contracting Officer.

Contractor Disposal Turn-In Requirements

For any waste hazardous materials or hazardous waste generated which requires the Contractor to dispose of, the following conditions must be complied with in order to be acceptable for disposal:

- (1) Drums compatible with waste contents and drums meet DOT requirements for 49 CFR 173 for transportation of materials.
- (2) Drums banded to wooden pallets. No more than three (3) 55 gallon drums to a pallet, or two (2) 85 gallon over packs.
- (3) Band using 1-1/4 inch minimum band on upper third of drum.
- (4) Recovery materials label (provided by Code 106.321) located in middle of drum, filled out to indicate actual volume of material, name of material manufacturer, other vendor information as available.
- (5) Always have three (3) to five (5) inches of empty space above volume of material. This space is called 'outage'.

3.12.2.4 Universal Waste/e-Waste Management

Universal waste including but not limited to some mercury containing building products such florescent lamps, mercury vapor lamps, high pressure

sodium lamps, CRTs, batteries, aerosol paint containers, electrical equipment containing PCBs, and consumed electronic devices, shall be managed in accordance with applicable environmental law and installation instructions.

3.12.3 Class I and II ODS Prohibition

Class I and II ODS in pure or blended form as defined and identified herein must not be used in the performance of this contract, nor be provided as part of the equipment except for the use of servicing existing government owned equipment. This prohibition will be considered to prevail over any other provision, specification, drawing, or referenced documents.

3.12.3.1 Recycling Requirements

Recycle used refrigerants and ozone depleting substances generated during the performance of this contract to the maximum extent practicable to minimize used refrigerant and ozone depleting substance disposal as HW.

Test, collect, transfer, recycle, and/or arrange for shipping and proper disposal of used refrigerants and ozone depleting substances generated during the performance of work under this contract. The Contractor is responsible for all associated costs.

Any and all Class I ODS and R-22 recovered by the Contractor as part of this contract shall be packaged and turned over to the Government for recycling upon the completion of the work covered by this contract. The Contractor shall arrange for recycling of used refrigerants not turned over to the government, at a licensed refrigerant recycler approved by the Contracting Officer.

3.12.3.2 EPA Certification Requirements

Heating and air conditioning technicians must be certified through an EPA-approved program. Copies of certifications shall be maintained at the employees' place of business and be carried as a wallet card by the technician, as provided by environmental law.

3.12.3.3 Accidental Venting of Refrigerant

Accidental venting of a refrigerant is a release and must be reported to the Contracting Officer

3.13 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.

3.13.1 Dirt and Dust Control Plan

If required on an individual Delivery Order requiring significant excavation or soil hauling: 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.

3.14 ABRASIVE BLASTING

3.14.1 Blasting Operations

The use of silica sand is prohibited in sandblasting.

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

3.14.2 Disposal Requirements

Submit analytical results of the debris generated from abrasive blasting operations per Laboratory Analysis in paragraph SAMPLING AND ANALYSIS OF HW. Hazardous waste generated from blasting operations will be managed in accordance with paragraph CONTROL AND MANAGEMENT OF HAZARDOUS WASTE and with the approved HWMP. Disposal of non-hazardous abrasive blasting debris will be in accordance with paragraph CONTROL AND DISPOSAL OF SOLID WASTES.

3.15 NOISE

Make the maximum use of low-noise emission products, as certified by the EPA.

Blasting or use of explosives will not be permitted.

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

3.16 MERCURY MATERIALS

Mercury is prohibited in the construction of any facility involved in any individual Delivery Order, unless specified otherwise, and with the exception of mercury vapor lamps and fluorescent lamps. Dumping of mercury-containing materials and devices such as mercury vapor lamps, fluorescent lamps, and mercury switches, in rubbish containers is prohibited. Remove without breaking, pack to prevent breakage, and transport out of the activity in an unbroken condition for disposal as directed. Immediately report to the Environmental Office and the Contracting Officer instances of breakage or mercury spillage. Clean mercury spill area to the satisfaction of the Contracting Officer.

Cleanup of a mercury spill shall not be recycled and shall be managed as a hazardous waste for disposal.

-- End of Section --

SECTION 01 57 20.00 10

ENVIRONMENTAL PROTECTION
04/06

PART 1 GENERAL

1.1 REFERENCES

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

U.S. ARMY (DA)

DA AR 200-5 (1999) Pest Management

U.S. ARMY CORPS OF ENGINEERS (USACE)

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

WETLAND MANUAL Corps of Engineers Wetlands Delineation Manual Technical Report Y-87-1

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

33 CFR 328 Definitions of Waters of the United States

40 CFR 150 - 189 Pesticide Programs

40 CFR 260 Hazardous Waste Management System: General

40 CFR 279 Standards for the Management of Used Oil

40 CFR 302 Designation, Reportable Quantities, and Notification

40 CFR 355 Emergency Planning and Notification

40 CFR 68 Chemical Accident Prevention Provisions

1.2 DEFINITIONS

1.2.1 Environmental Pollution and Damage

Environmental pollution and damage is the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade the environment aesthetically, culturally and/or historically.

1.2.2 Environmental Protection

Environmental protection is the prevention/control of pollution and habitat disruption that may occur to the environment during construction. The control of environmental pollution and damage requires consideration of

land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.2.3 Contractor Generated Hazardous Waste

Contractor generated hazardous waste means materials that, if abandoned or disposed of, may meet the definition of a hazardous waste. These waste streams would typically consist of material brought on site by the Contractor to execute work, but are not fully consumed during the course of construction. Examples include, but are not limited to, excess paint thinners (i.e. methyl ethyl ketone, toluene etc.), waste thinners, excess paints, excess solvents, waste solvents, and excess pesticides, and contaminated pesticide equipment rinse water.

1.2.4 Installation Pest Management Coordinator

Installation Pest Management Coordinator (IPMC) is the individual officially designated by the Installation Commander to oversee the Installation Pest Management Program and the Installation Pest Management Plan.

1.2.5 Project Pesticide Coordinator

The Project Pesticide Coordinator (PPC) is an individual that resides at a Civil Works Project office and that is responsible for oversight of pesticide application on Project grounds.

1.2.6 Land Application for Discharge Water

The term "Land Application" for discharge water implies that the Contractor must discharge water at a rate which allows the water to percolate into the soil. No sheeting action, soil erosion, discharge into storm sewers, discharge into defined drainage areas, or discharge into the "waters of the United States" must occur. Land Application must be in compliance with all applicable Federal, State, and local laws and regulations.

1.2.7 Pesticide

Pesticide is defined as any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest, or intended for use as a plant regulator, defoliant or desiccant.

1.2.8 Pests

The term "pests" means arthropods, birds, rodents, nematodes, fungi, bacteria, viruses, algae, snails, marine borers, snakes, weeds and other organisms (except for human or animal disease-causing organisms) that adversely affect readiness, military operations, or the well-being of personnel and animals; attack or damage real property, supplies, equipment, or vegetation; or are otherwise undesirable.

1.2.9 Surface Discharge

The term "Surface Discharge" implies that the water is discharged with possible sheeting action and subsequent soil erosion may occur. Waters that are surface discharged may terminate in drainage ditches, storm sewers, creeks, and/or "waters of the United States" and would require a

permit to discharge water from the governing agency.

1.2.10 Waters of the United States

All waters which are under the jurisdiction of the Clean Water Act, as defined in [33 CFR 328](#).

1.2.11 Wetlands

Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, and bogs. Official determination of whether or not an area is classified as a wetland must be done in accordance with [WETLAND MANUAL](#).

1.3 GENERAL REQUIREMENTS

Minimize environmental pollution and damage that may occur as the result of construction operations. The environmental resources within the project boundaries and those affected outside the limits of permanent work must be protected during the entire duration of this contract. Comply with all applicable environmental Federal, State, and local laws and regulations. Any delays resulting from failure to comply with environmental laws and regulations will be the Contractor's responsibility.

1.4 SUBCONTRACTORS

Ensure compliance with this section by subcontractors.

1.5 PAYMENT

No separate payment will be made for work covered under this section. Payment of fees associated with environmental permits, application, and/or notices obtained by the Contractor, and payment of all fines/fees for violation or non-compliance with Federal, State, Regional and local laws and regulations are the Contractor's responsibility. All costs associated with this section must be included in the contract price.

1.6 SUBMITTALS

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

[SD-01 Preconstruction Submittals](#)

[Environmental Protection Plan; G](#)

The environmental protection plan.

1.7 ENVIRONMENTAL PROTECTION PLAN

Prior to commencing construction activities for any Task Order or delivery of materials to the site, submit an Environmental Protection Plan for review and approval by the Contracting Officer. **The Environmental Protection Plan is to be revised for each Task Order to include any additional environmental concerns or plans that may be required for the**

construction Contractor to protect the environment during construction of the individual Task Orders.

The purpose of the Environmental Protection Plan is to present a comprehensive overview of known or potential environmental issues which the Contractor must address during construction. Issues of concern must be defined within the Environmental Protection Plan as outlined in this section. Address each topic at a level of detail commensurate with the environmental issue and required construction task(s). Topics or issues which are not identified in this section, but are considered necessary, must be identified and discussed after those items formally identified in this section. Prior to submittal of the Environmental Protection Plan, meet with the Contracting Officer for the purpose of discussing the implementation of the initial Environmental Protection Plan; possible subsequent additions and revisions to the plan including any reporting requirements; and methods for administration of the Contractor's Environmental Plans. The Environmental Protection Plan must be current and maintained onsite by the Contractor.

1.7.1 Compliance

No requirement in this Section will relieve the Contractor of any applicable Federal, State, and local environmental protection laws and regulations. During Construction, the Contractor will be responsible for identifying, implementing, and submitting for approval any additional requirements to be included in the Environmental Protection Plan.

1.7.2 Contents

Include in the environmental protection plan, but not limit it to, the following:

- a. Name(s) of person(s) within the Contractor's organization who is(are) responsible for ensuring adherence to the Environmental Protection Plan.
- b. Name(s) and qualifications of person(s) responsible for manifesting hazardous waste to be removed from the site, if applicable.
- c. Name(s) and qualifications of person(s) responsible for training the Contractor's environmental protection personnel.
- d. Description of the Contractor's environmental protection personnel training program.
- e. An erosion and sediment control plan which identifies the type and location of the erosion and sediment controls to be provided. The plan must include monitoring and reporting requirements to assure that the control measures are in compliance with the erosion and sediment control plan, Federal, State, and local laws and regulations. **The Storm Water Pollution Prevention Plan (SWPPP) may be substituted for this plan.**
- f. For each Task Order, drawings showing locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on the site.

- g. Traffic control plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Plan shall include measures to minimize the amount of mud transported onto paved public roads by vehicles or runoff.
- h. Work area plan showing the proposed activity in each portion of the area and identifying the areas of limited use or nonuse. Plan should include measures for marking the limits of use areas including methods for protection of features to be preserved within authorized work areas.
- j. Include in the Spill Control plan the procedures, instructions, and reports to be used in the event of an unforeseen spill of a substance regulated by 40 CFR 68, 40 CFR 302, 40 CFR 355, and/or regulated under State or Local laws and regulations. The Spill Control Plan supplements the requirements of EM 385-1-1. Include in this plan, as a minimum:
- 1). The name of the individual who will report any spills or hazardous substance releases and who will follow up with complete documentation. This individual will immediately notify the Contracting Officer, the Facility Fire Department, and the Facility Environmental Office in addition to the legally required Federal, State, and local reporting channels (including the National Response Center 1-800-424-8802) if a reportable quantity is released to the environment. Include in the plan a list of the required reporting channels and telephone numbers.
 - 2). The name and qualifications of the individual who will be responsible for implementing and supervising the containment and cleanup.
 - 3). Training requirements for Contractor's personnel and methods of accomplishing the training; documented classes and attendance.
 - 4). A list of materials and equipment to be immediately available at the job site, tailored to cleanup work of the potential hazard(s) identified.
 - 5). The names and locations of suppliers of containment materials and locations of additional fuel oil recovery, cleanup, restoration, and material-placement equipment available in case of an unforeseen spill emergency.
 - 6). The methods and procedures to be used for expeditious contaminant cleanup.
- k. A non-hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris and schedules for disposal.
- 1). Identify any subcontractors responsible for the transportation and disposal of solid waste. Submit licenses or permits for solid waste disposal sites that are not a commercial operating facility.
 - 2). Evidence of the disposal facility's acceptance of the solid waste must be attached to this plan during the construction. Attach a copy of each of the Non-hazardous Solid Waste Diversion Reports to the disposal plan. Submit the report for the previous

quarter on the first working day after the first quarter that non-hazardous solid waste has been disposed and/or diverted (e.g. the first working day of January, April, July, and October).

3). Indicate in the report the total amount of waste generated and total amount of waste diverted in cubic yards or tons along with the percent that was diverted.

4). A recycling and solid waste minimization plan with a list of measures to reduce consumption of energy and natural resources. Detail in the plan the Contractor's actions to comply with and to participate in Federal, State, Regional, and local government sponsored recycling programs to reduce the volume of solid waste at the source.

m. An air pollution control plan detailing provisions to assure that dust, debris, materials, trash, etc., do not become air borne and travel off the project site.

n. A contaminant prevention plan that: identifies potentially hazardous substances to be used on the job site; identifies the intended actions to prevent introduction of such materials into the air, water, or ground; and details provisions for compliance with Federal, State, and local laws and regulations for storage and handling of these materials. In accordance with EM 385-1-1, a copy of the Material Safety Data Sheets (MSDS) and the maximum quantity of each hazardous material to be onsite at any given time must be included in the contaminant prevention plan. Update the plan as new hazardous materials are brought onsite or removed from the site.

o. A waste water management plan that identifies the methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines. If land application will be the method of disposal for the waste water, the plan must include a sketch showing the location for land application along with a description of the pretreatment methods to be implemented. If surface discharge will be the method of disposal, include a copy of the permit and associated documents as an attachment prior to discharging the waste water. If disposal is to a sanitary sewer, the plan must include documentation that the Waste Water Treatment Plant Operator has approved the flow rate, volume, and type of discharge.

p. A historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands known to be on the project site: and/or identifies procedures to be followed if historical archaeological, cultural resources, biological resources and wetlands not previously known to be onsite or in the area are discovered during construction. Include in the plan methods to assure the protection of known or discovered resources, identifying lines of communication between Contractor personnel and the Contracting Officer.

q. Include and update a pesticide treatment plan, as information becomes available. Include in the plan: sequence of treatment, dates, times, locations, pesticide trade name, EPA registration numbers,

authorized uses, chemical composition, formulation, original and applied concentration, application rates of active ingredient (i.e. pounds of active ingredient applied), equipment used for application and calibration of equipment. Federal, State, Regional and Local pest management record keeping and reporting requirements as well as any additional Installation Project Office specific requirements are the Contractor's responsibility in conformance with DA AR 200-5 Pest Management, Chapter 2, Section III "Pest Management Records and Reports" for data required to be reported to the Installation.

1.7.3 Appendix

Attach to the Environmental Protection Plan, as an appendix, copies of all environmental permits, permit application packages, approvals to construct, notifications, certifications, reports, and termination documents.

1.8 PROTECTION FEATURES

This paragraph supplements the Contract Clause PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS. Prior to start of any onsite construction activities, the Contractor and the Contracting Officer will make a joint condition survey. Immediately following the survey, the Contractor will prepare a brief report including a plan describing the features requiring protection under the provisions of the Contract Clauses, which are not specifically identified on the drawings as environmental features requiring protection along with the condition of trees, shrubs and grassed areas immediately adjacent to the site of work and adjacent to the Contractor's assigned storage area and access route(s), as applicable. This survey report will be signed by both the Contractor and the Contracting Officer upon mutual agreement as to its accuracy and completeness. The Contractor must protect those environmental features included in the survey report and any indicated on the drawings, regardless of interference which their preservation may cause to the work under the contract.

1.9 ENVIRONMENTAL ASSESSMENT OF CONTRACT DEVIATIONS

Any deviations from the drawings, plans and specifications, requested by the Contractor and which may have an environmental impact, will be subject to approval by the Contracting Officer and may require an extended review, processing, and approval time. The Contracting Officer reserves the right to disapprove alternate methods, even if they are more cost effective, if the Contracting Officer determines that the proposed alternate method will have an adverse environmental impact.

1.10 NOTIFICATION

The Contracting Officer will notify the Contractor in writing of any observed noncompliance with Federal, State or local environmental laws or regulations, permits, and other elements of the Contractor's Environmental Protection plan. After receipt of such notice, the Contractor will inform the Contracting Officer of the proposed corrective action and take such action when approved by the Contracting Officer. The Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time extensions will be granted or equitable adjustments allowed for any such suspensions. This is in addition to any other actions the Contracting Officer may take under the contract, or in accordance with the Federal Acquisition Regulation or Federal Law.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 ENVIRONMENTAL PERMITS AND COMMITMENTS

Obtaining and complying with all environmental permits and commitments required by Federal, State, Regional, and local environmental laws and regulations is the Contractor's responsibility.

3.2 LAND RESOURCES

Confine all activities to areas defined by the drawings and specifications. Identify any land resources to be preserved within the work area prior to the beginning of any construction. Do not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, and land forms without approval, except in areas indicated on the drawings or specified to be cleared. Ropes, cables, or guys will not be fastened to or attached to any trees for anchorage unless specifically authorized. Provide effective protection for land and vegetation resources at all times, as defined in the following subparagraphs. Remove stone, soil, or other materials displaced into uncleared areas.

3.2.1 Work Area Limits

Mark the areas that need not be disturbed under this contract prior to commencing construction activities. Mark or fence isolated areas within the general work area which are not to be disturbed. Protect monuments and markers before construction operations commence. Where construction operations are to be conducted during darkness, any markers must be visible in the dark. The Contractor's personnel must be knowledgeable of the purpose for marking and/or protecting particular objects.

3.2.2 Landscape

Trees, shrubs, vines, grasses, land forms and other landscape features indicated and defined on the drawings to be preserved must be clearly identified by marking, fencing, or wrapping with boards, or any other approved techniques. Restore landscape features damaged or destroyed during construction operations outside the limits of the approved work area.

3.2.3 Erosion and Sediment Controls

Providing erosion and sediment control measures in accordance with Federal, State, and local laws and regulations is the Contractor's responsibility. The erosion and sediment controls selected and maintained by the Contractor shall be such that water quality standards are not violated as a result of construction activities. The area of bare soil exposed at any one time by construction operations should be kept to a minimum. Construct or install temporary and permanent erosion and sediment control best management practices (BMPs) as specified in Section 01 57 23 TEMPORARY STORM WATER POLLUTION CONTROL. BMPs may include, but not be limited to, vegetation cover, stream bank stabilization, slope stabilization, silt fences, construction of terraces, interceptor channels, sediment traps, inlet and outfall protection, diversion channels, and sedimentation basins. Remove any temporary measures after the area has been stabilized.

3.2.4 Contractor Facilities and Work Areas

Place field offices, staging areas, stockpile storage, and temporary buildings in areas designated on the drawings or as directed by the Contracting Officer. Temporary movement or relocation of Contractor facilities will be made only when approved. Erosion and sediment controls must be provided for onsite borrow and spoil areas to prevent sediment from entering nearby waters. Temporary excavation and embankments for plant and/or work areas must be controlled to protect adjacent areas.

3.3 WATER RESOURCES

Monitor all water areas affected by construction activities to prevent pollution of surface and ground waters. Do not apply toxic or hazardous chemicals to soil or vegetation without written authorization from the Contracting Officer. For construction activities immediately adjacent to impaired surface waters, the Contractor must be capable of quantifying sediment or pollutant loading to that surface water when required by State or Federally issued Clean Water Act permits.

3.3.1 Cofferdams, Diversions, and Dewatering Operations

Construction operations for dewatering will be controlled at all times to maintain compliance with existing State water quality standards and designated uses of the surface water body. Comply with the State of Indiana water quality standards and anti-degradation provisions.

3.3.2 Stream Crossings

Stream crossings must allow movement of materials or equipment without violating water pollution control standards of the Federal, State, and local governments.

3.3.3 Wetlands

Do not enter, disturb, destroy, or allow discharge of contaminants into any wetlands except as authorized herein. The protection of wetlands shown on the drawings in accordance with paragraph ENVIRONMENTAL PERMITS, REVIEWS, AND APPROVALS is the Contractor's responsibility. Authorization to enter specific wetlands identified will not relieve the Contractor from any obligation to protect other wetlands within, adjacent to, or in the vicinity of the construction site and associated boundaries.

3.4 AIR RESOURCES

Equipment operation, activities, or processes will be in accordance with all Federal and State air emission and performance laws and standards.

3.4.1 Particulates

Dust particles; aerosols and gaseous by-products from construction activities; and processing and preparation of materials, such as from asphaltic batch plants; must be controlled at all times, including weekends, holidays and hours when work is not in progress. Maintain excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and other work areas within or outside the project boundaries free from particulates which would cause the Federal, State, and local air pollution standards to be exceeded or which would cause a hazard or a nuisance. Sprinkling, chemical treatment of an

approved type, or other methods will be permitted to control particulates in the work area. Sprinkling, to be efficient, must be repeated to keep the disturbed area damp at all times. Provide sufficient, competent equipment available to accomplish these tasks. Perform particulate control as the work proceeds and whenever a particulate nuisance or hazard occurs. Comply with all State and local visibility regulations.

3.4.2 Odors

Odors from construction activities must be controlled at all times. The odors must be in compliance with State regulations and/or local ordinances and may not constitute a health hazard.

3.4.3 Burning

Burning is prohibited on the Government premises.

3.5 CHEMICAL MATERIALS MANAGEMENT AND WASTE DISPOSAL

Disposal of wastes will be as directed below, unless otherwise specified in other sections and/or shown on the drawings.

3.5.1 Solid Wastes

Place solid wastes (excluding clearing debris) in containers which are emptied on a regular schedule. Handling, storage, and disposal must be conducted to prevent contamination. Employ segregation measures so that no hazardous or toxic waste will become co-mingled with solid waste. Transport solid waste off Government property and dispose of it in compliance with Federal, State, and local requirements for solid waste disposal. A Subtitle D RCRA permitted landfill will be the minimum acceptable offsite solid waste disposal option. Verify that the selected transporters and disposal facilities have the necessary permits and licenses to operate.

3.5.2 Chemicals and Chemical Wastes

Dispense chemicals ensuring no spillage to the ground or water. Perform and document periodic inspections of dispensing areas to identify leakage and initiate corrective action. This documentation will be periodically reviewed by the Government. Collect chemical waste in corrosion resistant, compatible containers. Collection drums must be monitored and removed to a staging or storage area when contents are within 6 inches of the top. Wastes will be classified, managed, stored, and disposed of in accordance with Federal, State, and local laws and regulations.

3.5.3 Fuel and Lubricants

Storage, fueling and lubrication of equipment and motor vehicles must be conducted in a manner that affords the maximum protection against spill and evaporation. Manage and store fuel, lubricants and oil in accordance with all Federal, State, Regional, and local laws and regulations. Used lubricants and used oil to be discarded must be stored in marked corrosion-resistant containers and recycled or disposed in accordance with 40 CFR 279, State, and local laws and regulations. Storage of fuel on the project site will be in accordance with all Federal, State, and local laws and regulations.

3.5.4 Waste Water

Disposal of waste water will be as specified below.

- a. Waste water from construction activities, such as onsite material processing, concrete curing, foundation and concrete clean-up, water used in concrete trucks, forms, etc. will not be allowed to enter water ways or to be discharged prior to being treated to remove pollutants. Dispose of the construction related waste water off-Government property in accordance with all Federal, State, Regional and Local laws and regulations.
- b. For discharge of ground water, the Contractor will land apply on the project site in accordance with all Federal, State, Regional, and/or Local laws and regulations for pumping and land applying ground water, and as indicated in the Storm Water Permit.
- c. Water generated from the flushing of lines after disinfection or disinfection in conjunction with hydrostatic testing will be land applied in accordance with all Federal, State, and local laws and regulations for land application.

3.6 RECYCLING AND WASTE MINIMIZATION

Participate in State and local government sponsored recycling programs. The Contractor is further encouraged to minimize solid waste generation throughout the duration of the project. .

3.7 HISTORICAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

Existing historical, archaeological, and cultural resources within the Contractor's work area will be shown on the individual Task Order drawings. Protect these resources and be responsible for their preservation during the life of the Contract.

If during excavation or other construction activities any previously unidentified or unanticipated historical, archaeological, and cultural resources are discovered or found, all activities that may damage or alter such resources will be temporarily suspended. Resources covered by this paragraph include but are not limited to: any human skeletal remains or burials; artifacts; shell, midden, bone, charcoal, or other deposits; rock or coral alignments, pavings, wall, or other constructed features; and any indication of agricultural or other human activities. Upon such discovery or find, immediately notify the Contracting Officer so that the appropriate authorities may be notified and a determination made as to their significance and what, if any, special disposition of the finds should be made. Cease all activities that may result in impact to or the destruction of these resources. Secure the area and prevent employees or other persons from trespassing on, removing, or otherwise disturbing such resources.

3.8 BIOLOGICAL RESOURCES

Minimize interference with, disturbance to, and damage to fish, wildlife, and plants including their habitat. The protection of threatened and endangered animal and plant species, including their habitat, is the Contractor's responsibility in accordance with Federal, State, Regional, and local laws and regulations.

3.9 INTEGRATED PEST MANAGEMENT

In order to minimize impacts to existing fauna and flora, the Contractor through the Contracting Officer, must coordinate with the Installation Pest Management Coordinator (IPMC) Project Pesticide Coordinator (PPC) at the earliest possible time prior to pesticide application. Discuss integrated pest management strategies with the IPMC and receive concurrence from the IPMC through the COR prior to the application of any pesticide associated with these specifications. Installation Project Office Pest Management personnel will be given the opportunity to be present at all meetings concerning treatment measures for pest or disease control and during application of the pesticide. The use and management of pesticides are regulated under [40 CFR 150 - 189](#).

3.9.1 Pesticide Delivery and Storage

Deliver pesticides to the site in the original, unopened containers bearing legible labels indicating the EPA registration number and the manufacturer's registered uses. Store pesticides according to manufacturer's instructions and under lock and key when unattended.

3.9.2 Qualifications

For the application of pesticides, use the services of a subcontractor whose principal business is pest control. The subcontractor must be licensed and certified in the state where the work is to be performed.

3.9.3 Pesticide Handling Requirements

Formulate, treat with, and dispose of pesticides and associated containers in accordance with label directions and use the clothing and personal protective equipment specified on the labeling for use during all phases of the application. Furnish Material Safety Data Sheets (MSDS) for all pesticide products.

3.9.4 Application

Apply pesticides using a State Certified Pesticide Applicator in accordance with EPA label restrictions and recommendation. The Certified Applicator must wear clothing and personal protective equipment as specified on the pesticide label. The Contracting Officer will designate locations for water used in formulating. Do not allow the equipment to overflow. All equipment must be inspected for leaks, clogging, wear, or damage and repaired prior to application of pesticide.

3.10 PREVIOUSLY USED EQUIPMENT

Clean all previously used construction equipment prior to bringing it onto the project site. Ensure that the equipment is free from soil residuals, egg deposits from plant pests, noxious weeds, and plant seeds. Consult with the USDA jurisdictional office for additional cleaning requirements.

3.11 MAINTENANCE OF POLLUTION FACILITIES

Maintain permanent and temporary pollution control facilities and devices for the duration of the contract or for that length of time construction activities create the particular pollutant.

3.12 MILITARY MUNITIONS

In the event military munitions, as defined in 40 CFR 260, are discovered or uncovered, the Contractor will immediately stop work in that area and immediately inform the Contracting Officer.

3.13 TRAINING OF CONTRACTOR PERSONNEL

The Contractor's personnel must be trained in all phases of environmental protection and pollution control. Conduct environmental protection/pollution control meetings for all personnel prior to commencing construction activities. Additional meetings must be conducted for new personnel and when site conditions change. Include in the training and meeting agenda: methods of detecting and avoiding pollution; familiarization with statutory and contractual pollution standards; installation and care of devices, vegetative covers, and instruments required for monitoring purposes to ensure adequate and continuous environmental protection/pollution control; anticipated hazardous or toxic chemicals or wastes, and other regulated contaminants; recognition and protection of archaeological sites, artifacts, wetlands, and endangered species and their habitat that are known to be in the area.

3.14 POST CONSTRUCTION CLEANUP

The Contractor will clean up all areas used for construction in accordance with Contract Clause: "Cleaning Up". Unless otherwise instructed in writing by the Contracting Officer, obliterate all signs of temporary construction facilities such as haul roads, work area, structures, foundations of temporary structures, stockpiles of excess or waste materials, and other vestiges of construction prior to final acceptance of the work. The disturbed area must be graded, filled and the entire area seeded unless otherwise indicated.

-- End of Section --

SECTION 01 57 23

TEMPORARY STORM WATER POLLUTION CONTROL
04/08

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 4439 | (2004) Geosynthetics |
| ASTM D 4491 | (1999a; R 2004e1) Water Permeability of Geotextiles by Permittivity |
| ASTM D 4533 | (2004) Trapezoid Tearing Strength of Geotextiles |
| ASTM D 4632 | (2008) Grab Breaking Load and Elongation of Geotextiles |
| ASTM D 4751 | (2004) Determining Apparent Opening Size of a Geotextile |
| ASTM D 4873 | (2002) Identification, Storage, and Handling of Geosynthetic Rolls and Samples |

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

| | |
|------------------|--|
| EPA 832-R-92-005 | (1992) Storm Water Management for Construction Activities Developing Pollution Preventions and Plans and Best Management Practices |
|------------------|--|

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

| | |
|---------------|---|
| 40 CFR 122.26 | Storm Water Discharges (Applicable to State NPDES Programs, see section 123.25) |
|---------------|---|

1.2 SYSTEM DESCRIPTION

The work consists of implementing the storm water pollution prevention measures to prevent sediment from entering streams or water bodies as specified in this Section in conformance with the requirements of Section 01 57 20.00 10 ENVIRONMENTAL PROTECTION, and the requirements of the National Pollution Discharge Elimination System (NPDES) permit attached to that Section.

1.3 EROSION AND SEDIMENT CONTROLS

The controls and measures required of the Contractor are described below.

1.3.1 Stabilization Practices

The stabilization practices to be implemented may include the following as required by the individual Task Orders, including temporary seeding, mulching, geotextiles, sod stabilization, vegetative buffer strips, erosion control matts, protection of trees, preservation of mature vegetation, etc. On the daily CQC Report, record the dates when the major grading activities occur, (e.g., clearing and grubbing, excavation, embankment, and grading); when construction activities temporarily or permanently cease on a portion of the site; and when stabilization practices are initiated. Except as provided in paragraphs UNSUITABLE CONDITIONS and NO ACTIVITY FOR LESS THAN 21 DAYS, initiate stabilization practices as soon as practicable, but no more than 14 days, in any portion of the site where construction activities have temporarily or permanently ceased.

1.3.1.1 Unsuitable Conditions

Where the initiation of stabilization measures by the fourteenth day after construction activity temporarily or permanently ceases or is precluded by unsuitable conditions caused by the weather, initiate stabilization practices as soon as practicable after conditions become suitable.

1.3.1.2 No Activity for Less Than 21 Days

When the total time period in which construction activity is temporarily ceased on a portion of the site is 21 days minimum, stabilization practices do not have to be initiated on that portion of the site until 14 days have elapsed after construction activity temporarily ceased.

1.3.1.3 Burnoff

Burnoff of the ground cover is not permitted.

1.3.1.4 Protection of Erodible Soils

Immediately finish the earthwork brought to a final grade, as indicated or specified, and 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.

1.3.2 Erosion, Sediment and Stormwater Control

a. Submit [Storm Water Inspection Reports for General Permit](#) to the Contracting Officer once every 7 calendar days and within 24 hours of a storm event that produces 0.5 inch or more of rain.

b. Storm Water Notice of Intent for Construction Activities

c. Storm Water Notice of Intent for Construction Activities

For Task Order work that disturbs or potentially could disturb more than 1 acre of ground, submit a [Storm Water Notice of Intent](#) for NPDES coverage under the general permit for construction activities and a [Storm Water Pollution Prevention Plan](#) (SWPPP) for the project to the Contracting Officer prior to the commencement of work. The SWPPP shall meet the requirements of the State of Indiana general permit for storm water discharges from construction sites. Submit the SWPPP along with any required Notice of Intents, Notice of Termination, and appropriate permit fees, via the Contracting Officer, to the appropriate State agency for approval, a minimum of 30 calendar days prior to the start

of any land disturbing activities. Maintain an approved copy of the SWPPP at the construction on-site office, and continually update as regulations require, to reflect current site conditions. Include within the SWPPP:

- (1) Identify potential sources of pollution which may be reasonably expected to affect the quality of storm water discharge from the site.
- (2) Describe and ensure implementation of practices which will be used to reduce the pollutants in storm water discharge from the site.
- (3) Ensure compliance with terms of the State of Indiana general permit for storm water discharge.
- (4) Select applicable best management practices from EPA 832-R-92-005.
- (5) Include a completed copy of the Registration Statement, BMP Inspection Report Template and Notice of Termination except for the effective date.
- (6) Storm Water Pollution Prevention Measures and Notice of Intent [40 CFR 122.26](#), [EPA 832-R-92-005](#). Provide a "Storm Water Pollution Prevention Plan" (SWPPP) for the project. The SWPPP will meet the requirements of the State of Indiana general permit for storm water discharges from construction sites. Submit the SWPPP along with any required Notice of Intent, Notice of Termination, and appropriate permit fees, via the Contracting Officer, to the appropriate State agency for approval, a minimum of 14 calendar days prior to the start of construction. A copy of the approved SWPPP will be kept at the construction on-site office, and continually updated as regulations require to reflect current site conditions.
- (7) Following SWPPP approval, submit Registration Statement and appropriate permit fees to the Indiana Department of Environmental Management (IDEM) before any land disturbing activities begin. Coverage under the permit begins on the day the Registration Statement and fee are: (1) post marked by mail, (2) registered online at IDEM's website, or (3) hand delivered to the IDEM office. The Contractor is responsible for all associated fees; contact IDEM to determine applicable fees.
- (8) Install, inspect, and maintain best management practices (BMPs) as required by the general permit. Prepare and submit to IDEM, BMP Inspection Reports as required by the general permit.
- (9) Once construction is complete and the site has been stabilized with a final, sustainable cover, submit the Notice of Termination to IDEM within 30 days after all land disturbing activities end.
- (10) Once construction is complete and the site has been stabilized with a final, sustainable cover, submit the Notice of Termination to IDEM within 30 days after all land disturbing activities end.

1.3.3 Stormwater Drainage

There will be no discharge of excavation ground water to the sanitary sewer or storm drains without prior specific authorization of the Contracting Officer. Discharge of hazardous substances will not be permitted under any circumstances.

1.3.4 Structural Practices

Implement structural practices to divert flows from exposed soils, temporarily store flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Implement structural practices in a timely manner, during the construction process, to minimize erosion and sediment runoff. Include the following devices;

1.3.4.1 Silt Fences

Provide silt fences as a temporary structural practice to minimize erosion and sediment runoff. Properly install silt fences to effectively retain sediment immediately after completing each phase of work where erosion would occur in the form of sheet and rill erosion (e.g. clearing and grubbing, excavation, embankment, and grading). Install silt fences in the locations indicated on the drawings. Obtain approval from the Contracting Officer prior to final removal of silt fence barriers.

1.3.4.2 Straw Bales

Provide bales of straw as a temporary structural practice to minimize erosion and sediment runoff. If bales are used, properly place the bales to effectively retain sediment immediately after completing each phase of work (e.g., clearing and grubbing, excavation, embankment, and grading) in each independent runoff area (e.g., after clearing and grubbing in a area between a ridge and drain, place the bales as work progresses, remove/replace/relocate the bales as needed for work to progress in the drainage area). Show on the drawings areas where straw bales are to be used. The Contracting Officer will approve the final removal of straw bale barriers. Provide rows of bales of straw as follows:

- a. Along the downhill perimeter edge of all areas disturbed.
- b. Along the top of the slope or top bank of drainage ditches, channels, swales, etc. that traverse disturbed areas.
- c. Along the toe of all cut slopes and fill slopes of the construction areas.
- d. Perpendicular to the flow in the bottom of existing drainage ditches, channels, swales, etc. that traverse disturbed areas or carry runoff from disturbed areas. Rows shall be spaced as shown on the drawing or as directed by the contracting Officer (maximum 100 feet apart).
- e. Perpendicular to the flow in the bottom of new drainage ditches, channels, and swales. Space the rows a maximum of 100 feet apart.
- f. At the entrance to culverts that receive runoff from disturbed areas.
- g. As directed by the Contracting Officer.

1.3.4.3 Diversion Dikes

Build diversion dikes with a maximum channel slope of 2 percent and adequately compacted to prevent failure. The minimum height measured from the top of the dike to the bottom of the channel shall be 18 inches. The minimum base width shall be 6 feet and the minimum top width shall be 2 feet. Ensure that the diversion dikes are not damaged by construction operations or traffic. Locate diversion dikes where shown on the drawings.

1.3.5 Sediment Basins

Trap sediment in temporary sediment basins. Select a basin size to accommodate the runoff of a local 25-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. 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.

1.3.6 Vegetation and Mulch

a. 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.

b. 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 19 SEEDING.

1.4 SUBMITTALS

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

SD-01 Preconstruction Submittals

For Task Orders that disturb more than 1 Acre of ground, the following are required:

Storm Water Pollution Prevention Plan; G
Storm Water Notice of Intent; G

Pollution prevention plan and Notice of intent for NPDES coverage under the general permit for construction activities

SD-06 Test Reports

Storm Water Inspection Reports for General Permit; G
Erosion and Sediment Controls; G

SD-07 Certificates

Mill Certificate or Affidavit

Certificate attesting that the Contractor has met all specified requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

Identify, store and handle filter fabric in accordance with ASTM D 4873.

PART 2 PRODUCTS

2.1 COMPONENTS FOR SILT FENCES

2.1.1 Filter Fabric

Provide geotextile that complies with the requirements of ASTM D 4439, and consists of polymeric filaments which are formed into a stable network such that filaments retain their relative positions. The filament shall consist of a long-chain synthetic polymer composed of at least 85 percent by weight of ester, propylene, or amide, and contains stabilizers and/or inhibitors added to the base plastic to make the filaments resistant to deterioration due to ultraviolet and heat exposure. Provide synthetic filter fabric that contains ultraviolet ray inhibitors and stabilizers to assure a minimum of six months of expected usable construction life at a temperature range of 0 to 120 degrees F. The filter fabric shall meet the following requirements:

FILTER FABRIC FOR SILT SCREEN FENCE

| PHYSICAL PROPERTY | TEST PROCEDURE | STRENGTH REQUIREMENT |
|--------------------------------------|----------------|----------------------------------|
| Grab Tensile Elongation (percent) | ASTM D 4632 | 100 lbs. min. 30 percent max. |
| Trapezoid Tear | ASTM D 4533 | 55 lbs. min. |
| Permittivity | ASTM D 4491 | 0.2 sec-1 |
| AOS (U.S. Std Sieve) | ASTM D 4751 | 20-100 |

2.1.2 Silt Fence Stakes and Posts

Use either wooden stakes or steel posts for fence construction. Wooden stakes utilized for silt fence construction, shall have a minimum cross section of 1 by 2 inches when oak is used and 2 by 2 inches when pine is used, and have a minimum length of 5 feet. Steel posts (standard "U" or "T" section) utilized for silt fence construction, shall have a minimum weight of 1.33 pounds/linear foot and a minimum length of 5 feet.

2.1.3 Mill Certificate or Affidavit

Provide a mill certificate or affidavit attesting that the fabric and factory seams meet chemical, physical, and manufacturing requirements specified above. Specify in the mill certificate or affidavit the actual Minimum Average Roll Values and identify the fabric supplied by roll identification numbers. Submit a mill certificate or affidavit signed by a legally authorized official from the company manufacturing the filter fabric.

2.2 COMPONENTS FOR STRAW BALES

The straw in the bales shall be stalks from oats, wheat, rye, barley, rice, or from grasses such as byhalia, bermuda, etc., furnished in air dry condition. Provide bales with a standard cross section of 14 by 18 inches. Wire-bound or string-tie all bales. Use either wooden stakes or steel posts to secure the straw bales to the ground. Wooden stakes utilized for this purpose, shall have a minimum dimensions of 2 by 2 inches in cross section and have a minimum length of 3 feet. Steel posts (standard "U" or "T" section) utilized for securing straw bales, shall have a minimum weight of 1.33 pounds/linear foot and a minimum length of 3 feet.

PART 3 EXECUTION

3.1 INSTALLATION OF SILT FENCES

Extend silt fences a minimum of 16 inches above the ground surface without exceeding 34 inches above the ground surface. Provide filter fabric from a continuous roll cut to the length of the barrier to avoid the use of joints. When joints are unavoidable, splice together filter fabric at a support post, with a minimum 6 inch overlap, and securely sealed. Excavate trench approximately 4 inches wide and 4 inches deep on the upslope side of the location of the silt fence. The 4 by 4 inch trench shall be backfilled and the soil compacted over the filter fabric. Remove silt fences upon approval by the Contracting Officer.

3.2 INSTALLATION OF STRAW BALES

Place the straw bales in a single row, lengthwise on the contour, with ends of adjacent bales tightly abutting one another. Install straw bales so that bindings are oriented around the sides rather than along the tops and bottoms of the bales in order to prevent deterioration of the bindings. Entrench and backfill the barrier. Excavate a trench the width of a bale and the length of the proposed barrier to a minimum depth of 4 inches. After the bales are staked and chinked (gaps filled by wedging with straw), backfill the excavated soil against the barrier. Conform the backfill soil with the ground level on the downhill side and build up to 4 inches against the uphill side of the barrier. Scatter loose straw over the area immediately uphill from a straw bale barrier to increase barrier efficiency. Securely anchor each bale by at least two stakes driven through the bale. Drive the first stake or steel post in each bale toward the previously laid bale to force the bales together. Drive stakes or steel pickets a minimum 18 inches deep into the ground to securely anchor the bales.

3.3 FIELD QUALITY CONTROL

Maintain the temporary and permanent vegetation, erosion and sediment control measures, and other protective measures in good and effective operating condition by performing routine inspections to determine condition and effectiveness, by restoration of destroyed vegetative cover, and by repair of erosion and sediment control measures and other protective measures. Use the following procedures to maintain the protective measures.

3.3.1 Silt Fence Maintenance

Inspect the silt fences in accordance with paragraph, titled "Inspections," of this section. Any required repairs shall be made promptly. Pay close

attention to the repair of damaged silt fence resulting from end runs and undercutting. Should the fabric on a silt fence decompose or become ineffective, and the barrier is still necessary, replace the fabric promptly. Remove sediment deposits when deposits reach one-third of the height of the barrier. Remove a silt fence when it is no longer required. The immediate area occupied by the fence and any sediment deposits shall be shaped to an acceptable grade. The areas disturbed by this shaping shall be seeded in accordance with Section 32 92 19 SEEDING AND SODDING, except that the coverage requirements in paragraph, titled "Establishment" of this section do not apply.

3.3.2 Straw Bale Maintenance

Inspect straw bale barriers in accordance with paragraph, titled "Inspections". Pay close attention to the repair of damaged bales, end runs and undercutting beneath bales. Accomplish necessary repairs to barriers or replacement of bales in a promptly manner. Remove sediment deposits when deposits reach one-half of the height of the barrier. At the each end of each row turn bales uphill when used to retain sediment. Remove a straw bale barrier when it is no longer required. The immediate area occupied by the bales and any sediment deposits shall be shaped to an acceptable grade. Seed the areas disturbed by this shaping in accordance with Section 32 92 19 SEEDING.

3.3.3 Diversion Dike Maintenance

Inspect diversion dikes in accordance with paragraph, titled "Inspections," of this section. Pay close attention to the repair of damaged diversion dikes and accomplish necessary repairs promptly. When diversion dikes are no longer required, shape to an acceptable grade. Seed the areas disturbed by this shaping in accordance with Section 32 92 19 SEEDING.

3.4 INSPECTIONS

3.4.1 General

Inspect disturbed areas of the construction site, areas that have not been finally stabilized used for storage of materials exposed to precipitation, stabilization practices, structural practices, other controls, and area where vehicles exit the site at least once every seven (7) calendar days and within 24 hours of the end of any storm that produces 0.5 inches or more rainfall at the site. Conduct inspections at least once every month where sites have been finally stabilized.

3.4.2 Inspections Details

Inspect disturbed areas and areas used for material storage that are exposed to precipitation for evidence of, or the potential for, pollutants entering the drainage system. Observe erosion and sediment control measures identified in the Storm Water Pollution Prevention Plan to ensure that they are operating correctly. Inspect discharge locations or points to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters. Inspect locations where vehicles exit the site for evidence of offsite sediment tracking.

3.4.3 Inspection Reports

For each inspection conducted, prepare a report summarizing the scope of the inspection, name(s) and qualifications of personnel making the

inspection, the date(s) of the inspection, major observations relating to the implementation of the Storm Water Pollution Prevention Plan, maintenance performed, and actions taken. Furnish the report to the Contracting Officer within 24 hours of the inspection as a part of the Contractor's daily CQC REPORT. A copy of the inspection report shall be maintained on the job site.

3.4.4 Monthly Inspection Report and Certification Form

Complete, sign, and submit to the contracting Officer on the first working day of each month the report.

-- End of Section --

SECTION 01 74 19

CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT
01/07

PART 1 GENERAL

1.1 REFERENCES

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

ASTM INTERNATIONAL (ASTM)

ASTM E 1609

(2001) Development and Implementation of a
Pollution Prevention Program

1.2 GOVERNMENT POLICY

Government policy is to apply sound environmental principles in the design, construction and use of facilities. As part of the implementation of that policy the Contractor shall: (1) practice efficient waste management when sizing, cutting, and installing products and materials and (2) use all reasonable means to divert construction and demolition waste from landfills and incinerators and to facilitate their recycling or reuse. A minimum of 50 percent by weight of total project solid waste shall be diverted from the landfill.

1.3 MANAGEMENT

Develop and implement a waste management program in accordance with ASTM E 1609 and as specified. Take a pro-active, responsible role in the management of construction and demolition waste and require all subcontractors, vendors, and suppliers to participate in the effort. Construction and demolition waste includes products of demolition or removal, excess or unusable construction materials, packaging materials for construction products, and other materials generated during the construction process but not incorporated into the work. In the management of waste consideration shall be given to the availability of viable markets, the condition of the material, the ability to provide the material in suitable condition and in a quantity acceptable to available markets, and time constraints imposed by internal project completion mandates. The Contractor is responsible for implementation of any special programs involving rebates or similar incentives related to recycling of waste. Revenues or other savings obtained for salvage, or recycling accrue to the Contractor. Appropriately permit firms and facilities used for recycling, reuse, and disposal for the intended use to the extent required by federal, state, and local regulations. Also, provide on-site instruction of appropriate separation, handling, recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.

1.4 SUBMITTALS

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

01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Waste Management Plan; G;

SD-11 Closeout Submittals

Records;

1.5 MEETINGS

Conduct Construction Waste Management meetings. After award of the Contract and prior to commencement of work, schedule and conduct a meeting with the Contracting Officer to discuss the proposed Waste Management Plan and to develop a mutual understanding relative to the details of waste management. The requirements for this meeting may be fulfilled during the coordination and mutual understanding meeting outlined in Section 01 45 00.10 20 QUALITY CONTROL FOR MINOR CONSTRUCTION.

The goal shall be to direct at least 40% of the non-hazardous solid wastes produced from construction activities from landfills to recycling or re-use programs.

At a minimum, environmental and waste management goals and issues shall be discussed at the following additional meetings:

- a. Pre-bid meeting.
- b. Preconstruction meeting.
- c. Regular site meetings.
- d. Work safety meetings.

1.6 WASTE MANAGEMENT PLAN

A waste management plan shall be submitted within 15 days after award and not less than 10 days before the first preconstruction meeting. The plan shall demonstrate how the project waste diversion goal shall be met and shall include the following:

- a. Name of individuals on the Contractor's staff responsible for waste prevention and management.
- b. Actions that will be taken to reduce solid waste generation, including coordination with subcontractors to ensure awareness and participation.
- c. Description of the regular meetings to be held to address waste management.
- d. Description of the specific approaches to be used in recycling/reuse of the various materials generated, including the areas on site and equipment to be used for processing, sorting, and temporary storage of wastes.
- e. Characterization, including estimated types and quantities, of the waste to be generated.

- f. Name of landfill and/or incinerator to be used and the estimated costs for use, assuming that there would be no salvage or recycling on the project.
- g. Identification of local and regional reuse programs, including non-profit organizations such as schools, local housing agencies, and organizations that accept used materials such as materials exchange networks and Habitat for Humanity. Include the name, location, and phone number for each reuse facility to be used, and provide a copy of the permit or license for each facility.
- h. List of specific waste materials that will be salvaged for resale, salvaged and reused on the current project, salvaged and stored for reuse on a future project, or recycled. Recycling facilities that will be used shall be identified by name, location, and phone number, including a copy of the permit or license for each facility.
- i. Identification of materials that cannot be recycled/reused with an explanation or justification, to be approved by the Contracting Officer.
- j. Description of the means by which any waste materials identified in item (h) above will be protected from contamination.
- k. Description of the means of transportation of the recyclable materials (whether materials will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler and removed from the site).
- l. Anticipated net cost savings determined by subtracting Contractor program management costs and the cost of disposal from the revenue generated by sale of the materials and the incineration and/or landfill cost avoidance.

Revise and resubmit Plan as required by the individual Task Orders and Contracting Officer. Approval of Contractor's Plan will not relieve the Contractor of responsibility for compliance with applicable environmental regulations or meeting project cumulative waste diversion requirement. Distribute copies of the Waste Management Plan to each subcontractor, the Quality Control Manager, and the Contracting Officer.

1.7 RECORDS

Records shall be maintained to document the quantity of waste generated; the quantity of waste diverted through sale, reuse, or recycling; and the quantity of waste disposed by landfill or incineration. Quantities may be measured by weight or by volume, but must be consistent throughout. List each type of waste separately noting the disposal or diversion date. Identify the landfill, recycling center, waste processor, or other organization used to process or receive the solid waste. Provide explanations for any waste not recycled or reused. With each application for payment, submit updated documentation for solid waste disposal and diversion, and submit manifests, weight tickets, receipts, and invoices specifically identifying the project and waste material. The records shall be made available to the Contracting Officer during construction, and a copy of the records shall be delivered to the Contracting Officer upon completion of the construction.

1.8 COLLECTION

Separate, store, protect, and handle at the site identified recyclable and salvageable waste products in a manner that maximizes recyclability and salvagability of identified materials. Provide the necessary containers, bins and storage areas to facilitate effective waste management and clearly and appropriately identify them. Provide materials for barriers and enclosures around recyclable material storage areas which are nonhazardous and recyclable or reusable. Locate out of the way of construction traffic. Provide adequate space for pick-up and delivery and convenience to subcontractors. Recycling and waste bin areas are to be kept neat and clean, and recyclable materials shall be handled to prevent contamination of materials from incompatible products and materials. Clean contaminated materials prior to placing in collection containers. Use cleaning materials that are nonhazardous and biodegradable. Handle hazardous waste and hazardous materials in accordance with applicable regulations and coordinate with Section 01 57 20.00 10 ENVIRONMENTAL PROTECTION. Separate materials by one of the following methods:

1.8.1 Source Separated Method.

Waste products and materials that are recyclable shall be separated from trash and sorted as described below into appropriately marked separate containers and then transported to the respective recycling facility for further processing. Deliver materials in accordance with recycling or reuse facility requirements (e.g., free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process). Separate materials into the following category types as appropriate to the project waste and to the available recycling and reuse programs in the project area:

- a. Land clearing debris.
- b. Asphalt.
- c. Concrete and masonry.
- d. Metal (e.g. banding, stud trim, ductwork, piping, rebar, roofing, other trim, steel, iron, galvanized, stainless steel, aluminum, copper, zinc, lead brass, bronze).
 - (1) Ferrous.
 - (2) Non-ferrous.
- f. Debris.
- i. Plastic.
 - (3) Type 3: Vinyl (Polyvinyl Chloride or PVC).
- k. Non-hazardous paint and paint cans.

1.8.2 Co-Mingled Method.

Waste products and recyclable materials shall be placed into a single container and then transported to a recycling facility where the recyclable materials are sorted and processed.

1.8.3 Other Methods.

Other methods proposed by the Contractor may be used when approved by the Contracting Officer.

1.9 DISPOSAL

Control accumulation of waste materials and trash. Recycle or dispose of collected materials off-site at intervals approved by the Contracting Officer and in compliance with waste management procedures. Except as otherwise specified in other sections of the specifications, disposal shall be in accordance with the following:

1.9.1 Reuse.

First consideration shall be given to salvage for reuse since little or no re-processing is necessary for this method, and less pollution is created when items are reused in their original form. [Reuse materials as indicated on the drawings.](#) Sale or donation of waste suitable for reuse shall be considered.

1.9.2 Recycle.

Waste materials not suitable for reuse, but having value as being recyclable, shall be made available for recycling. All fluorescent lamps, HID lamps, and mercury-containing thermostats removed from the site shall be recycled. Arrange for timely pickups from the site or deliveries to recycling facilities in order to prevent contamination of recyclable materials.

1.9.3 Waste.

Materials with no practical use or economic benefit shall be disposed at a landfill or incinerator.

1.9.4 Return

Set aside and protect misdelivered and substandard products and materials and return to supplier for credit.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used. -- End of Section --

SECTION 01 78 00

CLOSEOUT SUBMITTALS
08/11

PART 1 GENERAL

1.1 REFERENCES

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

ASTM INTERNATIONAL (ASTM)

ASTM E1971 (2005; R 2011) Stewardship for the Cleaning of Commercial and Institutional Buildings

GREEN SEAL (GS)

GS-37 (2012) Cleaning Products for Industrial and Institutional Use

U.S. DEPARTMENT OF DEFENSE (DOD)

UFC 1-300-08 (2009, with Change 2) Criteria for Transfer and Acceptance of DoD Real Property

1.2 SUBMITTALS

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

SD-03 Product Data**As-Built Record of Equipment and Materials; G**

Two copies of the record listing the as-built materials and equipment incorporated into the construction of the project.

Warranty Management Plan

One set of the warranty management plan containing information relevant to the warranty of materials and equipment incorporated into the construction project, including the starting date of warranty of construction. Furnish with each warranty the name, address, and telephone number of each of the guarantor's representatives nearest to the project location.

Warranty Tags

Two record copies of the warranty tags showing the layout and design.

Final Cleaning

Two copies of the listing of completed final clean-up items.

Spare Parts Data

Two copies of list that indicates manufacturer's name, part number, nomenclature, and stock level recommended for maintenance and repair. List those items that may be standard to the normal maintenance of the system.

SD-08 Manufacturer's Instructions

Preventative Maintenance and **Inspection** schedules with instructions that state when systems should be retested.

Define within the schedule the anticipated length of each test, test apparatus, number of personnel identified by responsibility, and a testing validation procedure permitting the record operation capability requirements. On each test feature; e.g., gpm, rpm, psi, provide a signoff blank for the Contractor and Contracting Officer. Within a remarks column of the testing validation procedure include references to operating limits of time, pressure, temperature, volume, voltage, current, acceleration, velocity, alignment, calibration, adjustments, cleaning, or special system notes. Delineate procedures for preventative maintenance, condition monitoring (predictive testing) and inspection, adjustment, lubrication and cleaning necessary to prevent failure.

Posted Instructions

SD-10 Operation and Maintenance Data

Submit **Operation and Maintenance Manuals** in accordance with paragraph entitled, "Operation and Maintenance," of this section.

SD-11 Closeout Submittals

Record Drawings

Certification of EPA Designated Items; G

Interim Form DD1354; G

Checklist for Form DD1354; G

NAVFAC Sustainable & Energy Data Record Card; G

Installation Photos; G

Inspection Reports

Inspection Reports shall include all completed inspection reports produced during execution of an individual Delivery Order.

Test Reports

Test Reports shall include all completed test reports produced during execution of an individual Delivery Order.

1.3 PROJECT RECORD DOCUMENTS

1.3.1 Record Drawings

Drawings showing final as-built conditions of the project. This paragraph covers record drawings complete, as a requirement of the contract. The terms "drawings," "contract drawings," "drawing files," "working record drawings" and "final record drawings" refer to contract drawings which are revised to be used for final record drawings showing as-built conditions.

The final CAD record drawings must consist of one set of electronic CAD drawing files in AutoCAD 2010 DWG format, one set of mylar drawings, and one set of the approved working Record drawings.

1.3.1.1 Government Furnished Materials

One set of electronic CADD files in the specified software and format revised to reflect all bid amendments will be provided by the Government at the preconstruction conference for projects requiring CADD file record drawings.

1.3.1.2 Working Record and Final Record Drawings

Revise 2 sets of paper drawings by red-line process to show the as-built conditions during the prosecution of the project. Keep these working as-built marked drawings current on a weekly basis and at least one set available on the jobsite at all times. Changes from the contract plans which are made in the work or additional information which might be uncovered in the course of construction must be accurately and neatly recorded as they occur by means of details and notes. Prepare final record (as-built) drawings after the completion of each definable feature of work as listed in the Contractor Quality Control Plan (Foundations, Utilities, Structural Steel, etc., as appropriate for the project). The working as-built marked prints and final record (as-built) drawings will be jointly reviewed for accuracy and completeness by the Contracting Officer and the Contractor prior to submission of each monthly pay estimate. If the Contractor fails to maintain the working and final record drawings as specified herein, the Contracting Officer will deduct from the monthly progress payment an amount representing the estimated cost of maintaining the record drawings. This monthly deduction will continue until an agreement can be reached between the Contracting Officer and the Contractor regarding the accuracy and completeness of updated drawings. Show on the working and final record drawings, but not limited to, the following information:

- a. The actual location, plus or minus one foot, of all sub-surface utility lines. In order that the location of these lines and appurtenances may be determined in the event the surface openings or indicators become covered over or obscured, show by offset dimensions to two permanently fixed surface features the end of each run including each change in direction on the record drawings.

Locate valves, splice boxes and similar appurtenances by dimensioning along the utility run from a reference point. Also record the average depth below the surface of each run.

- b. Correct grade, elevations, cross section, or alignment of roads, earthwork, structures or utilities if any changes were made from

contract plans.

- c. Changes in details of design or additional information obtained from working drawings specified to be prepared and/or furnished by the Contractor; including but not limited to fabrication, erection, installation plans and placing details, pipe sizes, insulation material, dimensions of equipment foundations, etc.
- d. The topography, invert elevations and grades of drainage installed or affected as part of the project construction.
- e. Changes or modifications which result from the final inspection.
- f. Where contract drawings or specifications present options, show only the option selected for construction on the final as-built prints.
- g. Systems designed or enhanced by the Contractor, such as fire sprinkler and irrigation systems.
- h. Modifications (include within change order price the cost to change working and final record drawings to reflect modifications) and compliance with the following procedures.
 - (1) Follow directions in the modification for posting descriptive changes.
 - (2) Place a Modification Delta at the location of each deletion.
 - (3) For new details or sections which are added to a drawing, place a Modification Delta by the detail or section title.
 - (4) For minor changes, place a Modification Delta by the area changed on the drawing (each location).
 - (5) For major changes to a drawing, place a Modification Circle by the title of the affected plan, section, or detail at each location.
 - (6) For changes to schedules or drawings, place a Modification Delta either by the schedule heading or by the change in the schedule.
 - (7) The Modification Delta size shall be 1/2 inch diameter unless the area where the circle is to be placed is crowded. Smaller size circle shall be used for crowded areas.

1.3.1.3 Drawing Preparation

Modify the record drawings as may be necessary to correctly show the features of the project as it has been constructed by bringing the contract set into agreement with approved working as-built prints, and adding such additional drawings as may be necessary. These working as-built marked prints must be neat, legible and accurate. These drawings are part of the permanent records of this project and must be returned to the Contracting Officer after approval by the Government. Any drawings damaged or lost by the Contractor must be satisfactorily replaced by the Contractor at no expense to the Government.

1.3.1.4 Computer Aided Design and Drafting (CADD) Drawings

Only employ personnel proficient in the preparation of CADD drawings to

modify the contract drawings or prepare additional new drawings. Additions and corrections to the contract drawings must be equal in quality and detail to that of the originals. Line colors, line weights, lettering, layering conventions, and symbols must be the same as the original line colors, line weights, lettering, layering conventions, and symbols. If additional drawings are required, prepare them using the specified electronic file format applying the same graphic standards specified for original drawings. The title block and drawing border to be used for any new final record drawings must be identical to that used on the contract drawings. Accomplish additions and corrections to the contract drawings using CADD files. The Contractor will be furnished "as-designed" drawings in AutoCad Release 2010 format compatible with a Windows 7 operating system. The electronic files will be supplied either on optical disk (CD-ROM or DVD-ROM), or transmitted securely via AMRDEC SAFE file transfer system and a secure login and password will be provided to the contractor to access the files. Provide all program files and hardware necessary to prepare final record drawings. The Contracting Officer will review final record drawings for accuracy and return them to the Contractor for required corrections, changes, additions, and deletions.

- a. Provide CADD "base" colors of red, green, and blue. Color code for changes as follows:
 - (1) Deletions (Red) - Over-strike deleted graphic items (lines), lettering in notes and leaders.
 - (2) Additions (Green) - Added items, lettering in notes and leaders.
 - (3) Special (Blue) - Items requiring special information, coordination, or special detailing or detailing notes.
- b. Rename the Contract Drawing files in a manner related to the contract number (i.e., 98-C-10.DGN) as instructed in the Pre-Construction conference. Use only those renamed files for the Marked-up changes. All changes shall be made on the layer/level as the original item.
- c. When final revisions have been completed, show the wording "RECORD DRAWINGS / AS-BUILT CONDITIONS" followed by the name of the Contractor in letters at least $\frac{3}{16}$ inch high on the cover sheet drawing. Mark all other contract drawings either "Record" drawing denoting no revisions on the sheet or "Revised Record" denoting one or more revisions. Date original contract drawings in the revision block.
- d. Within 10 days (for contracts less than \$5 million) after Government approval of all of the working record drawings for a phase of work, prepare the final CADD record drawings for that phase of work and submit two sets of blue-lined prints of these drawings for Government review and approval. The Government will promptly return one set of prints annotated with any necessary corrections. Within 7 days (for contracts less than \$5 million) revise the CADD files accordingly at no additional cost and submit one set of final prints for the completed phase of work to the Government. Within 10 days (for contracts less than \$5 million) of substantial completion of all phases of work, submit the final record drawing package for the entire project. Submit one set of electronic files on optical disk (CD-ROM or DVD-ROM), one set of mylars, two sets of blue-line prints and one set of the approved working record drawings. They must be complete in all details and identical in form and function to the contract drawing files supplied by the Government. Any transactions or adjustments necessary to

accomplish this is the responsibility of the Contractor. The Government reserves the right to reject any drawing files it deems incompatible with the customer's CADD system. Paper prints, drawing files and storage media submitted will become the property of the Government upon final approval. Failure to submit final record drawing files and marked prints as specified will be cause for withholding any payment due the Contractor under this contract. Approval and acceptance of final record drawings must be accomplished before final payment is made to the Contractor.

1.3.1.5 Payment

No separate payment will be made for record drawings required under this contract, and all costs accrued in connection with such drawings are considered a subsidiary obligation of the Contractor.

1.3.2 SURVEY DATA AND DRAWING

If required by the individual task Order, provide surveying and survey data as described in attachment A. The intent for this item is to record by survey the actual Global Positioning System (GPS) location of the newly-installed pipelines and accessories. Surveys for Utility line installations shall be done in accordance with the current version of the "Minimum Standard Detail Requirements for ALTA/ACSM Land Title Surveys" as adopted by American Land Title Association and National Society of Professional Surveyors.

It is the further intent to be able to incorporate the survey data in the the Government Geographical Information System (GIS).

The location of the following items shall be surveyed and recorded on the as-built drawings and included in the electronic files:

- a. Elbow and fitting.
- b. Manholes. Manholes should be identified as 'sewer', 'air relief valve', 'air admittance valve', or as otherwise identified in the Individual Task Orders.
- c. Valve box lids.
- d. Corporation stops.
- e. Curb stops
- f. Meter pits.
- g. Hydrants.
- h. Splice (EXAMPLE: new AWWA PVC connected to old transite pipe)
- i. Pipeline location every 100' minimum.
- j. Inverts of all sewer manhole inlets and outlets (vertical accuracy +/- 1/2 inch)

See attachment A, "NAVFAC MIDWEST, Minimum Standards for Utility Line Surveys", for full details.

1.3.3 As-Built Record of Equipment and Materials

Furnish one copy of preliminary record of equipment and materials used on the project 15 days prior to final inspection. This preliminary submittal will be reviewed and returned 2 days after final inspection with Government comments. Submit Two sets of final record of equipment and materials 10 days after final inspection. Key the designations to the related area depicted on the contract drawings. List the following data:

| RECORD OF DESIGNATED EQUIPMENT AND MATERIALS DATA | | | | |
|---|-----------------------|--|----------------------|------------|
| Description | Specification Section | Manufacturer and Catalog, Model, and Serial Number | Composition and Size | Where Used |
| | | | | |

1.3.4 Final Approved Shop Drawings

Furnish final approved project shop drawings 30 days after transfer of the completed facility.

1.3.5 Construction Contract Specifications

Furnish final record (as-built) construction contract specifications, including modifications thereto, 30 days after transfer of the completed facility.

1.3.6 Real Property Equipment

Furnish a list of installed equipment furnished under this contract. Include all information usually listed on manufacturer's name plate. In the "EQUIPMENT-IN-PLACE LIST" include, as applicable, the following for each piece of equipment installed: description of item, location (by room number), model number, serial number, capacity, name and address of manufacturer, name and address of equipment supplier, condition, spare parts list, manufacturer's catalog, and warranty. Furnish a draft list at time of transfer. Furnish the final list 30 days after transfer of the completed facility.

1.4 SPARE PARTS DATA

For lift stations, indicate manufacturer's name, part number, nomenclature, and stock level required for maintenance and repair. List those items that may be standard to the normal maintenance of the system.

1.5 PREVENTATIVE MAINTENANCE

For lift station pumps and motors, submit Preventative Maintenance and Inspection schedules with instructions that state when systems should be retested.

- a. Define the anticipated length of each test, test apparatus, number of personnel identified by responsibility, and a testing validation procedure permitting the record operation capability requirements within the schedule. Provide a signoff blank for the Contractor and Contracting Officer for each test feature; e.g., gpm, rpm, psi. Include a remarks column for the testing validation procedure referencing operating limits of time, pressure, temperature, volume, voltage, current, acceleration, velocity, alignment, calibration, adjustments, cleaning, or special system notes. Delineate procedures for preventative maintenance, inspection, adjustment, lubrication and cleaning necessary to minimize corrective maintenance and repair.
- b. Repair requirements must inform operators how to check out, troubleshoot, repair, and replace components of the system. Include

electrical and mechanical schematics and diagrams and diagnostic techniques necessary to enable operation and troubleshooting of the system after acceptance.

1.6 CERTIFICATION OF EPA DESIGNATED ITEMS

Submit the [Certification of EPA Designated Items](#) as required by FAR 52.223-9, "Certification and Estimate of Percentage of Recovered Material Content for EPA Designated Items". Include on the certification form the following information: project name, project number, Contractor name, license number, Contractor address, and certification. The certification will read as follows and be signed and dated by the Contractor. "I hereby certify the information provided herein is accurate and that the requisition/procurement of all materials listed on this form comply with current EPA standards for recycled/recovered materials content. The following exemptions may apply to the non-procurement of recycled/recovered content materials: 1) The product does not meet appropriate performance standards; 2) The product is not available within a reasonable time frame; 3) The product is not available competitively (from two or more sources); 4) The product is only available at an unreasonable price (compared with a comparable non-recycled content product)." Recycled content values may be determined by weight or volume percent, but must be consistent throughout.

1.7 WARRANTY MANAGEMENT

1.7.1 [Warranty Management Plan](#)

Develop a warranty management plan which contains information relevant to the clause Warranty of Construction. Include within the warranty management plan all required actions and documents to assure that the Government receives all warranties to which it is entitled. The plan must be in narrative form and contain sufficient detail to render it suitable for use by future maintenance and repair personnel, whether tradesmen, or of engineering background, not necessarily familiar with this contract. The term "status" as indicated below must include due date and whether item has been submitted or was accomplished. Warranty information made available during the construction phase must be submitted to the Contracting Officer for approval prior to each monthly pay estimate. Assemble approved information in a binder and turn over to the Government upon acceptance of the work. The construction warranty period will begin on the date of project acceptance and continue for the full product warranty period. Include within the warranty management plan, but not limited to, the following:

- a. Roles and responsibilities of all personnel associated with the warranty process, including points of contact and telephone numbers within the organizations of the Contractors, subContractors, manufacturers or suppliers involved.
- b. Furnish with each warranty the name, address, and telephone number of each of the guarantor's representatives nearest to the project location.
- c. A list for each warranted equipment, item, feature of construction or system indicating:
 - (1) Name of item.
 - (2) Model and serial numbers.
 - (3) Location where installed.
 - (4) Name and phone numbers of manufacturers or suppliers.

- (5) Names, addresses and telephone numbers of sources of spare parts.
- (6) Warranties and terms of warranty. Include one-year overall warranty of construction, including the starting date of warranty of construction. Items which have extended warranties must be indicated with separate warranty expiration dates.
- (7) Cross-reference to warranty certificates as applicable.
- (8) Starting point and duration of warranty period.
- (9) Summary of maintenance procedures required to continue the warranty in force.
- (10) Cross-reference to specific pertinent Operation and Maintenance manuals.
- (11) Organization, names and phone numbers of persons to call for warranty service.
- (12) Typical response time and repair time expected for various warranted equipment.

1.7.2 Performance Bond

The Contractor's Performance Bond must remain effective throughout the construction period.

- a. In the event the Contractor fails to commence and diligently pursue any construction warranty work required, the Contracting Officer will have the work performed by others, and after completion of the work, will charge the remaining construction warranty funds of expenses incurred by the Government while performing the work, including, but not limited to administrative expenses.
- b. In the event sufficient funds are not available to cover the construction warranty work performed by the Government at the Contractor's expense, the Contracting Officer will have the right to recoup expenses from the bonding company.
- c. Following oral or written notification of required construction warranty repair work, respond in a timely manner. Written verification will follow oral instructions. Failure of the Contractor to respond will be cause for the Contracting Officer to proceed against the Contractor.

1.7.3 Warranty Tags

At the time of installation, tag each warranted item with a durable, oil and water resistant tag approved by the Contracting Officer. Attach each tag with a copper wire and spray with a silicone waterproof coating. Also, submit two record copies of the warranty tags showing the layout and design. The date of acceptance and the QC signature must remain blank until the project is accepted for beneficial occupancy. Show the following information on the tag.

| | |
|--------------------------|--|
| Type of product/material | |
| Model number | |
| Serial number | |
| Contract number | |

| | |
|---|--|
| Warranty period from/to | |
| Inspector's signature | |
| Construction Contractor | |
| Address | |
| Telephone number | |
| Warranty contact | |
| Address | |
| Telephone number | |
| Warranty response time priority code | |
| WARNING - PROJECT PERSONNEL TO PERFORM ONLY OPERATIONAL MAINTENANCE DURING THE WARRANTY PERIOD. | |

1.8 OPERATION AND MAINTENANCE MANUALS

Submit 4 copies of the project operation and maintenance manuals 30 calendar days prior to testing the system involved. Update and resubmit data for final approval no later than 30 calendar days prior to contract completion.

1.8.1 Configuration

Operation and Maintenance Manuals must be consistent with the manufacturer's standard brochures, schematics, printed instructions, general operating procedures, and safety precautions. Bind information in manual format and grouped by technical sections. Test data must be legible and of good quality. Light-sensitive reproduction techniques are acceptable provided finished pages are clear, legible, and not subject to fading. Pages for vendor data and manuals must have 0.3937-inch holes and be bound in 3-ring, loose-leaf binders. Organize data by separate index and tabbed sheets, in a loose-leaf binder. Binder must lie flat with printed sheets that are easy to read. Caution and warning indications must be clearly labeled.

1.8.2 Training and Instruction

Submit classroom and field instructions in the operation and maintenance of systems equipment where required by the technical provisions. These services must be directed by the Contractor, using the manufacturer's factory-trained personnel or qualified representatives. Contracting Officer will be given 7 calendar days written notice of scheduled instructional services. Instructional materials belonging to the manufacturer or vendor, such as lists, static exhibits, and visual aids, must be made available to the Contracting Officer.

1.9 CLEANUP

Provide final cleaning in accordance with ASTM E1971. Leave premises

"broom clean." Comply with **GS-37** for general purpose cleaning and bathroom cleaning. Use only nonhazardous cleaning materials, including natural cleaning materials, in the final cleanup. Clean interior and exterior glass surfaces exposed to view; remove temporary labels, stains and foreign substances; polish transparent and glossy surfaces; vacuum carpeted and soft surfaces. Clean equipment and fixtures to a sanitary condition. Replace filters of operating equipment and comply with the Indoor Air Quality (IAQ) Management Plan. Clean debris from roofs, gutters, downspouts and drainage systems. Sweep paved areas and rake clean landscaped areas. Remove waste and surplus materials, rubbish and construction facilities from the site. Recycle, salvage, and return construction and demolition waste from project in accordance with the Waste Management Plan. Promptly and legally transport and dispose of any trash. Do not burn, bury, or otherwise dispose of trash on the project site.

1.10 REAL PROPERTY RECORD

Near the completion of Project, but a minimum of 60 days prior to final acceptance of the work, complete, update draft DD Form 1354 attached to this section, and submit an accounting of all installed property with **Interim Form DD1354** "Transfer and Acceptance of Military Real Property." Include any additional assets/improvements/alterations from the Draft DD Form 1354. Contact the Contracting Officer for any project specific information necessary to complete the DD Form 1354. Refer to **UFC 1-300-08** for instruction on completing the DD Form 1354. For information purposes, a blank DD Form 1354 (fill-able) in ADOBE (PDF) may be obtained at the following web site:

<http://www.dtic.mil/whs/directives/infomgt/forms/eforms/dd1354.pdf>

Submit the completed **Checklist for Form DD1354** of Installed Building Equipment items. Attach this list to the updated DD Form 1354.

1.11 NAVFAC SUSTAINABLE & ENERGY DATA RECORD CARD

Within 60 days of the completion of Project, complete an electronic copy of the NAVFAC Sustainable & Energy Data Record Card, and submit to the Contracting Officer. Draft Record card for this project should be available from Designer of Record (DOR) or Contracting Officer.

Instructions and a blank DD Form (fill-able) in ADOBE (PDF) may be obtained at the Whole Building Design Guide web site by navigating:

Home > Participating Agencies > Department of Defense (DoD) > NAVFAC Sustainable Development Program > Contract Documents > NAVFAC Sustainable & Energy Data Record Card; or directly at

http://www.wbdg.org/pdfs/navfac_sustainable_energy_data_record_card.pdf.

1.12 INSTALLATION PHOTOS

Provide at least 2 Installation Photos of each item listed in the specifications after installation and prior to burial (thrust blocks, valves, and hydrants. Clearly indicate in the photo (by storyboard or fitting number) where the thrust block is located. Photos to be provided as digital media (CD ROM or DVD ROM) in JPG format, minimum 4 megapixels.

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 Review and Approval

The Government's Commissioning Authority shall review the commissioned systems and equipment submittals for completeness and applicability. The Government shall verify that the systems and equipment provided meet the requirements of the Contract documents and design intent, particularly as they relate to functionality, energy performance, water performance, maintainability, sustainability, system cost, and local environmental impacts. This work shall be in addition to the normal review procedures for O&M data.

1.1.5 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 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 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 **for the installed model and features of each system.**

1.2.3.1 Troubleshooting Guides and Diagnostic Techniques

Include step-by-step procedures to promptly isolate the cause of typical malfunctions. Describe clearly why the checkout is performed and what conditions are to be sought. Identify tests or inspections and test equipment required to determine whether parts and equipment may be reused or require replacement.

1.2.3.2 Wiring Diagrams and Control Diagrams

Wiring diagrams and control diagrams shall be point-to-point drawings of wiring and control circuits including factory-field interfaces. Provide a complete and accurate depiction of the actual job specific wiring and control work. On diagrams, number electrical and electronic wiring and pneumatic control tubing and the terminals for each type, identically to actual installation configuration and numbering.

1.2.3.3 Maintenance and Repair Procedures

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

1.2.3.4 Removal and Replacement Instructions

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

1.2.3.5 Spare Parts and Supply Lists

Include lists of spare parts and supplies required for maintenance and repair to ensure continued service or operation without unreasonable delays. Special consideration is required for facilities at remote locations. List spare parts and supplies that have a long lead-time to obtain.

1.2.4 Corrective Maintenance Work-Hours

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

1.2.5 Appendices

Provide information required below and information not specified in the preceding paragraphs but pertinent to the maintenance or operation of the product or equipment. Include the following:

1.2.5.1 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 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 TYPES OF INFORMATION REQUIRED IN CONTROLS O&M DATA PACKAGES

Include Data Package 3 and the following for lift stations:

- a. Narrative description on how to perform and apply all functions, features, modes, and other operations, including manual operation and alarms.
- b. Full as-built sequence of operations.
- c. Copies of all checkout tests and calibrations performed by the Contractor (not Cx tests).

1.4 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:

1.4.1 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

1.4.2 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
- h. Removal and replacement instructions
- i. Spare parts and supply list
- j. Parts identification
- k. Warranty information
- l. Contractor information

1.4.3 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

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 02 41 00

DEMOLITION
05/10

PART 1 GENERAL

1.1 REFERENCES

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

AIR-CONDITIONING, HEATING AND REFRIGERATION INSTITUTE (AHRI)

AHRI Guideline K (2009) Guideline for Containers for Recovered Non-Flammable Fluorocarbon Refrigerants

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO M 145 (1991; R 2008) Standard Specification for Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes

AASHTO T 180 (2010) Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop

AMERICAN SOCIETY OF SAFETY ENGINEERS (ASSE/SAFE)

ASSE/SAFE A10.6 (2006) Safety Requirements for Demolition Operations

U.S. ARMY CORPS OF ENGINEERS (USACE)

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

U.S. DEFENSE LOGISTICS AGENCY (DLA)

DLA 4145.25 (Jun 2000; Reaffirmed Oct 2010) Storage and Handling of Liquefied and Gaseous Compressed Gases and Their Full and Empty Cylinders
<http://www.aviation.dla.mil/UserWeb/aviationengineering/>

U.S. DEPARTMENT OF DEFENSE (DOD)

DOD 4000.25-1-M (2006) MILSTRIP - Military Standard Requisitioning and Issue Procedures

MIL-STD-129 (2014; Rev R) Military Marking for Shipment and Storage

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

| | |
|----------------|--|
| 40 CFR 61 | National Emission Standards for Hazardous Air Pollutants |
| 40 CFR 82 | Protection of Stratospheric Ozone |
| 49 CFR 173.301 | Shipment of Compressed Gases in Cylinders and Spherical Pressure Vessels |

1.2 PROJECT DESCRIPTION

1.2.1 Demolition Plan

Prepare a [Demolition Plan](#) and submit proposed salvage, demolition, and removal procedures for approval before work is started. Include in the plan procedures for careful removal and disposition of materials specified to be salvaged, coordination with other work in progress, a disconnection schedule of utility services, a detailed description of methods and equipment to be used for each operation and of the sequence of operations. [Identify components and materials to be salvaged for reuse or recycling with reference to paragraph Existing Facilities to be Removed. Append tracking forms for all removed materials indicating type, quantities, condition, destination, and end use.](#) Coordinate with Waste Management Plan. Provide procedures for safe conduct of the work in accordance with [EM 385-1-1](#). Plan shall be approved by Contracting Officer prior to work beginning.

1.2.2 General Requirements

Do not begin demolition or deconstruction until authorization is received from the Contracting Officer. [The work of this section is to be performed in a manner that maximizes the value derived from the salvage and recycling of materials.](#) The work includes demolition,, salvage of identified items and materials, and removal of resulting rubbish and debris. Remove rubbish and debris from Government property daily, unless otherwise directed. Store materials that cannot be removed daily in areas specified by the Contracting Officer. In the interest of occupational safety and health, perform the work in accordance with [EM 385-1-1](#), Section 23, Demolition, and other applicable Sections.

1.3 ITEMS TO REMAIN IN PLACE

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

1.3.1 Existing Construction Limits and Protection

Do not disturb existing construction beyond the extent indicated or

necessary for installation of new construction. Provide temporary shoring and bracing for support of building components to prevent settlement or other movement. Provide protective measures to control accumulation and migration of dust and dirt in all work areas. Remove snow, dust, dirt, and debris from work areas daily.

1.3.2 Weather Protection

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

1.3.3 Trees

Protect trees within the project site which might be damaged during demolition or deconstruction, and which are indicated to be left in place, by a 6 foot high fence. Erect and secure fence a minimum of 5 feet from the trunk of individual trees or follow the outer perimeter of branches or clumps of trees. Replace any tree designated to remain that is damaged during the work under this contract with like-kind or as approved by the Contracting Officer.

1.3.4 Utility Service

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

1.3.5 Facilities

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

1.4 BURNING

The use of burning at the project site for the disposal of refuse and debris will not be permitted. Where burning is permitted, adhere to federal, state, and local regulations.

1.5 AVAILABILITY OF WORK AREAS

Areas in which the work is to be accomplished will be coordinated with each separate Delivery Order.

1.6 SUBMITTALS

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

SD-01 Preconstruction Submittals

Demolition Plan; G
Existing Conditions

SD-07 Certificates

Notification; G

1.7 QUALITY ASSURANCE

Submit 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. Comply with federal, state, and local hauling and disposal regulations. In addition to the requirements of the "Contract Clauses," conform to the safety requirements contained in ASSE/SAFE A10.6. Comply with the Environmental Protection Agency requirements specified. Use of explosives will not be permitted.

1.7.1 Dust and Debris Control

Prevent the spread of dust and debris 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 vehicles.

1.8 PROTECTION

1.8.1 Traffic Control Signs

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

1.8.2 Protection of Personnel

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

1.9 RELOCATIONS

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

1.10 EXISTING CONDITIONS

Before beginning any demolition or deconstruction work, survey the site and examine the drawings and specifications to determine the extent of the work. Record existing conditions in the presence of the Contracting Officer showing the condition of structures and other facilities adjacent to areas of alteration or removal. Photographs sized 4 inch will be acceptable as a record of existing conditions. Include in the record the elevation of the top of foundation walls, finish floor elevations, possible conflicting electrical conduits, plumbing lines, alarms systems, the location and extent of existing cracks and other damage and description of surface conditions that exist prior to before starting work. It is the Contractor's responsibility to verify and document all required outages which will be required during the course of work, and to note these outages on the record document. Submit survey results.

PART 2 PRODUCTS

2.1 FILL MATERIAL

- a. Comply with excavating, backfilling, and compacting procedures for soils used as backfill material to fill basements, voids, depressions or excavations resulting from demolition or deconstruction of structures. *Fill material shall be waste products from demolition or deconstruction until all waste appropriate for this purpose is consumed.*
- b. Fill material shall conform to the definition of satisfactory soil material as defined in *AASHTO M 145*, Soil Classification Groups A-1, A-2-4, A-2-5 and A-3. In addition, fill material shall be free from roots and other organic matter, trash, debris, frozen materials, and stones larger than 2 inches in any dimension.
- c. Proposed fill material must be sampled and tested by an approved soil testing laboratory, as follows:

| | |
|----------------------------|-------------------------------------|
| Soil classification | <i>AASHTO M 145</i> |
| Moisture-density relations | <i>AASHTO T 180</i> , Method B or D |

PART 3 EXECUTION

3.1 EXISTING FACILITIES TO BE REMOVED

Inspect and evaluate existing structures onsite for reuse. Existing construction scheduled to be removed for reuse shall be disassembled. Dismantled and removed materials are to be separated, set aside, and prepared as specified, and stored or delivered to a collection point for reuse, remanufacture, recycling, or other disposal, as specified. Materials shall be designated for reuse onsite whenever possible.

3.1.1 Structures

- a. Unless noted otherwise in Individual Delivery Orders: Remove existing structures indicated to be removed to the bottom of the foundation. Remove sidewalks, curbs, gutters and street light bases as indicated.
- b. Demolish structures in a systematic manner from the top of the structure to the ground. Complete demolition work above each tier or floor before the supporting members on the lower level are disturbed. Demolish concrete and masonry walls in small sections. Remove structural framing members and lower to ground by means of derricks, platforms hoists, or other suitable methods as approved by the Contracting Officer.
- c. Locate demolition and deconstruction equipment throughout the structure and remove materials so as to not impose excessive loads to supporting walls, floors, or framing.

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 but are not indicated on the drawings, notify the Contracting Officer prior to further work in that area. Remove meters and related equipment and deliver to a location on the station in accordance with instructions of the Contracting Officer.

3.1.3 Chain Link Fencing

Remove chain link fencing, gates and other related salvaged items scheduled for removal and transport to designated areas. Remove gates as whole units. Cut chain link fabric to 25 foot lengths and store in rolls off the ground.

3.1.4 Paving and Slabs

Remove sawcut concrete and asphaltic concrete paving and slabs to prevent damage to adjacent paving to remain. Provide neat sawcuts at limits of pavement removal as indicated. Pavement and slabs not to be used in this project shall be removed from the Installation at Contractor's expense.

3.1.5 Masonry

Sawcut and remove masonry so as to prevent damage to surfaces to remain and to facilitate the installation of new work. Where new masonry adjoins existing, the new work shall abut or tie into the existing construction as

specified for the new work. Provide square, straight edges and corners where existing masonry adjoins new work and other locations.

3.1.6 Concrete

Saw concrete along straight lines to a depth of a minimum 2 inch. Make each cut in walls perpendicular to the face and in alignment with the cut in the opposite face. Break out the remainder of the concrete provided that the broken area is concealed in the finished work, and the remaining concrete is sound. At locations where the broken face cannot be concealed, grind smooth or saw cut entirely through the concrete. Salvage removed concrete.

3.1.7 Patching

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

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

3.1.8 Air Conditioning Equipment

Remove air conditioning, refrigeration, and other equipment containing refrigerants without releasing chlorofluorocarbon refrigerants to the atmosphere in accordance with the Clean Air Act Amendment of 1990.

Recover all refrigerants prior to removing air conditioning, refrigeration, and other equipment containing refrigerants and dispose of in accordance with the paragraph entitled "Disposal of Ozone Depleting Substance (ODS)." Turn in salvaged Class I ODS refrigerants as specified in paragraph, "Salvaged Materials and Equipment."

3.1.9 Cylinders and Canisters

Remove all fire suppression system cylinders and canisters and dispose of in accordance with the paragraph entitled "Disposal of Ozone Depleting Substance (ODS)."

3.1.10 Locksets on Swinging Doors

Remove all locksets from all swinging doors indicated to be removed and disposed of. Deliver the locksets and related items to a designated location for receipt by the Contracting Officer after removal.

3.1.11 Items With Unique/Regulated Disposal Requirements

Remove and dispose of items with unique or regulated disposal requirements in the manner dictated by law or in the most environmentally responsible manner.

3.2 CONCURRENT EARTH-MOVING OPERATIONS

Do not begin excavation, filling, and other earth-moving operations that are sequential to demolition or deconstruction work in areas occupied by structures to be demolished or deconstructed until all demolition and deconstruction in the area has been completed and debris removed. Fill holes, open basements and other hazardous openings.

3.3 DISPOSITION OF MATERIAL

3.3.1 Title to Materials

Except for salvaged items specified in related Sections, and for materials or equipment scheduled for salvage, all materials and equipment removed and not reused or salvaged, shall become the property of the Contractor and shall be removed from Government property. Title to materials resulting from demolition and deconstruction, and materials and equipment to be removed, is vested in the Contractor upon approval by the Contracting Officer of the Contractor's demolition, deconstruction, and removal procedures, and authorization by the Contracting Officer to begin demolition and deconstruction. The Government will not be responsible for the condition or loss of, or damage to, such property after contract award. Showing for sale or selling materials and equipment on site is prohibited.

3.3.2 Reuse of Materials and Equipment

Remove and store materials and equipment that are indicated in the individual Delivery Orders to be reused or relocated to prevent damage, and reinstall as the work progresses.

3.3.3 Salvaged Materials and Equipment

Remove materials and equipment that are that are indicated in the individual Delivery Orders to be removed by the Contractor and that are to remain the property of the Government, and deliver to a storage site, as directed in the individual Delivery Orders.

- a. Salvage items and material to the maximum extent possible.
- b. Store all materials salvaged for the Contractor as approved by the Contracting Officer and remove from Government property before completion of the contract. On site sales of salvaged material is prohibited.
- c. Remove salvaged items to remain the property of the Government in a manner to prevent damage, and packed or crated to protect the items from damage while in storage or during shipment. Items damaged during removal or storage must be repaired or replaced to match existing items. Properly identify the contents of containers.
- d. Historical items if discovered (Corner stones, contents of corner stones, and document boxes wherever located on the site) are to be left in place and the Contracting Officer is to notified immediatly. Within 24 hours the contracting Officer will direct the contractor as to the dispostion and delivery of the items to an on-site location.

3.3.4 Disposal of Ozone Depleting Substance (ODS)

Class I and Class II ODS are defined in Section, 602(a) and (b), of The Clean Air Act. Prevent discharge of Class I and Class II ODS to the atmosphere. Place recovered ODS in cylinders meeting [AHRI Guideline K](#) suitable for the type ODS (filled to no more than 80 percent capacity) and provide appropriate labeling. Recovered ODS shall be indicated in the individual Delivery Orders. Products, equipment and appliances containing ODS in a sealed, self-contained system (e.g. residential refrigerators and window air conditioners) shall be disposed of in accordance with [40 CFR 82](#).

3.3.4.1 Special Instructions

No more than one type of ODS is permitted in each container. A warning/hazardous label shall be applied to the containers in accordance with Department of Transportation regulations. All cylinders including but not limited to fire extinguishers, spheres, or canisters containing an ODS shall have a tag with the following information:

- a. Activity name and unit identification code
- b. Activity point of contact and phone number
- c. Type of ODS and pounds of ODS contained
- d. Date of shipment
- e. National stock number (for information, call (804) 279-4525).

3.3.4.2 Fire Suppression Containers

Deactivate fire suppression system cylinders and canisters with electrical charges or initiators prior to shipment. Also, safety caps must be used to cover exposed actuation mechanisms and discharge ports on these special cylinders.

3.3.5 Transportation Guidance

Ship all ODS containers in accordance with [MIL-STD-129](#), [DLA 4145.25](#) (also referenced one of the following: Army Regulation 700-68, Naval Supply Instruction 4440.128C, Marine Corps Order 10330.2C, and Air Force Regulation 67-12), [49 CFR 173.301](#), and [DOD 4000.25-1-M](#).

3.3.6 Unsalvageable and Non-Recyclable Material

Dispose of unsalvageable and non-recyclable noncombustible material off-site.

3.4 CLEANUP

Remove debris and rubbish from basement and similar excavations. Remove and transport the debris in a manner that prevents spillage on streets or adjacent areas. Apply local regulations regarding hauling and disposal.

3.5 DISPOSAL OF REMOVED MATERIALS

3.5.1 Regulation of Removed Materials

Dispose of debris, rubbish, scrap, and other nonsalvageable materials resulting from removal operations with all applicable federal, state and local regulations as contractually specified off the base.

3.5.2 Burning on Government Property

Burning of materials removed from demolished and deconstructed structures will not be permitted on Government property.

3.5.3 Removal to Spoil Areas on Government Property

Transport noncombustible materials removed from demolition and deconstruction structures to designated spoil areas on Government property as specified in the individual Delivery Orders.

3.5.4 Removal from Government Property

Transport waste materials removed from demolished and deconstructed structures, except waste soil, from Government property for legal disposal. Dispose of waste soil as directed.

3.6 REUSE OF SALVAGED ITEMS

Recondition salvaged materials and equipment designated for reuse before installation. Replace items damaged during removal and salvage operations or restore them as necessary to usable condition.

-- End of Section --

SECTION 02 82 16.00 20

ENGINEERING CONTROL OF ASBESTOS CONTAINING MATERIALS

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 Z88.2 (1992) Respiratory Protection
- ANSI Z9.2 (2001) Fundamentals Governing the Design and Operation of Local Exhaust Ventilation Systems

ASTM INTERNATIONAL (ASTM)

- ASTM C 732 (2006) Aging Effects of Artificial Weathering on Latex Sealants
- ASTM D 1331 (1989; R 2001) Surface and Interfacial Tension of Solutions of Surface-Active Agents
- ASTM D 2794 (1993; R 2004) Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
- ASTM D 522 (1993a; R 2008) Mandrel Bend Test of Attached Organic Coatings
- ASTM E 119 (2008a) Standard Test Methods for Fire Tests of Building Construction and Materials
- ASTM E 1368 (2005e1) Visual Inspection of Asbestos Abatement Projects
- ASTM E 736 (2000; R 2006) Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members
- ASTM E 84 (2009a) Standard Test Method for Surface Burning Characteristics of Building Materials
- ASTM E 96/E 96M (2005) Standard Test Methods for Water Vapor Transmission of Materials

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

- EPA 560/5-85-024 (1985) Guidance for Controlling

Asbestos-Containing Materials in Buildings
(Purple Book)

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

- 29 CFR 1926.103 Respiratory Protection
- 29 CFR 1926.1101 Asbestos
- 29 CFR 1926.200 Accident Prevention Signs and Tags
- 29 CFR 1926.51 Sanitation
- 29 CFR 1926.59 Hazard Communication
- 40 CFR 61-SUBPART A General Provisions
- 40 CFR 61-SUBPART M National Emission Standard for Asbestos
- 40 CFR 763 Asbestos

U.S. NAVAL FACILITIES ENGINEERING COMMAND (NAVFAC)

- ND OPNAVINST 5100.23 (Rev G) Navy Occupational Safety and Health (NAVOSH) Program Manual

UNDERWRITERS LABORATORIES (UL)

- UL 586 (1996; Rev thru Aug 2008) Standard for High-Efficiency Particulate, Air Filter Units

1.2 DEFINITIONS

1.2.1 ACM

Asbestos Containing Materials.

1.2.2 Amended Water

Water containing a wetting agent or surfactant with a maximum surface tension of 29 dynes per centimeter when tested in accordance with ASTM D 1331.

1.2.3 Area Sampling

Sampling of asbestos fiber concentrations which approximates the concentrations of asbestos in the theoretical breathing zone but is not actually collected in the breathing zone of an employee.

1.2.4 Asbestos

The term asbestos includes chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, and actinolite asbestos and any of these minerals that has been chemically treated or altered. Materials are considered to contain asbestos if the asbestos content of the material is determined to be at least one percent.

1.2.5 Asbestos Control Area

That area where asbestos removal operations are performed which is isolated by physical boundaries which assist in the prevention of the uncontrolled release of asbestos dust, fibers, or debris.

1.2.6 Asbestos Fibers

Those fibers having an aspect ratio of at least 3:1 and longer than 5 micrometers as determined by National Institute for Occupational Safety and Health (NIOSH) Method 7400.

1.2.7 Asbestos Permissible Exposure Limit

0.1 fibers per cubic centimeter of air as an 8-hour time weighted average measured in the breathing zone as defined by 29 CFR 1926.1101 or other Federal legislation having legal jurisdiction for the protection of workers health.

1.2.8 Background

The ambient airborne asbestos concentration in an uncontaminated area as measured prior to any asbestos hazard abatement efforts. Background concentrations for other (contaminated) areas are measured in similar but asbestos free locations.

1.2.9 Contractor

The Contractor is that individual, or entity under contract to the Navy to perform the herein listed work.

1.2.10 Competent Person

A person meeting the requirements for competent person as specified in 29 CFR 1926.1101 including a person capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure, who has the authority to take prompt corrective measures to eliminate them, and is specifically trained in a training course which meet the criteria of EPA's Model Accreditation Plan (40 CFR 763) for project designer or supervisor, or its equivalent. The competent person shall have a current State of Indian asbestos contractors or supervisors license.

1.2.11 Encapsulation

The abatement of an asbestos hazard through the appropriate use of chemical encapsulants.

1.2.12 Encapsulants

Specific materials in various forms used to chemically or physically entrap asbestos fibers in various configurations to prevent these fibers from becoming airborne. There are four types of encapsulants as follows which must comply with performance requirements as specified herein.

- a. Removal Encapsulant (can be used as a wetting agent)
- b. Bridging Encapsulant (used to provide a tough, durable surface coating to asbestos containing material)

- c. Penetrating Encapsulant (used to penetrate the asbestos containing material encapsulating all asbestos fibers and preventing fiber release due to routine mechanical damage)
- d. Lock-Down Encapsulant (used to seal off or "lock-down" minute asbestos fibers left on surfaces from which asbestos containing material has been removed).

1.2.13 Friable Asbestos Material

One percent asbestos containing material that can be crumbled, pulverized, or reduced to powder by hand pressure when dry.

1.2.14 Glovebag Technique

Those asbestos removal and control techniques put forth in [29 CFR 1926.1101](#) Appendix G.

1.2.15 HEPA Filter Equipment

High efficiency particulate air (HEPA) filtered vacuum and/or exhaust ventilation equipment with a filter system capable of collecting and retaining asbestos fibers. Filters shall retain 99.97 percent of particles 0.3 microns or larger as indicated in [UL 586](#).

1.2.16 Navy Consultant (NC)

That qualified person employed directly by the Government to monitor, sample, inspect the work or in some other way advise the Contracting Officer. The NC is normally a private consultant, but can be an employee of the Government.

1.2.17 Negative Pressure Enclosure (NPE)

That engineering control technique described as a negative pressure enclosure in [29 CFR 1926.1101](#).

1.2.18 Nonfriable Asbestos Material

Material that contains asbestos in which the fibers have been immobilized by a bonding agent, coating, binder, or other material so that the asbestos is well bound and will not normally release asbestos fibers during any appropriate use, handling, storage or transportation. It is understood that asbestos fibers may be released under other conditions such as demolition, removal, or mishap.

1.2.19 Personal Sampling

Air sampling which is performed to determine asbestos fiber concentrations within the breathing zone of a specific employee, as performed in accordance with [29 CFR 1926.1101](#).

1.2.20 Private Qualified Person (PQP)

That qualified person hired by the Contractor to perform the herein listed tasks.

1.2.21 Qualified Person (QP)

A Registered Architect, Professional Engineer, Certified Industrial Hygienist, consultant or other qualified person who has successfully completed training and is therefore accredited under a legitimate State Model Accreditation Plan as described in [40 CFR 763](#) as a Building Inspector, Contractor/Supervisor Abatement Worker, and Asbestos Project Designer; and has successfully completed the National Institute of Occupational Safety and Health (NIOSH) 582 course "Sampling and Evaluating Airborne Asbestos Dust" or equivalent. The QP must be qualified to perform visual inspections as indicated in [ASTM E 1368](#). The QP shall be appropriately licensed in the State of Indiana.

1.2.22 TEM

Refers to Transmission Electron Microscopy.

1.2.23 Time Weighted Average (TWA)

The TWA is an 8-hour time weighted average airborne concentration of asbestos fibers.

1.2.24 Wetting Agent

A chemical added to water to reduce the water's surface tension thereby increasing the water's ability to soak into the material to which it is applied. An equivalent wetting agent must have a surface tension of at most [29 dynes per centimeter](#) when tested in accordance with [ASTM D 1331](#).

1.3 REQUIREMENTS

1.3.1 Description of Work

If areas and materials that contain Asbestos are identified in the individual Task Order Scopes of work, then an Asbestos Compliance Plan for that Task Order will be prepared and the requirements of this specification will be followed.

While every effort to locate asbestos will be made, if suspect material is found during the work, the contractor is to stop work and inform the Contracting Officer.

The work covered by this section includes the handling and control of asbestos containing materials and describes some of the resultant procedures and equipment required to protect workers, the environment and occupants of the building or area, or both, from contact with airborne asbestos fibers. The work also includes the disposal of any asbestos containing materials generated by the work. More specific operational procedures shall be outlined in the Asbestos Hazard Abatement Plan called for elsewhere in this specification.

The asbestos work may include the demolition and removal or encapsulation of Asbestos materials which is governed by [40 CFR 763](#). Under normal conditions non-friable or chemically bound materials containing asbestos would not be considered hazardous; however, this material may release airborne asbestos fibers during demolition and removal and therefore must be handled in accordance with the removal and disposal procedures as specified herein. Depending on the scope, the Navy may evacuate the building or work area during the asbestos abatement work. All asbestos

removal work shall be supervised by a competent person as specified herein.

1.3.2 Medical Requirements

Provide medical requirements including but not limited to medical surveillance and medical record keeping as listed in [29 CFR 1926.1101](#).

1.3.2.1 Medical Examinations

Before exposure to airborne asbestos fibers, provide workers with a comprehensive medical examination as required by [29 CFR 1926.1101](#) or other pertinent State or local directives. This requirement must have been satisfied within the 12 months prior to the start of work on this contract. The same medical examination shall be given on an annual basis to employees engaged in an occupation involving asbestos and within 30 calendar days before or after the termination of employment in such occupation. Specifically identify x-ray films of asbestos workers to the consulting radiologist and mark medical record jackets with the word "ASBESTOS."

1.3.2.2 Medical Records

Maintain complete and accurate records of employees' medical examinations, medical records, and exposure data for a period of 50 years after termination of employment and make records of the required medical examinations and exposure data available for inspection and copying to: The Assistant Secretary of Labor for Occupational Safety and Health (OSHA), or authorized representatives of them, and an employee's physician upon the request of the employee or former employee.

1.3.3 Employee Training

Submit certificates, prior to the start of work but after the main abatement submittal, signed by each employee indicating that the employee has received training in the proper handling of materials and wastes that contain asbestos in accordance with [40 CFR 763](#); understands the health implications and risks involved, including the illnesses possible from exposure to airborne asbestos fibers; understands the use and limits of the respiratory equipment to be used; and understands the results of monitoring of airborne quantities of asbestos as related to health and respiratory equipment as indicated in [29 CFR 1926.1101](#) on an initial and annual basis. Certificates shall be organized by individual worker, not grouped by type of certification. Post appropriate evidence of compliance with the training requirements of [40 CFR 763](#). Train all personnel involved in the asbestos control work in accordance with United States Environmental Protection Agency (USEPA) Asbestos Hazard Emergency Response Act (AHERA) training criteria or State training criteria whichever is more stringent. The Contractor shall document the training by providing: dates of training, training entity, course outline, names of instructors, and qualifications of instructors upon request by the Contracting Officer. Furnish each employee with respirator training and fit testing administered by the PQP as required by [29 CFR 1926.1101](#). Fully cover engineering and other hazard control techniques and procedures. All asbestos workers shall have a current State of Indiana asbestos worker's license.

1.3.4 Permits, Licenses, and Notifications

Obtain necessary [permits and licenses](#) in conjunction with asbestos removal, encapsulation, hauling, and disposition, and furnish notification of such

actions required by Federal, State, regional, and local authorities prior to the start of work. Notify the Indiana Department of Environmental management and the Contracting Officer in writing 20 working days prior to commencement of work in accordance with [40 CFR 61-SUBPART M](#). Notify the Contracting Officer and other appropriate Government agencies in writing 10 working days prior to the start of asbestos work as indicated in applicable laws, ordinances, criteria, rules, and regulations. Submit copies of all [Notifications](#) to the Contracting Officer.

1.3.5 Environment, Safety and Health Compliance

In addition to detailed requirements of this specification, comply with those applicable laws, ordinances, criteria, rules, and regulations of Federal, State, regional, and local authorities regarding handling, storing, transporting, and disposing of asbestos waste materials. Comply with the applicable requirements of the current issue of [29 CFR 1926.1101](#), [40 CFR 61-SUBPART A](#), [40 CFR 61-SUBPART M](#), and [ND OPNAVINST 5100.23](#). Submit matters of interpretation of standards to the appropriate administrative agency for resolution before starting the work. Where the requirements of this specification, applicable laws, rules, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirement as defined by the Government shall apply. The following laws, ordinances, criteria, rules and regulations regarding removal, handling, storing, transporting and disposing of asbestos materials apply:

- a. IDEM 326 IAC 18 & all other State of Indiana solid waste requirements for asbestos.

1.3.6 Respiratory Protection Program

Establish and implement a respirator program as required by [ANSI Z88.2](#), [29 CFR 1926.1101](#), and [29 CFR 1926.103](#). Submit a written description of the program to the Contracting Officer. Submit a written program manual or operating procedure including methods of compliance with regulatory statutes.

1.3.6.1 Respirator Program Records

Submit records of the respirator program as required by [ANSI Z88.2](#), [29 CFR 1926.103](#), and [29 CFR 1926.1101](#).

1.3.7 Asbestos Hazard Control Supervisor

The Contractor shall be represented on site by a supervisor, trained using the model Contractor accreditation plan as indicated in the Federal statutes for all portions of the herein listed work.

1.3.8 Hazard Communication

Adhere to all parts of [29 CFR 1926.59](#) and provide the Contracting Officer with a copy of the [Material Safety Data Sheets \(MSDS\)](#) for all materials brought to the site.

1.3.9 Asbestos Hazard Abatement Plan

Submit a detailed plan of the safety precautions such as lockout, tagout, tryout, fall protection, and confined space entry procedures and equipment and work procedures to be used in the encapsulation, removal, and demolition of materials containing asbestos.

The plan, not to be combined with other hazard abatement plans, shall be prepared, signed, and sealed by the PQP. Provide a Table of Contents for each abatement submittal, which shall follow the sequence of requirements in the contract. Such plan shall include but not be limited to the precise personal protective equipment to be used including, but not limited to, respiratory protection, type of whole-body protection and if reusable coveralls are to be employed decontamination methods (operations and quality control plan), the location of asbestos control areas including clean and dirty areas, buffer zones, showers, storage areas, change rooms, removal and/or encapsulation method, interface of trades involved in the construction, sequencing of asbestos related work, disposal plan, type of wetting agent and asbestos sealer to be used, locations of local exhaust equipment, planned air monitoring strategies, and a detailed description of the method to be employed in order to control environmental pollution.

The plan shall also include (both fire and medical emergency) response plans. The Asbestos Hazard Abatement Plan must be approved in writing prior to starting any asbestos work. The Contractor, Asbestos Hazard Control Supervisor, and PQP shall meet with the Contracting Officer prior to beginning work, to discuss in detail the Asbestos Hazard Abatement Plan, including work procedures and safety precautions. Once approved by the Contracting Officer, the plan will be enforced as if an addition to the specification. Any changes required in the specification as a result of the plan shall be identified specifically in the plan to allow for free discussion and approval by the Contracting Officer prior to starting work.

1.3.10 Testing Laboratory

Submit the name, address, and telephone number of each testing laboratory selected for the sampling, analysis, and reporting of airborne concentrations of asbestos fibers along with evidence that each laboratory selected holds the appropriate State license and/or permits and certification that each laboratory is American Industrial Hygiene Association (AIHA) accredited and that persons counting the samples have been judged proficient by current inclusion on the AIHA Asbestos Analysis Registry (AAR) and successful participation of the laboratory in the Proficiency Analytical Testing (PAT) Program.

Where analysis to determine asbestos content in bulk materials or transmission electron microscopy is required, submit evidence that the laboratory is accredited by the National Institute of Science and Technology (NIST) under National Voluntary Laboratory Accreditation Program (NVLAP) for asbestos analysis. The testing laboratory firm shall be independent of the asbestos contractor and shall have no employee or employer relationship which could constitute a conflict of interest.

1.3.11 Landfill Approval

Submit written evidence that the landfill is for asbestos disposal by the U.S. Environmental Protection Agency, Region 3, Air Enforcement Section (38W12), and local regulatory agencies. Within 3 working days after delivery, submit detailed [delivery tickets](#), prepared, signed, and dated by an agent of the landfill, certifying the amount of asbestos materials delivered to the landfill. Submit a copy of the [waste shipment records](#) within 1 day of the shipment leaving the project site.

1.3.12 Medical Certification

Provide a written certification for each worker and supervisor, signed by a licensed physician indicating that the worker and supervisor has met or exceeded all of the medical prerequisites listed herein and in 29 CFR 1926.1101 and 29 CFR 1926.103 as prescribed by law. Submit certificates prior to the start of work but after the main abatement submittal.

1.4 SUBMITTALS

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

SD-03 Product Data

Local exhaust equipment; G

Vacuums; G

Respirators; G

Pressure differential automatic recording instrument; G

Amended water; G

Glovebags; G

Material Safety Data Sheets (MSDS) for all materials proposed for transport to the project site; G

Encapsulants; G

SD-06 Test Reports

Air sampling results; G

Pressure differential recordings for local exhaust system; G

Asbestos disposal quantity report; G

Clearance sampling; G

SD-07 Certificates

Asbestos hazard abatement plan; G

Testing laboratory; G

Private qualified person documentation; G

Contractor's license; G

Competent person documentation; G

Worker's license; G

Landfill approval; G

Employee training; G

Medical certification requirements; G

Waste shipment records and if applicable exemption report; G

Respiratory Protection Program; G

Delivery tickets; G

Vacuums; G

Water filtration equipment; G

Ventilation systems; G

Other equipment used to contain airborne asbestos fibers; G

Chemical encapsulants sealers; G

Notifications

Show compliance with ANSI Z9.2 by providing manufacturers' certifications.

SD-11 Closeout Submittals

Notifications; G

Rental equipment; G

Respirator program records; G

Permits and licenses; G

Protective clothing decontamination quality control records; G

Protective clothing decontamination facility notification; G

1.5 QUALITY ASSURANCE

1.5.1 Private Qualified Person Documentation

Submit the name, address, and telephone number of the Private Qualified Person (PQP) selected to prepare the Asbestos Hazard Abatement Plan, direct monitoring and training, and documented evidence that the PQP has successfully completed training in and is accredited and where required is certified as, a Building Inspector, Contractor/Supervisor Abatement Worker, and Asbestos Project Designer as described by 40 CFR 763 and has successfully completed the National Institute of Occupational Safety and Health (NIOSH) 582 course "Sampling and Evaluating Airborne Asbestos Dust" or equivalent. The PQP shall be appropriately licensed in the State of Indiana. The PQP and the asbestos contractor shall not have an employee/employer relationship or financial relationship which could constitute a conflict of interest. The PQP shall be a first tier subcontractor.

1.5.2 [Competent Person Documentation](#)

Submit training certification and a current State of Indiana Asbestos Contractor's and Supervisor's License.

1.5.3 [Worker's License](#)

Submit documentation that requires all workers have a current State of Indiana Asbestos Workers License.

1.5.4 [Contractor's License](#)

Contractor shall have current Indiana asbestos contractor's license. Submit a copy of the asbestos contractor's license issued by the State of Indiana.

1.5.5 [Air Sampling Results](#)

Complete fiber counting and provide results to the PQP and NC for review within 16 hours of the "time off" of the sample pump. Notify the Contracting Officer immediately of any airborne levels of asbestos fibers in excess of the acceptable limits. Submit sampling results to the Contracting Officer and the affected Contractor employees where required by law within 3 working days, signed by the testing laboratory employee performing air sampling, the employee that analyzed the sample, and the PQP and NC. Notify the Contractor and the Contracting Officer immediately of any variance in the pressure differential which could cause adjacent unsealed areas to have asbestos fiber concentrations in excess of 0.01 fibers per cubic centimeter or background whichever is higher. In no circumstance shall levels exceed 0.1 fibers per cubic centimeter.

1.5.6 [Pressure Differential Recordings for Local Exhaust System](#)

Provide a local exhaust system that creates a negative pressure of at least [0.02 inches](#) of water relative to the pressure external to the enclosure and operate it continuously, 24 hours a day, until the temporary enclosure of the asbestos control area is removed. Submit pressure differential recordings for each work day to the PQP for review and to the Contracting Officer within 24 hours from the end of each work day.

1.5.7 [Protective Clothing Decontamination Quality Control Records](#)

Provide all records that document quality control for the decontamination of reusable outer protective clothing.

1.5.8 [Protective Clothing Decontamination Facility Notification](#)

Submit written evidence that persons who decontaminate, store, or transport asbestos contaminated clothing used in the performance of this contract were duly notified in accordance with [29 CFR 1926.1101](#).

1.6 EQUIPMENT

1.6.1 [Rental Equipment](#)

Provide a copy of the written notification to the rental company concerning the intended use of the equipment and the possibility of asbestos contamination of the equipment.

PART 2 PRODUCTS

2.1 **ENCAPSULANTS**

Shall conform to current USEPA requirements, shall contain no toxic or hazardous substances as defined in 29 CFR 1926.59, and shall conform to the following performance requirements.

2.1.1 Removal Encapsulants

| <u>Requirement</u> | <u>Test Standard</u> |
|--|-----------------------------------|
| Flame Spread - 25, Smoke Emission - 50 | ASTM E 84 |
| Life Expectancy - 20 years | ASTM C 732 Accelerated Aging Test |
| Permeability - Minimum 0.4 perms | ASTM E 96/E 96M |

2.1.2 Bridging Encapsulant

| <u>Requirement</u> | <u>Test Standard</u> |
|--|-----------------------------------|
| Flame Spread - 25, Smoke Emission - 50 | ASTM E 84 |
| Life Expectancy - 20 years | ASTM C 732 Accelerated Aging Test |
| Permeability - Minimum 0.4 perms | ASTM E 96/E 96M |
| Fire Resistance - Negligible affect on fire resistance rating over 3 hour test (Classified by UL for use over fibrous and cementitious sprayed fireproofing) | ASTM E 119 |
| Impact Resistance - Minimum 43 in/lb Gardner Impact Test | ASTM D 2794 |
| Flexibility - no rupture or cracking | ASTM D 522 Mandrel Bend Test |

2.1.3 Penetrating Encapsulant

| <u>Requirement</u> | <u>Test Standard</u> |
|--|-----------------------------------|
| Flame Spread - 25, Smoke Emission - 50 | ASTM E 84 |
| Life Expectancy - 20 years | ASTM C 732 Accelerated Aging Test |
| Permeability - Minimum 0.4 perms | ASTM E 96/E 96M |
| Cohesion/Adhesion Test - 50 pounds of force/foot | ASTM E 736 |
| Fire Resistance - Negligible affect on fire resistance rating over 3 hour test (Classified by UL for use over fibrous and cementitious sprayed fireproofing) | ASTM E 119 |

| <u>Requirement</u> | <u>Test Standard</u> |
|--|---------------------------------|
| Impact Resistance - Minimum 43 in/lb Gardner Impact Test | ASTM D 2794 |
| Flexibility - no rupture or cracking | ASTM D 522 Mandrel Bend Test |

2.1.4 Lock-down Encapsulant

| <u>Requirement</u> | <u>Test Standard</u> |
|--|-----------------------------------|
| Flame Spread: 25, Smoke Emission - 50 | ASTM E 84 |
| Life Expectancy: 20 years | ASTM C 732 Accelerated Aging Test |
| Permeability: Minimum 0.4 perms | ASTM E 96/E 96M |
| Fire Resistance: Negligible affect on fire resistance rating over 3 hour test (Tested with fireproofing over encapsulant applied directly to steel member) | ASTM E 119 |
| Bond Strength: 100 pounds of force/foot (Tests compatibility with cementitious and fibrous fireproofing) | ASTM E 736 |

PART 3 EXECUTION

3.1 EQUIPMENT

At all times, provide the Contracting Officer or the Contracting Officer's Representative, with at least two complete sets of personal protective equipment as required for entry to and inspection of the asbestos control area. Provide equivalent training to the Contracting Officer or a designated representative as provided to Contractor employees in the use of the required personal protective equipment. Provide manufacturer's certificate of compliance for all equipment used to contain airborne asbestos fibers.

3.1.1 Respirators

Select respirators from those approved by the National Institute for Occupational Safety and Health (NIOSH), Department of Health and Human Services.

3.1.1.1 Respirators for Handling Asbestos

Provide personnel engaged in pre-cleaning, cleanup, handling, encapsulation removal and or demolition of asbestos materials with respiratory protection as indicated in 29 CFR 1926.1101 and 29 CFR 1926.103.

3.1.2 Exterior Whole Body Protection

3.1.2.1 Outer Protective Clothing

Provide personnel exposed to asbestos with disposable "non-breathable," or reusable "non-breathable" whole body outer protective clothing, head

coverings, gloves, and foot coverings. Provide disposable plastic or rubber gloves to protect hands. Cloth gloves may be worn inside the plastic or rubber gloves for comfort, but shall not be used alone. Make sleeves secure at the wrists, make foot coverings secure at the ankles, and make clothing secure at the neck by the use of tape. Reusable whole body outer protective clothing shall be either disposed of as asbestos contaminated waste upon exiting from the asbestos regulated work area or be properly decontaminated.

3.1.2.2 Work Clothing

Provide cloth work clothes for wear under the outer protective clothing and foot coverings and either dispose of or properly decontaminate them as recommended by the PQP after each use.

3.1.2.3 Personal Decontamination Unit

Provide a temporary, negative pressure unit with a separate decontamination locker room and clean locker room with a shower that complies with [29 CFR 1926.51\(f\)\(4\)\(ii\)](#) through (V) in between for personnel required to wear whole body protective clothing. Provide two separate lockers for each asbestos worker, one in each locker room. Keep street clothing and street shoes in the clean locker. HEPA vacuum and remove asbestos contaminated disposable protective clothing while still wearing respirators at the boundary of the asbestos work area and seal in impermeable bags or containers for disposal. HEPA vacuum and remove asbestos contaminated reusable protective clothing while still wearing respirators at the boundary of the asbestos work area, seal in two impermeable bags, label outer bag as asbestos contaminated waste, and transport for decontamination. Do not wear work clothing between home and work. Locate showers between the decontamination locker room and the clean locker room and require that all employees shower before changing into street clothes. Collect used shower water and filter with approved [water filtration equipment](#) to remove asbestos contamination. Dispose of filters and residue as asbestos waste. Discharge clean water to the sanitary system. Dispose of asbestos contaminated work clothing as asbestos contaminated waste or properly decontaminate as specified in the Contractor's Asbestos Hazard Abatement Plan. Decontamination units shall be physically attached to the asbestos control area. Build both a personnel decontamination unit and an equipment decontamination unit onto and integral with each asbestos control area.

3.1.2.4 Decontamination of Reusable Outer Protective Clothing

When reusable outer protective clothing is used, transport the double bagged clothing to a previously notified commercial/industrial decontamination facility for decontamination. Perform non-destructive testing to determine the effectiveness of asbestos decontamination. If representative sampling is used, ensure the statistical validity of the sampling results. If representative sampling is used, reject any entire batch in which any of the pieces exceed 40 fibers per square millimeter. Inspect reusable protective clothing prior to use to ensure that it will provide adequate protection and is not or is not about to become ripped, torn, deteriorated, or damaged, and that it is not visibly contaminated. Notify, in writing, all personnel involved in the decontamination of reusable outer protective clothing as indicated in [29 CFR 1926.1101](#).

3.1.2.5 Eye Protection

Provide goggles to personnel engaged in asbestos abatement operations when the use of a full face respirator is not required.

3.1.3 Warning Signs and Labels

Provide warning signs at all approaches to asbestos control areas. Locate signs at such a distance that personnel may read the sign and take the necessary protective steps required before entering the area. Provide labels and affix to all asbestos materials, scrap, waste, debris, and other products contaminated with asbestos.

3.1.3.1 Warning Sign

Provide vertical format conforming to 29 CFR 1926.200, and 29 CFR 1926.1101 minimum 20 by 14 inches displaying the following legend in the lower panel:

| <u>Legend</u> | <u>Notation</u> |
|---|--|
| Danger | one inch Sans Serif Gothic or Block |
| Asbestos | one inch Sans Serif Gothic or Block |
| Cancer and Lung Disease Hazard | 1/4 inch Sans Serif Gothic or Block |
| Authorized Personnel Only | 1/4 inch Gothic |
| Respirators and Protective Clothing are Required in this Area | 1/4 inch Gothic |

Spacing between lines shall be at least equal to the height of the upper of any two lines.

3.1.3.2 Warning Labels

Provide labels conforming to 29 CFR 1926.1101 of sufficient size to be clearly legible, displaying the following legend:

DANGER

CONTAINS ASBESTOS FIBERS

AVOID CREATING DUST

CANCER AND LUNG DISEASE HAZARD

BREATHING ASBESTOS DUST MAY
CAUSE SERIOUS BODILY HARM

3.1.4 Local Exhaust System

Provide a local exhaust system in the asbestos control area in accordance with ANSI Z9.2 and 29 CFR 1926.1101 that will provide at least four air

changes per hour inside of the negative pressure enclosure. **Local exhaust equipment** shall be operated 24 hours per day, until the asbestos control area is removed and shall be leak proof to the filter and equipped with HEPA filters. Maintain a minimum pressure differential in the control area of minus 0.02 inch of water column relative to adjacent, unsealed areas. Provide continuous 24-hour per day monitoring of the pressure differential with a **pressure differential automatic recording instrument**. In no case shall the building ventilation system be used as the local exhaust system for the asbestos control area. Filters on exhaust equipment shall conform to **ANSI Z9.2** and **UL 586**. The local exhaust system shall terminate out of doors and remote from any public access or ventilation system intakes.

3.1.5 Tools

Vacuums shall be leak proof to the filter and equipped with HEPA filters. Filters on vacuums shall conform to **ANSI Z9.2** and **UL 586**. Do not use power tools to remove asbestos containing materials unless the tool is equipped with effective, integral HEPA filtered exhaust **ventilation systems**. Remove all residual asbestos from reusable tools prior to storage or reuse.

3.1.6 Rental Equipment

If rental equipment is to be used, furnish written notification to the rental agency concerning the intended use of the equipment and the possibility of asbestos contamination of the equipment.

3.1.7 Glovebags

Submit written manufacturers proof that glovebags will not break down under expected temperatures and conditions.

3.2 WORK PROCEDURE

Perform asbestos related work in accordance with **29 CFR 1926.1101**, **40 CFR 61-SUBPART M**, and as specified herein. Use wet removal procedures and negative pressure enclosure techniques. Personnel shall wear and utilize protective clothing and equipment as specified herein. Eating, smoking, drinking, chewing gum, tobacco, or applying cosmetics shall not be permitted in the asbestos work or control areas. Personnel of other trades not engaged in the removal and demolition of asbestos containing material shall not be exposed at any time to airborne concentrations of asbestos unless all the personnel protection and training provisions of this specification are complied with by the trade personnel. Seal all roof top penetrations, except plumbing vents, prior to asbestos roofing work. Shut down the building heating, ventilating, and air conditioning system, cap the openings to the system, and provide temporary heating, and ventilation, prior to the commencement of asbestos work. Disconnect electrical service when wet removal is performed and provide temporary electrical service with verifiable ground fault circuit interrupter (GFCI) protection prior to the use of any water. If an asbestos fiber release or spill occurs outside of the asbestos control area, stop work immediately, correct the condition to the satisfaction of the Contracting Officer including clearance sampling, prior to resumption of work.

For work on transite water lines, see 33 11 00WATER DISTRIBUTION.

3.2.1 Protection of Existing Work to Remain

Perform work without damage or contamination of adjacent work. Where such

work is damaged or contaminated as verified by the Contracting Officer using visual inspection or sample analysis, it shall be restored to its original condition or decontaminated by the Contractor at no expense to the Government as deemed appropriate by the Contracting Officer. This includes inadvertent spill of dirt, dust, or debris in which it is reasonable to conclude that asbestos may exist. When these spills occur, stop work immediately. Then clean up the spill. When satisfactory visual inspection and air sampling results are obtained from the PQP work may proceed at the discretion of the Contracting Officer.

3.2.2 Furnishings

Furniture and equipment will be removed from the area of work by the Government before asbestos work begins.

3.2.3 Precleaning

Wet wipe and HEPA vacuum all surfaces potentially contaminated with asbestos prior to establishment of an enclosure.

3.2.4 Asbestos Control Area Requirements

3.2.4.1 Negative Pressure Enclosure

Block and seal openings in areas where the release of airborne asbestos fibers can be expected. Establish an asbestos negative pressure enclosure with the use of curtains, portable partitions, or other enclosures in order to prevent the escape of asbestos fibers from the contaminated asbestos work area. Negative pressure enclosure development shall include protective covering of uncontaminated walls, and ceilings with a continuous membrane of two layers of minimum 6-mil plastic sheet sealed with tape to prevent water or other damage. Provide two layers of 6-mil plastic sheet over floors and extend a minimum of 12 inches up walls. Seal all joints with tape. Provide local exhaust system in the asbestos control area. Openings will be allowed in enclosures of asbestos control areas for personnel and equipment entry and exit, the supply and exhaust of air for the local exhaust system and the removal of properly containerized asbestos containing materials. Replace local exhaust system filters as required to maintain the efficiency of the system.

3.2.4.2 Glovebag

If the construction of a negative pressure enclosure is infeasible for the removal of material specified in the individual Task Orders, use alternate techniques as indicated in 29 CFR 1926.1101. Establish designated limits for the asbestos regulated area with the use of rope or other continuous barriers, and maintain all other requirements for asbestos control areas. The PQP shall conduct personal samples of each worker engaged in asbestos handling (removal, disposal, transport and other associated work) throughout the duration of the project. If the quantity of airborne asbestos fibers monitored at the breathing zone of the workers at any time exceeds background or 0.01 fibers per cubic centimeter whichever is greater, stop work, evacuate personnel in adjacent areas or provide personnel with approved protective equipment at the discretion of the Contracting Officer. This sampling may be duplicated by the Government at the discretion of the Contracting Officer. If the air sampling results obtained by the Government differ from those obtained by the Contractor,

the Government will determine which results predominate. If adjacent areas are contaminated as determined by the Contracting Officer, clean the contaminated areas, monitor, and visually inspect the area as specified herein.

3.2.5 Removal Procedures

Wet asbestos material with a fine spray of amended water during removal, cutting, or other handling so as to reduce the emission of airborne fibers. Remove material and immediately place in 6 mil plastic disposal bags. Remove asbestos containing material in a gradual manner, with continuous application of the amended water or wetting agent in such a manner that no asbestos material is disturbed prior to being adequately wetted. Where unusual circumstances prohibit the use of 6 mil plastic bags, submit an alternate proposal for containment of asbestos fibers to the Contracting Officer for approval. For example, in the case where both piping and insulation are to be removed, the Contractor may elect to wet the insulation, wrap the pipes and insulation in plastic and remove the pipe by sections. Asbestos containing material shall be containerized while wet. At no time shall asbestos material be allowed to accumulate or become dry. Lower and otherwise handle asbestos containing material as indicated in 40 CFR 61-SUBPART M.

3.2.5.1 Sealing Contaminated Items Designated for Disposal

Remove contaminated architectural, mechanical, and electrical appurtenances such as venetian blinds, full-height partitions, carpeting, duct work, pipes and fittings, radiators, light fixtures, conduit, panels, and other contaminated items designated for removal by completely coating the items with an asbestos lock-down encapsulant at the demolition site before removing the items from the asbestos control area. These items need not be vacuumed. The asbestos lock-down encapsulant shall be tinted a contrasting color. It shall be spray-applied by airless method. Thoroughness of sealing operation shall be visually gauged by the extent of colored coating on exposed surfaces. Lock-down encapsulants shall comply with the performance requirements specified herein.

3.2.5.2 Exposed Pipe Insulation Edges

Contain edges of asbestos insulation to remain that are exposed by a removal operation. Wet and cut the rough ends true and square with sharp tools and then encapsulate the edges with a 1/4 inch thick layer of non-asbestos containing insulating cement troweled to a smooth hard finish. When cement is dry, lag the end with a layer of non-asbestos lagging cloth, overlapping the existing ends by at least 4 inches. When insulating cement and cloth is an impractical method of sealing a raw edge of asbestos, take appropriate steps to seal the raw edges as approved by the Contracting Officer.

3.2.6 Air Sampling

Sampling of airborne concentrations of asbestos fibers shall be performed in accordance with 29 CFR 1926.1101 and as specified herein. Sampling performed in accordance with 29 CFR 1926.1101 shall be performed by the PQP. Sampling performed for environmental and quality control reasons shall be performed by the PQP. Unless otherwise specified, use NIOSH Method 7400 for sampling and analysis. Monitoring may be duplicated by the Government at the discretion of the Contracting Officer. If the air sampling results obtained by the Government differ from those results

obtained by the Contractor, the Government will determine which results predominate.

3.2.6.1 Sampling Prior to Asbestos Work

Provide area air sampling and establish the baseline one day prior to the masking and sealing operations for each removal site. Establish the background by performing area sampling in similar but uncontaminated sites in the building.

3.2.6.2 Sampling During Asbestos Work

The PQP shall provide personal and area sampling as indicated in [29 CFR 1926.1101](#) and governing environmental regulations. In addition, provided the same type of work is being performed, provide area sampling at least once every work shift close to the work inside the enclosure, outside the clean room entrance to the enclosure, and at the exhaust opening of the local exhaust system. If sampling outside the enclosure shows airborne levels have exceeded background or 0.01 fibers per cubic centimeter, whichever is greater, stop all work, correct the condition(s) causing the increase, and notify the Contracting Officer immediately. Where alternate methods are used, perform personal and area air sampling at locations and frequencies that will accurately characterize the evolving airborne asbestos levels.

3.2.6.3 Sampling After Final Clean-Up ([Clearance Sampling](#))

Provide area sampling of asbestos fibers using aggressive air sampling techniques as defined in the [EPA 560/5-85-024](#) and establish an airborne asbestos concentration of less than 0.01 fibers per cubic centimeter after final clean-up but before removal of the enclosure or the asbestos work control area. After final cleanup and the asbestos control area is dry but prior to clearance sampling, the PQP shall perform a visual inspection in accordance with [ASTM E 1368](#) to ensure that the asbestos control and work area is free of any accumulations of dirt, dust, or debris. Prepare a written report signed and dated by the PQP documenting that the asbestos control area is free of dust, dirt, and debris and all waste has been removed. The asbestos fiber counts from these samples shall be less than 0.01 fibers per cubic centimeter or be not greater than the background, whichever is greater. Should any of the final samples indicate a higher value, the Contractor shall take appropriate actions to re-clean the area and shall repeat the sampling and TEM analysis at the Contractor's expense.

3.2.7 Lock-Down

Prior to removal of plastic barriers and after pre-clearance clean up of gross contamination, the PQP shall conduct a visual inspection of all areas affected by the removal in accordance with [ASTM E 1368](#). Inspect for any visible fibers .

3.2.8 Site Inspection

While performing asbestos engineering control work, the Contractor shall be subject to on-site inspection by the Contracting Officer who may be assisted by or represented by safety or industrial hygiene personnel. If the work is found to be in violation of this specification, the Contracting Officer or his representative will issue a stop work order to be in effect immediately and until the violation is resolved. All related costs including standby time required to resolve the violation shall be at the

Contractor's expense.

3.3 CLEAN-UP AND DISPOSAL

3.3.1 Housekeeping

Essential parts of asbestos dust control are housekeeping and clean-up procedures. Maintain surfaces of the asbestos control area free of accumulations of asbestos fibers. Give meticulous attention to restricting the spread of dust and debris; keep waste from being distributed over the general area. Use HEPA filtered vacuum cleaners. DO NOT BLOW DOWN THE SPACE WITH COMPRESSED AIR. When asbestos removal is complete, all asbestos waste is removed from the work-site, and final clean-up is completed, the Contracting Officer will attest that the area is safe before the signs can be removed. After final clean-up and acceptable airborne concentrations are attained but before the HEPA unit is turned off and the enclosure removed, remove all pre-filters on the building HVAC system and provide new pre-filters. Dispose of filters as asbestos contaminated materials. Reestablish HVAC mechanical, and electrical systems in proper working order. The Contracting Officer will visually inspect all surfaces within the enclosure for residual material or accumulated dust or debris. The Contractor shall re-clean all areas showing dust or residual materials. If re-cleaning is required, air sample and establish an acceptable asbestos airborne concentration after re-cleaning. The Contracting Officer must agree that the area is safe in writing before unrestricted entry will be permitted. The Government shall have the option to perform monitoring to determine if the areas are safe before entry is permitted.

3.3.2 Title to Materials

All waste materials, except as specified otherwise, shall become the property of the Contractor and shall be disposed of as specified in applicable local, State, and Federal regulations and herein.

3.3.3 Disposal of Asbestos

3.3.3.1 Procedure for Disposal

Collect asbestos waste, asbestos contaminated water, scrap, debris, bags, containers, equipment, and asbestos contaminated clothing which may produce airborne concentrations of asbestos fibers and place in sealed fiber-proof, waterproof, non-returnable containers (e.g. double plastic bags 6 mils thick, cartons, drums or cans). Wastes within the containers must be adequately wet in accordance with 40 CFR 61-SUBPART M. Affix a warning and Department of Transportation (DOT) label to each container including the bags or use at least 6 mils thick bags with the approved warnings and DOT labeling preprinted on the bag. The name of the waste generator and the location at which the waste was generated shall be clearly indicated on the outside of each container. Prevent contamination of the transport vehicle (especially if the transport vehicle is a rented truck likely to be used in the future for non-asbestos purposes). These precautions include lining the vehicle cargo area with plastic sheeting (similar to work area enclosure) and thorough cleaning of the cargo area after transport and unloading of asbestos debris is complete. Dispose of waste asbestos material at an Environmental Protection Agency (EPA) or State-approved asbestos landfill off Government property. For temporary storage, store sealed impermeable bags in asbestos waste drums or skids. An area for interim storage of asbestos waste-containing drums or skids will be assigned by the Contracting Officer or his authorized representative.

Procedure for hauling and disposal shall comply with 40 CFR 61-SUBPART M, State, regional, and local standards. Sealed plastic bags may be dumped from drums into the burial site unless the bags have been broken or damaged. Damaged bags shall remain in the drum and the entire contaminated drum shall be buried. Uncontaminated drums may be recycled. Workers unloading the sealed drums shall wear appropriate respirators and personal protective equipment when handling asbestos materials at the disposal site.

3.3.3.2 Asbestos Disposal Quantity Report

Direct the PQP to record and report, to the Contracting Officer, the amount of asbestos containing material removed and released for disposal. Deliver the report for the previous day at the beginning of each day shift with amounts of material removed during the previous day reported in linear feet or square feet as described initially in this specification and in cubic feet for the amount of asbestos containing material released for disposal.

-- End of Section --

SECTION 02 82 33.13 20

REMOVAL/CONTROL AND DISPOSAL OF PAINT WITH LEAD

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 Z88.2 (1992) Respiratory Protection

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT (HUD)

HUD 6780 (1995; Errata Aug 1996; Rev Ch. 7 - 1997)
Guidelines for the Evaluation and Control
of Lead-Based Paint Hazards in Housing

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

29 CFR 1926.103 Respiratory Protection

29 CFR 1926.21 Safety Training and Education

29 CFR 1926.33 Access to Employee Exposure and Medical Records

29 CFR 1926.55 Gases, Vapors, Fumes, Dusts, and Mists

29 CFR 1926.59 Hazard Communication

29 CFR 1926.62 Lead

29 CFR 1926.65 Hazardous Waste Operations and Emergency Response

40 CFR 260 Hazardous Waste Management System: General

40 CFR 261 Identification and Listing of Hazardous Waste

40 CFR 262 Standards Applicable to Generators of Hazardous Waste

40 CFR 263 Standards Applicable to Transporters of Hazardous Waste

40 CFR 264 Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

40 CFR 265 Interim Status Standards for Owners and Operators of Hazardous Waste Treatment,

Storage, and Disposal Facilities

40 CFR 268

Land Disposal Restrictions

40 CFR 745

Lead-Based Paint Poisoning Prevention in Certain Residential Structures

49 CFR 172

Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements

49 CFR 178

Specifications for Packagings

UNDERWRITERS LABORATORIES (UL)

UL 586

(1996; Rev thru Aug 2008) Standard for High-Efficiency Particulate, Air Filter Units

1.2 DEFINITIONS

1.2.1 Abatement

As applied to target housing and child occupied facilities, "abatement" means any set of measures designed to permanently eliminate lead-based paint hazards in accordance with standards established by appropriate Federal agencies. Such term includes:

- a. The removal of lead-based paint and lead-contaminated dust, the permanent containment or encapsulation of lead-based paint, the replacement of lead-painted surfaces or fixtures, and the removal or covering of lead contaminated soil; and
- b. All preparation, cleanup, disposal, and post-abatement clearance testing activities associated with such measures.

1.2.2 Action Level

Employee exposure, without regard to use of respirators, to an airborne concentration of lead of 30 micrograms per cubic meter of air averaged over an 8 hour period in a work environment.

1.2.3 Area Sampling

Sampling of lead concentrations within the lead control area and inside the physical boundaries, which is representative of the airborne lead concentrations but is not collected in the breathing zone of personnel.

1.2.4 Child Occupied Facility

A building or portion of a building constructed prior to 1978 visited regularly by the same child, 6 years of age or under, on a least two different days within any week, provided each days visit last at least 3 hours and the combined weekly visit last at least 6 hours and the combined annual visit last at least 60 hours. Child occupied facilities may include, but are not limited to day-care centers, preschools and kindergarten classrooms.

1.2.5 Competent Person (CP)

As used in this section, refers to a person employed by the Contractor who is trained in the recognition and control of lead hazards in accordance with current federal, State, and local regulations. A Certified Industrial Hygienist (CIH) certified for comprehensive practice by the American Board of Industrial Hygiene or a Certified Safety Professional (CSP) certified by the Board of Certified Safety Professionals is the best choice.

1.2.6 Contaminated Room

Refers to a room for removal of contaminated personal protective equipment (PPE).

1.2.7 Decontamination Shower Facility

That facility that encompasses a clean clothing storage room, and a contaminated clothing storage and disposal rooms, with a shower facility in between.

1.2.8 Deleading

Activities conducted by a person who offers to eliminate lead-based paint or lead-based paint hazards or to plan such activities in commercial buildings, bridges or other structures.

1.2.9 Eight-Hour Time Weighted Average (TWA)

Airborne concentration of lead to which an employee is exposed, averaged over an 8 hour workday as indicated in [29 CFR 1926.62](#).

1.2.10 High Efficiency Particulate Air (HEPA) Filter Equipment

HEPA filtered vacuuming equipment with a [UL 586](#) filter system capable of collecting and retaining lead-contaminated paint dust. A high efficiency particulate filter means 99.97 percent efficient against 0.3 micron or larger size particles.

1.2.11 Lead

Metallic lead, inorganic lead compounds, and organic lead soaps.

1.2.12 Lead-Based Paint (LBP)

Paint or other surface coating that contains lead in excess of 1.0 milligrams per centimeter squared or 0.5 percent by weight.

1.2.13 Lead-Based Paint Activities

In the case of target housing or child occupied facilities, lead-based paint activities include; a lead-based paint inspection, a risk assessment, or abatement of lead-based paint hazards.

1.2.14 Lead-Based Paint Hazard (LBP Hazard)

Any condition that causes exposure to lead from lead-contaminated dust, lead-contaminated soil, lead-based paint that is deteriorated or present in accessible surfaces, friction surfaces, or impact surfaces that would result in adverse human health effects.

1.2.15 Paint with Lead (PWL)

Any paint that contains lead as determined by the testing laboratory using a valid test method. The requirements of this section does not apply if no detectable levels of lead are found using a quantitative method for analyzing paint using laboratory instruments with specified limits of detection (usually 0.01%). An X-Ray Fluorescence (XRF) instrument is not considered a valid test method.

1.2.16 Lead Control Area

A system of control methods to prevent the spread of lead dust, paint chips or debris to adjacent areas that may include temporary containment, floor or ground cover protection, physical boundaries, and warning signs to prevent unauthorized entry of personnel. HEPA filtered local exhaust equipment may be used as engineering controls to further reduce personnel exposures or building/outdoor environmental contamination.

1.2.17 Lead Permissible Exposure Limit (PEL)

Fifty micrograms per cubic meter of air as an 8 hour time weighted average as determined by 29 CFR 1926.62. If an employee is exposed for more than eight hours in a workday, the PEL shall be determined by the following formula:

$$\text{PEL (micrograms/cubic meter of air)} = 400/\text{No. hrs worked per day}$$

1.2.18 Personal Sampling

Sampling of airborne lead concentrations within the breathing zone of an employee to determine the 8 hour time weighted average concentration in accordance with 29 CFR 1926.62. Samples shall be representative of the employees' work tasks. Breathing zone shall be considered an area within a hemisphere, forward of the shoulders, with a radius of 6 to 9 inches and centered at the nose or mouth of an employee.

1.2.19 Physical Boundary

Area physically roped or partitioned off around an enclosed lead control area to limit unauthorized entry of personnel. As used in this section, "inside boundary" shall mean the same as "outside lead control area but inside the physical boundary."

1.2.20 Target Housing

Housing constructed prior to 1978. It does not include housing for the elderly, or persons with disabilities unless any one or more children age 6 years and younger resides or is expected to reside in such housing.

1.3 DESCRIPTION

1.3.1 Description of Work

Remove/control lead-based / paint with lead as indicated in the scope of work or on drawings.

1.3.2 Coordination with Other Work

The contractor shall coordinate with work being performed in adjacent areas. Coordination procedures shall be explained in the Removal/Control Plan and shall describe how the Contractor will prevent lead exposure to other contractors and/or Government personnel performing work unrelated to lead activities.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Vacuum Filters; G

Respirators; G

SD-06 Test Reports

sampling results; G

Occupational and Environmental Assessment Data Report; G

SD-07 Certificates

Qualifications of CP; G

Testing Laboratory qualifications; G

Occupant Notification; G

Training Certification of workers and supervisors; G

Notification of the Commencement of LBP Hazard Abatement; G

Third Party Consultant Qualifications; G

lead-based paint/paint with lead removal/control plan including CP approval (signature, date, and certification number); G

Rental equipment notification; G

Respiratory Protection Program; G

Hazard Communication Program; G

EPA or State approved hazardous waste treatment, storage, or disposal facility for lead disposal; G

Lead Waste Management Plan; G

Vacuum filters; G

Clearance Certification; G

SD-08 Manufacturer's Instructions

Chemicals and equipment; G

Materials; G

Material safety data sheets for all chemicals; G

SD-11 Closeout Submittals

Completed and signed hazardous waste manifest from treatment or disposal facility; G

Certification of Medical Examinations; G

Employee Training Certification; G

Waste turn-in documents or weight tickets for non-hazardous wastes that are disposed of at sanitary or construction and demolition landfills; G

1.5 QUALITY ASSURANCE

1.5.1 Qualifications

1.5.1.1 Qualifications of CP

Submit name, address, and telephone number of the CP selected to perform responsibilities specified in paragraph entitled "Competent Person (CP) Responsibilities." Provide previous experience of the CP. Submit proper documentation that the CP is trained and licensed and/or certified in accordance with Federal, State, and local laws.

1.5.1.2 Training Certification

Submit a certificate for each employee and supervisor, signed and dated by the authorized training provider meeting 40 CFR 745 (Subpart L) requirements and Indiana Department of Environmental Management, stating that the employee or supervisor has received the required lead training and is certified to perform or supervise deleading or lead removal. Submit proof the work will be performed by a certified firm.

1.5.1.3 Testing Laboratory

Submit the name, address, and telephone number of the testing laboratory selected to perform the air, wipe, and soil sampling, testing, and reporting of airborne concentrations of lead. Use a laboratory accredited under the EPA National Lead Laboratory Accreditation Program (NLLAP) by either the American Association for Laboratory Accreditation (A2LA) or the American Industrial Hygiene Association (AIHA) and that is successfully participating in the Environmental Lead Proficiency Analytical Testing (ELPAT) program to perform sample analysis. Laboratories selected to perform blood lead analysis shall be OSHA approved.

1.5.1.4 Third Party Consultant Qualifications

Submit the name, address, and telephone number of the third party consultant selected to perform the wipe sampling for determining concentrations of lead in dust or soil sampling. Submit proper documentation that the consultant is trained and certified as an inspector technician or inspector/risk assessor by the USEPA authorized State (or local) certification and accreditation program.

1.5.2 Requirements

1.5.2.1 Competent Person (CP) Responsibilities

- a. Verify training meets all federal, State, and local requirements.
- b. Review and approve lead-based paint/paint with lead removal/control plan for conformance to the applicable standards. Ensure work is performed in strict accordance with specifications at all times.
- c. Continuously inspect lead-based paint removal/control work for conformance with the approved plan.
- d. Perform air and wipe sampling.
- e. Control work to prevent hazardous exposure to human beings and to the environment at all times.
- f. Certify the conditions of the work as called for elsewhere in this specification.

1.5.2.2 Lead-Based Paint/Paint with Lead Removal/Control Plan (LBP/PWL R/CP)

Submit a detailed job-specific plan of the work procedures to be used in the removal/control of LBP/PWL. The plan shall include a sketch showing the location, size, and details of lead control areas, location and details of decontamination facilities, viewing ports, and mechanical ventilation system. Include a description of equipment and materials, controls and job responsibilities for each activity from which lead is emitted. Include in the plan, eating, drinking, smoking and sanitary procedures, interface of trades, sequencing of lead related work, collected waste water and paint debris disposal plan, air sampling plan, respirators, personal protective equipment, and a detailed description of the method of containment of the operation to ensure that lead is not released outside the lead control area. Include site preparation, cleanup and clearance procedures. Include occupational and environmental sampling, training, sampling methodology, frequency, duration of sampling, and qualifications of sampling personnel in the air sampling portion of the plan. Include a description of arrangements made among contractors on multi-contractor worksites to inform affected employees and to clarify responsibilities to control exposures.

The Removal/Control Plan shall be developed by a certified planner/project designer.

In occupied buildings, the Removal/Control Plan shall also include an occupant protection program that describes the measures that will be taken during the work to protect the building occupants.

1.5.2.3 Occupational and Environmental Assessment Data Report

If initial monitoring is necessary, submit occupational and environmental [sampling results](#) to the Contracting Officer within three working days of collection, signed by the testing laboratory employee performing the analysis, the employee that performed the sampling, and the CP.

In order to reduce the full implementation of [29 CFR 1926.62](#), the Contractor shall provide documentation. Submit a report that supports the determination to reduce full implementation of the requirements of [29 CFR 1926.62](#) and supporting the Lead Removal/Control Plan.

a. The initial monitoring shall represent each job classification, or if working conditions are similar to previous jobs by the same employer, provide previously collected exposure data that can be used to estimate worker exposures per [29 CFR 1926.62](#). The data shall represent the worker's regular daily exposure to lead for stated work.

b. Submit worker exposure data gathered during the task based trigger operations of [29 CFR 1926.62](#) with a complete process description. This includes manual demolition, manual scraping, manual sanding, heat gun, power tool cleaning, rivet busting, cleanup of dry expendable abrasives, abrasive blast enclosure removal, abrasive blasting, welding, cutting and torch burning where lead containing coatings are present.

c. The initial assessment shall determine the requirement for further monitoring and the need to fully implement the control and protective requirements including the lead compliance plan per [29 CFR 1926.62](#).

1.5.2.4 Medical Examinations

Initial medical surveillance as required by [29 CFR 1926.62](#) shall be made available to all employees exposed to lead at any time (1 day) above the action level. Full medical surveillance shall be made available to all employees on an annual basis who are or may be exposed to lead in excess of the action level for more than 30 days a year or as required by [29 CFR 1926.62](#). Adequate records shall show that employees meet the medical surveillance requirements of [29 CFR 1926.33](#), [29 CFR 1926.62](#), and [29 CFR 1926.103](#). Maintain complete and accurate medical records of employees for a period of at least 30 years or for the duration of employment plus 30 years, whichever is longer.

1.5.2.5 Training

Train each employee performing paint removal, disposal, and air sampling operations prior to the time of initial job assignment and annually thereafter, in accordance with [29 CFR 1926.21](#), [29 CFR 1926.62](#), and State and local regulations where appropriate.

1.5.2.6 Respiratory Protection Program

a. Provide each employee required to wear a respirator a respirator fit test at the time of initial fitting and at least annually thereafter as required by [29 CFR 1926.62](#).

b. Establish and implement a respiratory protection program as required by [ANSI Z88.2](#), [29 CFR 1926.103](#), [29 CFR 1926.62](#), and [29 CFR 1926.55](#).

1.5.2.7 Hazard Communication Program

Establish and implement a Hazard Communication Program as required by 29 CFR 1926.59.

1.5.2.8 Lead Waste Management

The Lead Waste Management Plan shall comply with applicable requirements of federal, State, and local hazardous waste regulations and address:

- a. Identification and classification of hazardous wastes associated with the work.
- b. Estimated quantities of wastes to be generated and disposed of.
- c. Names and qualifications of each contractor that will be transporting, storing, treating, and disposing of the wastes. Include the facility location and operator and a 24-hour point of contact. Furnish two copies of proof of EPA, State and local hazardous waste permit applications, permits, manifests and EPA Identification numbers, and Transporter Number.
- d. Names and qualifications (experience and training) of personnel who will be working on-site with hazardous wastes.
- e. List of waste handling equipment to be used in performing the work, to include cleaning, volume reduction, and transport equipment.
- f. Spill prevention, containment, and cleanup contingency measures including a health and safety plan to be implemented in accordance with 29 CFR 1926.65.
- g. Work plan and schedule for waste containment, removal and disposal. Wastes shall be cleaned up and containerized daily. Proper containment of the waste includes using acceptable waste containers (e.g., 55-gallon drums) as well as proper marking/labeling of the containers.
- h. Unit cost for waste disposal according to this plan.

1.5.2.9 Environmental, Safety and Health Compliance

In addition to the detailed requirements of this specification, comply with laws, ordinances, rules, and regulations of Federal, State, and local authorities regarding removing, handling, storing, transporting, and disposing of lead waste materials. Comply with the applicable requirements of the current issue of 29 CFR 1926.62. Submit matters regarding interpretation of standards to the Contracting Officer for resolution before starting work. Where specification requirements and the referenced documents vary, the most stringent requirement shall apply.

1.5.3 Pre-Construction Conference

Along with the CP, meet with the Contracting Officer to discuss in detail the lead waste management plan and the lead-based paint/paint with lead removal/control plan, including work procedures and precautions for the

removal plan.

1.6 EQUIPMENT

1.6.1 Respirators

Furnish appropriate respirators approved by the National Institute for Occupational Safety and Health (NIOSH), Department of Health and Human Services, for use in atmospheres containing lead dust. Respirators shall comply with the requirements of 29 CFR 1926.62.

1.6.2 Special Protective Clothing

Furnish personnel who will be exposed to lead-contaminated dust with proper disposable, uncontaminated, reusable protective whole body clothing, head covering, gloves, and foot coverings as required by 29 CFR 1926.62. Furnish proper disposable plastic or rubber gloves to protect hands. Reduce the level of protection only after obtaining approval from the CP.

1.6.3 Rental Equipment Notification

If rental equipment is to be used during lead-based paint handling and disposal, notify the rental agency in writing concerning the intended use of the equipment. Furnish a copy of the written notification to the Contracting Officer.

1.6.4 Vacuum Filters

UL 586 labeled HEPA filters.

1.6.5 Equipment for Government Personnel

Furnish the Contracting Officer with two complete sets of personal protective equipment (PPE) daily, as required herein, for entry into and inspection of the paint removal work within the lead controlled area. Personal protective equipment shall include disposable whole body covering, including appropriate foot, head, and hand protection. PPE shall remain the property of the Contractor. The Government will provide respiratory protection for the Contracting Officer.

1.7 PROJECT/SITE CONDITIONS

1.7.1 Protection of Existing Work to Remain

Perform paint removal work without damage or contamination of adjacent areas. Where existing work is damaged or contaminated, restore work to its original condition or better.

PART 2 PRODUCTS

Section 01 35 26 GOVERNMENT SAFETY REQUIRMENTS.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 Protection

3.1.1.1 Notification

a. Notify the Contracting Officer 20 days prior to the start of any paint removal work.

b. [Occupant Notification](#)

Submit occupant written acknowledgment of the delivery of lead hazard information pamphlet (EPA 747-K-99-001 "Protect Your Family From Lead in Your Home") prior to commencing the renovation work for each affected unit per [40 CFR 745](#) Subpart E.

c. [Notification of the Commencement of LBP Hazard Abatement](#)

Submit a copy of the notification of the commencement of LBP hazard abatement to Contracting officer technical representative.

3.1.1.2 Boundary Requirements

a. Provide physical boundaries around the lead control area by roping off the area designated in the work plan or providing curtains, portable partitions or other enclosures to ensure that lead will not escape outside the lead control area.

b. Warning Signs - Provide warning signs at approaches to lead control areas. Locate signs at such a distance that personnel may read the sign and take the necessary precautions before entering the area. Signs shall comply with the requirements of [29 CFR 1926.62](#).

3.1.1.3 Furnishings

Not used.

3.1.1.4 Heating, Ventilating and Air Conditioning (HVAC) Systems

Shut down, lock out, and isolate HVAC systems that supply, exhaust, or pass through the lead control areas. Seal intake and exhaust vents in the lead control area with [6 mil](#) plastic sheet and tape. Seal seams in HVAC components that pass through the lead control area.

3.1.1.5 Decontamination Shower Facility

Provide clean and contaminated change rooms and shower facilities in accordance with this specification and [29 CFR 1926.62](#).

3.1.1.6 Eye Wash Station

Where eyes may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes shall be provided within the work area.

3.1.1.7 Mechanical Ventilation System

- a. Use adequate ventilation to control personnel exposure to lead in accordance with 29 CFR 1926.62.
- b. To the extent feasible, use local exhaust ventilation connected to HEPA filters or other collection systems, approved by the CP. Local exhaust ventilation systems shall be evaluated and maintained in accordance with 29 CFR 1926.62.
- c. Vent local exhaust outside the building only and away from building ventilation intakes.
- d. Use locally exhausted, power actuated, paint removal tools.

3.1.1.8 Personnel Protection

Personnel shall wear and use protective clothing and equipment as specified herein. Eating, smoking, or drinking or application of cosmetics is not permitted in the lead control area. No one will be permitted in the lead control area unless they have been appropriately trained and provided with protective equipment.

3.2 ERECTION

3.2.1 Lead Control Area Requirements

Establish a lead control area by situating critical barriers and physical boundaries around the area or structure where LBP/PWL removal/control operations will be performed.

3.3 APPLICATION

3.3.1 Work Procedures

Perform removal of lead-based paint in accordance with approved lead-based paint/paint with lead removal/control plan. Use procedures and equipment required to limit occupational and environmental exposure to lead when lead-based paint is removed in accordance with 29 CFR 1926.62. Dispose of removed paint chips and associated waste in compliance with Environmental Protection Agency (EPA), State, and local requirements.

3.3.2 Lead-Based Paint Removal/Control/Deleading

Manual or power sanding of interior and exterior surfaces is not permitted unless tools are equipped with HEPA attachments or wet methods. The dry sanding or grinding of surfaces that contain lead is prohibited. Provide methodology for LBP removal/control in work plan. Remove paint within the areas designated on the drawings in order to completely expose the substrate. Take whatever precautions necessary to minimize damage to the underlying substrate.

Provide methodology for LBP/PWL removal, abatement/control and processes to minimize contamination of work areas outside the control area with lead-contaminated dust or other lead-contaminated debris/waste and to ensure that unprotected personnel are not exposed to hazardous concentrations of lead. Describe this LBP/PWL removal/control process in the LBP/PWL R/CP.

3.3.2.1 Indoor Paint Removal

Perform chemical paint removal in lead control areas using enclosures, barriers, or containments and powered locally exhausted paint removal tools. Collect residue and debris for disposal in accordance with federal, State, and local requirements.

3.3.2.2 Outdoor Paint Removal

Perform outdoor removal as indicated in federal, State, and local regulations and in the LBP/CPR/CP. The worksite preparation (barriers or containments) shall be job dependent and presented in the LBP/PWL R/CP.

3.3.3 Personnel Exiting Procedures

Whenever personnel exit the lead-controlled area, they shall perform the following procedures and shall not leave the work place wearing any clothing or equipment worn during the work day:

- a. Vacuum themselves off.
- b. Remove protective clothing in the contaminated change room, and place them in an approved impermeable disposal bag.
- c. Depending upon the circumstances at the site indicated in an individual Delivery Order: 1. Shower at the site, or; 2. Wash hands and face at the site, don appropriate disposable or uncontaminated reusable clothing; move to an appropriate facility; shower.
- d. Change to clean clothes prior to leaving the physical boundary designated around the lead control area.

3.4 FIELD QUALITY CONTROL

3.4.1 Tests

3.4.1.1 Air and Wipe Sampling

Air sample for lead in accordance with 29 CFR 1926.62 and as specified herein. Air and wipe sampling shall be directed or performed by the CP.

- a. The CP shall be on the job site directing the air and non-clearance wipe sampling and inspecting the lead-based paint removal/control work to ensure that the requirements of the contract have been satisfied during the entire lead-based paint removal operation.
- b. Collect personal air samples on employees who are expected to have the greatest risk of exposure as determined by the CP. In addition, collect air samples on at least 25 percent of the work crew or a minimum of two employees, whichever is greater, during each work shift.
- c. Submit results of air samples, within 72 hours after the air samples are taken.

3.4.1.2 Air Sampling During Paint Removal Work

Conduct area air sampling daily, on each shift in which lead-based paint removal operations are performed, in areas immediately adjacent to the lead control area. Sufficient area monitoring shall be conducted to ensure

unprotected personnel are not exposed at or above 30 micrograms per cubic meter of air. If 30 micrograms per cubic meter of air is reached or exceeded, stop work, correct the condition(s) causing the increased levels. Notify the Contracting Officer immediately. Determine if condition(s) require any further change in work methods. Removal work shall resume only after the CP and the Contracting Officer give approval. For outdoor operations, at least one sample on each shift shall be taken on the downwind side of the lead control area.

3.4.1.3 Sampling After Paint Removal/Control

After the visual inspection, conduct soil sampling if bare soil is present during external removal/control operations and collect wipe samples according to the HUD protocol contained in [HUD 6780](#) to determine the lead content of settled dust and dirt in micrograms per square meter foot of surface area and [parts per million \(ppm\)](#) or for soil.

3.4.1.4 Testing of Removed Paint and Used Abrasive

Test removed paint and used abrasive in accordance with [40 CFR 261](#) for hazardous waste.

3.5 CLEANING AND DISPOSAL

3.5.1 Cleanup

Maintain surfaces of the lead control area free of accumulations of paint chips and dust. Restrict the spread of dust and debris; keep waste from being distributed over the work area. Do not dry sweep or use compressed air to clean up the area. At the end of each shift and when the paint removal operation has been completed, clean the area of visible lead paint contamination by vacuuming with a HEPA filtered vacuum cleaner, wet mopping the area and wet wiping the area as indicated by the CP. Reclean areas showing dust or residual paint chips or debris. After visible dust, chips and debris is removed, wet wipe and HEPA vacuum all surfaces in the work area. If adjacent areas become contaminated at any time during the work, clean, visually inspect, and then wipe sample all contaminated areas. The CP shall then certify in writing that the area has been cleaned of lead contamination before restarting work.

3.5.1.1 Clearance Certification

The CP shall certify in writing that air samples collected outside the lead control area during paint removal operations are less than 30 micrograms per cubic meter of air; the respiratory protection used for the employees was adequate; the work procedures were performed in accordance with [29 CFR 1926.62](#) and [40 CFR 745](#); and that there were no visible accumulations of material and dust containing lead left in the work site. Do not remove the lead control area or roped off boundary and warning signs prior to the Contracting Officer's acknowledgement of receipt of the CP certification.

Clear the lead control area in industrial facilities of all visible dust and debris.

For lead-based paint hazard abatement work, surface wipe and soil sampling shall be conducted and clearance determinations made according to the work practice standards presented in [40 CFR 745.227](#).

3.5.2 Disposal

- a. Collect lead-contaminated waste, scrap, debris, bags, containers, equipment, and lead-contaminated clothing that may produce airborne concentrations of lead particles. Label the containers in accordance with 29 CFR 1926.62 and 40 CFR 262. Dispose of lead-contaminated waste material at an EPA or State approved hazardous waste treatment, storage, or disposal facility off Government property.
- b. Place waste materials in U.S. Department of Transportation (49 CFR 178) approved 55 gallon drums. Properly label each drum to identify the type of waste (49 CFR 172) and the date the drum was filled. For hazardous waste, the collection drum requires marking/labeling in accordance with 40 CFR 262 during the accumulation/collection timeframe. The Contracting Officer or an authorized representative will assign an area for interim storage of waste-containing drums. Do not store hazardous waste drums in interim storage longer than 90 calendar days from the date affixed to each drum.
- c. Handle, transport, and dispose lead or lead-contaminated material classified as hazardous waste in accordance with 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, and 40 CFR 265. Comply with land disposal restriction notification requirements as required by 40 CFR 268.
- d. All material, whether hazardous or non-hazardous shall be disposed in accordance with laws and provisions and Federal, State, or local regulations. Ensure waste is properly characterized. The result of each waste characterization (TCLP for RCRA materials) will dictate disposal requirements.

3.5.2.1 Disposal Documentation

Submit written evidence to demonstrate the hazardous waste treatment, storage, or disposal facility (TSD) is approved for lead disposal by the EPA, State or local regulatory agencies. Submit one copy of the completed hazardous waste manifest, signed and dated by the initial transporter in accordance with 40 CFR 262. Contractor shall provide a certificate that the waste was accepted by the disposal facility. Provide turn-in documents or weight tickets for non-hazardous waste disposal.

3.5.3 Payment for Hazardous Waste

Payment for disposal of hazardous and non-hazardous waste will not be made until a signed copy of the manifest from the treatment or disposal facility certifying the amount of lead-containing materials or non-hazardous waste delivered is returned and a copy is furnished to the Government.

-- End of Section --

SECTION 03 30 53

MISCELLANEOUS CAST-IN-PLACE CONCRETE
05/14

PART 1 GENERAL

1.1 SUMMARY

Perform all work in accordance with ACI 318.

1.2 REFERENCES

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

AMERICAN CONCRETE INSTITUTE INTERNATIONAL (ACI)

| | |
|-------------|--|
| ACI 117 | (2010; Errata 2011) Specifications for Tolerances for Concrete Construction and Materials and Commentary |
| ACI 301 | (2010; Errata 2011) Specifications for Structural Concrete |
| ACI 302.1R | (2004; Errata 2006; Errata 2007) Guide for Concrete Floor and Slab Construction |
| ACI 305R | (2010) Guide to Hot Weather Concreting |
| ACI 306R | (2010) Guide to Cold Weather Concreting |
| ACI 318 | (2014; Errata 2014) Building Code Requirements for Structural Concrete and Commentary |
| ACI MCP SET | (2015) ACI Manual of Concrete Practice Set |
| ACI SP-66 | (2004) ACI Detailing Manual |

ASTM INTERNATIONAL (ASTM)

| | |
|-------------------|---|
| ASTM A1064/A1064M | (2014) Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete |
| ASTM A615/A615M | (2014) Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement |
| ASTM C1064/C1064M | (2011) Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete |
| ASTM C143/C143M | (2012) Standard Test Method for Slump of |

| | Hydraulic-Cement Concrete |
|-------------------|--|
| ASTM C150 | (2012) Standard Specification for Portland Cement |
| ASTM C1602/C1602M | (2012) Standard Specification for Mixing Water Used in Production of Hydraulic Cement Concrete |
| ASTM C171 | (2007) Standard Specification for Sheet Materials for Curing Concrete |
| ASTM C172/C172M | (2014a) Standard Practice for Sampling Freshly Mixed Concrete |
| ASTM C173/C173M | (2014) Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method |
| ASTM C231/C231M | (2014) Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method |
| ASTM C260 | (2010a) Standard Specification for Air-Entraining Admixtures for Concrete |
| ASTM C309 | (2011) Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete |
| ASTM C31/C31M | (2012) Standard Practice for Making and Curing Concrete Test Specimens in the Field |
| ASTM C33/C33M | (2013) Standard Specification for Concrete Aggregates |
| ASTM C39/C39M | (2014a) Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens |
| ASTM C494/C494M | (2013) Standard Specification for Chemical Admixtures for Concrete |
| ASTM C618 | (2012a) Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete |
| ASTM C685/C685M | (2011) Concrete Made by Volumetric Batching and Continuous Mixing |
| ASTM C94/C94M | (2014b) Standard Specification for Ready-Mixed Concrete |
| ASTM C989 | (2014) Standard Specification for Slag Cement for Use in Concrete and Mortars |
| ASTM D98 | (2005; R 2013) Calcium Chloride |
| ASTM E1155 | (2014) Standard Test Method for |

Determining Floor Flatness and Floor Levelness Numbers

ASTM E1155M

(2014) Standard Test Method for Determining Floor Flatness and Floor Levelness Numbers (Metric)

ASTM E1643

(2011) Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs

ASTM E96/E96M

(2013) Standard Test Methods for Water Vapor Transmission of Materials

U.S. ARMY CORPS OF ENGINEERS (USACE)

COE CRD-C 400

(1963) Requirements for Water for Use in Mixing or Curing Concrete

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

40 CFR 247

Comprehensive Procurement Guideline for Products Containing Recovered Materials

1.3 SUBMITTALS

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

SD-03 Product Data

Air-Entraining Admixture
 Accelerating Admixture
 Water-Reducing or Retarding Admixture
 Curing Materials
 Ready-Mix Concrete
 Mix Design Data
 Curing Compound

Manufacturer's literature from suppliers which demonstrates compliance with applicable specifications for the above materials.

Batching and Mixing Equipment
 Manufacturer's data for batching and mixing equipment which demonstrates compliance with the applicable specifications.

Conveying and Placing Concrete

Methods and equipment for transporting, handling, depositing, and consolidating the concrete prior to the first concrete placement.

SD-06 Test Reports

Aggregates

Test reports for aggregates showing the material(s) meets the quality and grading requirements of the specifications.

Concrete Mixture Proportions

The mixture proportions that will produce concrete of the quality required, ten days prior to placement of concrete. Applicable test reports to verify that the concrete mixture proportions selected will produce concrete of the quality specified.

Compressive Strength Testing Slump

SD-07 Certificates

Cementitious Materials

CPG for recycled materials or appropriate Waiver Form Manufacturer's certificates of compliance, accompanied by mill test reports, attesting that the concrete materials meet the requirements of the specifications in accordance with the Special Clause "CERTIFICATES OF COMPLIANCE". Certificates for all material conforming to EPA's Comprehensive Procurement Guidelines (CPG), in accordance with 40 CFR 247.

Aggregates

Certificates of compliance stating that the material(s) meet the quality and grading requirements of the specifications under which it is furnished.

Delivery Tickets

1.4 QUALITY ASSURANCE

Indicate specific locations of Concrete Placement Forms on installation drawings and include, but not be limited to, square feet of concrete placements, thicknesses and widths, plan dimensions, and arrangement of cast-in-place concrete section.

1.4.1 Flatness and Levelness of Floor Slabs

Conduct floor flatness and levelness test, (FF and FL respectively), on floor slabs in accordance with the provisions set forth in ASTM E1155M or ASTM E1155. Make floor tolerance measurements by the approved laboratory and inspection service within 24 hours after completion of final troweling operation and before forms and shores have been removed. Provide results of floor tolerance tests, including formal notice of acceptance or rejection of the work, to the Contracting Officer within 24 hours after data collection.

PART 2 PRODUCTS

2.1 MATERIALS

Submit manufacturer's literature from suppliers which demonstrates compliance with applicable specifications for the specified materials.

2.1.1 Cementitious Materials

Submit Manufacturer's certificates of compliance, accompanied by mill test reports, attesting that the concrete materials meet the requirements of the specifications in accordance with the Special Clause "CERTIFICATES OF

COMPLIANCE". Also, certificates for all material conforming to EPA's Comprehensive Procurement Guidelines (CPG), in accordance with 40 CFR 247. Provide cementitious materials that conform to the appropriate specifications listed:

2.1.1.1 Portland Cement

ASTM C150, Type I, IA, II, IIA, III, IIIA, or V, low alkali, with tri-calcium aluminates (C3A) content less than 10 percent and a maximum cement-alkali content of 0.80 percent Na₂O_e (sodium oxide) equivalent.

2.1.1.2 Pozzolan

Provide pozzolan that conforms to ASTM C618, Class F, including requirements of Tables 1A and 2A.

2.1.2 Aggregates

For fine and coarse aggregates meet the quality and grading requirements of ASTM C33/C33M Class Designation 4M or better.

2.1.3 Admixtures

Provide admixtures, when required or approved, in compliance with the appropriate specification listed. Retest chemical admixtures that have been in storage at the project site, for longer than 6 months or that have been subjected to freezing, at the expense of the Contractor at the request of the Contracting Officer and will be rejected if test results are not satisfactory.

2.1.3.1 Air-Entraining Admixture

Provide air-entraining admixture that meets the requirements of ASTM C260.

2.1.3.2 Accelerating Admixture

Provide calcium chloride meeting the requirements of ASTM D98. Other accelerators must meet the requirements of ASTM C494/C494M, Type C or E.

2.1.3.3 Water-Reducing or Retarding Admixture

Provide water-reducing or retarding admixture meeting the requirements of ASTM C494/C494M, Type A, B, or D. High-range water reducing admixture Type F may be used only when approved, approval being contingent upon particular placement requirements as described in the Contractor's Quality Control Plan.

2.1.4 Water

Mixing and curing water in compliance with the requirements of ASTM C1602/C1602M; potable, and free of injurious amounts of oil, acid, salt, or alkali, except that unpotable water may be used if it meets the requirements of COE CRD-C 400. Submit test report showing water complies with ASTM C1602/C1602M.

2.1.5 Reinforcing Steel

Provide reinforcing bars conforming to the requirements of ASTM A615/A615M, Grade 60, deformed. Provide welded steel wire reinforcement conforming to

the requirements of [ASTM A1064/A1064M](#). Detail reinforcement not indicated in accordance with [ACI 301](#) and [ACI SP-66](#). Provide mechanical reinforcing bar connectors in accordance with [ACI 301](#) and provide 125 percent minimum yield strength of the reinforcement bar.

2.1.6 Vapor Barrier

Provide polyethylene vapor barrier sheeting, minimum of 6 mil thickness having a vapor permeance rating not exceeding 0.5 perms per [ASTM E96/E96M](#).

Consider plastic vapor retarders and adhesives with a high recycled content, low toxicity low VOC (Volatile Organic Compounds) levels.

2.1.7 Curing Materials

Provide curing materials in accordance with [ACI 301](#), Section 5.

2.1.7.1 Impervious Sheet Materials

Impervious sheet materials, [ASTM C171](#), type optional, except polyethylene film, if used, shall be white opaque.

2.1.7.2 Membrane-Forming Curing Compound

[ASTM C309](#), Type 1-D or 2, Class A.

2.2 READY-MIX CONCRETE

Provide ready-mix concrete with [mix design data](#) conforming to [ACI 301](#) Part 2. Submit [delivery tickets](#) in accordance with [ASTM C94/C94M](#) for each ready-mix concrete delivery, include the following additional information: .

- a. Concrete shall be ready-mix concrete with [mix design data](#) conforming to [ACI 301](#) Part 2.
- b. Non-exposed concrete elements: 4000 psi minimum compressive strength.
- c. Direct-exposed concrete elements (including air-conditioned rooms): 5000 psi minimum compressive strength as determined in 28 calendar days.
- d. Slump: 1 to 4 inch according to [ASTM C143/C143M](#) and [ACI MCP SET](#) Part 1.
- e. Portland Cement conforming to [ASTM C150](#).
- f. Use one brand and type of cement for formed concrete having exposed-to-view finished surfaces.
- g. [Air-Entraining Admixtures](#) conforming to [ASTM C260](#). Exterior concrete exposed to freezing needs to be air-entrained 5 to 6 percent by volume. Nonair-entrained interior concrete shall have a total air content of 2 to 4 percent by volume.
- h. Water-reducing admixtures, retarding admixtures, accelerating admixtures, water-reducing and accelerating admixtures, and water-reducing and retarding admixtures shall conform to [ASTM C494/C494M](#).

- i. Fly Ash used as an admixture shall conform to [ASTM C618](#), Class C or F with 4 percent maximum loss on ignition and 35 percent maximum cement replacement by weight.
- j. Ground granulated blast furnace slag used as an admixture shall conform to [ASTM C989](#), Grade 120 with between 25 to 50 percent maximum cement replacement by weight.

2.3 STEEL REINFORCEMENT

2.3.1 Deformed Steel Bars

Provide steel bars conforming to [ASTM A615/A615M](#), Grade .60 ksi [ACI MCP SET](#) Parts 2 and 3.

2.3.2 Welded Wire Fabric

Provide welded wire fabric conforming to [ASTM A1064/A1064M](#).

2.4 FORMS

Forms shall be of wood, steel, or other approved material and conform to [ACI MCP SET](#), Parts 2 and 3.

Provide form release conforming to [ACI MCP SET](#), Part 4.

2.5 ACCESSORIES

2.5.1 Chemical Floor Hardener

Provide hardener which is a colorless aqueous solution containing a blend of inorganic silicate or silicate material and proprietary components combined with a wetting agent; that penetrates, hardens, and densifies concrete surfaces. Submit manufactures instructions for placement of liquid chemical floor hardener.

2.5.2 [Curing Compound](#)

Provide curing compound conforming to [ASTM C309](#). Submit manufactures instructions for placing curing compound.

PART 3 EXECUTION

3.1 PREPARATION

Prepare construction joints to expose coarse aggregate. The surface must be clean, damp, and free of laitance. Construct ramps and walkways, as necessary, to allow safe and expeditious access for concrete and workmen. Remove snow, ice, standing or flowing water, loose particles, debris, and foreign matter. Satisfactorily compact earth foundations. Make spare vibrators available. Placement cannot begin until the entire preparation has been accepted by the Government.

3.1.1 Embedded Items

Secure reinforcement in place after joints, anchors, and other embedded items have been positioned. Arrange internal ties so that when the forms are removed the metal part of the tie is not less than [2 inches](#) from

concrete surfaces permanently exposed to view or exposed to water on the finished structures. Prepare embedded items so they are free of oil and other foreign matters such as loose coatings or rust, paint, and scale. The embedding of wood in concrete is permitted only when specifically authorized or directed. Provide all equipment needed to place, consolidate, protect, and cure the concrete at the placement site and in good operating condition.

3.1.2 Formwork Installation

Forms must be properly aligned, adequately supported, and mortar-tight. Provide smooth form surfaces, free from irregularities, dents, sags, or holes when used for permanently exposed faces. Chamfer all exposed joints and edges, unless otherwise indicated.

3.1.3 Vapor Barrier Installation

Install in accordance with [ASTM E1643](#). Apply vapor barrier over gravel fill. Lap edges not less than [12 inches](#). Seal all joints with pressure-sensitive adhesive not less than [2 inches](#) wide. Protect the vapor barrier at all times to prevent injury or displacement prior to and during concrete placement.

3.1.4 Production of Concrete

3.1.4.1 Ready-Mixed Concrete

Provide ready-mixed concrete conforming to [ASTM C94/C94M](#) except as otherwise specified.

3.1.4.2 Concrete Made by Volumetric Batching and Continuous Mixing

Conform to [ASTM C685/C685M](#).

3.2 CONVEYING AND PLACING CONCRETE

Convey and place concrete in accordance with [ACI 301](#), Section 5. Concrete placement is not permitted when weather conditions prevent proper placement and consolidation without approval. When concrete is mixed and/or transported by a truck mixer, deliver the concrete to the site of the work completing the discharge within 1-1/2 hours or 45 minutes when the placing temperature is 86 degrees F or greater unless a retarding admixture is used. Convey concrete from the mixer to the forms as rapidly as practicable by methods which prevent segregation or loss of ingredients. Concrete shall be in place and consolidated within 15 minutes after discharge from the mixer. Deposit concrete as close as possible to its final position in the forms and regulate it so that it may be effectively consolidated in horizontal layers 18 inches or less in thickness with a minimum of lateral movement. Carry on the placement at such a rate that the formation of cold joints will be prevented.

3.2.1 Consolidation

Consolidate each layer of concrete by internal vibrating equipment. External vibrating equipment may be used when authorized. Systematically accomplish internal vibration by inserting the vibrator through the fresh concrete in the layer below at a uniform spacing over the entire area of placement. The distance between insertions shall be approximately 1.5 times the radius of action of the vibrator and overlay the adjacent,

just-vibrated area by approximately 4 inches. Ensure that the vibrator penetrates rapidly to the bottom of the layer and at least 6 inches into the layer below, if such a layer exists. Hold vibrator stationary until the concrete is consolidated and then withdraw it slowly at the rate of about 3 inches per second.

3.2.2 Cold-Weather Requirements

Place concrete in cold weather in accordance with [ACI 306R](#). No concrete is to be mixed or placed when the ambient temperature is below 36 degrees F or if the ambient temperature is below 41 degrees F and falling. Provide suitable covering and other means as approved for maintaining the concrete at a temperature of at least 50 degrees F for not less than 72 hours after placing and at a temperature above freezing for the remainder of the curing period. Do not mix salt, chemicals, or other foreign materials with the concrete to prevent freezing. Remove and replace concrete damaged by freezing at the expense of the Contractor.

3.2.3 Hot-Weather Requirements

Place concrete in hot weather in accordance with [ACI 305R](#). When the rate of evaporation of surface moisture, as determined by use of Figure 1 of [ACI MCP SET Part 2](#), is expected to exceed 0.2 psf per hour, provisions for windbreaks, shading, fog spraying, or covering with a light-colored material shall be made in advance of placement, and such protective measures taken as quickly as finishing operations will allow.

3.2.4 Lifts in Concrete

When the rate of evaporation of surface moisture, as determined by use of Figure 1 of [ACI MCP SET Part 2](#), is expected to exceed 0.2 psf per hour, provisions for windbreaks, shading, fog spraying, or covering with a light-colored material shall be made in advance of placement, and such protective measures taken as quickly as finishing operations will allow.

3.3 FINISHING

3.3.1 Temperature Requirement

Do not finish or repair concrete when either the concrete or the ambient temperature is below [50 degrees F](#).

3.3.2 Finishing Formed Surfaces

Remove all fins and loose materials, and surface defects including filling of tie holes. Repair all honeycomb areas and other defects. Remove all unsound concrete from areas to be repaired. Ream or chip surface defects greater than [1/2 inch](#) in diameter and holes left by removal of tie rods in all surfaces not to receive additional concrete and fill with dry-pack mortar. Brush-coat the prepared area with an approved epoxy resin or latex bonding compound or with a neat cement grout after dampening and filling with mortar or concrete. Use a blend of portland cement and white cement in mortar or concrete for repairs to all surfaces permanently exposed to view shall be so that the final color when cured is the same as adjacent concrete.

3.3.3 Finishing Unformed Surfaces

Finish unformed surfaces in accordance with [ACI 301](#), Section 5. Float

finish all unformed surfaces, that are not to be covered by additional concrete or backfill, to elevations shown, unless otherwise specified. Surfaces to receive additional concrete or backfill shall be brought to the elevations shown and left as a true and regular surface. Slope exterior surfaces for drainage unless otherwise shown. Carefully make joints with a jointing tool. Finish unformed surfaces to a tolerance of 3/8 inch for a float finish and 5/16 inch for a trowel finish as determined by a 10 foot straightedge placed on surfaces shown on the drawings to be level or having a constant slope. Do not perform finishing while there is excess moisture or bleeding water on the surface. No water or cement is to be added to the surface during finishing.

3.3.3.1 Flat Floor Finishes

In accordance with ACI 302.1R, construct in accordance with one of the methods recommended in Table 7.15.3, "Typical Composite FF/FL Values for Various Construction Methods." ACI 117 for tolerances tested by ASTM E1155M or ASTM E1155. These requirements are based upon the latest FF/FL method.

3.3.3.1.1 Float Finish

Provide float finished surfaces, screeded and darbied or bullfloated to eliminate the ridges and to fill in the voids left by the screed. In addition, the darby or bullfloat shall fill all surface voids and only slightly embed the coarse aggregate below the surface of the fresh concrete. When the water sheen disappears and the concrete supports a person's weight without deep imprint, complete floating. Floating shall embed large aggregates just beneath the surface, remove slight imperfections, humps, and voids to produce a plane surface, compact the concrete, and consolidate mortar at the surface.

3.3.3.1.2 Trowel Finishe

Apply a trowel finish as specified in teh individual Task Orders. Trowelling shall be done immediately following floating to provide a smooth, even, dense finish free from blemishes including trowel marks. Protect finished surfaces from damage during the construction period.

3.3.3.1.3 Floor Slabs

In accordance with ACI MCP SET Part 2, construct in accordance with one of the methods recommended in Table 7.15.3, "Typical Composite FF/FL Values for Various Construction Methods." ACI MCP SET Part 1 for tolerances tested by ASTM E1155M or ASTM E1155. These requirements are based upon the latest FF/FL method. Floor slabs shall conform to the following ACI F-number requirements unless noted otherwise:

| | |
|--------------------------|-------------------|
| Specified Overall Values | FF20/FL15 minimum |
| Minimum Local Values | FF17/FL15 minimum |

3.3.3.2 Measurement of Floor Tolerances

Test floor slabs within 24 hours of the final troweling. Submit test results to Contracting Officer within 12 hours after collecting data. Floor flatness inspector mustl provide a tolerance report which includes:

- a. Name of Project

- b. Name of Contractor
- c. Date of Data Collection
- d. Date of Tolerance Report
- e. A Key Plan Showing Location of Data Collected
- f. Results Required by [ASTM E1155M](#) [ASTM E1155](#)

3.3.4 Broom Finish

Apply a broom finish to areas as specified in the individual Task Orders. Screed and float the concrete to required finish plane with no coarse aggregate visible. After surface moisture disappears, broom or brush the surface with a broom or fiber bristle brush in a direction transverse to that of the main traffic or as directed.

3.4 CURING AND PROTECTION

Cure and protect in accordance with [ACI 301](#), Section 5. Beginning immediately after placement, and continuing for at least 7 days, except for concrete made with Type III cement, at least 3 days, cure and protect all concrete from premature drying, extremes in temperature, rapid temperature change, freezing, mechanical damage, and exposure to rain or flowing water. Provide all materials and equipment needed for adequate curing and protection at the site of the placement prior to the start of concrete placement. Accomplish moisture preservation of moisture for concrete surfaces not in contact with forms by one of the following methods:

- a. Continuous sprinkling or ponding.
- b. Application of absorptive mats or fabrics kept continuously wet.
- c. Application of sand kept continuously wet.
- d. Application of impervious sheet material conforming to [ASTM C 171](#).
- e. Application of membrane-forming curing compound conforming to [ASTM C309](#), Type 1-D, on surfaces permanently exposed to view. Accomplish Type 2 on other surfaces in accordance with manufacturer's instructions.

Accomplish the preservation of moisture for concrete surfaces placed against wooden forms by keeping the forms continuously wet for 7 days, except for concrete made with Type III cement, for 3 days. If forms are removed prior to end of the required curing period, use other curing methods for the balance of the curing period. Do not perform protection removal if the temperature of the air in contact with the concrete may drop more than 60 degrees F within a 24 hour period.

3.5 FORM WORK

Provide form work in accordance with [ACI 301](#), Section 2 and Section 5.

3.5.1 Removal of Forms

Remove forms in accordance with **ACI 301**, Section 2. Remove forms carefully to prevent damage to the concrete. Do not remove forms before the expiration of the minimum time indicated below:

Arches, beams and deck-type slabs 144 hours

Columns and walls (lifts 15 feet and under) 24 hours

Columns and walls (lifts over 15 feet) 48 hours

3.6 STEEL REINFORCING

Reinforcement must be free from loose, flaky rust and scale, and free from oil, grease, or other coating which might destroy or reduce the reinforcement's bond with the concrete.

3.6.1 Fabrication

Shop fabricate steel reinforcement in accordance with **ACI 318** and **ACI SP-66**. Provide shop details and bending in accordance with **ACI 318** and **ACI SP-66**.

3.6.2 Splicing

Perform splices in accordance with **ACI 318** and **ACI SP-66**.

3.6.3 Supports

Secure reinforcement in place by the use of metal or concrete supports, spacers, or ties.

3.7 EMBEDDED ITEMS

Before placing concrete, take care to determine that all embedded items are firmly and securely fastened in place. Provide embedded items free of oil and other foreign matter, such as loose coatings of rust, paint and scale. Embedding of wood in concrete is permitted only when specifically authorized or directed.

3.8 CHEMICAL FLOOR HARDENER

Apply Chemical Floor Hardener where indicated, after curing and drying concrete surface. Dilute liquid hardener with water and apply in three coats. First coat is one-third strength, second coat one-half strength, and third coat two-thirds strength. Apply each coat evenly and allow it to dry 24 hours before applying next coat. Apply proprietary chemical hardeners in accordance with manufacturer's printed directions.

3.9 TESTING AND INSPECTING

Report the results of all tests and inspections conducted at the project site informally at the end of each shift. Submit written reports weekly. Deliver within three days after the end of each weekly reporting period. See Section **01 45 00.10 20** QUALITY CONTROL FOR MINOR CONSTRUCTION.

3.9.1 Field Testing Technicians

The individuals who sample and test concrete must have demonstrated a

knowledge and ability to perform the necessary test procedures equivalent to the ACI minimum guidelines for certification of Concrete Field Testing Technicians, Grade I.

3.9.2 Preparations for Placing

Inspect foundation or construction joints, forms, and embedded items in sufficient time prior to each concrete placement to certify that it is ready to receive concrete.

3.9.3 Sampling and Testing

- a. Obtain samples and test concrete for quality control during placement. Sample fresh concrete for testing in accordance with [ASTM C172/C172M](#). Make six test cylinders.
- b. Test concrete for compressive strength at 7 and 28 days for each design mix. Test two cylinders at 7 days; two cylinders at 28 days; and hold two cylinders in reserve. Conform test specimens to [ASTM C31/C31M](#). Perform [compressive strength testing](#) conforming to [ASTM C39/C39M](#).
- c. Test [slump](#) at the site of discharge for each design mix in accordance with [ASTM C143/C143M](#).
- d. Test air content for air-entrained concrete in accordance with [ASTM C231/C231M](#). Test concrete using lightweight or extremely porous aggregates in accordance with [ASTM C173/C173M](#).
- e. Determine temperature of concrete at time of placement in accordance with [ASTM C1064/C1064M](#).

3.9.4 Action Required

3.9.4.1 Placing

Do not begin placement until the availability of an adequate number of acceptable vibrators, which are in working order and have competent operators, has been verified. Discontinue placing if any lift is inadequately consolidated.

3.9.4.2 Air Content

Whenever an air content test result is outside the specification limits, adjust the dosage of the air-entrainment admixture prior to delivery of concrete to forms.

3.9.4.3 Slump

Whenever a slump test result is outside the specification limits, adjust the batch weights of water and fine aggregate prior to delivery of concrete to the forms. Make the adjustments so that the water-cementitious material ratio does not exceed that specified in the submitted concrete mixture proportion and the required concrete strength is still met.

-- End of Section --

SECTION 03 40 00.00 10

PLANT-PRECAST CONCRETE PRODUCTS FOR BELOW GRADE CONSTRUCTION
08/06

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 CONCRETE INSTITUTE INTERNATIONAL (ACI)

- ACI 211.1 (1991; R 2009) Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete
- ACI 211.2 (1998; R 2004) Standard Practice for Selecting Proportions for Structural Lightweight Concrete
- ACI 305R (2010) Guide to Hot Weather Concreting
- ACI 306.1 (1990; R 2002) Standard Specification for Cold Weather Concreting
- ACI 318 (2014; Errata 2014) Building Code Requirements for Structural Concrete and Commentary

AMERICAN CONCRETE PIPE ASSOCIATION (ACPA)

- ACPA 01-102 (2000) Concrete Pipe Handbook
- ACPA 01-110 (1984) Design Manual for Sulfide and Corrosion Prediction and Control
- ACPA QPC (2005; Ver 3.0) QCast Plant Certification Manual

AMERICAN WELDING SOCIETY (AWS)

- AWS D1.1/D1.1M (2008; Errata 2009) Structural Welding Code - Steel
- AWS D1.4/D1.4M (2005; Errata 2005) Structural Welding Code - Reinforcing Steel

ASTM INTERNATIONAL (ASTM)

- ASTM A 153/A 153M (2009) Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
- ASTM A 185/A 185M (2007) Standard Specification for Steel

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| | Welded Wire Reinforcement, Plain, for Concrete |
| ASTM A 36/A 36M | (2008) Standard Specification for Carbon Structural Steel |
| ASTM A 496/A 496M | (2007) Standard Specification for Steel Wire, Deformed, for Concrete Reinforcement |
| ASTM A 497/A 497M | (2007) Standard Specification for Steel Welded Wire Reinforcement, Deformed, for Concrete |
| ASTM A 615/A 615M | (2009) Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement |
| ASTM A 706/A 706M | (2009) Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement |
| ASTM A 767/A 767M | (2005) Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement |
| ASTM A 775/A 775M | (2007b) Standard Specification for Epoxy-Coated Steel Reinforcing Bars |
| ASTM A 82/A 82M | (2007) Standard Specification for Steel Wire, Plain, for Concrete Reinforcement |
| ASTM A 884/A 884M | (2006) Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement |
| ASTM C 1064/C 1064M | (2008) Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete |
| ASTM C 1107/C 1107M | (2008) Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink) |
| ASTM C 1116/C 1116M | (2008a) Standard Specification for Fiber-Reinforced Concrete |
| ASTM C 1240 | (2005) Standard Specification for Silica Fume Used in Cementitious Mixtures |
| ASTM C 1244 | (2005e1) Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test Prior to Backfill |
| ASTM C 138/C 138M | (2009) Standard Test Method for Density ("Unit Weight"), Yield, and Air Content (Gravimetric) of Concrete |
| ASTM C 143/C 143M | (2008) Standard Test Method for Slump of Hydraulic-Cement Concrete |

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|-------------------|--|
| ASTM C 1478 | (2008a) Standard Specification for Storm Drain Resilient Connectors Between Reinforced Concrete Storm Sewer Structures, Pipes and Laterals |
| ASTM C 150 | (2007) Standard Specification for Portland Cement |
| ASTM C 171 | (2007) Standard Specification for Sheet Materials for Curing Concrete |
| ASTM C 173/C 173M | (2009) Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method |
| ASTM C 192/C 192M | (2007) Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory |
| ASTM C 231 | (2009) Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method |
| ASTM C 260 | (2006) Standard Specification for Air-Entraining Admixtures for Concrete |
| ASTM C 309 | (2007) Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete |
| ASTM C 31/C 31M | (2009) Standard Practice for Making and Curing Concrete Test Specimens in the Field |
| ASTM C 33/C 33M | (2008) Standard Specification for Concrete Aggregates |
| ASTM C 330 | (2005) Standard Specification for Lightweight Aggregates for Structural Concrete |
| ASTM C 39/C 39M | (2005e1e2) Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens |
| ASTM C 443M | (2007) Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets (Metric) |
| ASTM C 494/C 494M | (2008a) Standard Specification for Chemical Admixtures for Concrete |
| ASTM C 595 | (2008a) Standard Specification for Blended Hydraulic Cements |
| ASTM C 618 | (2008a) Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete |
| ASTM C 877M | (2002; E 2005) External Sealing Bands for |

Concrete Pipe, Manholes, and Precast Box Sections (Metric)

- ASTM C 891** (1990; R 2003) Installation of Underground Precast Concrete Utility Structures
- ASTM C 920** (2008) Standard Specification for Elastomeric Joint Sealants
- ASTM C 923M** (2008b) Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals (Metric)
- ASTM C 990M** (2009) Standard Specification for Joints for Concrete Pipe, Manholes and Precast Box Sections Using Preformed Flexible Joint Sealants (Metric)

CANADIAN STANDARDS ASSOCIATION (CSA)

- CAN/CSA A23.4** (2005) Precast Concrete - Materials and Construction

NATIONAL PRECAST CONCRETE ASSOCIATION (NPCA)

- NPCA QC Manual** (2005; R 2006) Quality Control Manual for Precast Plants

1.2 SUBMITTALS

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

SD-01 Preconstruction Submittals

Quality Control Procedures

Quality control procedures established by the precast manufacturer in accordance with **NPCA QC Manual** and/or **ACPA QPC**.

SD-02 Shop Drawings

Standard Precast Units

Drawings for standard precast concrete units furnished by the precast concrete producer for approval by the Contracting Officer. These drawings shall demonstrate that the applicable industry design standards have been met. Include installation and construction information on shop drawings. Include details of steel reinforcement size and placement as well as supporting design calculations, if appropriate. Produce precast concrete units in accordance with the approved drawings.

Custom-Made Precast Units; G

Drawings for custom-made precast concrete units furnished by the precast concrete producer for approval by the Contracting Officer. Show on these drawings complete design, installation, and construction information in such detail as to enable the Contracting Officer to determine the adequacy of the proposed units for the intended purpose. Include details of steel reinforcement size and placement as well as supporting design calculations, if appropriate. Produce precast concrete units in accordance with the approved drawings.

SD-03 Product Data

Standard Precast Units

Cut sheets, for standard precast concrete units, showing conformance to project drawings and requirements, and to applicable industry design standards listed in this specification.

Proprietary Precast Units

Standard plans or informative literature, for proprietary precast concrete units. Make available supporting calculations and design details upon request. Provide sufficient information as to demonstrate that such products will perform the intended task.

Embedded Items

Product data sheets and proper installation instruction for anchors, lifting inserts and other devices. Clearly indicate the products dimensions and safe working load.

Accessories

Proper installation instructions and relevant product data for items including, but not limited to, sealants, gaskets, connectors, steps, cable racks and other items installed before or after delivery.

SD-05 Design Data

Design Calculations Concrete Mix Proportions

Precast concrete unit design calculations, and concrete mix proportions.

SD-06 Test Reports

Test Reports

a. Copies of material certifications and/or laboratory test reports, including mill tests and all other test data, for portland cement, blended cement, pozzolans, ground granulated blast furnace slag, silica fume, aggregate, admixtures, and curing compound proposed for use on this project.

b. Copies of test reports showing that the mix has been successfully tested to produce concrete with the properties

specified and will be suitable for the job conditions. Such tests may include compressive strength, flexural strength, plastic or hardened air content, freeze thaw durability, abrasion and absorption. Clearly detail in the specifications special tests for precast concrete or cast-in items.

c. Sufficient documentation, when the use of self-consolidating concrete (SCC) is proposed, showing a minimum of 30-days production track records demonstrating that SCC is appropriate for casting of the product.

d. Copies of in-plant QA/QC inspection reports, upon the request of the Contracting Officer.

SD-07 Certificates

Quality Control Procedures

Quality control procedures established in accordance with [NPCA QC Manual](#) and/or [ACPA QPC](#).

1.3 GENERAL REQUIREMENTS

Furnish precast concrete units designed and fabricated by an experienced and acceptable precast concrete manufacturer who has been, for at least 3 years, regularly and continuously engaged in the manufacture of precast concrete work similar to that indicated on the drawings. Coordinate precast work with the work of other trades.

1.4 DESIGN

1.4.1 Standard Precast Units

Design standard precast concrete units to withstand indicated design load conditions in accordance with applicable industry design standards [ACI 318](#), [ACPA 01-102](#), Chapter 7-Design for Sulfide Control. Design must also consider stresses induced during handling, shipping and installation as to avoid product cracking or other handling damage. Indicate design loads for precast concrete units on the shop drawings.

1.4.2 Custom-Made Precast Units

Submit [design calculations](#) and drawings of custom-made precast units, prepared and sealed by a registered professional engineer, for approval prior to fabrication. Include in the calculations the analysis of units for lifting stresses and the sizing of lifting devices.

1.4.3 Proprietary Precast Units

Products manufactured under franchise arrangements must conform to all the requirements specified by the franchiser. Items not included in the franchise specification, but included in this specification, must conform to the requirements in this specification.

1.4.4 Joints and Sealants

Provide joints and sealants between adjacent units of the type and configuration indicated on shop drawings meeting specified design and performance requirements.

1.4.5 Concrete Mix Design

1.4.5.1 Concrete Mix Proportions

Base selection of proportions for concrete on the methodology presented in [ACI 211.1](#) for normal weight concrete and [ACI 211.2](#) for lightweight concrete. Develop the concrete proportions using the same type and brand of cement, the same type and brand of pozzolan, the same type and gradation of aggregates, and the same type and brand of admixture that will be used in the manufacture of precast concrete units for the project. Do not use calcium chloride in precast concrete containing reinforcing steel or other embedded metal items. At a minimum of thirty days prior to precast concrete unit manufacturing, the precast concrete producer will submit a mix design for each strength and type of concrete that will be used. Furnish a complete list of materials, including quantity, type, brand and applicable data sheets for all mix design constituents as well as applicable reference specifications. The use of self-consolidating concrete is permitted, provided that mix design proportions and constituents meet the requirements of this specification.

1.4.5.2 Concrete Strength

Provide precast concrete units with a 28-day compressive strength (f'c) of 4,000 [psi](#).

1.4.5.3 Water-to-Cement Ratio

Furnish concrete, that will be exposed to freezing and thawing, containing entrained air and with water-cement ratios of 0.45 or less. Furnish concrete which will not be exposed to freezing, but which is required to be watertight, with a water-cement ratio of 0.48 or less if the concrete is exposed to fresh water, or 0.45 or less if exposed to brackish water or sea water. Furnish reinforced concrete exposed to deicer salts, brackish water or seawater with a water-cement ratio of 0.40 or less for corrosion protection.

1.4.5.4 Air Content

The air content of concrete that will be exposed to freezing conditions must be within the limits given below.

| NOMINAL MAXIMUM AGGREGATE SIZE | AIR CONTENT % | |
|-----------------------------------|-----------------|-------------------|
| | SEVERE EXPOSURE | MODERATE EXPOSURE |
| 10 mm (3/8 inch) | 6.0 to 9.0 | 4.5 to 7.5 |
| 13 mm (1/2 inch) | 5.5 to 8.5 | 4.0 to 7.0 |
| 19 mm (3/4 inch) | 4.5 to 7.5 | 3.5 to 6.5 |
| 25 mm (1.0 inch) | 4.5 to 7.5 | 3.0 to 6.0 |
| 38 mm (1.5 inch) | 4.5 to 7.0 | 3.0 to 6.0 |

Note: For specified compressive strengths greater than 5000 [psi](#), air content may be reduced 1%

1.4.5.5 Corrosion Control for Sanitary Sewer Systems

Follow design recommendations outlined in Chapter 7 of [ACPA 01-102](#) or the [ACPA 01-110](#) when hydrogen sulfide is indicated as a potential problem.

1.5 QUALITY ASSURANCE

Demonstrate adherence to the standards set forth in [NPCA QC Manual](#) and/or [ACPA QPC](#). Meet requirements written in the subparagraphs below.

1.5.1 NPCA and ACPA Plant Certification

The precast concrete producer shall be certified by the National Precast Concrete Association's and/or the American Concrete Pipe Association's Plant Certification Program prior to and during production of the products for this project.

1.5.2 Qualifications, Quality Control and Inspection

1.5.2.1 Qualifications

Select a precast concrete producer that has been in the business of producing precast concrete units similar to those specified for a minimum of 3 years. The precast concrete producer must maintain a permanent quality control department or retain an independent testing agency on a continuing basis.

1.5.2.2 [Quality Control Procedures](#)

Show that the following QC tests are performed as required and in accordance with the ASTM standards indicated.

- a. Slump: Perform a slump test for each [150 cu yd](#) of concrete produced, or once a day, whichever comes first. Perform slump tests in accordance with [ASTM C 143/C 143M](#).
- b. Temperature: Measure the temperature of fresh concrete when slump or air content tests are made and when compressive test specimens are made in accordance with [ASTM C 1064/C 1064M](#).
- c. Compressive Strength: Make at least four compressive strength specimens for each [150 cubic yards](#) of concrete of each mix in accordance with the following Standards: [ASTM C 31/C 31M](#), [ASTM C 192/C 192M](#), [ASTM C 39/C 39M](#).
- d. Air Content: Perform tests for air content on air-entrained, wet-cast concrete for each [150 cu yd](#) of concrete, but not less often than once each day when air-entrained concrete is used. Determine the air content in accordance with either [ASTM C 231](#) or [ASTM C 173/C 173M](#) for normal weight aggregates and [ASTM C 173/C 173M](#) for lightweight aggregates.
- e. Unit Weight: Perform tests for unit weight a minimum of once per week to verify the yield of batch mixes. Perform unit weight tests for each [100 cu yd](#) of lightweight concrete in accordance with [ASTM C 138/C 138M](#).

Submit [test reports](#) as specified in the Submittals paragraph and documentation to demonstrate compliance with the above subparagraphs.

1.5.2.3 Inspection

The Contracting Officer may place an inspector in the plant when the units covered by this specification are being manufactured. The burden of

payment for plant inspection will be clearly detailed in the specification. The precast concrete producer shall give notice 14 days prior to the time the units will be available for plant inspection. Neither the exercise nor waiver of inspection at the plant will affect the Government's right to enforce contractual provisions after units are transported or erected.

1.6 HANDLING, STORAGE AND DELIVERY

1.6.1 Handling

Handle, transport, and store products in a manner to minimize damage. Lifting devices or holes shall be consistent with industry standards. Perform lifting with methods or devices intended for this purpose as indicated on shop drawings.

1.6.2 Storage

Store units off the ground or in a manner that will minimize potential damage.

1.6.3 Delivery

Deliver precast units to the site in accordance with the delivery schedule to avoid excessive build-up of units in storage at the site. Upon delivery to the jobsite, all precast concrete units will be inspected by the Contracting Officer for quality and final acceptance.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Cement

Furnish cement conforming to [ASTM C 150](#), Type I, II, III or V. Furnish blended cements that conform to [ASTM C 595](#).

2.1.2 Silica Fume

Provide silica fume conforming to [ASTM C 1240](#). Provide available alkalies conforming to the optimal limit given in Table 2 of [ASTM C 1240](#). Silica fume may be furnished as a dry, densified material or as a slurry. When necessary, coordinate the services of a technical representative experienced in mixing, proportioning, placement procedures, and curing of concrete containing silica fume.

2.1.3 Fly Ash and Pozzolans

Fly ash is used as an admixture conforming to [ASTM C 618](#), Class C or F with 4 percent maximum loss on ignition and 35 percent maximum cement replacement by weight.

2.1.4 Water

Furnish water potable or free of deleterious substances in amounts harmful to concrete or embedded metals.

2.1.5 Aggregates

2.1.5.1 Selection

Furnish aggregates conforming to [ASTM C 33/C 33M](#). Provide aggregates not containing any substance, which may be deleteriously reactive with the alkalis in the cement.

2.1.5.2 Aggregates for Lightweight Concrete

[ASTM C 330](#)

2.1.6 Admixtures

2.1.6.1 Air-Entraining

[ASTM C 260](#)

2.1.6.2 Accelerating, Retarding, Water Reducing

[ASTM C 494/C 494M](#)

2.1.6.3 Pigments

Non-fading and lime-resistant

2.1.7 Reinforcement

2.1.7.1 Reinforcing Bars

- a. Deformed Billet-steel: [ASTM A 615/A 615M](#)
- b. Deformed Low-alloy steel: [ASTM A 706/A 706M](#)

2.1.7.2 Reinforcing Wire

- a. Plain Wire: [ASTM A 82/A 82M](#)
- b. Deformed Wire: [ASTM A 496/A 496M](#)

2.1.7.3 Welded Wire Fabric

- a. Plain Wire: [ASTM A 185/A 185M](#)
- b. Deformed Wire: [ASTM A 497/A 497M](#)

2.1.7.4 Epoxy Coated Reinforcement

- a. Reinforcing Bars: [ASTM A 775/A 775M](#)
- b. Wires and Fabric: [ASTM A 884/A 884M](#)

2.1.7.5 Galvanized Reinforcement

Provide galvanized reinforcement conforming to [ASTM A 767/A 767M](#).

2.1.8 Synthetic Fiber Reinforcement

Synthetic fiber shall be polypropylene with a denier less than 100 and a nominal fiber length of 2 inch.

2.1.9 Inserts and Embedded Metal

All items embedded in concrete shall be of the type required for the intended task, and meet the following standards.

- a. Structural Steel Plates, Angles, etc.: [ASTM A 36/A 36M](#)
- b. Hot-dipped Galvanized: [ASTM A 153/A 153M](#)
- c. Proprietary Items: In accordance with manufacturers published literature

2.1.10 Accessories

- a. Rubber Gaskets for Circular Concrete Sewer Pipe and Culvert Pipe: [ASTM C 443M](#).
- b. External Sealing Bands for Noncircular Sewer, Storm Drain and Culvert Pipe: [ASTM C 877M](#).
- c. Preformed Flexible Joint Sealants for Concrete Pipe, Manholes, and Manufactured Box Sections: [ASTM C 990M](#).
- d. Elastomeric Joint Sealants: [ASTM C 920](#)

2.1.11 Pipe Entry Connectors

Pipe entry connectors shall conform to [ASTM C 923M](#) or [ASTM C 1478](#).

2.1.12 Grout

Nonshrink Grout shall conform to [ASTM C 1107/C 1107M](#). Cementitious grout shall be a mixture of portland cement, sand, and water. Proportion one part cement to approximately 2.5 parts sand, with the amount of water based on placement method. Provide air entrainment for grout exposed to the weather.

PART 3 EXECUTION

3.1 FABRICATION AND PLACEMENT

Perform fabrication in accordance with [NPCA QC Manual](#) and/or [ACPA QPC](#) unless specified otherwise.

3.1.1 Forms

Use forms, for manufacturing precast concrete products, of the type and design consistent with industry standards and practices. They should be capable of consistently providing uniform products and dimensions. Construct forms so that the forces and vibrations to which the forms will be subjected can cause no product damage. Clean forms of concrete build-up after each use. Apply form release agents according to the manufacturers recommendations and do not allow to build up on the form casting surfaces.

3.1.2 Reinforcement

Follow applicable ASTM Standard or [ACI 318](#) for placement and splicing. Fabricate cages of reinforcement either by tying the bars, wires or welded wire fabric into rigid assemblies or by welding, where permissible, in accordance with [AWS D1.4/D1.4M](#). Position reinforcing as specified by the design and so that the concrete cover conforms to requirements. The

tolerance on concrete cover shall be one-third of that specified but not more than $1/2$ inch. Provide concrete cover not less than $1/2$ inch. Take positive means to assure that the reinforcement does not move significantly during the casting operations.

3.1.3 Embedded Items

Position embedded items at locations specified in the design documents. Perform welding in accordance with AWS D1.1/D1.1M when necessary. Hold rigidly in place inserts, plates, weldments, lifting devices and other items to be imbedded in precast concrete products so that they do not move significantly during casting operations.

3.1.4 Synthetic Fiber Reinforced Concrete

Add fiber reinforcement to the concrete mix in accordance with the applicable sections of ASTM C 1116/C 1116M and the recommendations of the manufacturer, and in an amount of 0.1 percent by volume.

3.2 CONCRETE

3.2.1 Concrete Mixing

Mixing operations shall produce batch-to-batch uniformity of strength, consistency, and appearance.

3.2.2 Concrete Placing

Deposit concrete into forms as near to its final location as practical. Keep the free fall of the concrete to a minimum. Consolidate concrete in such a manner that segregation of the concrete is minimized and honeycombed areas are kept to a minimum. Use vibrators to consolidate concrete with frequencies and amplitudes sufficient to produce well consolidated concrete.

3.2.2.1 Cold Weather Concreting

Perform cold weather concreting in accordance with ACI 306.1.

- a. Provide adequate equipment for heating concrete materials and protecting concrete during freezing or near-freezing weather.
- b. Free from frost all concrete materials and all reinforcement, forms, fillers, and ground with which concrete is to come in contact.
- c. Do not use frozen materials or materials containing ice.
- d. In cold weather the temperature of concrete at the time of placing shall not be below 45 degrees F. Discard concrete that freezes before its compressive strength reaches 500 psi.

3.2.2.2 Hot Weather Concreting

Recommendations for hot weather concreting are given in detail in ACI 305R. During hot weather, give proper attention to constituents, production methods, handling, placing, protection, and curing to prevent excessive concrete temperatures or water evaporation that could impair required strength or serviceability of the member or structure. The temperature of concrete at the time of placing shall not exceed 90 degrees F.

3.2.3 Concrete Curing

Commence curing immediately following the initial set and completion of surface finishing.

3.2.3.1 Curing by Moisture Retention

Prevent moisture evaporation from exposed surfaces until adequate strength for stripping is reached by one of the following methods:

- a. Cover with polyethylene sheets a minimum of 6 mils thick in accordance with ASTM C 171.
- b. Cover with burlap or other absorptive material and keep continually moist.
- c. Use of a membrane-curing compound applied at a rate not to exceed 200 square ft/gallon, or in accordance with manufacturers' recommendations according to ASTM C 309.

3.2.3.2 Curing with Heat and Moisture

Do not subject concrete to steam or hot air until after the concrete has attained its initial set. Apply steam, if used, within a suitable enclosure, which permits free circulation of the steam in accordance with CAN/CSA A23.4. If hot air is used for curing, take precautions to prevent moisture loss from the concrete. The temperature of the concrete shall not be permitted to exceed 150 degrees F. These requirements do not apply to products cured with steam under pressure in an autoclave.

3.2.4 Surface Finish

Finish unformed surfaces of wet-cast precast concrete products as specified. If no finishing procedure is specified, finish such surfaces using a strike-off to level the concrete with the top of the form.

3.2.4.1 Formed Non-Architectural Surfaces

Cast surfaces against approved forms following industry practices in cleaning forms, designing concrete mixes, placing and curing concrete. Normal color variations, form joint marks, small surface holes caused by air bubbles, and minor chips and spalls will be accepted but no major imperfections, honeycombs or other major defects will be permitted.

3.2.4.2 Unformed Surfaces

Finish unformed surfaces with a vibrating screed, or by hand with a float. Normal color variations, minor indentations, minor chips and spalls will be accepted but no major imperfections, honeycombs, or other major defects shall be permitted.

3.2.4.3 Special Finishes

Troweled, broom or other finishes shall be according to the requirements of project documents and performed in accordance with industry standards or supplier specifications. Submit finishes for approval when required by the project documents. The sample finishes shall be approved prior to the start of production.

3.2.5 Stripping Products from Forms

Do not remove products from the forms until the concrete reaches the compressive strength for stripping required by the design. If no such requirement exists, products may be removed from the forms after the final set of concrete provided that stripping damage is minimal.

3.2.6 Patching and Repair

No repair is required to formed surfaces that are relatively free of air voids and honeycombed areas, unless the surfaces are required by the design to be finished.

3.2.6.1 Repairing Minor Defects

Defects that will not impair the functional use or expected life of a precast concrete product may be repaired by any method that does not impair the product.

3.2.6.2 Repairing Honeycombed Areas

When honeycombed areas are to be repaired, remove all loose material and cut back the areas into essentially horizontal or vertical planes to a depth at which coarse aggregate particles break under chipping rather than being dislodged. Use proprietary repair materials in accordance with the manufacturer's instructions. If a proprietary repair material is not used, saturate the area with water. Immediately prior to repair, the area should be damp, but free of excess water. Apply a cement-sand grout or an approved bonding agent to the chipped surfaces, followed immediately by consolidating an appropriate repair material into the cavity.

3.2.6.3 Repairing Major Defects

Evaluate, by qualified personnel, defects in precast concrete products which impair the functional use or the expected life of products to determine if repairs are feasible and, if so, to establish the repair procedure.

3.2.7 Shipping Products

Do not ship products until they are at least 5 days old, unless it can be shown that the concrete strength has reached at least 75% of the specified 28-day strength, or that damage will not result, impairing the performance of the product.

3.3 INSTALLATION

3.3.1 Site Access

It is the Contractor's responsibility to provide adequate access to the site to facilitate hauling, storage and proper handling of the precast concrete products.

3.3.2 General Requirements

- a. Install precast concrete products to the lines and grades shown in the contract documents or otherwise specified.
- b. Lift products by suitable lifting devices at points provided by the

precast concrete producer.

c. Install products in accordance with the precast concrete producer's instructions. In the absence of such instructions, install underground utility structures in accordance with [ASTM C 891](#). Install pipe and manhole sections in accordance with the procedures outlined by the American Concrete Pipe Association.

d. Field modifications to the product will relieve the precast producer of liability even if such modifications result in the failure of the product.

3.3.3 Water Tightness

Where water tightness is a necessary performance characteristic of the precast concrete product's end use, watertight joints, connectors and inserts should be used to ensure the integrity of the entire system.

3.4 FIELD QUALITY CONTROL

3.4.1 Site Tests

When water tightness testing is required for an underground product, use one of the following methods:

3.4.2 Vacuum Testing

Prior to backfill vacuum test system according to [ASTM C 1244](#).

3.4.3 Water Testing

Perform water testing according to the contract documents and precast concrete producer's recommendations.

-- End of Section --

SECTION 22 05 83.63

CURED-IN-PLACE PIPE (CIPP) LINING

11/13

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN PETROLEUM INSTITUTE (API)

API Spec 13A (2010; Errata 2014) Specification for Drilling-Fluid Materials

ASTM INTERNATIONAL (ASTM)

ASTM D543 (2014) Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents

ASTM D638 (2010) Standard Test Method for Tensile Properties of Plastics

ASTM D790 (2010) Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials

ASTM F1216 (2009) Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube

ASTM F1743 (2008) Standard Practice for Rehabilitation of Existing Pipeline and Conduits by Pulled-In-Place Installation of Cured-In-Place Thermosetting Resin Pipe (CIPP)

1.2 SUBMITTALS

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

SD-03 Product Data**Installation Equipment****CIPP Lining Tube; G****Pipe Thermoset Epoxy Resin; G****Liner Materials; G**

SD-08 Manufacturer's Instructions

CIPP Manufacturer's Written Installation Instructions; G

SD-11 Closeout Submittals

Report Summarizing The Extent Of Pipe Lining Performed; G

Pipe Pre-Lining Inspection; G

Pipe Post-Lining Inspection; G

Manufacturer's Warranty; G

Record Drawings; G

1.3 PROJECT/SITE CONDITIONS

Inspect the line with CCTV and determine the overall condition of the pipe prior to starting the Pre-conditioning of the pipe.

1.4 WARRANTY

Submit three (3) copies of the signed [Manufacturer's Warranty](#) for all products within 30 calendar days of final completion of the work, or at CCD of the Delivery Order, whichever is sooner.

PART 2 PRODUCTS

2.1 SYSTEM DESCRIPTION

Provide new cured-in-place pipe (CIPP) lining systems for the [wastewater piping](#) (mainlines and laterals as directed on an individual Delivery Order) complete and ready for operation.

Perform the reconstruction using a tube of one or more layers of flexible needle perforated felt or an equivalent non-woven perforated material, of specified length not to exceed [60 feet](#), and a thermo-set resin with physical and chemical properties appropriate for the application, in conformance with [ASTM F1216](#). Submit product data for [epoxy resin](#), [liner materials](#), and [installation equipment](#). Ensure all drilling fluids conform to [API Spec 13A](#).

2.2 PIPE LINING MATERIALS

2.2.1 CIPP Lining Tube

Provide a liner tube consisting of one or more layers of flexible needle perforated felt or an equivalent non-woven perforated material, continuous in length with uniform wall thickness. Overlapping sections are allowed in the length of the liner. Ensure that the liner tube is capable of conforming to 45 and 90 degree bends, offset joints, bells, and disfigured pipe sections.

Provide an integrated bladder within the felt tube that is made from materials compatible with the felt and resin systems used and capable of withstanding the required installation pressure.

Provide fiberglass pressure pipe conforming to AWWA C950 if directed on an individual Delivery Order.

2.2.2 Resin

Provide an epoxy resin impregnated, cured tube that is resistant to shrinkage, corrosion, oxidation, and is resistant to abrasion from solids, grit, sand in rainwater, and is solvent free. Use a resin with proven resistance to storm water and ultra-violet light (sunlight) at any stage prior to installation. Polyester or vinyl ester resins are not acceptable.

Ensure the proposed resin system does not contain silicones, stearates, and/or natural waxes that would adversely affect the adhesives properties or any other chemical or physical properties of the CIPP liner.

2.2.3 CIPP Properties

Provide CIPP with minimum chemical resistance requirements in accordance with [ASTM D543](#). Conduct exposure to the chemical solutions listed in Table 1 at temperatures of up to [75 degrees F](#). Conduct this test for a minimum period of one month. Loss result can not exceed 20 percent of the initial structural properties.

| TABLE 1 - CHEMICAL RESISTANCE REQUIREMENTS | |
|--|----------------|
| <u>Chemical Solution Concentration</u> | <u>Percent</u> |
| Tap Water (pH 6-9) | 100.0 |
| Nitric Acid | 5.0 |
| Phosphoric Acid | 10.0 |
| Sulfuric Acid | 10.0 |
| Gasoline | 100.0 |
| Vegetable Oil | 100.0 |
| Detergent or Soap | 0.1 |

Ensure the CIPP meets the minimum structural properties listed in Table 2 below:

| TABLE 2 - CIPP INITIAL STRUCTURAL PROPERTIES - ASTM F1743 | | |
|---|---------------------------|----------------------|
| <u>Property</u> | <u>ASTM Test Method</u> | <u>Minimum Value</u> |
| Tensile Strength | ASTM D638 | 3,000 psi |
| Flexural Strength | ASTM D790 | 4,500 psi |

| TABLE 2 - CIPP INITIAL STRUCTURAL PROPERTIES - ASTM F1743 | | |
|---|-------------------------|----------------------|
| <u>Property</u> | <u>ASTM Test Method</u> | <u>Minimum Value</u> |
| Short Term Flexural Modulus of Elasticity | ASTM D790 | 250,000 psi |

Provide a cured liner with a light blue reflective internal wall color so that a clear detail CCTV inspection can be accomplished.

PART 3 EXECUTION

3.1 INSTALLATION

Provide installation of CIPP system, including materials, workmanship, fabrication, assembly, erection, examination, and inspection.

3.1.1 Deviations

Should pre-installation inspection reveal conditions in the rain leader to be substantially different than those used in the design of wall thickness, liner tube construction, liner tube length, or resin system; notify the Contracting Officer and provide a videotape recording of existing conditions and design data. Do not proceed without direction from Contracting Officer.

3.1.2 Pipe Preparation

Perform pre-conditioning of the pipe section, including preparatory cleaning, corrosion removal, removal of grease buildup, or any other obstruction that may interfere with lining operations.

Leave obstructions that are less than 15 percent of the pipe diameter, that can not be removed from the pipe, in place and line over.

CCTV inspect the line immediately prior to lining and after the cleaning is complete to ensure that the pipe is ready for lining.

3.1.3 CIPP Installation Procedure

3.1.3.1 Wet Out

Accurately calculate and measure the amount of resin and catalyst required. Thoroughly mix the resin and catalyst. Thoroughly saturate/impregnate the flexible felt tube with the pre-calculated amount of epoxy resin prior to installation. Handle the resin impregnated flexible tube to retard or prevent resin setting until it is ready for insertion.

3.1.3.2 Insertion

Install the liner/bladder system using the pull in place method. Pull the liner/bladder system to the specified location in the pipe. Inflate the bladder using compressed air to a pressure adequate to form the liner to tightly fit the internal circumference of the pipe and to cause the resin to migrate into pipe joints, voids and defects. Install the liner at low pressure (not to exceed 10 psi) to prevent initial or further damage to the host pipe.

3.1.3.3 Curing

Inflate the bladder using compressed air and leave the liner in place until the resin curing cycle is complete. Curing occurs at ambient temperature within one hour.

When the curing process is complete, release the pressure and pull out the inflation bladder. Ensure the cured composite liner remains in place within the host pipe and provides a smooth bore interior that conforms to the existing pipe. Ensure the tube is continuous in length, wall thickness, and is uniform. Reline any existing defects in the original pipe.

3.1.3.4 Finish

Do not leave in the host pipe, any barriers, coatings, or any material other than the cured liner tube/resin composite, specifically designed for desirable physical and chemical resistance properties. Remove any materials used in the installation, other than the cured liner tube/resin composite. Remove any cured liner tube/resin composite pipe left protruding from the service connection. Ensure that the finished CIPP is continuous and free from visual defects such as foreign inclusions, dry spots, pinholes, and delimitation.

3.1.4 Liner Inspection

Perform a final Closed-Circuit Television (CCTV) inspection to verify proper cure and integrity of the composite liner. Verify that existing lateral connections are cut-in and are operable.

3.2 FIELD QUALITY CONTROL

Test system in accordance with [ASTM F1743](#), as supplemented and modified by [CIPP manufacturer's written installation instructions](#).

Upon completion, submit the DVD records of [pre-lining inspection](#) and [post-lining inspection](#), along with the written [report summarizing the extent of pipe lining performed](#). The report shall include validation of existing lateral connections being properly cut-in and operable after the pipe lining installation. Update pipe lining contract [record drawings](#) to reflect the as-built condition after lining is complete and submit to the Contracting Officer. The Contracting Officer may review the video and documentation, and may inspect the work site to determine that the scope of work is complete, that the work is satisfactory, and the site has been returned to its original condition.

3.3 ADJUSTING AND CLEANING

After liner installation has been completed and accepted, clean the entire project area and restore the site to its original condition prior to the commencement of work. Dispose of all excess material and debris not incorporated into the permanent installation.

-- End of Section --

SECTION 23 07 00

THERMAL INSULATION FOR MECHANICAL SYSTEMS
02/13

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only. At the discretion of the Government, the manufacturer of any material supplied will be required to furnish test reports pertaining to any of the tests necessary to assure compliance with the standard or standards referenced in this specification.

AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS (ASHRAE)

ASHRAE 90.1 - IP (2010; ERTA 2011-2013) Energy Standard for Buildings Except Low-Rise Residential Buildings

ASTM INTERNATIONAL (ASTM)

ASTM A580/A580M (2014) Standard Specification for Stainless Steel Wire

ASTM B209 (2014) Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate

ASTM C1126 (2014) Standard Specification for Faced or Unfaced Rigid Cellular Phenolic Thermal Insulation

ASTM C1136 (2012) Standard Specification for Flexible, Low Permeance Vapor Retarders for Thermal Insulation

ASTM C1710 (2011) Standard Guide for Installation of Flexible Closed Cell Preformed Insulation in Tube and Sheet Form

ASTM C195 (2007; R 2013) Standard Specification for Mineral Fiber Thermal Insulating Cement

ASTM C450 (2008) Standard Practice for Fabrication of Thermal Insulating Fitting Covers for NPS Piping, and Vessel Lagging

ASTM C533 (2013) Standard Specification for Calcium Silicate Block and Pipe Thermal Insulation

ASTM C534/C534M (2014) Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form

| | |
|--|--|
| ASTM C547 | (2012) Standard Specification for Mineral Fiber Pipe Insulation |
| ASTM C552 | (2014) Standard Specification for Cellular Glass Thermal Insulation |
| ASTM C610 | (2011) Standard Specification for Molded Expanded Perlite Block and Pipe Thermal Insulation |
| ASTM C795 | (2008; R 2013) Standard Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel |
| ASTM C916 | (2014) Standard Specification for Adhesives for Duct Thermal Insulation |
| ASTM C920 | (2014a) Standard Specification for Elastomeric Joint Sealants |
| ASTM C921 | (2010) Standard Practice for Determining the Properties of Jacketing Materials for Thermal Insulation |
| ASTM E2231 | (2014) Specimen Preparation and Mounting of Pipe and Duct Insulation Materials to Assess Surface Burning Characteristics |
| ASTM E84 | (2014) Standard Test Method for Surface Burning Characteristics of Building Materials |
| ASTM E96/E96M | (2013) Standard Test Methods for Water Vapor Transmission of Materials |
| FM GLOBAL (FM) | |
| FM APP GUIDE | (updated on-line) Approval Guide http://www.approvalguide.com/ |
| MANUFACTURERS STANDARDIZATION SOCIETY OF THE VALVE AND FITTINGS INDUSTRY (MSS) | |
| MSS SP-69 | (2003; Notice 2012) Pipe Hangers and Supports - Selection and Application (ANSI Approved American National Standard) |
| MIDWEST INSULATION CONTRACTORS ASSOCIATION (MICA) | |
| MICA Insulation Stds | (1999) National Commercial & Industrial Insulation Standards |
| U.S. DEPARTMENT OF DEFENSE (DOD) | |
| MIL-A-24179 | (1969; Rev A; Am 2 1980; Notice 1 1987) Adhesive, Flexible Unicellular-Plastic Thermal Insulation |

MIL-A-3316 (1987; Rev C; Am 2 1990) Adhesives, Fire-Resistant, Thermal Insulation

UNDERWRITERS LABORATORIES (UL)

UL 723 (2008; Reprint Aug 2013) Test for Surface Burning Characteristics of Building Materials

UL 94 (2013; Reprint Sep 2014) Standard for Tests for Flammability of Plastic Materials for Parts in Devices and Appliances

1.2 SYSTEM DESCRIPTION

1.2.1 General

Provide field-applied insulation and accessories on mechanical systems as specified herein; factory-applied insulation is specified under the piping, duct or equipment to be insulated. Field applied insulation materials required for use on Government-furnished items as listed in the SPECIAL CONTRACT REQUIREMENTS shall be furnished and installed by the Contractor.

1.2.2 Recycled Materials

Provide thermal insulation containing recycled materials to the extent practicable, provided that the materials meet all other requirements of this section. The minimum recycled material content of the following insulation are:

| | |
|------------|--------------------------------------|
| Rock Wool | 75 percent slag of weight |
| Fiberglass | 20-25 percent glass cullet by weight |
| Rigid Foam | 9 percent recovered material |

1.3 SUBMITTALS

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

Submit the three SD types, SD-02 Shop Drawings, SD-03 Product Data, and SD-08 Manufacturer's Instructions at the same time for each system.

SD-02 Shop Drawings

Pipe Insulation Systems and Associated Accessories

SD-03 Product Data

Pipe Insulation Systems; G

SD-08 Manufacturer's Instructions

Pipe Insulation Systems; G

1.4 QUALITY ASSURANCE

1.4.1 Installer Qualification

Qualified installers shall have successfully completed three or more similar type jobs within the last 5 years.

1.5 DELIVERY, STORAGE, AND HANDLING

Materials shall be delivered in the manufacturer's unopened containers. Materials delivered and placed in storage shall be provided with protection from weather, humidity, dirt, dust and other contaminants. The Contracting Officer may reject insulation material and supplies that become dirty, dusty, wet, or contaminated by some other means. Packages or standard containers of insulation, jacket material, cements, adhesives, and coatings delivered for use, and samples required for approval shall have manufacturer's stamp or label attached giving the name of the manufacturer and brand, and a description of the material, date codes, and approximate shelf life (if applicable). Insulation packages and containers shall be asbestos free.

PART 2 PRODUCTS

2.1 STANDARD PRODUCTS

Provide materials which are the standard products of manufacturers regularly engaged in the manufacture of such products and that essentially duplicate items that have been in satisfactory use for at least 2 years prior to bid opening. Submit a complete list of materials, including manufacturer's descriptive technical literature, performance data, catalog cuts, and installation instructions. The product number, k-value, thickness and furnished accessories including adhesives, sealants and jackets for each mechanical system requiring insulation shall be included. The product data must be copyrighted, have an identifying or publication number, and shall have been published prior to the issuance date of this solicitation. Materials furnished under this section shall be submitted together in a booklet.

2.1.1 Insulation System

Provide insulation systems in accordance with the approved MICA National Insulation Standards plates as supplemented by this specification. Provide field-applied insulation for heating, ventilating, and cooling (HVAC) air distribution systems and piping systems that are located within, on, under, and adjacent to buildings; and for plumbing systems. Insulation shall be CFC and HCFC free.

2.1.2 Surface Burning Characteristics

Unless otherwise specified, insulation shall have a maximum flame spread index of 25 and a maximum smoke developed index of 50 when tested in accordance with [ASTM E84](#). Flame spread, and smoke developed indexes, shall be determined by [ASTM E84](#) or [UL 723](#). Insulation shall be tested in the same density and installed thickness as the material to be used in the actual construction. Test specimens shall be prepared and mounted according to [ASTM E2231](#).

2.2 MATERIALS

Provide insulation that meets or exceed the requirements of [ASHRAE 90.1 - IP](#). Insulation exterior shall be cleanable, grease resistant, non-flaking and non-peeling. Materials shall be compatible and shall not contribute to corrosion, soften, or otherwise attack surfaces to which applied in either wet or dry state. Materials to be used on stainless steel surfaces shall meet [ASTM C795](#) requirements. Calcium silicate shall not be used on chilled or cold water systems. Materials shall be asbestos free. Provide product recognized under [UL 94](#) (if containing plastic) and listed in [FM APP GUIDE](#).

2.2.1 Adhesives

2.2.1.1 Acoustical Lining Insulation Adhesive

Adhesive shall be a nonflammable, fire-resistant adhesive conforming to [ASTM C916](#), Type I.

2.2.1.2 Mineral Fiber Insulation Cement

Cement shall be in accordance with [ASTM C195](#).

2.2.1.3 Lagging Adhesive

Lagging is the material used for thermal insulation, especially around a cylindrical object. This may include the insulation as well as the cloth/material covering the insulation. Lagging adhesives shall be nonflammable and fire-resistant and shall have a maximum flame spread index of 25 and a maximum smoke developed index of 50 when tested in accordance with [ASTM E84](#). Adhesive shall be [MIL-A-3316](#), Class 1, pigmented white and be suitable for bonding fibrous glass cloth to faced and unfaced fibrous glass insulation board; for bonding cotton brattice cloth to faced and unfaced fibrous glass insulation board; for sealing edges of and bonding glass tape to joints of fibrous glass board; for bonding lagging cloth to thermal insulation; or Class 2 for attaching fibrous glass insulation to metal surfaces. Lagging adhesives shall be applied in strict accordance with the manufacturer's recommendations for pipe and duct insulation.

2.2.1.4 Contact Adhesive

Adhesives may be any of, but not limited to, the neoprene based, rubber based, or elastomeric type that have a maximum flame spread index of 25 and a maximum smoke developed index of 50 when tested in accordance with [ASTM E84](#). The adhesive shall not adversely affect, initially or in service, the insulation to which it is applied, nor shall it cause any corrosive effect on metal to which it is applied. Any solvent dispersing medium or volatile component of the adhesive shall have no objectionable odor and shall not contain any benzene or carbon tetrachloride. The dried adhesive shall not emit nauseous, irritating, or toxic volatile matters or

aerosols when the adhesive is heated to any temperature up to 212 degrees F. The dried adhesive shall be nonflammable and fire resistant. Flexible Elastomeric Adhesive: Comply with MIL-A-24179, Type II, Class I. Provide product listed in FM APP GUIDE.

2.2.2 Caulking

ASTM C920, Type S, Grade NS, Class 25, Use A.

2.2.3 Corner Angles

Nominal 0.016 inch aluminum 1 by 1 inch with factory applied kraft backing. Aluminum shall be ASTM B209, Alloy 3003, 3105, or 5005.

2.2.4 Fittings

Fabricated Fittings are the prefabricated fittings for flexible elastomeric pipe insulation systems in accordance with ASTM C1710. Together with the flexible elastomeric tubes, they provide complete system integrity for retarding heat gain and controlling condensation drip from chilled-water and refrigeration systems. Flexible elastomeric, fabricated fittings provide thermal protection (0.25 k) and condensation resistance (0.05 Water Vapor Transmission factor). For satisfactory performance, properly installed protective vapor retarder/barriers and vapor stops shall be used on high relative humidity and below ambient temperature applications to reduce movement of moisture through or around the insulation to the colder interior surface.

2.2.5 Finishing Cement

ASTM C450: Mineral fiber hydraulic-setting thermal insulating and finishing cement. All cements that may come in contact with Austenitic stainless steel must comply with ASTM C795.

2.2.6 Fibrous Glass Cloth and Glass Tape

Fibrous glass cloth, with 20X20 maximum mesh size, and glass tape shall have maximum flame spread index of 25 and a maximum smoke developed index of 50 when tested in accordance with ASTM E84. Tape shall be 4 inch wide rolls. Class 3 tape shall be 4.5 ounces/square yard. Elastomeric Foam Tape: Black vapor-retarder foam tape with acrylic adhesive containing an anti-microbial additive.

2.2.7 Staples

Outward clinching type monel or ASTM A167, Type 304 or 316 stainless steel.

2.2.8 Jackets

2.2.8.1 Aluminum Jackets

Aluminum jackets shall be corrugated, embossed or smooth sheet, 0.016 inch nominal thickness; ASTM B209, Temper H14, Temper H16, Alloy 3003, 5005, or 3105. Corrugated aluminum jacket shall not be used outdoors. Aluminum jacket securing bands shall be Type 304 stainless steel, 0.015 inch thick, 1/2 inch wide for pipe under 12 inch diameter and 3/4 inch wide for pipe over 12 inch and larger diameter. Aluminum jacket circumferential seam bands shall be 2 by 0.016 inch aluminum matching jacket material. Bands for insulation below ground shall be 3/4 by 0.020 inch thick stainless

steel, or fiberglass reinforced tape. The jacket may, at the option of the Contractor, be provided with a factory fabricated Pittsburgh or "Z" type longitudinal joint. When the "Z" joint is used, the bands at the circumferential joints shall be designed by the manufacturer to seal the joints and hold the jacket in place.

2.2.9 Vapor Retarder Not Required

ASTM C921, Type II, Class D, minimum puncture resistance 50 Beach units on all surfaces except ductwork, where Type IV, maximum moisture vapor transmission 0.10, a minimum puncture resistance of 25 Beach units is acceptable. Jacket shall have a maximum flame spread index of 25 and a maximum smoke developed index of 50 when tested in accordance with ASTM E84.

2.2.10 Wire

Soft annealed ASTM A580/A580M Type 302, 304 or 316 stainless steel, 16 or 18 gauge.

2.2.11 Insulation Bands

Insulation bands shall be 1/2 inch wide; 26 gauge stainless steel.

2.2.12 Sealants

Sealants shall be chosen from the butyl polymer type, the styrene-butadiene rubber type, or the butyl type of sealants. Sealants shall have a maximum permeance of 0.02 perms based on Procedure B for ASTM E96/E96M, and a maximum flame spread index of 25 and a maximum smoke developed index of 50 when tested in accordance with ASTM E84.

2.3 PIPE INSULATION SYSTEMS

Insulation materials shall conform to Table 1. Insulation thickness shall be as listed in Table 2 and meet or exceed the requirements of ASHRAE 90.1 - IP. Pipe insulation materials shall be limited to those listed herein and shall meet the following requirements:

2.3.1 Aboveground Hot Pipeline (Above 60 deg. F)

Insulation for outdoor, indoor, exposed or concealed applications shall meet the following requirements. Supply the insulation with manufacturer's recommended factory-applied jacket/vapor barrier.

2.3.1.1 Mineral Fiber

ASTM C547, Types I, II or III, supply the insulation with manufacturer's recommended factory-applied jacket.

2.3.1.2 Calcium Silicate

ASTM C533, Type I indoor only, or outdoors above 250 degrees F pipe temperature. Supply insulation with the manufacturer's recommended factory-applied jacket/vapor barrier.

2.3.1.3 Cellular Glass

ASTM C552, Type II and Type III. Supply the insulation with manufacturer's recommended factory-applied jacket.

2.3.1.4 Flexible Elastomeric Cellular Insulation

Closed-cell, foam- or expanded-rubber materials containing anti-microbial additive, complying with ASTM C534/C534M, Grade 1, Type I or II to 220 degrees F service. Type I for tubular materials. Type II for sheet materials.

2.3.1.5 Phenolic Insulation

ASTM C1126 Type III to 250 degrees F service shall comply with ASTM C795. Supply the insulation with manufacturer's recommended factory-applied jacket/vapor barrier.

2.3.1.6 Perlite Insulation

ASTM C610

2.3.2 Below-ground Pipeline Insulation

For below-ground pipeline insulation, use cellular glass, ASTM C552, type II.

PART 3 EXECUTION

3.1 APPLICATION - GENERAL

Insulation shall only be applied to unheated and uncooled piping and equipment. Flexible elastomeric cellular insulation shall not be compressed at joists, studs, columns, ducts, hangers, etc. The insulation shall not pull apart after a one hour period; any insulation found to pull apart after one hour, shall be replaced.

3.1.1 Installation

Except as otherwise specified, material shall be installed in accordance with the manufacturer's written instructions. Insulation materials shall not be applied until tests and heat tracing specified in other sections of this specification are completed. Material such as rust, scale, dirt and moisture shall be removed from surfaces to receive insulation. Insulation shall be kept clean and dry. Insulation shall not be removed from its shipping containers until the day it is ready to use and shall be returned to like containers or equally protected from dirt and moisture at the end of each workday. Insulation that becomes dirty shall be thoroughly cleaned prior to use. If insulation becomes wet or if cleaning does not restore the surfaces to like new condition, the insulation will be rejected, and shall be immediately removed from the jobsite. Joints shall be staggered on multi layer insulation. Mineral fiber thermal insulating cement shall be mixed with demineralized water when used on stainless steel surfaces. Insulation, jacketing and accessories shall be installed in accordance with MICA Insulation Stds plates except where modified herein or on the drawings.

3.1.2 Painting and Finishing

Painting shall be as specified in individual delivery orders.

3.1.3 Welding

No welding shall be done on piping, or without written approval of the

Contracting Officer. .

3.1.4 Pipes That Require Insulation

Insulation is required on all pipes, or except for omitted items as specified.

3.2 PIPE INSULATION SYSTEMS INSTALLATION

3.2.1 Pipe Insulation

3.2.1.1 General

Pipe insulation shall be installed on aboveground hot and cold pipeline systems as specified below to form a continuous thermal retarder/barrier, including straight runs, fittings and appurtenances unless specified otherwise. Installation shall be with full length units of insulation and using a single cut piece to complete a run. Cut pieces or scraps abutting each other shall not be used. Pipe insulation shall be omitted on the following:

- a. Pipe used solely for fire protection.
- b. Chromium plated pipe to plumbing fixtures. However, fixtures for use by the physically handicapped shall have the hot water supply and drain, including the trap, insulated where exposed.
- c. Sanitary drain lines.
- d. Air chambers.
- e. Adjacent insulation.
- f. ASME stamps.
- g. Access plates of fan housings.
- h. Cleanouts or handholes.

3.2.1.2 Pipes Passing Through Walls, Roofs, and Floors

Pipe insulation shall be continuous through the sleeve.

An Aluminum jacket or vapor barrier/weatherproofing Jacket or Vapor Barrier/Weatherproofing - self adhesive jacket (minimum 2 mils adhesive, 3 mils embossed) less than 0.0000 permeability, greater than 3 ply standard grade, silver, white, black and embossed with factory applied moisture retarder shall be provided over the insulation wherever penetrations require sealing.

3.2.1.2.1 Penetrate Interior Walls

The aluminum jacket or vapor barrier/weatherproofing - self adhesive jacket (minimum 2 mils adhesive, 3 mils embossed) less than 0.0000 permeability, greater than 3 plies standard grade, silver, white, black and embossed shall extend 2 inches beyond either side of the wall and shall be secured on each end with a band.

3.2.1.2.2 Penetrating Floors

Extend the aluminum jacket from a point below the backup material to a point 10 inches above the floor with one band at the floor and one not more than 1 inch from the end of the aluminum jacket.

3.2.1.2.3 Penetrating Waterproofed Floors

Extend the aluminum jacket from below the backup material to a point 2 inches above the flashing with a band 1 inch from the end of the aluminum jacket.

3.2.1.2.4 Penetrating Exterior Walls

Continue the aluminum jacket required for pipe exposed to weather through the sleeve to a point 2 inches beyond the interior surface of the wall.

3.2.1.2.5 Penetrating Roofs

Insulate pipe as required for interior service to a point flush with the top of the flashing and sealed with flashing sealant. Tightly butt the insulation for exterior application to the top of flashing and interior insulation. Extend the exterior aluminum jacket 2 inches down beyond the end of the insulation to form a counter flashing. Seal the flashing and counter flashing underneath with metal jacketing/flashing sealant.

3.2.1.3 Pipes Passing Through Hangers

Insulation, whether hot or cold application, shall be continuous through hangers. All horizontal pipes 2 inches and smaller shall be supported on hangers with the addition of a Type 40 protection shield to protect the insulation in accordance with MSS SP-69. Whenever insulation shows signs of being compressed, or when the insulation or jacket shows visible signs of distortion at or near the support shield, insulation inserts as specified below for piping larger than 2 inches shall be installed, or factory insulated hangers (designed with a load bearing core) can be used.

3.2.1.3.1 Horizontal Pipes Larger Than 2 Inches at 60 Degrees F and Above

Supported on hangers in accordance with MSS SP-69.

3.2.1.3.2 Vertical Pipes

Supported with either Type 8 or Type 42 riser clamps with the addition of two Type 40 protection shields in accordance with MSS SP-69 covering the 360-degree arc of the insulation. An insulation insert of cellular glass or calcium silicate shall be installed between each shield and the pipe. The insert shall cover the 360-degree arc of the pipe. Inserts shall be the same thickness as the insulation, and shall extend 2 inches on each end beyond the protection shield. When insulation inserts are required in accordance with the above, and the insulation thickness is less than 1 inch, wooden or cork dowels or blocks may be installed between the pipe and the shield to prevent the hanger from crushing the insulation, as an option instead of installing insulation inserts. The insulation jacket shall be continuous over the wooden dowel, wooden block, or insulation insert. The vertical weight of the pipe shall be supported with hangers located in a horizontal section of the pipe. When the pipe riser is longer than 30 feet, the weight of the pipe shall be additionally supported with hangers in the vertical run of the pipe that are directly clamped to the pipe, penetrating the pipe insulation. These hangers shall be insulated and the insulation

jacket sealed as indicated herein for anchors in a similar service.

3.2.1.3.3 Inserts

Covered with a jacket material of the same appearance and quality as the adjoining pipe insulation jacket, overlap the adjoining pipe jacket 1-1/2 inches, and seal as required for the pipe jacket. The jacket material used to cover inserts in flexible elastomeric cellular insulation shall conform to ASTM C1136, Type 1, and is allowed to be of a different material than the adjoining insulation material.

3.2.1.4 Pipes in high abuse areas.

In high abuse areas such as janitor closets and traffic areas in equipment rooms, kitchens, and mechanical rooms, stainless steel, aluminum or flexible laminate cladding (comprised of elastomeric, plastic or metal foil laminate) laminated self-adhesive (minimum 2 mils adhesive, 3 mils embossed) vapor barrier/weatherproofing jacket, - less than 0.0000 permeability; (greater than 3 ply, standard grade, silver, white, black and embossed) aluminum jackets shall be utilized. Pipe insulation to the 6 foot level shall be protected.

3.2.1.5 Pipe Insulation Material and Thickness

| TABLE 1 | | | | | |
|---|----------------------|-----------------|---------|-------|-------------|
| Insulation Material for Piping | | | | | |
| Service | | | | | |
| | Material | Specificati | Type | Class | VR/VB Req'd |
| Steam and Condensate Return (201 to 250 Degrees F) | | | | | |
| | Cellular Glass | ASTM C552 | II | | No |
| | Mineral Fiber | ASTM C547 | I | 1 | No |
| | Calcium Silicate | ASTM C533 | I | | No |
| | Faced Phenolic | ASTM C1126 | III | | Yes |
| | Perlite | ASTM C610 | | | No |
| | Flexible Elastomeric | ASTM C534/C534M | I | 2 | No |
| Medium Temperature Hot Water, Steam and Condensate (251 to 350 Degrees F) | | | | | |
| | Mineral Fiber | ASTM C547 | I | 1 | No |
| | Calcium Silicate | ASTM C533 | I | | No |
| | Cellular Glass | ASTM C552 | I or II | | No |
| | Perlite | ASTM C610 | | | No |
| | Flexible Elastomeric | ASTM C534/C534M | I | 2 | No |
| High Temperature Hot Water & Steam (351 to 700 Degrees F) | | | | | |
| | Mineral Fiber | ASTM C547 | I | 2 | No |
| | Calcium Silicate | ASTM C533 | I | | No |
| | Perlite | ASTM C610 | | | No |
| | Cellular Glass | ASTM C552 | | | No |
| Note: VR/VB = Vapor Retarder/Vapor Barrier | | | | | |

| TABLE 2 | | | | | | |
|---|------------------|---------------------------|--------|--------|------|-----------|
| Piping Insulation Thickness (inch);Economic thickness or prevention of condensation is the basis of these tables. | | | | | | |
| Service | | | | | | |
| | Material | Tube And Pipe Size (inch) | | | | |
| | | <1 | 1-<1.5 | 1.5-<4 | 4-<8 | > or = >8 |
| Steam and Condensate Return (201 to 250 Degrees F) | | | | | | |
| | Mineral Fiber | 1.5 | 1.5 | 2 | 2 | 2 |
| | | 1.5* | 2* | 2.5* | 3* | 3.5* |
| | Calcium Silicate | 2.5 | 3 | 4 | 4 | 4.5 |
| | Cellular Glass | 2 | 2.5 | 3 | 3 | 3 |
| | Perlite | 2.5 | 3 | 4 | 4 | 4.5 |
| Medium Temperature Hot Water, Steam and Condensate (251 to 350 Degrees F) | | | | | | |
| | Mineral Fiber | 1.5 | 3 | 3 | 4 | 4 |
| | | 2.5* | 3* | 3.5* | | |
| | Calcium Silicate | 2.5 | 3.5 | 4.5 | 4.5 | 5 |
| | Perlite | 2.5 | 3.5 | 4.5 | 4.5 | 5 |
| High Temperature Hot Water & Steam (351 to 700 Degrees F) | | | | | | |
| | Mineral Fiber | 2.5 | 3 | 3 | 4 | 4 |
| | Calcium Silicate | 4 | 4.5 | 6 | 6 | 6 |
| | Perlite | 4 | 4.5 | 6 | 6 | 6 |
| | | | | | | |

3.2.2 Aboveground Hot Pipelines

3.2.2.1 General Requirements

All hot pipe lines above 60 degrees F, except those piping listed in subparagraph Pipe Insulation in PART 3 as to be omitted, shall be insulated in accordance with Table 2. This includes but is not limited to the following:

- a. Domestic hot water supply & re-circulating system.
- b. Steam.
- c. Condensate & compressed air discharge.
- d. Hot water heating.
- e. Heated oil.
- f. Water defrost lines in refrigerated rooms.

Insulation shall be covered, in accordance with manufacturer's recommendations, with a factory applied Type I jacket or field applied aluminum where required or seal welded PVC.

3.2.2.2 Insulation for Fittings and Accessories

Pipe insulation shall be tightly butted to the insulation of the fittings and accessories. The butted joints and ends shall be sealed with joint sealant. Insulation shall be marked showing the location of unions, strainers, check valves and other components that would otherwise be hidden from view by the insulation.

3.2.2.2.1 Precut or Preformed

Place precut or preformed insulation around all fittings and accessories. Insulation shall be the same insulation as the pipe insulation, including same density, thickness, and thermal conductivity.

3.2.2.2.2 Rigid Preformed

Where precut/preformed is unavailable, rigid preformed pipe insulation sections may be segmented into the shape required. Insulation of the same thickness and conductivity as the adjoining pipe insulation shall be used. If nesting size insulation is used, the insulation shall be overlapped 2 inches or one pipe diameter. Elbows insulated using segments shall conform to MICA Tables 12.20 "Mitered Insulation Elbow".

3.2.3 Piping Exposed to Weather

Piping exposed to weather shall be insulated and jacketed as specified for the applicable service inside the building. After this procedure, a laminated self-adhesive (minimum 2 mils adhesive, 3 mils embossed) vapor barrier/weatherproofing jacket - less than 0.0000 permeability (greater than 3 ply, standard grade, silver, white, black and embossed aluminum jacket or PVC jacket shall be applied. PVC jacketing requires no factory-applied jacket beneath it, however an all service jacket shall be

applied if factory applied jacketing is not furnished. Flexible elastomeric cellular insulation exposed to weather shall be treated in accordance with paragraph INSTALLATION OF FLEXIBLE ELASTOMERIC CELLULAR INSULATION in PART 3.

3.2.3.1 Aluminum Jacket

The jacket for hot piping may be factory applied. The jacket shall overlap not less than 2 inches at longitudinal and circumferential joints and shall be secured with bands at not more than 12 inch centers. Longitudinal joints shall be overlapped down to shed water and located at 4 or 8 o'clock positions. Joints on piping 60 degrees F and below shall be sealed with metal jacketing/flushing sealant while overlapping to prevent moisture penetration. Where jacketing on piping 60 degrees F and below abuts an un-insulated surface, joints shall be caulked to prevent moisture penetration. Joints on piping above 60 degrees F shall be sealed with a moisture retarder.

3.2.3.2 Insulation for Fittings

Flanges, unions, valves, fittings, and accessories shall be insulated and finished as specified for the applicable service. Two coats of breather emulsion type weatherproof mastic (impermeable to water, permeable to air) recommended by the insulation manufacturer shall be applied with glass tape embedded between coats. Tape overlaps shall be not less than 1 inch and the adjoining aluminum jacket not less than 2 inches. Factory preformed aluminum jackets may be used in lieu of the above. Molded PVC fitting covers shall be provided when PVC jackets are used for straight runs of pipe. PVC fitting covers shall have adhesive welded joints and shall be weatherproof laminated self-adhesive (minimum 2 mils adhesive, 3 mils embossed) vapor barrier/weatherproofing jacket - less than 0.0000 permeability, (greater than 3 ply, standard grade, silver, white, black and embossed, and UV resistant).

3.2.3.3 PVC Jacket

PVC jacket shall be ultraviolet resistant and adhesive welded weather tight with manufacturer's recommended adhesive. Installation shall include provision for thermal expansion.

3.2.4 Below Ground Pipe Insulation

Below ground pipes shall be insulated in accordance with Table 2, except as precluded in subparagraph Pipe Insulation in PART 3. This includes, but is not limited to the following:

- a. Heated oil.
- b. Domestic hot water.
- c. Heating hot water.
- d. Dual temperature water.
- e. Steam.
- f. Condensate.

3.2.4.1 Type of Insulation

Below ground pipe shall be insulated with Cellular Glass insulation, in accordance with manufacturer's instructions for application with thickness as determined from Table 2 (whichever is the most restrictive).

3.2.4.2 Installation of Below ground Pipe Insulation

- a. Bore surfaces of the insulation shall be coated with a thin coat of gypsum cement of a type recommended by the insulation manufacturer. Coating thickness shall be sufficient to fill surface cells of insulation. Mastic type materials shall not be used for this coating. Note that unless this is for a cyclic application (i.e., one that fluctuates between high and low temperature on a daily process basis) there is no need to bore coat the material.
- b. Stainless steel bands, 3/4 inch wide by 0.020 inch thick shall be used to secure insulation in place. A minimum of two bands per section of insulation shall be applied. As an alternate, fiberglass reinforced tape may be used to secure insulation on piping up to 12 inches in diameter. A minimum of two bands per section of insulation shall be applied.
- c. Insulation shall terminate at anchor blocks but shall be continuous through sleeves and manholes.
- d. At point of entry to buildings, underground insulation shall be terminated 2 inches inside the wall or floor, shall butt tightly against the aboveground insulation and the butt joint shall be sealed with high temperature silicone sealant and covered with fibrous glass tape.
- e. Provision for expansion and contraction of the insulation system shall be made in accordance with the insulation manufacturer's recommendations.
- f. Flanges, couplings, valves, and fittings shall be insulated with factory pre-molded, prefabricated, or field-fabricated sections of insulation of the same material and thickness as the adjoining pipe insulation. Insulation sections shall be secured as recommended by the manufacturer.
- g. Insulation, including fittings, shall be finished with three coats of asphaltic mastic, with 6 by 5.5 mesh synthetic reinforcing fabric embedded between coats. Fabric shall be overlapped a minimum of 2 inches at joints. Total film thickness shall be a minimum of 3/16 inch. As an alternate, a prefabricated bituminous laminated jacket, reinforced with internal reinforcement mesh, shall be applied to the insulation. Jacketing material and application procedures shall match manufacturer's written instructions. Vapor barrier - less than 0.0000 permeability self adhesive (minimum 2 mils adhesive, 3 mils embossed) jacket greater than 3 ply, standard grade, silver, white, black and embossed or greater than 8 ply (minimum 2.9 mils adhesive), heavy duty, white or natural). Application procedures shall match the manufacturer's written instructions.
- h. At termination points, other than building entrances, the mastic and cloth or tape shall cover the ends of insulation and extend 2 inches along the bare pipe.

-- End of Section --

SECTION 31 00 00

EARTHWORK
08/08

PART 1 GENERAL

1.1 CRITERIA FOR BIDDING

Base bids on the following criteria:

- a. Surface elevations are as indicated.
- b. Pipes or other artificial obstructions, except those indicated, will not be encountered.
- c. Ground water elevations indicated by the boring log, if available, were those existing at the time subsurface investigations were made and do not necessarily represent ground water elevation at the time of construction.
- d. Hard materials and rock whose location is known will be identified in the individual Task Orders. Should other hard materials or rock be encountered, it will be treated as an unforeseen condition.
- e. Blasting will not be permitted.

1.2 HAZWOPER Training

Crane has approximately 30 known solid waste management units (SWMUs) which may present the potential for exposure to contaminated substances. It is possible that a tasking under this contract may require work within the boundary of a SWMU, or that work may uncover a previously unknown SWMU. All Personnel performing duties with potential for exposure to onsite contaminants (i.e., at the jobsite where earthwork has occurred) must meet and maintain the training requirements provided under 29 CFR 1910.120/29 CFR 1926.65 (e).

1.3 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 T 180 | (2010) Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop |
| AASHTO T 224 | (2001; R 2004) Correction for Coarse Particles in the Soil Compaction Test |

AMERICAN WATER WORKS ASSOCIATION (AWWA)

AWWA C200 (2005) Steel Water Pipe - 6 In. (150 mm) and Larger

AWWA C600 (2010) Installation of Ductile-Iron Water Mains and Their Appurtenances

AMERICAN WELDING SOCIETY (AWS)

AWS D1.1/D1.1M (2008; Errata 2009) Structural Welding Code - Steel

AMERICAN WOOD PROTECTION ASSOCIATION (AWPA)

AWPA C2 (2003) Lumber, Timber, Bridge Ties and Mine Ties - Preservative Treatment by Pressure Processes

AWPA P5 (2005) Standard for Waterborne Preservatives

ASTM INTERNATIONAL (ASTM)

ASTM A 252 (1998; R 2007) Standard Specification for Welded and Seamless Steel Pipe Piles

ASTM C 136 (2006) Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates

ASTM C 150 (2007) Standard Specification for Portland Cement

ASTM C 33/C 33M (2008) Standard Specification for Concrete Aggregates

ASTM C 618 (2008a) Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete

ASTM D 1140 (2000; R 2006) Amount of Material in Soils Finer than the No. 200 (75-micrometer) Sieve

ASTM D 1556 (2007) Density and Unit Weight of Soil in Place by the Sand-Cone Method

ASTM D 1557 (2007) Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³) (2700 kN-m/m³)

ASTM D 2487 (2006e1) Soils for Engineering Purposes (Unified Soil Classification System)

ASTM D 422 (1963; R 2007) Particle-Size Analysis of Soils

ASTM D 4318 (2005) Liquid Limit, Plastic Limit, and

Plasticity Index of Soils

ASTM D 698

(2007e1) Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/cu. ft. (600 kN-m/cu. m.))

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1

(2014) Safety and Health Requirements Manual

1.4 DEFINITIONS

1.4.1 Satisfactory Materials

Satisfactory materials comprise any materials classified by ASTM D 2487 as GW, GP, GM, GP-GM, GW-GM, GC, GP-GC, GM-GC, SW, or SP. Satisfactory materials for grading comprise stones less than 8 inches, except for fill material for pavements and railroads which comprise stones less than 3 inches in any dimension.

1.4.2 Unsatisfactory Materials

Materials which do not comply with the requirements for satisfactory materials are unsatisfactory. Materials classified as PT, OH, OL by ASTM D 2487 are unsatisfactory.

Unsatisfactory materials also include man-made fills; trash; refuse; backfills from previous construction; and material classified as satisfactory which contains root and other organic matter, frozen material, large rocks, or other material which could damage the pipe or cause the backfill not to compact. Notify the Contracting Officer when encountering any contaminated materials.

1.4.3 Cohesionless and Cohesive Materials

Cohesionless materials include materials classified in ASTM D 2487 as GW, GP, SW, and SP. Cohesive materials include materials classified as GC, SC, ML, CL, MH, and CH. Materials classified as GM and SM will be identified as cohesionless only when the fines are nonplastic. Perform testing, required for classifying materials, in accordance with ASTM D 4318, ASTM C 136, ASTM D 422, and ASTM D 1140.

1.4.4 Degree of Compaction

Degree of compaction required, except as noted in the second sentence, is expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D 1557 abbreviated as a percent of laboratory maximum density. Since ASTM D 1557 applies only to soils that have 30 percent or less by weight of their particles retained on the 3/4 inch sieve, express the degree of compaction for material having more than 30 percent by weight of their particles retained on the 3/4 inch sieve as a percentage of the maximum density in accordance with AASHTO T 180 and corrected with AASHTO T 224. To maintain the same percentage of coarse material, use the "remove and replace" procedure as described in NOTE 8 of Paragraph 7.2 in AASHTO T 180.

1.4.5 Topsoil

Material suitable for topsoils obtained from offsite areas, excavations, and areas if indicated on the drawings is defined as: Natural, friable soil representative of productive, well-drained soils in the area, free of subsoil, stumps, rocks larger than 3/4 inch diameter, brush, weeds, toxic substances, and other material detrimental to plant growth. Amend topsoil pH range to obtain a pH of 6.2 to 7.4.

1.4.6 Hard/Unyielding Materials

Hard/Unyielding materials comprise weathered rock, dense consolidated deposits, or conglomerate materials which are not included in the definition of "rock" with stones greater than 3 inch in any dimension or as defined by the pipe manufacturer, whichever is smaller. These materials usually require the use of heavy excavation equipment, ripper teeth, or jack hammers for removal.

1.4.7 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 1/2 cubic yard in volume. Removal of hard material will not be considered rock excavation because of intermittent drilling that is performed merely to increase production.

If at any time during excavation, including excavation from borrow areas, the Contractor encounters material that may be classified as rock excavation, uncover such material and notify the Contracting Officer. Do not proceed with the excavation of this material until the Contracting Officer has classified the materials as common excavation or rock excavation and has taken cross sections as required. Failure on the part of the Contractor to uncover such material, notify the Contracting Officer, and allow ample time for classification and cross sectioning of the undisturbed surface of such material will cause the forfeiture of the Contractor's right of claim to any classification or volume of material to be paid for other than that allowed by the Contracting Officer for the areas of work in which such deposits occur.

1.4.8 Unstable Material

Unstable material are too wet to properly support the utility pipe, conduit, or appurtenant structure during backfilling. This may be material otherwise identified as satisfactory which has been disturbed or saturated..

1.4.9 Initial Backfill Material

Material used to refill a cut, trench, or other excavation.

1.4.10 Nonfrost Susceptible (NFS) Material

Nonfrost susceptible material are a uniformly graded washed sand with a maximum particle size of 1/2 inch and less than 5 percent passing the No. 200 size sieve, and with not more than 3 percent by weight finer than 0.02 mm grain size.

1.5 SUBMITTALS

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

SD-01 Preconstruction Submittals

Shoring and Sheet piling Plan; G
Dewatering Work Plan
Trenching Plan; G

Submit 15 days prior to starting work.

SD-03 Product Data

Utilization of Excavated Materials

Opening of any Excavation or Borrow Pit

Procedure and location for disposal of unused satisfactory material. Proposed source of borrow material. Notification of encountering rock in the project. Advance notice on the opening of excavation or borrow areas. Advance notice on shoulder construction for rigid pavements.

SD-06 Test Reports

Pipe bedding materials tests

Topsoil Tests

Test for moisture-density relation

Borrow Site Testing

Within 24 hours of conclusion of physical tests, 3 copies of Borrow Site Testing results, including calibration curves and results of calibration tests. Results of testing at the borrow site.

SD-07 Certificates

Testing

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

PART 2 PRODUCTS

2.1 REQUIREMENTS FOR OFFSITE SOILS

Submit topsoil tests verifying conformance to required parameters prior to commencing seeding operations. Do not bring material onsite until tests have been approved by the Contracting Officer.

2.2 INITIAL BACKFILL

Initial backfill consists of crushed Lime Stone No. 11 from an INDOT certified aggregate producer. Stone shall be of size ordered and shall be Type O, Class A or B, in accordance with Section 904 of the INDOT Standard Specifications. When the pipe is coated or wrapped for corrosion protection, free the initial backfill material of stones larger than 1 inches in any dimension or as recommended by the pipe manufacturer, whichever is smaller.

2.3 SPECIAL BACKFILL FOR STRUCTURES AND PAVEMENTS (FLOWABLE FILL)

FLOWABLE FILL: flowable mortar to fill trenches for pipe structures, culverts, utility cuts and other work extending under pavement locations, and other locations in accordance with the following mix design:

| | | |
|-----------|-----------|--|
| Cement: | 100 Lbs | ASTM C 150 |
| Flyash | 500 lbs | ASTM C 618 |
| Sand(SSD) | 2500 lbs | ASTM C 33/C 33M or INDOT specification # 23 sand |
| water | 3-400 Lbs | (IMI mix #197 or approved equal) |

The Contractor shall submit the mix design. The mix design shall include a list of all ingredients, the source of all materials, the gradation of all aggregates, the names of all admixtures and dosage rates, and the batch weights. Except for adjustments to compensate for routine moisture fluctuations, mix design changes shall be documented and justified prior to implementation by the Contractor.

2.4 SAND

Clean, coarse-grain sand shall be provided from an INDOT certified aggregate provider.

2.5 GRAVEL

Clean, coarsley graded natural gravel, crushed stone, or a combination thereof to provided from an INDOT certified aggregate producer.

2.6 PIPE BEDDING

Crushed Lime Stone No. 11 from an INDOT certified aggregate producer. Stone shall be of size ordered and shall be Type O, Class A or B, in accordance with Section 904 of the INDOT Standard Specifications. Submit copies of [Pipe Bedding Materials tests](#).

2.7 BURIED WARNING AND IDENTIFICATION TAPE

Provide metallic core or metallic-faced, acid- and alkali-resistant, polyethylene plastic warning tape manufactured specifically for warning and identification of buried utility lines. Provide tape on rolls, 3 inch minimum width, color coded as specified below for the intended utility with warning and identification imprinted in bold black letters continuously over the entire tape length. Warning and identification to read, "CAUTION, BURIED (intended service) LINE BELOW" or similar wording. Provide permanent color and printing, unaffected by moisture or soil.

Warning Tape Color Codes

Red: Electric

Warning Tape Color Codes

Blue: Water Systems
Green: Sewer Systems

2.7.1 Warning Tape for Metallic Piping

Provide acid and alkali-resistant polyethylene plastic tape conforming to the width, color, and printing requirements specified above, with a minimum thickness of 0.003 inch and a minimum strength of 1500 psi lengthwise, and 1250 psi crosswise, with a maximum 350 percent elongation.

2.7.2 Detectable Warning Tape for Non-Metallic Piping

Provide polyethylene plastic tape conforming to the width, color, and printing requirements specified above, with a minimum thickness of 0.004 inch, and a minimum strength of 1500 psi lengthwise and 1250 psi crosswise. Manufacture tape with integral wires, foil backing, or other means of enabling detection by a metal detector when tape is buried up to 3 1/2 feet deep. Encase metallic element of the tape in a protective jacket or provide with other means of corrosion protection.

2.8 DETECTION WIRE FOR NON-METALLIC PIPING

Insulate a single strand, solid copper detection wire with a minimum of 12 AWG.

2.9 CAPILLARY WATER BARRIER

Provide capillary water barrier of clean, poorly graded crushed rock, crushed gravel, or uncrushed gravel placed beneath a building slab with or without a vapor barrier to cut off the capillary flow of pore water to the area immediately below. Conform to ASTM C 33/C 33M for fine aggregate grading with a maximum of 3 percent by weight passing ASTM D 1140, No. 200 sieve, or 1-1/2 inch and no more than 2 percent by weight passing the No. 4 size sieve .

2.10 PIPE CASING

2.10.1 Casing Pipe

Steel, manufactured in accordance with AWWA C200/ASTM A 139/A 139M, Grade B, or ASTM A 252, Grade 2, smooth wall pipe. Minimum wall thickness of 3/8". A minimum clearance of at least 2 inches between the inner wall of the sleeve and the maximum outside diameter of the sleeved pipe and joints shall be provided. Protective coating is not required on casing pipe. Where sleeves are required, in all other cases, the sand bedding or suitable pipe support shall be provided for the water pipe through the sleeve.

2.10.2 Wood Supports

Treated Yellow Pine or Douglas Fir, rough, structural grade. Provide wood with nonleaching water-borne pressure preservative (ACA or CCA) and treatment conforming to AWPA P5 and AWPA C2, respectively. Secure wood supports to carrier pipe with stainless steel or zinc-coated steel bands.

PART 3 EXECUTION

3.1 Digging Permits

A digging permit for shall be obtained prior the start of any excavation work.

3.2 STRIPPING OF TOPSOIL

Where indicated or directed, strip topsoil to a depth of 4 inch. Spread topsoil on areas already graded and prepared for topsoil, or transported and deposited in stockpiles convenient to areas that are to receive application of the topsoil later, or at locations indicated or specified. Keep topsoil separate from other excavated materials, brush, litter, objectionable weeds, roots, stones larger than 2 inch in diameter, and other materials that would interfere with planting and maintenance operations. Dispose of any surplus of topsoil from excavations and gradings as indicated in the Individual Task Orders.

3.3 GENERAL EXCAVATION

Perform excavation of every type of material encountered within the limits of the project to the lines, grades, and elevations indicated and as specified. Perform the grading in accordance with the typical sections shown and the tolerances specified in paragraph FINISHING. Transport satisfactory excavated materials and place in fill or embankment within the limits of the work. Excavate unsatisfactory materials encountered within the limits of the work below grade and replace with satisfactory materials as directed. Include such excavated material and the satisfactory material ordered as replacement in excavation. Dispose surplus satisfactory excavated material not required for fill or embankment in areas approved for surplus material storage or designated waste areas. Dispose unsatisfactory excavated material in designated waste or spoil areas. During construction, perform excavation and fill in a manner and sequence that will provide proper drainage at all times. Excavate material required for fill or embankment in excess of that produced by excavation within the grading limits from the borrow areas indicated in the individual Task Orders or from other approved areas selected by the Contractor as specified.

3.3.1 Underground Utilities

The location of underground utilites is approximate. The contractor shall physically verify the location and elevation of existng utilities indicated prior to the start of construction. The Contractor is responsible for movement of construction machinery and equipment over pipes and utilities during construction. Excavation made with power-driven equipment is not permitted within two feet of known Government-owned utility or subsurface construction. For work immediately adjacent to or for excavations exposing a utility or other buried obstruction, excavate by hand. Start hand excavation on each side of the indicated obstruction and continue until the obstruction is uncovered or until clearance for the new grade is assured. Support uncovered lines or other existing work affected by the contract excavation until approval for backfill is granted by the Contracting Officer. Report damage to utility lines or subsurface construction immediately to the Contracting Officer.

3.3.2 Trench Excavation Requirements

Perform trenching work in accordance with section 25 of EM 385-1-1. If

trenching deeper than 5 feet is required, submit a [trenching plan](#) for approval 15 days prior to starting work. Include provisions in the 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.

Excavate the trench as recommended by the manufacturer of the pipe to be installed. Slope trench walls below the top of the pipe, or make vertical, and of such width as recommended in the manufacturer's printed installation manual.

Provide vertical trench walls where no manufacturer's printed installation manual is available. Shore trench walls more than 5 feet high, cut back to a stable slope, or provide with equivalent means of protection for employees who may be exposed to moving ground or cave in. Excavate trench walls which are cut back to at least the angle of repose of the soil. Give special attention to slopes which may be adversely affected by weather or moisture content. Do not exceed the trench width below the pipe top of 24 inches plus pipe outside diameter (O.D.) for pipes of less than 24 inch inside diameter, and do not exceed 36 inch plus pipe outside diameter for sizes larger than 24 inch inside diameter. Where recommended trench widths are exceeded, provide redesign, stronger pipe, or special installation procedures by the Contractor. The Contractor is responsible for the cost of redesign, stronger pipe, or special installation procedures without any additional cost to the Government.

3.3.2.1 Bottom Preparation

Grade the bottoms of trenches accurately to provide uniform bearing and support for the bottom quadrant of each section of the pipe. Excavate bell holes to the necessary size at each joint or coupling to eliminate point bearing. Remove stones of 2 inch or greater in any dimension, or as recommended by the pipe manufacturer, whichever is smaller, to avoid point bearing.

3.3.2.2 Removal of Unyielding Material

Where unyielding material is encountered in the bottom of the trench, remove such material 4 inch below the required grade and replaced with suitable materials as provided in paragraph BACKFILLING AND COMPACTION.

3.3.2.3 Removal of Unstable Material

Where unstable material is encountered in the bottom of the trench, remove such material to the depth directed and replace it to the proper grade with select granular material as provided in paragraph BACKFILLING AND COMPACTION. When removal of unstable material is required due to the Contractor's fault or neglect in performing the work, the Contractor is responsible for excavating the resulting material and replacing it without additional cost to the Government.

3.3.2.4 Excavation for Appurtenances

Provide excavation for manholes, catch-basins, inlets, or similar structures sufficient to leave at least 12 inch clear between the outer structure surfaces and the face of the excavation or support members Clean

rock of loose debris and cut to a firm surface either level, stepped, or serrated, as shown or as directed. Remove loose disintegrated rock and thin strata. Specify removal of unstable material. When concrete or masonry is to be placed in an excavated area, take special care not to disturb the bottom of the excavation. Do not excavate to the final grade level until just before the concrete or masonry is to be placed.

3.3.2.5 Jacking, Boring, and Tunneling

Unless otherwise indicated, provide excavation by open cut except that sections of a trench may be jacked, bored, or tunneled if, in the opinion of the Contracting Officer, the pipe, cable, or duct can be safely and properly installed and backfill can be properly compacted in such sections.

3.3.3 Ditches, Gutters, and Channel Changes

Finish excavation of ditches, gutters, and channel changes by cutting accurately to the cross sections, grades, and elevations shown on the individual Task Orders. Do not excavate ditches and gutters below grades shown or existing adjacent grades. Backfill the excessive open ditch or gutter excavation with satisfactory, thoroughly compacted, material or with suitable stone or cobble to grades shown. Dispose excavated material as shown or as directed, except in no case allow material be deposited a maximum 4 feet from edge of a ditch. Maintain excavations free from detrimental quantities of leaves, brush, sticks, trash, and other debris until final acceptance of the work.

3.3.4 Drainage Structures

Make excavations to the lines, grades, and elevations shown, or as directed. Provide trenches and foundation pits of sufficient size to permit the placement and removal of forms for the full length and width of structure footings and foundations as shown. Clean rock or other hard foundation material of loose debris and cut to a firm, level, stepped, or serrated surface. Remove loose disintegrated rock and thin strata. Do not disturb the bottom of the excavation when concrete or masonry is to be placed in an excavated area. Do not excavate to the final grade level until just before the concrete or masonry is to be placed.

3.3.5 Drainage

Provide for the collection and disposal of surface and subsurface water encountered during construction. Completely drain construction site during periods of construction to keep soil materials sufficiently dry. 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 or provide temporary ditches, swales, and other drainage features and equipment as required to maintain dry soils. 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.

3.3.6 Dewatering

Control groundwater flowing toward or into excavations to prevent sloughing

of excavation slopes and walls, boils, uplift and heave in the excavation and to eliminate interference with orderly progress of construction. Do not permit French drains, sumps, ditches or trenches 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. Take control measures 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, maintain the water level continuously, at least 2 feet below the working level. Operate dewatering system continuously until construction work below existing water levels is complete. Submit a [Dewatering Work Plan](#). Submit performance records weekly.

3.3.7 Structural Excavation

Ensure that footing subgrades have been inspected and approved by the Contracting Officer prior to concrete placement. Excavate to bottom of pile cap prior to placing or driving piles, unless authorized otherwise by the Contracting Officer. Backfill and compact over excavations and changes in grade due to pile driving operations to 95 percent of [ASTM D 698](#) maximum density.

3.4 SELECTION OF BORROW MATERIAL

Select borrow material to meet the requirements and conditions of the particular fill or embankment for which it is to be used. Obtain borrow material from the borrow areas as identified in the individual Task Orders. Unless otherwise provided in the contract, the Contractor is responsible for obtaining the right to procure material, pay royalties and other charges involved, and bear the expense of developing the sources, including rights-of-way for hauling from the owners. Borrow material from approved sources on Government-controlled land may be obtained without payment of royalties. Unless specifically provided, do not obtain borrow within the limits of the project site without prior written approval. Consider necessary clearing, grubbing, and satisfactory drainage of borrow pits and the disposal of debris thereon related operations to the borrow excavation.

3.5 OPENING AND DRAINAGE OF EXCAVATION AND BORROW PITS

Notify the Contracting Officer sufficiently in advance of the [opening of any excavation or borrow pit](#) to permit elevations and measurements of the undisturbed ground surface to be taken. Except as otherwise permitted, [excavate borrow pits and other excavation areas](#) providing adequate drainage. Transport overburden and other spoil material to designated spoil areas or otherwise dispose of as directed. [Provide neatly trimmed and drained borrow pits after the excavation is completed](#). Ensure that excavation of any area, [operation of borrow pits](#), or dumping of spoil material results in minimum detrimental effects on natural environmental conditions.

3.6 SHORING

3.6.1 General Requirements

Submit a [Shoring and Sheet piling plan](#) for approval 15 days prior to starting work. Submit drawings and calculations, certified by a registered professional engineer, describing the methods for shoring and sheeting of excavations. Finish shoring, including sheet piling, and install as

necessary to protect workmen, banks, adjacent paving, structures, and utilities. Remove shoring, bracing, and sheeting as excavations are backfilled, in a manner to prevent caving.

3.6.2 Geotechnical Engineer

For Task Orders requiring shoring and sheeting, and for other work as required by EM 385-1-1, hire a Professional Geotechnical Engineer to provide inspection of excavations and soil/groundwater conditions throughout construction. The Geotechnical Engineer is responsible for performing pre-construction and periodic site visits throughout construction to assess site conditions. The Geotechnical Engineer is responsible for updating the excavation, sheeting and dewatering plans as construction progresses to reflect changing conditions and submit an updated plan if necessary. Submit a monthly written report, informing the Contractor and Contracting Officer of the status of the plan and an accounting of the Contractor's adherence to the plan addressing any present or potential problems. The Contracting Officer is responsible for arranging meetings with the Geotechnical Engineer at any time throughout the contract duration.

3.7 GRADING AREAS

Where indicated, divide work into grading areas within which satisfactory excavated material will be placed in embankments, fills, and required backfills. Do not haul satisfactory material excavated in one grading area to another grading area except when so directed in writing. Place and grade stockpiles of satisfactory and unsatisfactory as specified. Keep stockpiles in a neat and well drained condition, giving due consideration to drainage at all times. Clear, grub, and seal by rubber-tired equipment, the ground surface at stockpile locations; separately stockpile excavated satisfactory and unsatisfactory materials. Protect stockpiles of satisfactory materials from contamination which may destroy the quality and fitness of the stockpiled material. If the Contractor fails to protect the stockpiles, and any material becomes unsatisfactory, remove and replace such material with satisfactory material from approved sources.

3.8 FINAL GRADE OF SURFACES TO SUPPORT CONCRETE

Do not excavate to final grade until just before concrete is to be placed. Only use excavation methods that will leave the foundation rock in a solid and unshattered condition. Roughen the level surfaces, and cut the sloped surfaces, as indicated, into rough steps or benches to provide a satisfactory bond. Protect shales from slaking and all surfaces from erosion resulting from ponding or water flow.

3.9 GROUND SURFACE PREPARATION

3.9.1 General Requirements

Remove and replace unsatisfactory material with satisfactory materials, as directed by the Contracting Officer, in surfaces to receive fill or in excavated areas. Scarify the surface to a depth of 6 inch before the fill is started. Plow, step, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so that the fill material will bond with the existing material. When subgrades are less than the specified density, break up the ground surface to a minimum depth of 6 inch, pulverizing, and compacting to the specified density. When the subgrade is part fill and part excavation or natural ground, scarify the excavated or natural ground

portion to a depth of 12 inch and compact it as specified for the adjacent fill.

3.9.2 Cutting Pavement, Curbs, and Gutter.

Saw cut to full depth of improvement with neat, parallel lines, straight lines one foot wider than required trench width on each side of trench and one foot beyond each edge of pits. When saw cut is within 2 feet of an existing joint, remove pavement to the existing joint.

3.9.3 Frozen Material

Do not place material on surfaces that are muddy, frozen, or contain frost. Finish compaction by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, or other approved equipment well suited to the soil being compacted. Moisten material as necessary to provide the moisture content that will readily facilitate obtaining the specified compaction with the equipment used.

3.10 UTILIZATION OF EXCAVATED MATERIALS

Dispose unsatisfactory materials removing from excavations into designated waste disposal or spoil areas. Use satisfactory material removed from excavations, insofar as practicable, in the construction of fills, embankments, subgrades, shoulders, bedding (as backfill), and for similar purposes. Do not waste any satisfactory excavated material without specific written authorization. Dispose of satisfactory material, authorized to be wasted, in designated areas approved for surplus material storage or designated waste areas as directed. Clear and grub newly designated waste areas on Government-controlled land before disposal of waste material thereon. Stockpile and use coarse rock from excavations for constructing slopes or embankments adjacent to streams, or sides and bottoms of channels and for protecting against erosion. Do not dispose excavated material to obstruct the flow of any stream, endanger a partly finished structure, impair the efficiency or appearance of any structure, or be detrimental to the completed work in any way.

3.11 BURIED TAPE AND DETECTION WIRE

3.11.1 Buried Warning and Identification Tape

Provide buried utility lines with utility identification tape. Bury tape 12 inch below finished grade; under pavements and slabs, bury tape 6 inch below top of subgrade.

3.11.2 Buried Detection Wire

Bury detection wire directly above both metallic and non-metallic piping at a distance not to exceed 12 inch above the top of pipe. Extend the wire continuously and unbroken, from manhole to manhole. Terminate the ends of the wire inside the manholes at each end of the pipe, with a minimum of 3 feet of wire, coiled, remaining accessible in each manhole. Furnish insulated wire over it's entire length. Install wires at manholes between the top of the corbel and the frame, and extend up through the chimney seal between the frame and the chimney seal. For force mains, terminate the wire in the valve pit at the pump station end of the pipe.

3.12 BACKFILLING AND COMPACTION

Place backfill adjacent to any and all types of structures, and compact to at least 90 percent laboratory maximum density for cohesive materials or 95 percent laboratory maximum density for cohesionless materials, to prevent wedging action or eccentric loading upon or against the structure. Prepare ground surface on which backfill is to be placed as specified in paragraph GROUND SURFACE PREPARATION. Provide compaction requirements for backfill materials in conformance with the applicable portions of paragraphs GROUND SURFACE PREPARATION. Finish compaction by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment.

3.12.1 Trench Backfill

Backfill trenches to the grade shown. Construct backfill in two operations (initial and final) as indicated and specified in this section. Backfill the trench to 2 feet above the top of pipe prior to performing the required pressure tests. Leave the joints and couplings uncovered during the pressure test.

3.12.1.1 Replacement of Unyielding Material

Replace unyielding material removed from the bottom of the trench with select granular material or initial backfill material.

3.12.1.2 Replacement of Unstable Material

Replace unstable material removed from the bottom of the trench or excavation with select granular material placed in layers not exceeding 6 inch loose thickness.

3.12.1.3 Bedding and Initial Backfill

Place initial backfill material and compact it with approved tampers to a height of at least 6 inches above the utility pipe or conduit. Place initial backfill in 6 inch maximum loose lifts to 6 inches above pipe unless indicated in the individual Task Order. Bring up the backfill evenly on both sides of the pipe for the full length of the pipe. Take care to ensure thorough compaction of the fill under the haunches of the pipe. Except as specified otherwise in the individual piping section, provide bedding for buried piping in accordance with AWWA C600, Type 4, except as specified herein. Compact backfill to top of pipe to 95 percent of ASTM D 698 maximum density. Provide plastic piping with bedding to spring line of pipe. Provide materials as follows:

- d. Crushed Lime Stone No. 11 from an INDOT certified aggregate producer. Stone shall be of size ordered and shall be Type O, Class A or B, in accordance with Section 904 of the INDOT Standard Specifications.

3.12.1.4 Final Backfill

Fill the remainder of the trench, except for special materials for roadways, railroads and airfields, with satisfactory material. Place backfill material and compact as follows:

- a. Roadways, Railroads, paved areas: Place flowable fill up to the required elevation as specified.

b. Sidewalks, Turfed or Seeded Areas and Miscellaneous Areas: Deposit backfill in layers of a maximum of 12 inch loose thickness, and compact it to 85 percent maximum density for cohesive soils and 90 percent maximum density for cohesionless soils. Do not permit compaction by water flooding or jetting. Apply this requirement to all other areas not specifically designated above.

3.12.2 Backfill for Appurtenances

After the manhole, catchbasin, inlet, or similar structure has been constructed and the concrete has been allowed to cure for 7 days, place backfill in such a manner that the structure is not be damaged by the shock of falling earth. Deposit the backfill material, compact it as specified for final backfill, and bring up the backfill evenly on all sides of the structure to prevent eccentric loading and excessive stress.

3.13 SPECIAL REQUIREMENTS

Special requirements for both excavation and backfill relating to the specific utilities are as follows:

3.13.1 Water Lines

Excavate trenches to a depth that provides a minimum cover of 3 1/2 feet from the existing ground surface, or from the indicated finished grade, whichever is lower, to the top of the pipe. For fire protection yard mains or piping, an additional 6 inch of cover is required.

3.13.2 Pipeline Casing

Provide new smooth wall steel pipeline casing under new or existing railroads and pavement in a trench by the boring and jacking method of installation. Provide each new pipeline casing, where indicated and to the lengths and dimensions shown, complete and suitable for use with the new piped utility as indicated. Install pipeline casing by dry boring and jacking method as follows:

3.13.2.1 Bore Holes

Mechanically bore holes and case through the soil with a cutting head on a continuous auger mounted inside the casing pipe. Weld lengths of pipe together in accordance with AWS D1.1/D1.1M. Do not use water or other fluids in connection with the boring operation.

3.13.2.2 Cleaning

Clean inside of the pipeline casing of dirt, weld splatters, and other foreign matter which would interfere with insertion of the piped utilities by attaching a pipe cleaning plug to the boring rig and passing it through the pipe.

3.13.2.3 End Seals

After installation of piped utilities in pipeline casing, provide watertight end seals at each end of pipeline casing between pipeline casing and piping utilities. Provide watertight segmented elastomeric end seals.

3.14 FINISHING

Finish the surface of excavations, embankments, and subgrades to a smooth and compact surface in accordance with the lines, grades, and cross sections or elevations shown. Finish gutters and ditches in a manner that will result in effective drainage. Finish the surface of areas to be turfed from settlement or washing to a smoothness suitable for the application of turfing materials. Repair graded, topsoiled, or backfilled areas prior to acceptance of the work, and re-established grades to the required elevations and slopes.

3.14.1 Subgrade and Embankments

During construction, keep embankments and excavations shaped and drained. Maintain ditches and drains along subgrade to drain effectively at all times. Do not disturb the finished subgrade by traffic or other operation. Protect and maintain the finished subgrade in a satisfactory condition until ballast, subbase, base, or pavement is placed. Do not permit the storage or stockpiling of materials on the finished subgrade. Do not lay subbase, base course, ballast, or pavement until the subgrade has been checked and approved, and in no case place subbase, base, surfacing, pavement, or ballast on a muddy, spongy, or frozen subgrade.

3.14.2 Capillary Water Barrier

Place a capillary water barrier under concrete floor and area-way slabs grade directly on the subgrade and compact with a minimum of two passes of a hand-operated plate-type vibratory compactor.

3.14.3 Grading Around Structures

Construct areas within **5 feet** outside of each building and structure line true-to-grade, shape to drain, and maintain free of trash and debris until final inspection has been completed and the work has been accepted.

3.15 TESTING

Perform testing by a Corps validated commercial testing laboratory or the Contractor's validated testing facility. If the Contractor elects to establish testing facilities, do not permit work requiring testing until the Contractor's facilities have been inspected, Corps validated and approved by the Contracting Officer. Determine field in-place density in accordance with **ASTM D 1556**. When test results indicate, as determined by the Contracting Officer, that compaction is not as specified, remove the material, replace and recompact to meet specification requirements. Perform tests on recompacted areas to determine conformance with specification requirements. Appoint a registered professional civil engineer to certify inspections and test results. These certifications shall state that the tests and observations were performed by or under the direct supervision of the engineer and that the results are representative of the materials or conditions being certified by the tests. The following number of tests, if performed at the appropriate time, will be the minimum acceptable for each type operation.

3.15.1 Test for Moisture-Density Relation

Refer to the following:

3.15.1.1 Moisture Contents

In the stockpile, excavation, or borrow areas, perform a minimum of two tests per day per type of material or source of material being placed during stable weather conditions. During unstable weather, perform tests as dictated by local conditions and approved by the Contracting Officer.

3.15.1.2 Optimum Moisture and Laboratory Maximum Density

Perform tests for each type material or source of material **including borrow material** to determine the optimum moisture and laboratory maximum density values. One representative test per 25 cubic **yards** of fill and backfill, or when any change in material occurs which may affect the optimum moisture content or laboratory maximum density.

3.15.2 Tolerance Tests for Subgrades

Perform continuous checks on the degree of finish specified in paragraph SUBGRADE PREPARATION during construction of the subgrades.

3.15.3 Displacement of Sewers

After other required tests have been performed and the trench backfill compacted to 2, **feet** above the top of the pipe, inspect the pipe to determine whether significant displacement has occurred. Conduct this inspection in the presence of the Contracting Officer. Inspect pipe sizes larger than **36 inch**, while inspecting smaller diameter pipe by shining a light or laser between manholes or manhole locations, or by the use of television cameras passed through the pipe. If, in the judgement of the Contracting Officer, the interior of the pipe shows poor alignment or any other defects that would cause improper functioning of the system, replace or repair the defects as directed at no additional cost to the Government.

3.16 DISPOSITION OF SURPLUS MATERIAL

Provide surplus material or other soil material not required or suitable for filling or backfilling, and brush, refuse, stumps, roots, and timber as wasted as directed by the Contracting Officer.

-- End of Section --

SECTION 32 12 16

HOT-MIX ASPHALT (HMA) FOR ROADS
08/09

PART 1 GENERAL

1.1 UNIT PRICES

1.1.1 Method of Measurement

See Section 01 22 00.00 10 MEASUREMENT AND PAYMENT, paragraph 1.3.30.

1.1.2 Basis of Payment

See Section 01 22 00.00 10 MEASUREMENT AND PAYMENT, paragraph 1.3.30.

1.2 REFERENCES

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

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
(AASHTO)

AASHTO M 156

(2013) Standard Specification for Requirements for Mixing Plants for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures

AASHTO TP53

(1997) Standard Test Method for Determining the Asphalt Content of Hot Mix Asphalt (HMA) by the Ignition Method

ASPHALT INSTITUTE (AI)

AI MS-2

(1997 6th Ed) Mix Design Methods

ASTM INTERNATIONAL (ASTM)

ASTM C117

(2013) Standard Test Method for Materials Finer than 75-um (No. 200) Sieve in Mineral Aggregates by Washing

ASTM C1252

(2006) Standard Test Methods for Uncompacted Void Content of Fine Aggregate (as Influenced by Particle Shape, Surface Texture, and Grading)

ASTM C127

(2012) Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Coarse Aggregate

ASTM C128

(2012) Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Fine Aggregate

| | |
|-------------------|--|
| ASTM C131/C131M | (2014) Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine |
| ASTM C136 | (2006) Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates |
| ASTM C142/C142M | (2010) Standard Test Method for Clay Lumps and Friable Particles in Aggregates |
| ASTM C29/C29M | (2009) Standard Test Method for Bulk Density ("Unit Weight") and Voids in Aggregate |
| ASTM C88 | (2013) Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate |
| ASTM D1461 | (2011) Moisture or Volatile Distillates in Bituminous Paving Mixtures |
| ASTM D2172 | (2011) Quantitative Extraction of Bitumen from Bituminous Paving Mixtures |
| ASTM D2419 | (2014) Sand Equivalent Value of Soils and Fine Aggregate |
| ASTM D242/D242M | (2009; R 2014) Mineral Filler for Bituminous Paving Mixtures |
| ASTM D2489/D2489M | (2008) Estimating Degree of Particle Coating of Bituminous-Aggregate Mixtures |
| ASTM D2950/D2950M | (2014) Density of Bituminous Concrete in Place by Nuclear Methods |
| ASTM D3666 | (2013) Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials |
| ASTM D4125 | (2010) Asphalt Content of Bituminous Mixtures by the Nuclear Method |
| ASTM D4791 | (2010) Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate |
| ASTM D5444 | (2008) Mechanical Size Analysis of Extracted Aggregate |
| ASTM D6307 | (2010) Asphalt Content of Hot Mix Asphalt by Ignition Method |

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION (CALTRANS)

| | |
|---------|--|
| CTM 526 | (2002) Operation of California Profilograph and Evaluation of Profiles |
|---------|--|

U.S. ARMY CORPS OF ENGINEERS (USACE)

COE CRD-C 171

(1995) Standard Test Method for
Determining Percentage of Crushed
Particles in Aggregate

1.3 SUBMITTALS

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

SD-03 Product Data

Mix Design; G

SD-07 Certificates

Amount, type and description of any modifiers blended into the asphalt cement binder.

1.4 ENVIRONMENTAL REQUIREMENTS

HMA courses less than 110 lb/syd are to be placed when the ambient and surface temperatures are 60°F or above. HMA courses equal to or greater than 110 lb/syd) but less than 220 lb/syd) are to be placed when the ambient and surface temperatures are 45°F or above. HMA courses equal to or greater than 220 lb/syd and HMA curbing are to be placed when the ambient and surface temperatures are 32°F (or above. Mixture shall not be placed on a frozen subgrade. However, HMA courses may be placed at lower temperatures, provided the density of the HMA course is in accordance with INDOT specifications

PART 2 PRODUCTS

2.1 SYSTEM DESCRIPTION

Perform the work consisting of pavement courses composed of mineral aggregate and asphalt material heated and mixed in a central mixing plant and placed on a prepared course. HMA designed and constructed in accordance with this section shall conform to the lines, grades, thicknesses, and typical cross sections indicated. Construct each course to the depth, section, or elevation required by the drawings and roll, finish, and approve it before the placement of the next course.

2.1.1 Asphalt Mixing Plant

Plants used for the preparation of hot-mix asphalt shall conform to the requirements of AASHTO M 156 with the following changes:

2.1.1.1 Truck Scales

Weigh the asphalt mixture on approved, certified scales at the Contractor's expense. Inspect and seal scales at least annually by an approved calibration laboratory.

2.1.1.2 Testing Facilities

Provide laboratory facilities at the plant for the use of the Government's acceptance testing and the Contractor's quality control testing.

2.1.1.3 Inspection of Plant

Provide the Contracting Officer with access at all times, to all areas of the plant for checking adequacy of equipment; inspecting operation of the plant; verifying weights, proportions, and material properties; checking the temperatures maintained in the preparation of the mixtures and for taking samples. Provide assistance as requested, for the Government to procure any desired samples.

2.1.1.4 Storage bins

Use of storage bins for temporary storage of hot-mix asphalt will be permitted as follows:

- a. The asphalt mixture may be stored in non-insulated storage bins for a period of time not exceeding 3 hours.
- b. The asphalt mixture may be stored in insulated storage bins for a period of time not exceeding 8 hours. The mix drawn from bins shall meet the same requirements as mix loaded directly into trucks.

2.1.2 Hauling Equipment

Provide trucks for hauling hot-mix asphalt having tight, clean, and smooth metal beds. To prevent the mixture from adhering to them, the truck beds shall be lightly coated with a minimum amount of paraffin oil, lime solution, or other approved material. Petroleum based products shall not be used as a release agent. Each truck shall have a suitable cover to protect the mixture from adverse weather. When necessary to ensure that the mixture will be delivered to the site at the specified temperature, truck beds shall be insulated or heated and covers (tarps) shall be securely fastened.

2.1.3 Asphalt Pavers

Provide asphalt pavers which are self-propelled, with an activated screed, heated as necessary, and capable of spreading and finishing courses of hot-mix asphalt which will meet the specified thickness, smoothness, and grade. The paver shall have sufficient power to propel itself and the hauling equipment without adversely affecting the finished surface.

2.1.3.1 Receiving Hopper

Provide paver with a receiving hopper of sufficient capacity to permit a uniform spreading operation and equipped with a distribution system to place the mixture uniformly in front of the screed without segregation. The screed shall effectively produce a finished surface of the required evenness and texture without tearing, shoving, or gouging the mixture.

2.1.3.2 Automatic Grade Controls

Equip the paver with a control system capable of automatically maintaining the specified screed elevation. The control system shall be automatically actuated from either a reference line and/or through a system of mechanical

sensors or sensor-directed mechanisms or devices which will maintain the paver screed at a predetermined transverse slope and at the proper elevation to obtain the required surface. The transverse slope controller shall be capable of maintaining the screed at the desired slope within plus or minus 0.1 percent. A transverse slope controller shall not be used to control grade. Provide controls capable of working in conjunction with any of the following attachments:

- a. Ski-type device of not less than 30 feet in length.
- b. Taut stringline set to grade.
- c. Short ski or shoe for joint matching.
- d. Laser control.

2.1.4 Rollers

Rollers shall be in good condition and shall be operated at slow speeds to avoid displacement of the asphalt mixture. The number, type, and weight of rollers shall be sufficient to compact the mixture to the required density while it is still in a workable condition. Do not use equipment which causes excessive crushing of the aggregate.

2.2 AGGREGATES

Aggregates shall consist of crushed stone, crushed gravel, crushed slag, screenings, natural sand and mineral filler, as required. All crushed stone and materials shall meet INDOT ITM 203 requirements. The portion of material retained on the No. 4 sieve is coarse aggregate. The portion of material passing the No. 4 sieves and retained on the No. 200 sieve is fine aggregate. The portion passing the No. 200 sieve is defined as mineral filler. All aggregate test results and samples shall be submitted to the Contracting Officer at least 14 days prior to start of construction.

2.2.1 Coarse Aggregate

Provide coarse aggregate consisting of sound, tough, durable particles, free from films of material that would prevent thorough coating and bonding with the asphalt material and free from organic matter and other deleterious substances. All individual coarse aggregate sources shall meet the following requirements:

- a. The percentage of loss shall not be greater than 40 percent after 500 revolutions when tested in accordance with [ASTM C131/C131M](#).
- b. The percentage of loss shall not be greater than 18 percent after five cycles when tested in accordance with [ASTM C88](#) using magnesium sulfate or 12 percent when using sodium sulfate.
- c. At least 75 percent by weight of coarse aggregate shall have at least two or more fractured faces when tested in accordance with [COE CRD-C 171](#). Fractured faces shall be produced by crushing.
- d. The particle shape shall be essentially cubical and the aggregate shall not contain more than 20 percent percent, by weight, of flat and elongated particles (3:1 ratio of maximum to minimum) when tested in accordance with [ASTM D4791](#).

- e. Slag shall be air-cooled, blast furnace slag, with a compacted weight of not less than 75 lb/cu ft when tested in accordance with ASTM C29/C29M.
- f. Clay lumps and friable particles shall not exceed 0.3 percent, by weight, when tested in accordance with ASTM C142/C142M.

2.2.2 Fine Aggregate

Fine aggregate shall consist of clean, sound, tough, durable particles free from coatings of clay, silt, or any objectionable material and containing no clay balls.

- a. All individual fine aggregate sources shall have a sand equivalent value not less than 45 when tested in accordance with ASTM D2419.
- b. The fine aggregate portion of the blended aggregate shall have an uncompacted void content not less than 45.0 percent when tested in accordance with ASTM C1252 Method A.
- c. The quantity of natural sand (noncrushed material) added to the aggregate blend shall not exceed 25 percent by weight of total aggregate.
- d. Clay lumps and friable particles shall not exceed 0.3 percent, by weight, when tested in accordance with ASTM C142/C142M

2.2.3 Mineral Filler

Mineral filler shall be nonplastic material meeting the requirements of ASTM D242/D242M.

2.2.4 Aggregate Gradation

The combined aggregate gradation shall conform to gradations specified in Table 4, when tested in accordance with ASTM C136 and ASTM C117, and shall not vary from the low limit on one sieve to the high limit on the adjacent sieve or vice versa, but grade uniformly from coarse to fine.

| Table 4. Aggregate Gradations | | | |
|-------------------------------|---|---|---|
| Sieve Size, inch | Gradation 1 Percent Passing by Mass | Gradation 2 Percent Passing by Mass | Gradation 3 Percent Passing by Mass |
| 1 | 100 | --- | --- |
| 3/4 | 76-96 | 100 | --- |
| 1/2 | 68-88 | 76-96 | 100 |
| 3/8 | 60-82 | 69-89 | 76-96 |
| No. 4 | 45-67 | 53-73 | 58-78 |
| No. 8 | 32-54 | 38-60 | 40-60 |

| Table 4. Aggregate Gradations | | | |
|----------------------------------|---|---|---|
| Sieve Size, inch | Gradation 1 Percent Passing by Mass | Gradation 2 Percent Passing by Mass | Gradation 3 Percent Passing by Mass |
| No. 16 | 22-44 | 26-48 | 28-48 |
| No. 30 | 15-35 | 18-38 | 18-38 |
| No. 50 | 9-25 | 11-27 | 11-27 |
| No. 100 | 6-18 | 6-18 | 6-18 |
| No. 200 | 3-6 | 3-6 | 3-6 |

2.2.5 Asphalt Materials

Asphalt materials shall be in accordance with the following:

- PG Binder, PG 58-28, PG 64-22, PG 64-28, PG 70-22, PG 76-22 - INDOT 902.01
- Coarse Aggregates - INDOT 904
- Base Mixtures - Class D or Higher
- Intermediate Mixtures - Class C or Higher
- Surface Mixtures - Class B or Higher
- Fine Aggregates - INDOT 904
- Only for use in mixtures containing greater than 15% RAP. Refer to INDOT 402.05
- Surface Aggregate requirements are listed in INDOT 904.03(d).

2.3 ASPHALT CEMENT BINDER

Asphalt cement binder shall conform to INDOT 902 and 904.

2.4 [MIX DESIGN](#)

- a. Develop the mix design. The asphalt mix shall conform to INDOT Section 402. The asphalt mix shall be composed of a mixture of well-graded aggregate, mineral filler if required, and asphalt material. The aggregate fractions shall be sized, handled in separate size groups, and combined in such proportions that the resulting mixture meets the grading requirements of the job mix formula (JMF). Do not produce hot-mix asphalt for payment until a JMF has been approved.
- b. The number of compaction gyrations, *N_{des}*, shall be based on a design traffic of 2,000,000 equivalent single axle loads (ESALs).

2.4.1 JMF Requirements

Submit in writing the job mix formula for approval at least 14 days prior to the start of the test section including as a minimum:

- a. Percent passing each sieve size.
- b. Percent of asphalt cement.

- c. Percent of each aggregate and mineral filler to be used.
- d. Asphalt viscosity grade, penetration grade, or performance grade.
- e. Number of blows of hand-held hammer per side of molded specimen. (NA for Superpave)
- f. Number of gyrations of Superpave gyratory compactor, (NA for Marshall mix design)
- g. Laboratory mixing temperature.
- h. Lab compaction temperature.
- i. Temperature-viscosity relationship of the asphalt cement.
- j. Plot of the combined gradation on the 0.45 power gradation chart, stating the nominal maximum size.
- k. Graphical plots of stability (NA for Superpave), flow (NA for Superpave), air voids, voids in the mineral aggregate, and unit weight versus asphalt content as shown in [AI MS-2](#).
- l. Specific gravity and absorption of each aggregate.
- m. Percent natural sand.
- n. Percent particles with 2 or more fractured faces (in coarse aggregate).
- o. Fine aggregate angularity.
- p. Percent flat or elongated particles (in coarse aggregate).
- q. Tensile Strength Ratio(TSR).
- r. Antistripping agent (if required) and amount.
- s. List of all modifiers and amount.
- t. Correlation of hand-held hammer with mechanical hammer (NA for Superpave).
- u. Percentage and properties (asphalt content, binder properties, and aggregate properties) of reclaimed asphalt pavement (RAP) in accordance with paragraph RECYCLED HOT-MIX ASPHALT, if RAP is used.

| Table 5. Mix Design Criteria | | |
|--|---------------------------|---------------------------|
| Test Property | 50 Blows or Mix Gyrations | 75 Blows or Mix Gyrations |
| Stability, pounds , minimum (NA for Superpave) | *1000 | *1800 |
| Flow, 0.01 inch , (NA for Superpave) | 8-18 | 8-16 |
| Air voids, percent | 3-5 | 3-5 |

| Table 5. Mix Design Criteria | | |
|---|--------------------------|--------------------------|
| Test Property | 50 Blows or Mix Gyration | 75 Blows or Mix Gyration |
| Percent Voids in mineral aggregate (VMA), (minimum) | | |
| Gradation 1 | 13.0 | 13.0 |
| Gradation 2 | 14.0 | 14.0 |
| Gradation 3 | 15.0 | 15.0 |
| TSR, minimum percent | 75 | 75 |
| * This is a minimum requirement. The average during construction shall be significantly higher than this number to ensure compliance with the specifications. | | |
| ** Calculate VMA in accordance with AI MS-2, based on ASTM C127 and ASTM C128 bulk specific gravity for the aggregate. | | |

2.4.2 Adjustments to Field JMF

Keep the Laboratory JMF for each mixture in effect until a new formula is approved in writing by the Contracting Officer. Should a change in sources of any materials be made, perform a new laboratory jmf design and a new JMF approved before the new material is used. The Contractor will be allowed to adjust the Laboratory JMF within the limits specified below to optimize mix volumetric properties with the approval of the Contracting Officer. Adjustments to the Laboratory JMF shall be applied to the field (plant) established JMF and limited to those values as shown. Adjustments shall be targeted to produce or nearly produce 4 percent voids total mix (VTM).

| TABLE 6. Field (Plant) Established JMF Tolerances | |
|---|--------------------------------------|
| Sieves | Adjustments (plus or minus), percent |
| 1/2 inch | 3 |
| No. 4 | 3 |
| No. 8 | 3 |
| No. 200 | 1 |
| Binder Content | 0.4 |

If adjustments are needed that exceed these limits, develop a new mix design. Tolerances given above may permit the aggregate grading to be outside the limits shown in Table 4; while not desirable, this is acceptable, except for the No. 200 sieve, which shall remain within the aggregate grading of Table 4.

2.5 RECYCLED HOT MIX ASPHALT

Recycled materials may consist of reclaimed asphalt pavement, RAP, or asphalt roofing shingles, ARS, or a blend of both. RAP shall be the product resulting from the cold milling or crushing of an existing HMA pavement. The RAP shall be processed so that 100% will pass the 2 in. sieve when entering the HMA plant. ARS shall consist of waste from a shingle manufacturing facility. No tear-off materials from roofs will be allowed. ARS shall be stockpiled separately from other materials. The coarse aggregate in the recycled materials shall pass the maximum size sieve for the mixture being produced.

Recycled materials may be used as a substitute for a portion of the new materials required to produce HMA mixtures. When only RAP is used in the mixture, **the RAP shall not exceed 15.0% by weight (mass) of the total mixture.** When only ARS is used in the mixture, the ARS shall not exceed 5.0% by weight (mass) of the total mixture. For substitution or use, 1.0% of ARS is considered equal to 5.0% RAP. The percentages of recycled materials shall be as specified on the JMF.

Recycled materials may be used in all mixtures except type C and type D surface mixtures. The combined aggregate properties of a mixture with recycled materials shall be determined in accordance with ITM 584 and shall be in accordance with 904. Gradations of the combined aggregates shall be in accordance with 402.03. Aggregates and Asphalt Cement. The blend of aggregates used in the recycled mix shall meet the requirements of paragraph AGGREGATES. The percentage of asphalt in the RAP shall be established for the mixture design according to ASTM D 2172 using the appropriate dust correction procedure.

PART 3 EXECUTION

3.1 PREPARATION OF ASPHALT BINDER MATERIAL

The asphalt cement material shall be heated avoiding local overheating and providing a continuous supply of the asphalt material to the mixer at a uniform temperature

3.2 PREPARATION OF HOT-MIX ASPHALT MIXTURE

The aggregates and the asphalt cement shall be weighed or metered and introduced into the mixer in the amount specified by the JMF. Mix the combined materials until the aggregate obtains a uniform coating of asphalt binder and is thoroughly distributed throughout the mixture. Wet mixing time shall be the shortest time that will produce a satisfactory mixture, but no less than 25 seconds for batch plants. Establish the wet mixing time for all plants based on the procedure for determining the percentage of coated particles described in [ASTM D2489/D2489M](#), for each individual plant and for each type of aggregate used. The wet mixing time will be set to at least achieve 95 percent of coated particles. The moisture content of all hot-mix asphalt upon discharge from the plant shall not exceed 0.5 percent by total weight of mixture as measured by [ASTM D1461](#).

3.2.1 Acceptance of Mixtures

Acceptance of mixtures will be in accordance with the INDOT Frequency Manual on the basis of a type D certification in accordance with INDOT 916. The test results shown on the certification shall be the quality control

tests representing the material supplied and include air voids and binder content. Air voids tolerance shall be $\pm 1.5\%$ and binder content tolerance shall be $\pm 0.7\%$ from DMF or JMF. Single test values and averages will be reported to the nearest 0.1%. Rounding will be in accordance with INDOT 109.01(a). Test results exceeding the tolerance limits will be considered as a failed material and adjudicated in accordance with 105.03.

3.3 PREPARATION OF THE UNDERLYING SURFACE

Immediately before placing the hot mix asphalt, the underlying course shall be cleaned of dust and debris. tack coat shall be applied in accordance with the contract specifications. Equipment for HMA operations shall be in accordance with INDOT SEC 409. Segregation, flushing or bleeding of HMA mixtures will not be permitted. Corrective action shall be taken to prevent continuation of these conditions. Areas of segregation, flushing or bleeding shall be corrected, if directed. All areas showing an excess or deficiency of asphalt materials shall be removed and replaced. All mixtures that become loose and broken, mixed with dirt, or is in any way defective shall be removed and replaced. The subgrade shall be shaped to the required grade and sections, free from all ruts, corrugations, or other irregularities, and uniformly compacted and approved in accordance with INDOT 207. Milling of an existing surface shall be in accordance with INDOT 306. Surfaces on which a mixture is placed shall be free from objectionable or foreign materials at the time of placement.

3.4 TESTING LABORATORY

Use a laboratory to develop the JMF that meets the requirements of [ASTM D3666](#). The Government will inspect the laboratory equipment and test procedures prior to the start of hot mix operations for conformance to [ASTM D3666](#). The laboratory shall maintain the Corps certification for the duration of the project. A statement signed by the manager of the laboratory stating that it meets these requirements or clearly listing all deficiencies shall be submitted to the Contracting Officer prior to the start of construction. The statement shall contain as a minimum:

- a. Qualifications of personnel; laboratory manager, supervising technician, and testing technicians.
- b. A listing of equipment to be used in developing the job mix.
- c. A copy of the laboratory's quality control system.
- d. Evidence of participation in the AASHTO Materials Reference Laboratory (AMRL) program.

3.5 TRANSPORTING AND PLACING

3.5.1 Transporting

The hot-mix asphalt shall be transported from the mixing plant to the site in clean, tight vehicles. Deliveries shall be scheduled so that placing and compacting of mixture is uniform with minimum stopping and starting of the paver. Adequate artificial lighting shall be provided for night placements. Hauling over freshly placed material will not be permitted until the material has been compacted as specified, and allowed to cool to 140 degrees F. To deliver mix to the paver, the Contractor shall use a material transfer vehicle, which shall be operated to produce continuous forward motion of the paver.

3.5.2 Placing

The mixture shall be placed upon an approved surface by means of laydown equipment in accordance with INDOT 409.03(c). Prior to paving, both the planned quantity and lay rate shall be adjusted by multiplying by the MAF. When mixture is produced from more than one DMF or JMF for a given pay item, the MAF will be applied to the applicable portion of the mixture for each. Mixtures in areas inaccessible to laydown equipment or mechanical devices may be placed by other methods. The temperature of each mixture at the time of spreading shall not be more than 18°F below the minimum mixing temperature as shown on the DMF or JMF. Planned HMA courses greater than 165 lb/syd placed under traffic shall be brought up even with each adjacent lane at the end of each workday. Planned HMA courses less than or equal to 165 lb/syd shall be brought forward concurrently, within practical limits, limiting the work in one lane to not more than one work day of production before moving back to bring forward the adjacent lane. Traffic shall not be allowed on open graded mixtures. Hydraulic extensions on the paver will not be permitted for continuous paving operations. Fixed extensions or extendable screeds shall be used on courses greater than the nominal width of the paver except in areas where the paving widths vary. Hydraulic extensions may be used on approaches, tapers, and added lanes less than 250 ft in length. The speed of the paver shall not exceed 50 ft (15 m) per min when spreading mixtures. Automatic slope and grade controls shall be required except when placing mixtures on roadway approaches, which are less than 200 ft. in length, or on miscellaneous work. The use of automatic controls on other courses where use is impractical due to project conditions may be waived. The finished thickness of each course shall be at least two times but not more than four times the maximum particle size as shown on the DMF or JMF. The finished thickness of wedge and level mixtures shall be at least 1.5 times but not more than six times the maximum particle size as shown on the DMF or JMF. Feathering may be less than the minimum thickness requirements. The mix shall be placed and compacted at a temperature suitable for obtaining density, surface smoothness, and other specified requirements. Upon arrival, the mixture shall be placed to the full width by an asphalt paver; it shall be struck off in a uniform layer of such depth that, when the work is completed, it shall have the required thickness and conform to the grade and contour indicated. Unless otherwise permitted, placement of the mixture shall begin along the centerline of a crowned section or on the high side of areas with a one-way slope. The mixture shall be placed in consecutive adjacent strips having a minimum width of 10 feet. The longitudinal joint in one course shall offset the longitudinal joint in the course immediately below by at least 1 foot; however, the joint in the surface course shall be at the centerline of the pavement. Transverse joints in one course shall be offset by at least 10 feet from transverse joints in the previous course. Transverse joints in adjacent lanes shall be offset a minimum of 10 feet. On isolated areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the mixture may be spread and luted by hand tools.

3.6 COMPACTION OF MIXTURE

The HMA mixture shall be compacted with equipment in accordance with INDOT 409.03(d) immediately after the mixture has been spread and finished. Rollers shall not cause undue displacement, cracking, or shoving. A roller application is defined as one pass of the roller over the entire mat. Compaction operations shall be completed in accordance with one of the following options.

| Rollers | Number of Roller Applications | | | | | |
|------------------|-------------------------------|----------|----------|----------|---------------------|----------|
| | Courses < 440 lb/syd | | | | Courses > 440lb/syd | |
| | Option 1 | Option 2 | Option 3 | Option 4 | Option 1 | Option 2 |
| Three Wheel | 2 | | 4 | | 4 | |
| Pneumatic Tire | 2 | 4 | | | 4 | |
| Tandem | 2 | 2 | 2 | | 4 | |
| Vibratory Roller | | | | 6 | | 8 |

A reduced number of applications on a course may be approved if detrimental results are being observed. Compaction equipment shall be operated with the drive roll or wheels nearest the paver and at speeds not to exceed 3 mph. However, vibratory rollers will be limited to 2.5 mph. Rolling shall be continued until applications are completed and all roller marks are eliminated. Compaction operations shall begin at the low side and proceed to the high side of the mat. The heaviest roller wheel shall overlap its previous pass by a minimum of 6 in. Longitudinal joints shall be compacted in accordance with the following:

(a) For confined edges, the first pass adjacent to the confined edge, the compaction equipment shall be entirely on the hot mat 6 in. from the confined edge.

(b) For unconfined edges, the compaction equipment shall extend 6 in. beyond the edge of the hot mat.

All displacement of the HMA mixture shall be corrected at once by the use of lutes and/or the addition of fresh mixture as required. The line and grade of the edges of the HMA mixture shall not be displaced during rolling. The wheels shall be kept properly moistened with water or water with detergent to prevent adhesion of the materials to the wheels. Areas inaccessible to rollers shall be compacted thoroughly with hand tampers or other mechanical devices in accordance with INDOT 409.03(d)6 to achieve the required compaction. A trench roller, in accordance with 409.03(d) 5, may be used to obtain compaction in depressed areas. The final two roller applications shall be completed at the highest temperature where the mixture does not exhibit any tenderness. Vehicular traffic will not be permitted on a course until the mixture has cooled sufficiently to prevent distortions.

3.7 JOINTS

The formation of joints shall be performed ensuring a continuous bond between the courses and to obtain the required density. All joints shall have the same texture as other sections of the course and meet the requirements for smoothness and grade.

3.7.1 Transverse Joints

Do not pass the roller over the unprotected end of the freshly laid mixture, except when necessary to form a transverse joint. When necessary to form a transverse joint, it shall be made by means of placing a bulkhead or by tapering the course. The tapered edge shall be cut back to its full depth and width on a straight line to expose a vertical face prior to

placing material at the joint. Remove the cutback material from the project. In both methods, all contact surfaces shall be given a light tack coat of asphalt material before placing any fresh mixture against the joint.

3.7.2 Longitudinal Joints

Longitudinal joints which are irregular, damaged, uncompacted, cold (less than 175 degrees F at the time of placing adjacent lanes), or otherwise defective, shall be cut back a maximum of 3 inches from the top of the course with a cutting wheel to expose a clean, sound vertical surface for the full depth of the course. All cutback material shall be removed from the project. All contact surfaces shall be given a light tack coat of asphalt material prior to placing any fresh mixture against the joint. The Contractor will be allowed to use an alternate method if it can be demonstrated that density, smoothness, and texture can be met.

3.8 QUALITY CONTROL

3.8.1 General Quality Control Requirements

The HMA shall be supplied from a certified HMA plant in accordance with ITM 583; Certified Volumetric Hot Mix Asphalt Producer Program. The HMA shall be transported and placed according to a Quality Control Plan, QCP, prepared and submitted by the Contractor in accordance with ITM 803; Contractor Quality Control Plans for Hot Mix Asphalt Pavements. The QCP shall be submitted to the OICC at least 15 days prior to commencing HMA paving operations. The Contractor shall develop an approved Quality Control Plan. Hot-mix asphalt for payment shall not be produced until the quality control plan has been approved. The plan shall address all elements, which affect the quality of the pavement including, but not limited to:

- a. Mix Design
- b. Aggregate Grading
- c. Quality of Materials
- d. Stockpile Management
- e. Proportioning
- f. Mixing and Transportation
- g. Mixture Volumetrics
- h. Moisture Content of Mixtures
- i. Placing and Finishing
- j. Joints
- k. Compaction
- l. Surface Smoothness

3.8.2 Testing Laboratory

Provide a fully equipped asphalt laboratory located at the plant or job site and meeting the pertinent requirements in ASTM D3666. Laboratory

facilities shall be kept clean and all equipment maintained in proper working condition. The Contracting Officer shall be permitted unrestricted access to inspect the Contractor's laboratory facility, to witness quality control activities, and to perform any check testing desired. The Contracting Officer will advise the Contractor in writing of any noted deficiencies concerning the laboratory facility, equipment, supplies, or testing personnel and procedures. When the deficiencies are serious enough to adversely affect test results, the incorporation of the materials into the work shall be suspended immediately and will not be permitted to resume until the deficiencies are corrected.

3.8.3 Quality Control Testing

The Contractor shall perform all quality control tests applicable to these specifications and as set forth in the Quality Control Program. The testing program shall include, but shall not be limited to, tests for the control of asphalt content, aggregate gradation, temperatures, aggregate moisture, moisture in the asphalt mixture, laboratory air voids, stability, flow, in-place density, grade and smoothness. A Quality Control Testing Plan shall be developed as part of the Quality Control Program.

3.8.3.1 Asphalt Content

A minimum of two tests to determine asphalt content will be performed per lot (a lot is defined in paragraph MATERIAL ACCEPTANCE AND PERCENT PAYMENT) by one of the following methods: the extraction method in accordance with [ASTM D2172](#), Method A or B, the ignition method in accordance with the [AASHTO TP53](#) or [ASTM D6307](#), or the nuclear method in accordance with [ASTM D4125](#), provided the nuclear gauge is calibrated for the specific mix being used. For the extraction method, the weight of ash, as described in [ASTM D2172](#), shall be determined as part of the first extraction test performed at the beginning of plant production; and as part of every tenth extraction test performed thereafter, for the duration of plant production. The last weight of ash value obtained shall be used in the calculation of the asphalt content for the mixture.

3.8.3.2 Gradation

Determine aggregate gradations a minimum of twice per lot from mechanical analysis of recovered aggregate in accordance with [ASTM D5444](#). When asphalt content is determined by the ignition oven or nuclear method, aggregate gradation shall be determined from hot bin samples on batch plants, or from the cold feed on drum mix plants. For batch plants, test aggregates in accordance with [ASTM C136](#) using actual batch weights to determine the combined aggregate gradation of the mixture.

3.8.3.3 In-Place Density

Conduct any necessary testing to ensure the specified density is achieved. A nuclear gauge may be used to monitor pavement density in accordance with [ASTM D2950/D2950M](#).

3.8.3.4 Grade and Smoothness

Conduct the necessary checks to ensure the grade and smoothness requirements are met in accordance with paragraphs MATERIAL ACCEPTANCE and PERCENT PAYMENT.

3.8.3.5 QC Monitoring

Submit all QC test results to the Contracting Officer on a daily basis as the tests are performed. The Contracting Officer reserves the right to monitor any of the Contractor's quality control testing and to perform duplicate testing as a check to the Contractor's quality control testing.

3.8.4 Sampling

When directed by the Contracting Officer, sample and test any material which appears inconsistent with similar material being produced, unless such material is voluntarily removed and replaced or deficiencies corrected by the Contractor. All sampling shall be in accordance with standard procedures specified.

3.9 FINAL GRADE

The final wearing surface of pavement shall conform to the elevations and cross sections shown and shall vary not more than 0.05 foot from the plan grade established and approved at site of work. Finished surfaces at juncture with other pavements shall coincide with finished surfaces of abutting pavements. Deviation from the plan elevation will not be permitted in areas of pavements where closer conformance with planned elevation is required for the proper functioning of drainage and other appurtenant structures involved. The final wearing surface of the pavement will be tested for conformance with specified plan grade requirements. The grade will be determined by running lines of levels at intervals of 25 feet, or less, longitudinally and transversely, to determine the elevation of the completed pavement surface. Within 5 working days, after the completion of a particular lot incorporating the final wearing surface, the Contracting Officer will inform the Contractor in writing, of the results of the grade-conformance tests. When more than 5 percent of all measurements made within a lot are outside the 0.05-foot tolerance, the pay factor based on grade for that lot will be 95 percent. In areas where the grade exceeds the tolerance by more than 50 percent, the Contractor shall remove the surface lift full depth; the Contractor shall then replace the lift with hot-mix asphalt to meet specification requirements, at no additional cost to the Government. Diamond grinding may be used to remove high spots to meet grade requirements. Skin patching for correcting low areas or planing or milling for correcting high areas will not be permitted.

3.9.1 Surface Smoothness

The Contractor shall use one of the following methods to test and evaluate surface smoothness of the pavement. All testing shall be performed in the presence of the Contracting Officer. Detailed notes of the results of the testing shall be kept and a copy furnished to the Government immediately after each day's testing. The profilograph method shall be used for all longitudinal and transverse testing, except where the runs would be less than 200 feet in length and the ends where the straightedge shall be used. Where drawings show required deviations from a plane surface (crowns, drainage inlets, etc.), the surface shall be finished to meet the approval of the Contracting Officer.

3.9.1.1 Smoothness Requirements

3.9.1.1.1 Straightedge Testing

The finished surfaces of the pavements shall have no abrupt change of 1/4

inch or more, and all pavements shall be within the tolerances of 1/4 inch in both the longitudinal and transverse directions, when tested with an approved 12 feet straightedge.

3.9.1.1.2 Profilograph Testing

The finished surfaces of the pavements shall have no abrupt change of 1/8 inch or more, and each 0.1 mile segment of each pavement lot shall have a Profile Index not greater than 9 inches/mile when tested with an approved California-type profilograph. If the extent of the pavement in either direction is less than 200 feet, that direction shall be tested by the straightedge method and shall meet requirements specified above.

3.9.1.2 Testing Method

After the final rolling, but not later than 24 hours after placement, test the surface of the pavement in each entire lot in such a manner as to reveal all surface irregularities exceeding the tolerances specified above. Separate testing of individual sublots is not required. If any pavement areas are ground, these areas shall be retested immediately after grinding. Test each lot of the pavement in both a longitudinal and a transverse direction on parallel lines. Set the transverse lines 15 feet or less apart, as directed. The longitudinal lines shall be at the centerline of each paving lane for lanes less than 20 feet wide and at the third points for lanes 20 feet or wider. Also test other areas having obvious deviations. Longitudinal testing lines shall be continuous across all joints.

3.9.1.2.1 Straightedge Testing

Hold the straightedge in contact with the surface and move it ahead one-half the length of the straightedge for each successive measurement. Determine the amount of surface irregularity by placing the freestanding (unleveled) straightedge on the pavement surface and allowing it to rest upon the two highest spots covered by its length, and measuring the maximum gap between the straightedge and the pavement surface in the area between these two high points.

3.9.1.2.2 Profilograph Testing

Perform profilograph testing using approved equipment and procedures described in CTM 526. The equipment shall utilize electronic recording and automatic computerized reduction of data to indicate "must-grind" bumps and the Profile Index for each 0.1 mile segment of each pavement lot. Grade breaks on parking lots shall be accommodated by breaking the profile segment into shorter sections and repositioning the blanking band on each segment. The "blanking band" shall be 0.2 inches wide and the "bump template" shall span 1 inch with an offset of 0.3 inch. Compute the Profile Index for each pass of the profilograph in each 0.1 mile segment. The Profile Index for each segment shall be the average of the Profile Indices for each pass in each segment. The profilograph shall be operated by a DOT approved operator. Furnish a copy of the reduced tapes to the Government at the end of each day's testing.

-- End of Section --

SECTION 32 92 19

SEEDING AND SODDING

10/06

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 C 602 | (2007) Agricultural Liming Materials |
| ASTM D 4427 | (2007) Peat Samples by Laboratory Testing |
| ASTM D 4972 | (2001; R 2007) pH of Soils |

U.S. DEPARTMENT OF AGRICULTURE (USDA)

| | |
|--------------|--|
| AMS Seed Act | (1940; R 1988; R 1998) Federal Seed Act |
| DOA SSIR 42 | (1996) Soil Survey Investigation Report No. 42, Soil Survey Laboratory Methods Manual, Version 3.0 |

TURFGRASS PRODUCERS INTERNATIONAL (TPI)

| | |
|---------|--|
| TPI GSS | (1995) Guideline Specifications to Turfgrass Sodding |
|---------|--|

1.2 DEFINITIONS

1.2.1 Stand of Turf

95 percent ground cover of the established species.

1.3 RELATED REQUIREMENTS

Section 31 00 00 EARTHWORK, applies to this section for pesticide use and plant establishment requirements, with additions and modifications herein.

1.4 SUBMITTALS

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

SD-03 Product Data

Wood cellulose fiber mulch

Fertilizer

Include physical characteristics, and recommendations.

SD-06 Test Reports

Topsoil composition tests (reports and recommendations).

SD-07 Certificates

State certification and approval for seed

SD-08 Manufacturer's Instructions

Erosion Control Materials

1.5 DELIVERY, STORAGE, AND HANDLING

1.5.1 Delivery

1.5.1.1 Seed Protection

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

1.5.1.2 Fertilizer and Lime Delivery

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

1.5.2 Storage

1.5.2.1 Fertilizer and Lime Storage

Store in cool, dry locations away from contaminants.

1.5.2.2 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.

1.5.2.3 Handling

Do not drop or dump materials from vehicles.

1.6 TIME RESTRICTIONS AND PLANTING CONDITIONS

1.6.1 Restrictions

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

1.7 TIME LIMITATIONS

1.7.1 Seed

Apply seed within twenty four hours after seed bed preparation.

PART 2 PRODUCTS

2.1 SEED

2.1.1 Classification

Provide State-approved seed of the latest season's crop delivered in original sealed packages, bearing producer's guaranteed analysis for percentages of mixtures, purity, germination, weedseed content, and inert material. Label in conformance with **AMS Seed Act** and applicable state seed laws. Wet, moldy, or otherwise damaged seed will be rejected. Field mixes will be acceptable when field mix is performed on site in the presence of the Contracting Officer.

2.1.2 Planting Dates

| <u>Planting Season</u> | <u>Planting Dates</u> |
|------------------------|--------------------------|
| Spring/Summer | April 1st to October 1st |
| Fall/Winter | October 1st to April 1st |

2.1.3 Seed Purity

| Common Name | Min. | Max. Percent | |
|---------------------|-------------------|---------------------------|-------------------|
| | Percent Pure Seed | Germination and Hard Seed | Percent Weed Seed |
| Kentucky Bluegras | 80 | 85 | .5 |
| KY 31 Fescue | 98 | 85 | .75 |
| Perennial Rye Grass | 95 | 90 | .5 |

total mixture shall be applied at no less than 150 Lbs/acre.

2.1.4 Seed Mixture by Weight

| <u>Planting Season</u> | <u>Variety</u> | <u>Percent (by Weight)</u> |
|------------------------|---------------------|----------------------------|
| Spring/Summer | Kentucky Bluegrass | 50 |
| | Ky 31 Fescue | 30 |
| | Perennial Rye Grass | 20 |
| Fall/Winter | Kentucky Bluegrass | 30 |
| | KY 31 Fescue | 40 |
| | Perennial Rye Grass | 30 |

Proportion seed mixtures by weight.

2.2 SOD

If called for in the individual Task Orders, lay sod from May to June for warm season spring planting and from September to November for cool season fall planting.

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

support its own weight when lifted by the ends. Broken pads, irregularly shaped pieces, and torn or uneven ends will be rejected. After sod has been harvested and prior to delivery to the site, each piece shall be processed using a high pressure water washing leaving no soil or substrate attached to the roots. Wood pegs and wire staples for anchorage shall be as recommended by sod supplier.

2.2.1 Composition

| Common Name | Percent |
|---------------------|---------|
| Kentucky Bluegras | 50 |
| KY 31 Fescue | 30 |
| Perennial Rye Grass | 20 |

2.3 TOPSOIL

2.3.1 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 00 00 EARTHWORK.

2.3.2 Off-Site Topsoil

Conform to requirements specified in paragraph entitled "Composition." Additional topsoil shall be furnished as directed in the individual Task Orders. Topsoil shall be a neutral, friable soil representative of productive soils in the vicinity. If borrow areas are not indicated, topsoil shall be furnished by the Contractor.

2.3.3 Composition

Containing from 5 to 8 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. Other components shall conform to the following limits:

| | |
|---------------|-----------------|
| Silt | 25-50 percent |
| Clay | 10-30 percent |
| Sand | 20-35 percent |
| pH | 6.2 to 7.4 |
| Soluble Salts | 600 ppm maximum |

2.4 SOIL CONDITIONERS

Add conditioners to topsoil as required to bring into compliance with "composition" standard for topsoil as specified herein.

2.4.1 Lime

Commercial grade hydrate or burnt limestone containing a calcium carbonate equivalent (C.C.E.) as specified in [ASTM C 602](#) of not less than 140% for

hydrated lime and 110% for hydrated lime.

Provide teh following ASTM E11 gradation: minimum 86% passing a #20 sieve and 28% passing a # 100 sieve.

2.4.2 Aluminum Sulfate

Commercial grade.

2.4.3 Sulfur

100 percent elemental

2.4.4 Iron

100 percent elemental

2.4.5 Peat

Natural product of peat moss derived from a freshwater site and conforming to ASTM D 4427. Shred and granulate peat to pass a 1/2 inch mesh screen and condition in storage pile for minimum 6 months after excavation.

2.4.6 Sand

Clean and free of materials harmful to plants.

2.4.7 Perlite

Horticultural grade.

2.4.8 Composted Derivatives

Ground bark, nitrolized sawdust, humus or other green wood waste material free of stones, sticks, and soil stabilized with nitrogen and having the following properties:

2.4.8.1 Particle Size

Minimum percent by weight passing:

| | |
|-------------------|----|
| No. 4 mesh screen | 95 |
| No. 8 mesh screen | 80 |

2.4.8.2 Nitrogen Content

Minimum percent based on dry weight:

| | |
|------------------|-----|
| Fir Sawdust | 0.7 |
| Fir or Pine Bark | 1.0 |

2.4.9 Gypsum

Coarsely ground gypsum comprised of calcium sulfate dihydrate 61 percent, calcium 22 percent, sulfur 17 percent; minimum 96 percent passing through 20 mesh screen, 100 percent passing thru 16 mesh screen.

2.4.10 Calcined Clay

Calcined clay shall be granular particles produced from montmorillonite clay calcined to a minimum temperature of 1200 degrees F. Gradation: A minimum 90 percent shall pass a No. 8 sieve; a minimum 99 percent shall be retained on a No. 60 sieve; and a maximum 2 percent shall pass a No. 100 sieve. Bulk density: A maximum 40 pounds per cubic foot.

2.5 FERTILIZER

2.5.1 Granular Fertilizer

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

- 12 percent available nitrogen
- 12 percent available phosphorus
- 12 percent available potassium

2.5.2 Hydroseeding Fertilizer

Controlled release fertilizer, to use with hydroseeding and composed of pills coated with plastic resin to provide a continuous release of nutrients for at least 6 months and containing the following minimum percentages, by weight, of plant food nutrients.

- 12 percent available nitrogen
- 12 percent available phosphorus
- 12 percent available potassium

2.6 MULCH

Mulch shall be free from noxious weeds, mold, and other deleterious materials.

2.6.1 Straw

Stalks from oats, wheat, rye, barley, or rice. Furnish in air-dry condition and of proper consistency for placing with commercial mulch blowing equipment. Straw shall contain no fertile seed.

2.6.2 Hay

Air-dry condition and of proper consistency for placing with commercial mulch blowing equipment. Hay shall be sterile, containing no fertile seed.

2.6.3 Wood Cellulose Fiber Mulch

Use recovered materials of either paper-based (100 percent) or wood-based (100 percent) hydraulic mulch. Processed to contain no growth or germination-inhibiting factors and dyed an appropriate color to facilitate visual metering of materials application. Composition on air-dry weight basis: 9 to 15 percent moisture, pH range from 5.5 to 8.2 . Use with hydraulic application of grass seed and fertilizer.

2.7 WATER

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

2.8 EROSION CONTROL MATERIALS

Erosion control material shall conform to the following:

2.8.1 Erosion Control Net

Net shall be heavy, twisted jute mesh, weighing approximately 1.22 pounds per linear yard and 4 feet wide with mesh openings of approximately 1 inch square.

2.8.2 Erosion Control Material Anchors

Erosion control anchors shall be as recommended by the manufacturer.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 EXTENT OF WORK

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

3.1.1.1 Topsoil

Remove existing topsoil to a minimum depth of 4" and stockpile. Provide additional topsoil as directed in the individual Task Orders to meet indicated finish grade. After areas have been brought to indicated finish grade, till by disking, harrowing, tilling or other method approved by the Contracting Officer. Remove debris and stones larger than 1 inch in any dimension remaining on the surface after finish grading.

Do not spread topsoil when frozen or ground is excessively dry, or as directed by the Contracting Officer

Correct irregularities in finish surfaces to eliminate depressions. Protect finished topsoil areas from damage by vehicular or pedestrian traffic.

3.1.1.2 Soil Conditioner Application Rates

Apply soil conditioners at rates as determined by laboratory soil analysis of the soils at the job site. For bidding purposes only apply at rates for the following:

Lime: 600 pounds per acre.

3.1.1.3 Fertilizer Application Rates

Apply fertilizer at rates as determined by laboratory soil analysis of the soils at the job site. For bidding purposes only apply at rates for the following:

Fertilizer: 600 pounds per acre.

3.2 SEEDING

3.2.1 Seed Application Seasons and Conditions

Immediately before seeding, restore soil to proper grade and thoroughly moisten to depth of 2 inches. Do not seed when ground is muddy, frozen, or snow covered or in an unsatisfactory condition for seeding. If special conditions exist that may warrant a variance in the above seeding dates or conditions, submit a written request to the Contracting Officer stating the special conditions and proposed variance. Apply seed within twenty four hours after seedbed preparation. Sow seed by approved sowing equipment. Sow one-half the seed in one direction, and sow remainder at right angles to the first sowing.

3.2.2 Seed Application Method

Seeding method shall be broadcasted, drop, drill, or hydro seeding.

3.2.2.1 Broadcast and Drop Seeding

Sow one-half the seed in one direction, and sow remainder at right angles to the first sowing. Cover seed uniformly to a maximum depth of $1/4$ inch in clay soils and $1/2$ inch in sandy soils by means of spike-tooth harrow, cultipacker, raking or other approved devices.

3.2.2.2 Drill Seeding

Use cultipacker seeders. Drill seed uniformly to average depth of $1/2$ inch.

3.2.2.3 Hydroseeding

First, mix water and fiber. Wood cellulose fiber, paper fiber, or recycled paper shall be applied as part of the hydroseeding operation. Fiber shall be added at 1,000 pounds, dry weight, per acre. Then add and mix seed and fertilizer to produce a homogeneous slurry. When hydraulically sprayed on the ground, material shall form a blotter like cover impregnated uniformly with grass seed. Spread with one application with no second application of mulch.

3.2.3 Mulching

3.2.3.1 Hay or Straw Mulch

Hay or straw mulch shall be spread uniformly at the rate of 2 tons per acre. Mulch shall be spread by hand, blower-type mulch spreader, or other approved method. Mulching shall be started on the windward side of relatively flat areas or on the upper part of steep slopes, and continued uniformly until the area is covered. The mulch shall not be bunched or clumped. Sunlight shall not be completely excluded from penetrating to the ground surface. All areas installed with seed shall be mulched on the same day as the seeding. Mulch shall be anchored immediately following spreading.

3.2.3.2 Mechanical Anchor

Mechanical anchor shall be a V-type-wheel land packer; a scalloped-disk land packer designed to force mulch into the soil surface; or other suitable equipment.

3.2.4 Rolling

Immediately after seeding, firm entire area except for slopes in excess of 3 to 1 with a roller not exceeding 90 pounds for each foot of roller width. If seeding is performed with cultipacker-type seeder or by hydroseeding, rolling may be eliminated.

3.2.5 Erosion Control Material

Install in accordance with manufacturer's instructions, where indicated or as directed by the Contracting Officer.

3.2.6 Watering

Start watering areas seeded as required by temperature and wind conditions. Apply water at a rate sufficient to insure thorough wetting of soil to a depth of 2 inches without run off. During the germination process, seed is to be kept actively growing and not allowed to dry out.

3.3 SODDING

3.3.1 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 00 00 EARTHWORK.

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.

3.3.2 Placing

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

3.3.3 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. Anchor each piece of sod with wood pegs or wire staples maximum 2 feet on center. On slope areas, start sodding at bottom of the slope.

3.3.4 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 missing corners shall be patched with sod.

3.3.5 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.

3.3.6 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.

3.4 PROTECTION OF TURF AREAS

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

3.5 RESTORATION

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

-- End of Section --

SECTION 33 11 00

WATER DISTRIBUTION

02/11

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
(AASHTO)

AASHTO HB-17 (2002; Errata 2003; Errata 2005, 17th Edition) Standard Specifications for Highway Bridges

AMERICAN RAILWAY ENGINEERING AND MAINTENANCE-OF-WAY ASSOCIATION
(AREMA)

AREMA Eng Man (2012) Manual for Railway Engineering

AMERICAN WATER WORKS ASSOCIATION (AWWA)

AWWA B300 (2010; Addenda 2011) Hypochlorites

AWWA B301 (2010) Liquid Chlorine

AWWA C104/A21.4 (2013) Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water

AWWA C105/A21.5 (2010) Polyethylene Encasement for Ductile-Iron Pipe Systems

AWWA C110/A21.10 (2012) Ductile-Iron and Gray-Iron Fittings for Water

AWWA C111/A21.11 (2012) Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings

AWWA C115/A21.15 (2011) Flanged Ductile-Iron Pipe With Ductile-Iron or Gray-Iron Threaded Flanges

AWWA C151/A21.51 (2009) Ductile-Iron Pipe, Centrifugally Cast, for Water

AWWA C153/A21.53 (2011) Ductile-Iron Compact Fittings for Water Service

AWWA C500 (2009) Metal-Seated Gate Valves for Water Supply Service

AWWA C502 (2014) Dry-Barrel Fire Hydrants

AWWA C504 (2010) Standard for Rubber-Seated

Butterfly Valves

- AWWA C508 (2009; Addenda A 2011) Swing-Check Valves for Waterworks Service, 2 In. (50 mm) Through 24 In. (600 mm) NPS
- AWWA C509 (2009) Resilient-Seated Gate Valves for Water Supply Service
- AWWA C515 (2009) Reduced-Wall, Resilient-Seated Gate Valves for Water Supply Service
- AWWA C600 (2010) Installation of Ductile-Iron Water Mains and Their Appurtenances
- AWWA C605 (2013) Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water
- AWWA C651 (2014) Standard for Disinfecting Water Mains
- AWWA C700 (2009) Standard for Cold Water Meters - Displacement Type, Bronze Main Case
- AWWA C701 (2012) Standard for Cold-Water Meters - Turbine Type for Customer Service
- AWWA C706 (2010) Direct-Reading, Remote-Registration Systems for Cold-Water Meters
- AWWA C707 (2010) Encoder-Type Remote-Registration Systems for Cold-Water Meters
- AWWA C800 (2014) Underground Service Line Valves and Fittings
- AWWA C900 (2007; Errata 2008) Polyvinyl Chloride (PVC) Pressure Pipe, and Fabricated Fittings, 4 In. Through 12 In. (100 mm Through 300 mm), for Water Distribution
- AWWA C901 (2008) Polyethylene (PE) Pressure Pipe and Tubing, 1/2 In. (13mm) Through 3 In. (76 mm), for Water Service
- AWWA C905 (2010; Errata 2012; Errata 2013) Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings 14 In. Through 48 In. (350 mm through 1,200 mm) for Water Transmission and Distribution
- AWWA C906 (2007) Polyethylene (PE) Pressure Pipe and Fittings, 4 In. (100 mm) through 63 In., (1,575 mm) for Water Distribution and Transmission
- AWWA M23 (2002; 2nd Ed) Manual: PVC Pipe - Design and Installation

ASME INTERNATIONAL (ASME)

| | |
|-----------------|--|
| ASME B16.1 | (2010) Gray Iron Pipe Flanges and Flanged Fittings Classes 25, 125, and 250 |
| ASME B16.15 | (2013) Cast Copper Alloy Threaded Fittings Classes 125 and 250 |
| ASME B16.18 | (2012) Cast Copper Alloy Solder Joint Pressure Fittings |
| ASME B16.22 | (2013) Standard for Wrought Copper and Copper Alloy Solder Joint Pressure Fittings |
| ASME B16.26 | (2013) Standard for Cast Copper Alloy Fittings for Flared Copper Tubes |
| ASME B18.2.2 | (2010) Nuts for General Applications: Machine Screw Nuts, Hex, Square, Hex Flange, and Coupling Nuts (Inch Series) |
| ASME B18.5.2.1M | (2006; R 2011) Metric Round Head Short Square Neck Bolts |
| ASME B18.5.2.2M | (1982; R 2010) Metric Round Head Square Neck Bolts |

ASTM INTERNATIONAL (ASTM)

| | |
|---------------|---|
| ASTM A307 | (2014) Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength |
| ASTM A47/A47M | (1999; R 2014) Standard Specification for Ferritic Malleable Iron Castings |
| ASTM A536 | (1984; R 2014) Standard Specification for Ductile Iron Castings |
| ASTM A563 | (2007a; R2014) Standard Specification for Carbon and Alloy Steel Nuts |
| ASTM A746 | (2009; R 2014) Standard Specification for Ductile Iron Gravity Sewer Pipe |
| ASTM B32 | (2008; R 2014) Standard Specification for Solder Metal |
| ASTM B42 | (2010) Standard Specification for Seamless Copper Pipe, Standard Sizes |
| ASTM B61 | (2008; R 2013) Standard Specification for Steam or Valve Bronze Castings |
| ASTM B62 | (2009) Standard Specification for Composition Bronze or Ounce Metal Castings |
| ASTM B88 | (2014) Standard Specification for Seamless |

Copper Water Tube

| | |
|--|---|
| ASTM C94/C94M | (2014b) Standard Specification for Ready-Mixed Concrete |
| ASTM D1785 | (2012) Standard Specification for Poly(Vinyl Chloride) (PVC), Plastic Pipe, Schedules 40, 80, and 120 |
| ASTM D2241 | (2009) Standard Specification for Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series) |
| ASTM D2464 | (2013) Standard Specification for Threaded Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80 |
| ASTM D2466 | (2013) Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40 |
| ASTM D2467 | (2013a) Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80 |
| ASTM D2564 | (2012) Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems |
| ASTM D2657 | (2007) Heat Fusion Joining Polyolefin Pipe and Fittings |
| ASTM D2774 | (2012) Underground Installation of Thermoplastic Pressure Piping |
| ASTM D2855 | (1996; R 2010) Standard Practice for Making Solvent-Cemented Joints with Poly(Vinyl Chloride) (PVC) Pipe and Fittings |
| ASTM D3139 | (1998; R 2011) Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals |
| ASTM F402 | (2005; R 2012) Safe Handling of Solvent Cements, Primers, and Cleaners Used for Joining Thermoplastic Pipe and Fittings |
| ASTM F477 | (2010) Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe |
| MANUFACTURERS STANDARDIZATION SOCIETY OF THE VALVE AND FITTINGS INDUSTRY (MSS) | |
| MSS SP-80 | (2013) Bronze Gate, Globe, Angle and Check Valves |

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

- NFPA 24 (2013) Standard for the Installation of Private Fire Service Mains and Their Appurtenances
- NFPA 704 (2012) Standard System for the Identification of the Hazards of Materials for Emergency Response

NATIONAL SANITATION FOUNDATION, INTERNATIONAL (NSF)

- NSF 14 (2014) Plastics Piping System Components and Related Materials s
- NSF 61 (2014) Drinking Water System Components - Health Effects
- NSF 372 (2011) Drinking Water System Components - Lead Content

UNDERWRITERS LABORATORIES (UL)

- UL 246 (2011; Reprint Feb 2013) Hydrants for Fire-Protection Service
- UL 262 (2004; Reprint Oct 2011) Gate Valves for Fire-Protection Service
- UL 312 (2010) Check Valves for Fire-Protection Service
- UL 789 (2004; Reprint Feb 2013) Standard for Indicator Posts for Fire-Protection Service

UNI-BELL PVC PIPE ASSOCIATION (UBPPA)

- UBPPA UNI-PUB-8 (2010) Tapping Guide for PVC Pressure Pipe)

1.2 DESIGN REQUIREMENTS

1.2.1 Water Distribution Mains

Provide water distribution mains as indicated in the individual Delivery Orders. In general, for 4 through 12 inch diameter pipe sizes, use AWWA C900 polyvinyl chloride (PVC) pipe unless otherwise specified. Provide AWWA C151 ductile iron pipe for pipe sizes larger than 12 inch diameter.

Also provide water main accessories, gate valves and check valves as specified and where indicated.

ENSURE THAT ALL MATERIALS INSTALLED IN POTABLE WATER DISTRIBUTION MAINS CONFORM TO THE LATEST REQUIREMENTS OF THE REDUCTION IN LEAD IN DRINKING WATER ACT AND THE SAFE DRINKING WATER ACT REQUIREMENTS. REFER TO REQUIREMENTS IN NSF 14, NSF 61 AND NSF 372 AS REQUIRED.

1.2.2 Water Service Lines

Provide water service lines indicated as in individual Delivery Orders:

Water service lines shall be copper tubing or Ductile-iron. Provide water service line appurtenances as specified and where indicated.

ENSURE THAT ALL MATERIALS INSTALLED IN POTABLE WATER SERVICE LINES CONFORM TO THE LATEST REQUIREMENTS OF THE REDUCTION IN LEAD IN DRINKING WATER ACT AND THE SAFE DRINKING WATER ACT REQUIREMENTS. REFER TO REQUIREMENTS IN NSF 14, NSF 61 AND NSF 372 AS REQUIRED.

1.3 SUBMITTALS

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

SD-02 Shop Drawings

As-Built Drawings; G

Installation As-Built Drawings, as specified.

Survey drawings and survey data, if required by the Individual Delivery Order.

SD-03 Product Data

Piping Materials; G

Valves; G

Hydrants; G

Water distribution main piping, fittings, joints, valves, and coupling

Water service line piping, fittings, joints, valves, and coupling

Indicator posts

Corporation stops

Valve boxes

Submit manufacturer's standard drawings or catalog cuts, except submit both drawings and cuts for push-on and rubber-gasketed bell-and-spigot joints. Include information concerning gaskets with submittal for joints and couplings.

SD-06 Test Reports

Bacteriological Disinfection; G.

Test results from commercial laboratory verifying disinfection

Contractor's Material and Test Certificate for Underground Piping; G

SD-07 Certificates

Water distribution main piping, fittings, joints, valves, and couplings

Water service line piping, fittings, joints, valves, and couplings

Shop-applied lining and coating

Lining

Fire hydrants

Displacement Type Meters

Turbine Type Meters

Certificates shall attest that tests set forth in each applicable referenced publication have been performed, whether specified in that publication to be mandatory or otherwise and that production control tests have been performed at the intervals or frequency specified in the publication. Other tests shall have been performed within 3 years of the date of submittal of certificates on the same type, class, grade, and size of material as is being provided for the project.

SD-08 Manufacturer's Instructions

Delivery, storage, and handling

Installation procedures for water piping

1.4 DELIVERY, STORAGE, AND HANDLING

1.4.1 Delivery and Storage

Inspect materials delivered to site for damage. Unload and store with minimum handling. Store materials on site in enclosures or under protective covering. Store plastic piping, jointing materials and rubber gaskets under cover out of direct sunlight. Do not store materials directly on the ground. Keep inside of pipes, fittings, valves and hydrants free of dirt and debris.

1.4.2 Handling

Handle pipe, fittings, valves, hydrants, and other accessories in a manner to ensure delivery to the trench in sound undamaged condition. Pipe and accessories shall be carefully lowered into the trench by means of derrick, ropes, belt slings, or other authorized equipment. Water line materials shall not be dropped or dumped into the trench. Take special care to avoid injury to coatings and linings on pipe and fittings; make repairs if coatings or linings are damaged. Do not place any other material or pipe inside a pipe or fitting after the coating has been applied. Carry, do not drag pipe to the trench. Use of pinch bars and tongs for aligning or turning pipe will be permitted only on the bare ends of the pipe. The interior of pipe and accessories shall be thoroughly cleaned of foreign matter before being lowered into the trench and shall be kept clean during laying operations by plugging or other approved method. Before installation, the pipe shall be inspected for defects. Material found to be defective before or after laying shall be replaced with sound material

without additional expense to the Government. Store rubber gaskets that are not to be installed immediately, under cover out of direct sunlight.

1.4.2.1 Polyethylene (PE) Pipe, Fittings, and Accessories

Handle PE pipe, fittings, and accessories in accordance with [AWWA C901](#).

1.4.2.2 Miscellaneous Plastic Pipe and Fittings

Handle Polyvinyl Chloride (PVC) pipe and fittings in accordance with the manufacturer's recommendations. Store plastic piping and jointing materials that are not to be installed immediately under cover out of direct sunlight.

Storage facilities shall be classified and marked in accordance with [NFPA 704](#).

PART 2 PRODUCTS

2.1 WATER DISTRIBUTION MAIN MATERIALS

ENSURE THAT ALL MATERIALS INSTALLED IN POTABLE WATER DISTRIBUTION MAINS CONFORM TO THE LATEST REQUIREMENTS OF THE REDUCTION IN LEAD IN DRINKING WATER ACT AND THE SAFE DRINKING WATER ACT REQUIREMENTS. REFER TO REQUIREMENTS IN [NSF 14](#), [NSF 61](#) AND [NSF 372](#) AS REQUIRED.

2.1.1 Piping Materials

2.1.1.1 Ductile-Iron Piping

- a. Pipe and Fittings: Pipe, except flanged pipe, [AWWA C151/A21.51](#), Pressure Class 350. Flanged pipe, [AWWA C115/A21.15](#). Fittings, [AWWA C110/A21.10](#) or [AWWA C153/A21.53](#) ; fittings with push-on joint ends conforming to the same requirements as fittings with mechanical-joint ends, except that the bell design shall be modified, as approved, for push-on joint. Fittings shall have pressure rating at least equivalent to that of the pipe. Ends of pipe and fittings shall be suitable for the specified joints. Pipe and fittings shall have cement-mortar [lining](#), [AWWA C104/A21.4](#), standard thickness.
- b. Joints and Jointing Material:
 - (1) Joints: Joints for pipe and fittings shall be push-on joints or mechanical joints unless otherwise indicated. Provide mechanical joints where indicated. Provide flanged joints where indicated. Provide mechanically coupled type joints using a sleeve-type mechanical coupling where indicated. Provide insulating joints where indicated.
 - (2) Push-On Joints: Shape of pipe ends and fitting ends, gaskets, and lubricant for joint assembly, [AWWA C111/A21.11](#).
 - (3) Mechanical Joints: Dimensional and material requirements for pipe ends, glands, bolts and nuts, and gaskets, [AWWA C111/A21.11](#).
 - (4) Flanged Joints: Bolts, nuts, and gaskets for flanged connections as recommended in the Appendix to [AWWA C115/A21.15](#). Flange for setscrewed flanges shall be of ductile iron, [ASTM A536](#), Grade 65-45-12, and conform to the applicable requirements of [ASME B16.1](#),

Class 250. Setscrews for setscrewed flanges shall be 190,000 psi tensile strength, heat treated and zinc-coated steel. Gasket and lubricants for setscrewed flanges, in accordance with applicable requirements for mechanical-joint gaskets specified in [AWWA C111/A21.11](#). Design of setscrewed gasket shall provide for confinement and compression of gasket when joint to adjoining flange is made.

- (5) Insulating Joints: Designed to effectively prevent metal-to-metal contact at the joint between adjacent sections of piping. Joint shall be of the flanged type with insulating gasket, insulating bolt sleeves, and insulating washers. Gasket shall be of the dielectric type, full face, and in other respects as recommended in the Appendix to [AWWA C115/A21.15](#). Bolts and nuts, as recommended in the Appendix to [AWWA C115/A21.15](#).
- (6) Sleeve-Type Mechanical Coupled Joints: As specified in paragraph entitled "Sleeve-Type Mechanical Couplings."

2.1.1.2 Polyvinyl Chloride (PVC) Plastic Piping

- a. Pipe and Fittings: Pipe, [AWWA C900](#), shall be plain end or gasket bell end, Pressure Class 150 (DR 18) or 200 (DR 14) with cast-iron-pipe-equivalent OD.
- b. Pipe 14 through 36 diameter: [AWWA C905](#).
- c. Fittings for PVC pipe: Fittings shall be gray iron or ductile iron, [AWWA C110/A21.10](#) or [AWWA C153/A21.53](#), and have cement-mortar lining, [AWWA C104/A21.4](#), standard thickness. Fittings with push-on joint ends shall conform to the same requirements as fittings with mechanical-joint ends, except that bell design shall be modified, as approved, for push-on joint suitable for use with PVC plastic pipe specified in this paragraph. Iron fittings and specials shall be cement-mortar lined in accordance with [AWWA C104/A21.4](#). Fittings and specials may be of the same material as the pipe with elastomeric gaskets, all in conformance with [AWWA C605](#) and [AWWA C900](#).
- d. Joints and Jointing Material: Joints for pipe shall be push-on joints, [ASTM D3139](#). Joints between pipe and metal fittings, valves, and other accessories shall be push-on joints [ASTM D3139](#), or compression-type joints/mechanical joints, [ASTM D3139](#) and [AWWA C111/A21.11](#). Provide each joint connection with an elastomeric gasket suitable for the bell or coupling with which it is to be used. Gaskets for push-on joints for pipe, [ASTM F477](#). Gaskets for push-on joints and compression-type joints/mechanical joints for joint connections between pipe and metal fittings, valves, and other accessories, [AWWA C111/A21.11](#), respectively, for push-on joints and mechanical joints. Mechanically coupled joints using a sleeve-type mechanical coupling, as specified in paragraph entitled "Sleeve-Type Mechanical Couplings," may be used as an optional jointing method in lieu of push-on joints on plain-end PVC plastic pipe, subject to the limitations specified for mechanically coupled joints using a sleeve-type mechanical coupling and to the use of internal stiffeners as specified for compression-type joints in [ASTM D3139](#).

2.1.1.3 Polyethylene (PE) Plastic Piping

Pipe, tubing, and heat-fusion fittings shall conform to [AWWA C906](#).

2.1.1.4 Piping Beneath Railroad Right-of-Way

Piping passing under the right-of-way of a commercial railroad shall conform to the specifications for pipelines conveying nonflammable substances in Chapter 1, Part 5 of the [AREMA Eng Man](#), except for casing pipe, provide ductile-iron pipe in lieu of cast-iron pipe. Ductile-iron pipe shall conform to and have strength computed in accordance with [ASTM A746](#).

2.1.2 Valves, Hydrants, and Other Water Main Accessories

ENSURE THAT ALL MATERIALS INSTALLED IN POTABLE WATER DISTRIBUTION MAINS CONFORM TO THE LATEST REQUIREMENTS OF THE REDUCTION IN LEAD IN DRINKING WATER ACT AND THE SAFE DRINKING WATER ACT REQUIREMENTS. REFER TO REQUIREMENTS IN [NSF 14](#), [NSF 61](#) AND [NSF 372](#) AS REQUIRED.

2.1.2.1 Gate Valves on Buried Piping

[AWWA C509](#) or [UL 262](#). Unless otherwise specified, valves conforming to:

- (1) [AWWA C509](#) shall be nonrising stem type with mechanical-joint ends or resilient-seated gate valves 3 to 12 inches in size.
- (2) [UL 262](#) shall be inside-screw type with operating nut, double-disc or split-wedge type gate, designed for a hydraulic working pressure of 175 psi, and shall have mechanical-joint ends or push-on joint ends as appropriate for the pipe to which it is joined. Materials for [UL 262](#) valves shall conform to the reference standards specified in [AWWA C500](#).

Valves shall open by counterclockwise rotation of the valve stem. Stuffing boxes shall have O-ring stem seals , except for those valves for which gearing is specified, in which case use conventional packing in place of O-ring seal. Stuffing boxes shall be bolted and constructed so as to permit easy removal of parts for repair.

Valve ends and gaskets for connection to sleeve-type mechanical coupling shall conform to the applicable requirements specified respectively for the joint or coupling. Where a post indicator is shown, the valve shall have an indicator post flange.

Valves shall be of one manufacturer.

[AWWA C509](#) gate valves shall be Kennedy 8000, Mueller 2300 or M&H 4067 series valves. Valves for the individual Delivery Orders shall be of one manufacturer.

2.1.2.2 Gate Valves in Valve Pit(s) and Aboveground Location

[AWWA C509](#) or [UL 262](#). Unless otherwise specified, valves conforming to:

- (1) [AWWA C509](#) shall be outside-screw-and-yoke rising-stem type with flanged ends, and
- (2) [UL 262](#) shall be outside-screw-and-yoke type and shall have double-disc or split-wedge type gate and flanged ends, and shall be designed for a hydraulic working pressure of 175 psi.

Materials for [UL 262](#) valves shall conform to the reference standards

specified in AWWA C500. Provide valves with handwheels that open by counterclockwise rotation of the valve stem. Stuffing boxes shall be bolted and constructed so as to permit easy removal of parts for repair.

2.1.2.3 Check Valves

Swing-check type, AWWA C508 or UL 312. Valves conforming to:

- (1) AWWA C508 shall have iron or steel body and cover and flanged ends, and
- (2) UL 312 shall have cast iron or steel body and cover, flanged ends, and designed for a working pressure of 175 psi.

Materials for UL 312 valves shall conform to the reference standards specified in AWWA C508. Valves shall have clear port opening. Valves shall be spring-loaded or weight-loaded as indicated.

Valves shall be of one manufacturer.

2.1.2.4 Rubber-Seated Butterfly Valves

Rubber-seated butterfly valves shall conform to the performance requirements of AWWA C504. Wafer type valves conforming to the performance requirements of AWWA C504 in all respects, but not meeting laying length requirements will be acceptable if supplied and installed with a spacer providing the specified laying length. All tests required by AWWA C504 shall be met. Flanged-end valves shall be installed in an approved pit and provided with a union or sleeve-type coupling in the pit to permit removal. Mechanical-end valves 3 through 10 inches in diameter may be direct burial if provided with a suitable valve box, means for manual operation, and an adjacent pipe joint to facilitate valve removal. Valve operators shall restrict closing to a rate requiring approximately 60 seconds, from fully open to fully closed.

2.1.2.5 Pressure Reducing Valves

Pressure reducing valves shall maintain a constant downstream pressure regardless of fluctuations in demand. Valves shall be suitable for 175 psi operating pressure on the inlet side, with outlet pressure set for 60 psi. The valves shall be of the hydraulically-operated, pilot controlled, globe or angle type, and may be actuated either by diaphragm or piston. The pilot control shall be the diaphragm-operated, adjustable, spring-loaded type, designed to permit flow when controlling pressure exceeds the spring setting. Ends shall be flanged. Valve bodies shall be bronze, cast iron or cast steel with bronze trim. Valve stem shall be stainless steel. Valve discs and diaphragms shall be synthetic rubber. Valve seats shall be bronze. Pilot controls shall be bronze with stainless steel working parts.

2.1.2.6 Vacuum and Air Relief Valves

Vacuum and air relief valves shall be of the size shown and shall be of a type that will release air and prevent the formation of a vacuum. The valves shall automatically release air when the lines are being filled with water and shall admit air into the line when water is being withdrawn in excess of the inflow. Valves shall be iron body with bronze trim and stainless steel float.

2.1.2.7 Fire Hydrants

Fire hydrants shall be Dry-barrel Kennedy K81-D, Waterous Pacer or American Flow Control B-84-B unless otherwise specified in the individual Delivery Order.

Paint hydrants with at least one coat of primer and two coats of RED enamel paint.

Barrel and bonnet colors shall be in accordance with UFC 3-600-01 (NFPA 291) Following is a synopsis of the requirements:

The tops and nozzle caps should be painted with the following capacity-indicating color scheme to provide simplicity and consistency with colors used in signal work for safety, danger, and intermediate condition:

- (1) Class AA- Light blue
- (2) Class A- Green
- (3) Class B - Orange
- (4) Class C - Red

For rapid identification at night, it is recommended that the capacity colors be of a reflective-type paint.

Classification of Hydrants (Per NFPA 291). Hydrants should be classified in accordance with their rated capacities at 20 psi residual pressure as follows:

- (1) Class AA - Rated capacity of 1500 gpm or greater
- (2) Class A - Rated capacity of 1000-1499 gpm
- (3) Class B - Rated capacity of 500-999 gpm
- (4) Class C - Rated capacity of less than 500 gpm

- a. Dry-Barrel Type Fire Hydrants: Dry-barrel type hydrants, **AWWA C502** or **UL 246**, "Base Valve" design, unless otherwise specified in the individual Delivery Orders, shall have **6 inch** inlet, **5 1/4 inch** valve opening, one **4 1/2 inch** pumper connection, and two **2 1/2 inch** hose connections. Inlet shall have mechanical-joint end only; end shall conform to the applicable requirements as specified for the joint. Size and shape of operating nut, cap nuts, and threads on hose and pumper connections shall be as specified in **AWWA C502** or **UL 246**.

2.1.2.8 Indicator Posts

UL 789. Provide for gate valves where indicated.

2.1.2.9 Valve Boxes

Provide a valve box for each gate valve on buried piping, except where indicator post is shown. Valve boxes shall be of precast concrete of a size suitable for the valve on which it is to be used and shall be adjustable. Precast concrete boxes installed in locations subjected to vehicular traffic shall be designed to withstand AASHTO loads as outlined in **AASHTO HB-17**, or as called out in the individual Delivery Orders.

Precast concrete boxes shall be manufactured in accordance with Section **03 40 00.00 10** PLANT-PRECAST CONCRETE PRODUCTS FOR BELOW GRADE CONSTRUCTION. Provide a round head. Cast the word "WATER" on the lid.

The least diameter of the shaft of the box shall be 5 1/4 inches.

2.1.2.10 Valve Pits

Valve pits shall be constructed at locations indicated or as required above and in accordance with the details shown.

2.1.2.11 Displacement Type Meters

Displacement type meters shall conform to AWWA C700. Registers shall be straight-reading and shall read in cubic meters U.S. gallon. Meters in sizes 13 through 1/2 through 1 shall not be of the frost-protection design unless denoted as such in the individual Delivery Order. Connections shall be suitable to the type of pipe and conditions encountered. Register type shall be a direct reading remote register designed in accordance with AWWA C706 or an encoder type remote register designed in accordance with AWWA C707. Meters shall comply with the accuracy and capacity requirements of AWWA C700.

2.1.2.12 Turbine Type Meters

Turbine type meters shall conform to AWWA C701 Class II. The main casing shall be bronze with stainless steel external fasteners. Registers shall be straight-reading type, shall be permanently sealed and shall read in U.S. gallons. Connections shall be suitable to the type of pipe and conditions encountered. Register type shall be a direct reading remote register designed in accordance with AWWA C706. Meters shall comply with the accuracy and capacity requirements of AWWA C701.

2.1.2.13 Meter Vaults

Large meters shall be installed in reinforced concrete vaults manufactured in accordance with Section 03 40 00.00 10 PLANT-PRECAST CONCRETE PRODUCTS FOR BELOW GRADE CONSTRUCTION. Large meters shall be installed in reinforced concrete vaults in accordance with the details shown on the drawings.

2.1.2.14 Sleeve-Type Mechanical Couplings

Couplings shall be designed to couple plain-end piping by compression of a ring gasket at each end of the adjoining pipe sections. The coupling shall consist of one middle ring flared or beveled at each end to provide a gasket seat; two follower rings; two resilient tapered rubber gaskets; and bolts and nuts to draw the follower rings toward each other to compress the gaskets. The middle ring and the follower rings shall be true circular sections free from irregularities, flat spots, and surface defects; the design shall provide for confinement and compression of the gaskets. For ductile iron and PVC plastic pipe, the middle ring shall be of cast-iron or steel; and the follower rings shall be of malleable or ductile iron. Malleable and ductile iron shall, conform to ASTM A47/A47M and ASTM A536, respectively. Steel shall have a strength not less than that of the pipe. Gaskets shall be designed for resistance to set after installation and shall meet the applicable requirements specified for gaskets for mechanical joint in AWWA C111/A21.11. Bolts shall be track-head type, ASTM A307, Grade A, with nuts, ASTM A563, Grade A; or round-head square-neck type bolts, ASME B18.5.2.1M and ASME B18.5.2.2M with hex nuts, ASME B18.2.2. Bolts shall be 5/8 inch in diameter. Bolt holes in follower rings shall be

of a shape to hold fast the necks of the bolts used. Mechanically coupled joints using a sleeve-type mechanical coupling shall not be used as an optional method of jointing except where pipeline is adequately anchored to resist tension pull across the joint. Mechanical couplings shall provide a tight flexible joint under all reasonable conditions, such as pipe movements caused by expansion, contraction, slight setting or shifting in the ground, minor variations in trench gradients, and traffic vibrations. Couplings shall be of strength not less than the adjoining pipeline.

2.1.2.15 Tracer Wire for Metallic and Nonmetallic Piping

Provide insulated single strand, solid copper detection wire with a minimum of 12 AWG in diameter in sufficient length to be continuous over each separate run of metallic and nonmetallic pipe.

2.2 WATER SERVICE LINE MATERIALS

ENSURE THAT ALL MATERIALS INSTALLED IN POTABLE WATER SERVICE LINES CONFORM TO THE LATEST REQUIREMENTS OF THE REDUCTION IN LEAD IN DRINKING WATER ACT AND THE SAFE DRINKING WATER ACT REQUIREMENTS. REFER TO REQUIREMENTS IN NSF 14, NSF 61 AND NSF 372 AS REQUIRED.

2.2.1 Piping Materials

2.2.1.1 Copper Pipe and Associated Fittings

Pipe, **ASTM B42**, regular, threaded ends. Fittings shall be brass or bronze, **ASME B16.15**, 125 pound.

2.2.1.2 Copper Tubing and Associated Fittings

Tubing, **ASTM B88**, Type K. Fittings for solder-type joint, **ASME B16.18** or **ASME B16.22**; fittings for compression-type joint, **ASME B16.26**, flared tube type.

2.2.1.3 Plastic Piping

Plastic pipe and fittings shall bear the seal of the National Sanitation Foundation (NSF) for potable water service. Plastic pipe and fittings shall be supplied from the same manufacturer.

- a. Polyvinyl Chloride (PVC) Plastic Piping with Screw Joints: **ASTM D1785**, Schedule 40; or **ASTM D2241**, with SDR as necessary to provide 150 psi minimum pressure rating. Fittings, **ASTM D2466** or **ASTM D2467**. Pipe and fittings shall be of the same PVC plastic material and shall be one of the following pipe/fitting combinations, as marked on the pipe and fitting, respectively: PVC 2120/PVC II; PVC 2116/PVC II. Solvent cement for jointing, **ASTM D2564**. Pipe couplings, when used shall be tested as required by **ASTM D2464**.
- b. Polyvinyl Chloride (PVC) Plastic Piping with Elastomeric-Gasket Joints:
Pipe shall conform to dimensional requirements of **ASTM D1785** Schedule 40, with joints meeting the requirements of 150 psi working pressure, 200 psi hydrostatic test pressure, unless otherwise shown or specified.
- c. Polyvinyl Chloride (PVC) Plastic Piping with Solvent Cement Joints:

Pipe shall conform to dimensional requirements of **ASTM D1785** or **ASTM D2241** with joints meeting the requirements of 150 psi working pressure and 200 psi hydrostatic test pressure.

- d. Polyethylene (PE) Plastic Pipe: Pipe tubing, and heat fusion fitting shall conform to **AWWA C901**.

2.2.1.4 Ductile-Iron Piping

Comply with "Ductile-Iron Piping" subparagraph under paragraph "Water Distribution Main Materials."

2.2.1.5 Insulating Joints

Joints between pipe of dissimilar metals shall have a rubber-gasketed or other suitable approved type of insulating joint or dielectric coupling which will effectively prevent metal-to-metal contact between adjacent sections of piping.

2.2.2 Water Service Line Appurtenances

ENSURE THAT ALL MATERIALS INSTALLED IN POTABLE WATER SERVICE LINES CONFORM TO THE LATEST REQUIREMENTS OF THE REDUCTION IN LEAD IN DRINKING WATER ACT AND THE SAFE DRINKING WATER ACT REQUIREMENTS. REFER TO REQUIREMENTS IN NSF 14, NSF 61 AND NSF 372 AS REQUIRED.

2.2.2.1 Corporation Stops

Ground key type; bronze, **ASTM B61** or **ASTM B62**; and suitable for the working pressure of the system. Ends shall be suitable for solder-joint, or flared tube compression type joint. Threaded ends for inlet and outlet of corporation stops, **AWWA C800**; coupling nut for connection to flared copper tubing, **ASME B16.26**.

2.2.2.2 Curb or Service Stops

Ground key, round way, inverted key type; made of bronze, **ASTM B61** or **ASTM B62**; and suitable for the working pressure of the system. Ends shall be as appropriate for connection to the service piping. Arrow shall be cast into body of the curb or service stop indicating direction of flow.

2.2.2.3 Service Clamps

Service clamps used for repairing damaged cast-iron, steel, PVC or asbestos-cement pipe shall have a pressure rating not less than that of the pipe to be connected and shall be either the single or double flattened strap type. Clamps shall have a galvanized malleable-iron body with cadmium plated straps and nuts. Clamps shall have a rubber gasket cemented to the body.

2.2.2.4 Goosenecks

Type K copper tubing. Joint ends for goosenecks shall be appropriate for connecting to corporation stop and service line. Length of goosenecks shall be in accordance with standard practice.

2.2.2.5 Dielectric Fittings

Dielectric fittings shall be installed between threaded ferrous and

nonferrous metallic pipe, fittings and valves, except where corporation stops join mains. Dielectric fittings shall prevent metal-to-metal contact of dissimilar metallic piping elements and shall be suitable for the required working pressure.

2.2.2.6 Check Valves

Check valves shall be designed for a minimum working pressure of 150 psi or as indicated. Valves shall have a clear waterway equal to the full nominal diameter of the valve. Valves shall open to permit flow when inlet pressure is greater than the discharge pressure, and shall close tightly to prevent return flow when discharge pressure exceeds inlet pressure. The size of the valve, working pressure, manufacturer's name, initials, or trademark shall be cast on the body of each valve.

- a. Valves 2 inches and larger shall be outside lever and spring type.
- b. Valves 2 inches and smaller shall be all bronze designed for screwed fittings, and shall conform to MSS SP-80, Class 150, Types 3 and 4 as suitable for the application.

2.2.2.7 Gate Valves Smaller than 3 Inch in Size on Buried Piping

Gate valves smaller than 3 inch size on Buried Piping MSS SP-80, Class 150, solid wedge, nonrising stem. Valves shall have flanged or threaded end connections, with a union on one side of the valve. Provide handwheel operators.

2.2.2.8 Gate Valves Smaller Than 3 Inch Size in Valve Pits

MSS SP-80, Class 150, solid wedge, inside screw, rising stem. Valves shall have flanged or threaded end connections, with a union on one side of the valve and a handwheel operator.

2.2.2.9 Curb Boxes

Provide a curb box for each curb or service stop. Curb boxes shall be of cast iron of a size suitable for the stop on which it is to be used. Provide a round head. Cast the word "WATER" on the lid. Each box shall have a heavy coat of bituminous paint.

2.2.2.10 Valve Boxes

Provide a valve box for each gate valve on buried piping. Valve boxes shall be of precast concrete as indicated of a size suitable for the valve on which it is to be used and shall be adjustable. Precast concrete boxes installed in locations subjected to vehicular traffic shall be designed and specified in the individual Delivery Orders to withstand the AASHTO load designation as outline in AASHTO HB-17. Precast concrete boxes shall be manufactured in accordance with Section 03 40 00.00 10 PLANT-PRECAST CONCRETE PRODUCTS FOR BELOW GRADE CONSTRUCTION. Provide a round head. Cast the word "WATER" on the lid. The least diameter of the shaft of the box shall be 5 1/4 inches.

2.2.2.11 Tapping Sleeves

Tapping sleeves of the sizes indicated for connection to existing main shall be the cast gray, ductile, or malleable iron, split-sleeve type with flanged or grooved outlet, and with bolts, follower rings and gaskets on

each end of the sleeve. Construction shall be suitable for a maximum working pressure of 175 psi. Bolts shall have square heads and hexagonal nuts. Longitudinal gaskets and mechanical joints with gaskets shall be as recommended by the manufacturer of the sleeve. When using grooved mechanical tee, it shall consist of an upper housing with full locating collar for rigid positioning which engages a machine-cut hole in pipe, encasing an elastomeric gasket which conforms to the pipe outside diameter around the hole and a lower housing with positioning lugs, secured together during assembly by nuts and bolts as specified, pretorqued to 50 foot-pound.

2.2.2.12 Disinfection

Chlorinating materials shall conform to the following:

Chlorine, Liquid: AWWA B301.

Hypochlorite, Calcium and Sodium: AWWA B300.

PART 3 EXECUTION

3.1 INSTALLATION OF PIPELINES

3.1.1 General Requirements for Installation of Pipelines

These requirements shall apply to all pipeline installation except where specific exception is made in the "Special Requirements..." paragraphs.

3.1.1.1 Location of Water Lines

Terminate the work covered by this section at a point approximately 5 feet from the building, unless otherwise indicated. Do not lay water lines in the same trench with gas lines, fuel lines or electric wiring.

a. Water Piping Installation Parallel With Sewer Piping

- (1) Normal Conditions: Lay water piping at least 10 feet horizontally from a sewer or sewer manhole whenever possible. Measure the distance edge-to-edge.
- (2) Unusual Conditions: When local conditions prevent a horizontal separation of 10 feet, the water piping may be laid closer to a sewer or sewer manhole provided that:
 - (a) The bottom (invert) of the water piping shall be at least 18 inches above the top (crown) of the sewer piping.
 - (b) Where this vertical separation cannot be obtained, the sewer piping shall be constructed of AWWA-approved water pipe and pressure tested in place without leakage prior to backfilling. Approved waste water disposal method shall be utilized.
 - (c) The sewer manhole shall be of watertight construction and tested in place.

b. Installation of Water Piping Crossing Sewer Piping

- (1) Normal Conditions: Water piping crossing above sewer piping shall be laid to provide a separation of at least 18 inches

between the bottom of the water piping and the top of the sewer piping.

- (2) Unusual Conditions: When local conditions prevent a vertical separation described above, use the following construction:

(a) Sewer piping passing over or under water piping shall be constructed of AWWA-approved ductile iron water piping, pressure tested in place without leakage prior to backfilling.

(b) Water piping passing under sewer piping shall, in addition, be protected by providing a vertical separation of at least 18 inches between the bottom of the sewer piping and the top of the water piping; adequate structural support for the sewer piping to prevent excessive deflection of the joints and the settling on and breaking of the water piping; and that the length, minimum 20 feet, of the water piping be centered at the point of the crossing so that joints shall be equidistant and as far as possible from the sewer piping.

(c) Sewer Piping or Sewer Manholes: No water piping shall pass through or come in contact with any part of a sewer manhole.

3.1.1.2 Earthwork

Perform earthwork operations in accordance with Section 31 00 00 EARTHWORK.

3.1.1.3 Pipe Laying and Jointing

Remove fins and burrs from pipe and fittings. Before placing in position, clean pipe, fittings, valves, and accessories, and maintain in a clean condition. Provide proper facilities for lowering sections of pipe into trenches. Do not under any circumstances drop or dump pipe, fittings, valves, or any other water line material into trenches.

Cut pipe in a neat workmanlike manner accurately to length established at the site and work into place without springing or forcing. Replace by one of the proper length any pipe or fitting that does not allow sufficient space for proper installation of jointing material.

Blocking or wedging between bells and spigots will not be permitted. Lay bell-and-spigot pipe with the bell end pointing in the direction of laying.

Grade the pipeline in straight lines; avoid the formation of dips and low points. Support pipe at proper elevation and grade. Secure firm, uniform support. Wood support blocking will not be permitted. Lay pipe so that the full length of each section of pipe and each fitting will rest solidly on the pipe bedding; excavate recesses to accommodate bells, joints, and couplings.

Provide anchors and supports where indicated and where necessary for fastening work into place. Make proper provision for expansion and contraction of pipelines. Keep trenches free of water until joints have been properly made.

At the end of each work day, close open ends of pipe temporarily with wood blocks or bulkheads. Do not lay pipe when conditions of trench or weather prevent installation. Depth of cover over top of pipe shall not be less

than 3 feet.

3.1.1.4 Installation of Tracer Wire

Install a continuous length of tracer wire for the full length of each run of metallic or nonmetallic pipe. Attach wire to top of pipe in such manner that it will not be displaced during construction operations.

3.1.1.5 Connections to Existing Water Lines

Provide the Contracting Officer with 14 calendar days written notice in advance of water service outages.

Make connections to existing water lines after approval is obtained and with a minimum interruption of service on the existing line. Make connections to existing lines under pressure in accordance with the recommended procedures of the manufacturer of the pipe being tapped, except as otherwise specified.

Perform disinfecting work in the presence of the Contracting officer.

3.1.1.5.1 Connection to Existing Transite Water Lines

For work involving transite pipe, the contractor is required to have on-site one person trained and licensed as an IDEM asbestos supervisor. Other workers who will be directly working with the transite pipe shall be trained as IDEM 16 hours asbestos O&M workers.

Contractor shall use "wet method", prompt cleanup, and meet all OSHA, IDEM and EPA regulations when saw cutting or handling transite pipe. The preferred method is to sever the couplings at each end of a complete pipe section and replace the section with other materials.

Transite pipe will not be removed from the trench, but will be left in the trench and covered.

CONTRACTOR SHALL PHOTOGRAPH THE INTERIOR OF THE EXISTING TRANSITE PIPE TO REMAIN FOR THE PURPOSES OF DOCUMENTING THE CONDITION OF THE EXISTING PIPING. CONTRACTOR SHALL SUBMIT PHOTOGRAPHS TO THE CONTRACT OFFICER AS PART OF THE CLOSEOUT DOCUMENTS.

3.1.1.6 Penetrations

Pipe passing through walls of valve pits and structures shall be provided with ductile-iron or Schedule 40 steel wall sleeves. The sleeve shall be long enough to pass through the entire wall and shall be large enough to provide a minimum clear distance of 1 1/4 -inch between the pipe and sleeve. The sleeve shall be accurately located on center with the pipe and shall be securely fastened in place.

A modular mechanical type sealing assembly shall be installed in annular space between the pipe and sleeve. The seals shall consist of interlocking synthetic rubber links shaped to continuously fill the annular space between the pipe and sleeve with corrosion-protected carbon steel bolts, nuts, and pressure plates. The links shall be loosely assembled with bolts to form a continuous rubber belt around the pipe 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 pipe

and sleeve.

3.1.1.7 Flanged Pipe

Flanged pipe shall only be installed above ground or with the flanges in valve pits.

3.1.2 Special Requirements for Installation of Water Mains

3.1.2.1 Installation of Ductile-Iron Piping

Unless otherwise specified, install pipe and fittings in accordance with paragraph entitled "General Requirements for Installation of Pipelines" and with the requirements of [AWWA C600](#) for pipe installation, joint assembly, valve-and-fitting installation, and thrust restraint.

- a. **Jointing:** Make push-on joints with the gaskets and lubricant specified for this type joint; assemble in accordance with the applicable requirements of [AWWA C600](#) for joint assembly. Make mechanical joints with the gaskets, glands, bolts, and nuts specified for this type joint; assemble in accordance with the applicable requirements of [AWWA C600](#) for joint assembly and the recommendations of Appendix A to [AWWA C111/A21.11](#). Make flanged joints with the gaskets, bolts, and nuts specified for this type joint. Make flanged joints up tight; avoid undue strain on flanges, fittings, valves, and other accessories. Align bolt holes for each flanged joint. Use full size bolts for the bolt holes; use of undersized bolts to make up for misalignment of bolt holes or for any other purpose will not be permitted. Do not allow adjoining flange faces to be out of parallel to such degree that the flanged joint cannot be made watertight without overstraining the flange. When flanged pipe or fitting has dimensions that do not allow the making of a proper flanged joint as specified, replace it by one of proper dimensions. Use setscrewed flanges to make flanged joints where conditions prevent the use of full-length flanged pipe and assemble in accordance with the recommendations of the setscrewed flange manufacturer. Assemble joints made with sleeve-type mechanical couplings in accordance with the recommendations of the coupling manufacturer. Make insulating joints with the gaskets, sleeves, washers, bolts, and nuts previously specified for this type joint. Assemble insulating joints as specified for flanged joints, except that bolts with insulating sleeves shall be full size for the bolt holes. Ensure that there is no metal-to-metal contact between dissimilar metals after the joint has been assembled.
- b. **Allowable Deflection:** The maximum allowable deflection shall be as given in [AWWA C600](#). If the alignment requires deflection in excess of the above limitations, special bends or a sufficient number of shorter lengths of pipe shall be furnished to provide angular deflections within the limit set forth.
- c. **Pipe Anchorage:** Provide concrete thrust blocks (reaction backing) for pipe anchorage as per detail table provided in contract detail drawings. Thrust blocks shall be in accordance with the requirements of [AWWA C600](#) for thrust restraint, except that size and positioning of thrust blocks shall be as indicated. Use concrete, [ASTM C94/C94M](#), having a minimum compressive strength of 2,500 psi at 28 days; or use concrete of a mix not leaner than one part cement, 2 1/2 parts sand, and 5 parts gravel, having the same minimum compressive strength.

Where required by a Delivery Order, provide pipe restraints (other than concrete thrust blocks) as specified.

Provide at least 2 photos of each thrust block and pipe restraint system. Clearly indicate in the photo where the thrust block or pipe restraint system is located. Photos to be provided as digital media (CD ROM or DVD ROM) in JPG format, minimum 4 megapixels.

- d. Exterior Protection: Completely encase buried ductile iron pipelines with polyethylene tube or sheet, using Class A polyethylene film, in accordance with [AWWA C105/A21.5](#).

3.1.2.2 Installation of PVC Plastic Water Main Pipe

Installation of PVC Plastic Water Main Pipe and Associated Fittings: Unless otherwise specified, install pipe and fittings in accordance with paragraph entitled "General Requirements for Installation of Pipelines"; with the requirements of [AWWA C605](#) for laying of pipe, joining PVC pipe to fittings and accessories, and setting of hydrants, valves, and fittings; and with the recommendations for pipe joint assembly and appurtenance installation in [AWWA M23](#), Chapter 7, "Installation."

- a. Jointing: Make push-on joints with the elastomeric gaskets specified for this type joint, using either elastomeric-gasket bell-end pipe or elastomeric-gasket couplings. For pipe-to-pipe push-on joint connections, use only pipe with push-on joint ends having factory-made bevel; for push-on joint connections to metal fittings, valves, and other accessories, cut spigot end of pipe off square and re-bevel pipe end to a bevel approximately the same as that on ductile-iron pipe used for the same type of joint. Use an approved lubricant recommended by the pipe manufacturer for push-on joints. Assemble push-on joints for pipe-to-pipe joint connections in accordance with the requirements of [AWWA C605](#) for laying the pipe and the recommendations in [AWWA M23](#), Chapter 7, "Installation," for pipe joint assembly. Assemble push-on joints for connection to fittings, valves, and other accessories in accordance with the requirements of [AWWA C605](#) for joining PVC pipe to fittings and accessories and with the applicable requirements of [AWWA C600](#) for joint assembly. Make compression-type joints/mechanical joints with the gaskets, glands, bolts, nuts, and internal stiffeners previously specified for this type joint; assemble in accordance with the requirements of [AWWA C605](#) for joining PVC pipe to fittings and accessories, with the applicable requirements of [AWWA C600](#) for joint assembly, and with the recommendations of Appendix A to [AWWA C111/A21.11](#). Cut off spigot end of pipe for compression-type joint/mechanical-joint connections and do not re-bevel. Assemble joints made with sleeve-type mechanical couplings in accordance with the recommendations of the coupling manufacturer using internal stiffeners as previously specified for compression-type joints.
- b. Offset: Maximum offset in alignment between adjacent pipe joints shall be as recommended by the manufacturer and approved by the Contracting Officer, but shall not exceed 5 degrees.
- c. Pipe Anchorage: Provide concrete thrust blocks (reaction backing) for pipe anchorage as indicated in detail tables on the design drawings. Thrust blocks shall be in accordance with the requirements of [AWWA C605](#) for reaction or thrust blocking and plugging of dead ends, except that size and positioning of thrust blocks shall be as indicated. Use concrete, [ASTM C94/C94M](#), having a minimum compressive strength of 2,500

psi at 28 days; or use concrete of a mix not leaner than one part cement, 2 1/2 parts sand, and 5 parts gravel, having the same minimum compressive strength.

Where required by a Delivery Order, provide pipe restraints (other than concrete thrust blocks) as specified.

Provide at least 2 photos of each thrust block and pipe restraint system. Clearly indicate in the photo where the thrust block or pipe restraint system is located. Photos to be provided as digital media (CD ROM or DVD ROM) in JPG format, minimum 4 megapixels.

- d. Fittings: Install in accordance with **AWWA C605**.

3.1.2.3 Installation of Polyethylene (PE) Plastic Piping

- a. General Installation:

PE pipes shall be installed in accordance with **ASTM D2774**.

- b. Jointing:

Jointing shall comply with **ASTM D2657**, Technique I-Socket Fusion or Technique II-Butt Fusion.

- c. Offsets:

Maximum offset in alignment between adjacent pipe joints shall be as recommended by the manufacturer and approved by the Contracting Officer, but shall not exceed 5 degrees.

3.1.2.4 Installation of Valves and Hydrants

- a. Installation of Valves: Install gate valves, **AWWA C500** and **UL 262**, in accordance with the requirements of **AWWA C600** for valve-and-fitting installation and with the recommendations of the Appendix ("Installation, Operation, and Maintenance of Gate Valves") to **AWWA C500**. Install gate valves, **AWWA C509** or **AWWA C515**, in accordance with the requirements of **AWWA C600** for valve-and-fitting installation and with the recommendations of the Appendix ("Installation, Operation, and Maintenance of Gate Valves") to **AWWA C509** or **AWWA C515**. Install gate valves on PVC water mains in accordance with the recommendations for appurtenance installation in **AWWA M23**, Chapter 7, "Installation." Install check valves in accordance with the applicable requirements of **AWWA C600** for valve-and-fitting installation, except as otherwise indicated. Make and assemble joints to gate valves and check valves as specified for making and assembling the same type joints between pipe and fittings.

Provide at least 2 photos of each valve after installation and prior to burial. Clearly indicate in the photo where the valve is located. Photos to be provided as digital media (CD ROM or DVD ROM) in JPG format, minimum 4 megapixels.

- b. Installation of Hydrants: Install hydrants in accordance with **AWWA C600** for hydrant installation and as indicated. Make and assemble joints as specified for making and assembling the same type joints between pipe and fittings. Install hydrants with the **4 1/2 inch** connections facing the adjacent paved surface. If there are two paved adjacent

surfaces, contact the Contracting Officer for further instructions.

Provide at least 2 photos of each hydrant after installation and prior to burial. Clearly indicate in the photo where the hydrant is located. Photos to be provided as digital media (CD ROM or DVD ROM) in JPG format, minimum 4 megapixels.

- c. Marking of Hydrants: If the hydrant is a replacement hydrant, retain and re-install the existing hydrant metal tag. If the hydrant is a new hydrant, NAVFAC UEM will provide and install the metal tag.

3.1.2.5 Installation Beneath Railroad Right-of-Way

Install piping passing under the right-of-way of a commercial railroad in accordance with the specifications for pipelines conveying nonflammable substances in Chapter 1, Part 5, of the [AREMA Eng Man](#). For PVC plastic water main pipe, also install in accordance with the recommendations of [AWWA M23](#) for installation of casings.

3.1.3 Installation of Water Service Piping

3.1.3.1 Location

Connect water service piping to the building service where the building service has been installed. Where building service has not been installed, terminate water service lines approximately **5 feet** from the building line at a point directed by the Contracting Officer; such water service lines shall be closed with plugs or caps.

3.1.3.2 Service Line Connections to Water Mains

Connect service lines up to 2 inch size to the main by a curb stop and below the frostline.

Connect service lines greater than 2 inches size to the main with a rigid connection and install a gate valve on service line below the frostline.

Connect service lines to ductile-iron water mains in accordance with [AWWA C600](#) for service taps.

Connect service lines to PVC plastic water mains in accordance with [UBPPA UNI-PUB-8](#) and the recommendations of [AWWA M23](#), Chapter 9, "Service Connections."

3.1.4 Special Requirements for Installation of Water Service Piping

3.1.4.1 Installation of Metallic Piping

Install pipe and fittings in accordance with paragraph entitled "General Requirements for Installation of Pipelines" and with the applicable requirements of [AWWA C600](#) for pipe installation, unless otherwise specified.

a. Jointing:

- (1) Screwed Joints: Make screwed joints up tight with a stiff mixture of graphite and oil, inert filler and oil, or graphite compound; apply to male threads only. Threads shall be full cut; do not leave more than three threads on the pipe exposed after assembling the joint.

- (2) Joints for Copper Tubing: Cut copper tubing with square ends; remove fins and burrs. Handle tubing carefully; replace dented, gouged, or otherwise damaged tubing with undamaged tubing. Make solder joints using ASTM B32, 95-5 tin-antimony or Grade Sn96 solder. Solder and flux shall contain not more than 0.2 percent lead. Before making joint, clean ends of tubing and inside of fitting or coupling with wire brush or abrasive. Apply a rosin flux to the tubing end and on recess inside of fitting or coupling. Insert tubing end into fitting or coupling for the full depth of the recess and solder. For compression joints on flared tubing, insert tubing through the coupling nut and flare tubing.
- (3) Flanged Joints: Make flanged joints up tight, taking care to avoid undue strain on flanges, valves, fittings, and accessories.

3.1.4.2 Installation of Plastic Piping

Install pipe and fittings in accordance with paragraph entitled "General Requirements for Installation of Pipelines" and with the applicable requirements of ASTM D2774 and ASTM D2855, unless otherwise specified. Handle solvent cements used to join plastic piping in accordance with ASTM F402.

- a. Jointing: Make solvent-cemented joints for PVC plastic piping using the solvent cement previously specified for this material; assemble joints in accordance with ASTM D2855. Make plastic pipe joints to other pipe materials in accordance with the recommendations of the plastic pipe manufacturer.
- b. Plastic Pipe Connections to Appurtenances: Connect plastic pipe service lines to corporation stops and gate valves in accordance with the recommendations of the plastic pipe manufacturer.

3.1.4.3 Service Lines for Sprinkler Supplies

Water service lines used to supply building sprinkler systems for fire protection shall be connected to the water distribution main in accordance with NFPA 24.

3.1.4.4 Location of Meters

Meters and meter boxes shall be installed at the locations shown on the drawings. The meters shall be centered in the boxes to allow for reading and ease of removal or maintenance.

3.1.5 Disinfection

Prior to disinfection, obtain Contracting Officer approval of the proposed method for disposal of waste water from disinfection procedures. Disinfect new water piping and existing water piping affected by Contractor's operations in accordance with AWWA C651. Fill piping systems with solution containing minimum of 50 parts per million of available chlorine and allow solution to stand for minimum of 24 hours. Flush solution from the systems with domestic water until maximum residual chlorine content is within the range of 0.2 and 0.5 parts per million, or the residual chlorine content of domestic water supply. Obtain at least two consecutive satisfactory bacteriological samples from new water piping, analyze by a certified laboratory, and submit the results prior to the new water piping

being placed into service. Disinfection of systems supplying nonpotable water is not required.

3.2 FIELD QUALITY CONTROL

3.2.1 Field Tests and Inspections

Prior to hydrostatic testing, obtain Contracting Officer approval of the proposed method for disposal of waste water from hydrostatic testing. The Contracting Officer will conduct field inspections and witness field tests specified in this section. The Contractor shall perform field tests, and provide labor, equipment, and incidentals required for testing.

The Contractor shall produce evidence, when required, that any item of work has been constructed in accordance with the drawings and specifications.

Do not begin testing on any section of a pipeline where concrete thrust blocks have been provided until at least 5 days after placing of the concrete.

3.2.2 Testing Procedure

3.2.2.1 Hydrostatic Testing

Test water mains and water service lines in accordance with the applicable specified standard. Where water mains and water service lines ARE NOT indicated to provide fire service, test in accordance with the special testing requirements given in the paragraph entitled "Special Testing Requirements". Where water mains and water service lines ARE indicated to provide fire service, test in accordance with the special testing requirements given in the paragraph entitled "Special Testing Requirements for Fire Service."

Test ductile-iron water mains and water service lines in accordance with the requirements of AWWA C600 for hydrostatic testing. The amount of leakage on ductile-iron pipelines with mechanical-joints or push-on joints shall not exceed the amounts given in AWWA C600; no leakage will be allowed at joints made by any other method.

Test PVC plastic water mains and water service lines made with PVC plastic water main pipe in accordance with the requirements of AWWA C605 for pressure and leakage tests. The amount of leakage on pipelines made of PVC plastic water main pipe shall not exceed the amounts given in AWWA C605, except that at joints made with sleeve-type mechanical couplings, no leakage will be allowed.

Test water service lines in accordance with applicable requirements of AWWA C600 for hydrostatic testing. No leakage will be allowed at copper pipe joints, copper tubing joints (soldered, compression type, brazed), plastic pipe joints, flanged joints, and screwed joints.

3.2.2.2 Leakage Testing

For leakage test, use a hydrostatic pressure not less than the maximum working pressure of the system. Leakage test may be performed at the same time and at the same test pressure as the pressure test.

3.2.3 Special Testing Requirements

For pressure test, use a hydrostatic pressure 50 psi greater than the maximum working pressure of the system, except that for those portions of the system having pipe size larger than 2 inches in diameter, hydrostatic test pressure shall be not less than 200 psi. Hold this pressure for not less than 2 hours. Prior to the pressure test, fill that portion of the pipeline being tested with water for a soaking period of not less than 24 hours. For leakage test, use a hydrostatic pressure not less than the maximum working pressure of the system. Leakage test may be performed at the same time and at the same test pressure as the pressure test.

3.2.4 Special Testing Requirements for Fire Service

Test water mains and water service lines providing fire service or water and fire service in accordance with [NFPA 24](#). The additional water added to the system must not exceed the limits given in [NFPA 24](#).

Per [NFPA 24](#), Paragraph 10.10 TESTING AND ACCEPTANCE, the following are required for Approval of Underground Piping for fire service mains and their appurtenances as well as combined service mains used to carry water for fire service and other uses. Per this section of [NFPA 24](#), the installing contractor shall be responsible for the following:

- (1) Notifying the authority having jurisdiction and the owner's representative of the time and date testing is to be performed.
- (2) Performing all required acceptance tests.
- (3) Completing and signing the [Contractor's Material and Test Certificate for Underground Piping](#) shown in Figure 10.10.

Per [NFPA 24](#), Paragraph 10.10.2 ACCEPTANCE REQUIREMENTS, the following are required:

1. Flushing of Piping ([NFPA 24 Paragraph 10.10.2.1](#))
2. Hydrostatic Test ([NFPA 24 Paragraph 10.10.2.2](#))
3. Operating Test ([NFPA 24 Paragraph 10.10.2.4](#)): to include hydrants, control valves, etc.
4. Backflow Prevention Assemblies ([NFPA 24 Paragraph 10.10.2.5](#))

3.2.5 Final Survey

Provide survey data performed by a Licensed Land Surveyor. Provide [as-built drawings](#) as specified in [01 78 00 CLOSEOUT SUBMITTALS](#). At a minimum, provide surveyed locations of each:

- a. Elbows and fittings.
- b. Manholes. Manholes should be identified as 'sewer', 'air relief valve', 'air admittance valve', or as otherwise identified in the Individual Delivery Orders.
- c. Valve box lids.
- d. Corporation stop.
- e. Curb stop.
- f. Meter pits.
- g. Hydrants.
- h. Splices between two different piping materials (EXAMPLES: new AWWA PVC or Ductile Iron pipe connected to existing transite pipe.)

3.3 CLEANUP

Upon completion of the installation of water lines, and appurtenances, all debris and surplus materials resulting from the work shall be removed.

-- End of Section --

SECTION 33 30 00

SANITARY SEWERS
04/08

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 RAILWAY ENGINEERING AND MAINTENANCE-OF-WAY ASSOCIATION
(AREMA)

AREMA Eng Man (2012) Manual for Railway Engineering

AMERICAN WATER WORKS ASSOCIATION (AWWA)

AWWA C104/A21.4 (2013) Cement-Mortar Lining for
Ductile-Iron Pipe and Fittings for Water

AWWA C110/A21.10 (2012) Ductile-Iron and Gray-Iron Fittings
for Water

AWWA C111/A21.11 (2012) Rubber-Gasket Joints for
Ductile-Iron Pressure Pipe and Fittings

AWWA C115/A21.15 (2011) Flanged Ductile-Iron Pipe With
Ductile-Iron or Gray-Iron Threaded Flanges

AWWA C151/A21.51 (2009) Ductile-Iron Pipe, Centrifugally
Cast, for Water

AWWA C153/A21.53 (2011) Ductile-Iron Compact Fittings for
Water Service

AWWA C600 (2010) Installation of Ductile-Iron Water
Mains and Their Appurtenances

AWWA C605 (2013) Underground Installation of
Polyvinyl Chloride (PVC) Pressure Pipe and
Fittings for Water

AWWA C900 (2007; Errata 2008) Polyvinyl Chloride
(PVC) Pressure Pipe, and Fabricated
Fittings, 4 In. Through 12 In. (100 mm
Through 300 mm), for Water Distribution

AWWA M23 (2002; 2nd Ed) Manual: PVC Pipe - Design
and Installation

ASME INTERNATIONAL (ASME)

ASME B1.20.1 (1983; R 2006) Pipe Threads, General
Purpose (Inch)

| | |
|---------------------------|---|
| ASME B16.1 | (2010) Gray Iron Pipe Flanges and Flanged Fittings Classes 25, 125, and 250 |
| ASTM INTERNATIONAL (ASTM) | |
| ASTM A 123/A 123M | (2009) Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products |
| ASTM A 536 | (1984e1; R 2004) Standard Specification for Ductile Iron Castings |
| ASTM A 746 | (2009) Standard Specification for Ductile Iron Gravity Sewer Pipe |
| ASTM C 150 | (2007) Standard Specification for Portland Cement |
| ASTM C 270 | (2008a) Standard Specification for Mortar for Unit Masonry |
| ASTM C 443 | (2007) Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets |
| ASTM C 478 | (2009) Standard Specification for Precast Reinforced Concrete Manhole Sections |
| ASTM C 923 | (2008b) Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals |
| ASTM C 924 | (2002; R 2009) Testing Concrete Pipe Sewer Liner by Low-Pressure Air Test Method |
| ASTM C 94/C 94M | (2009) Standard Specification for Ready-Mixed Concrete |
| ASTM C 969 | (2002) Standard Practice for Infiltration and Exfiltration Acceptance Testing of Installed Precast Concrete Pipe Sewer Lines (Metric) |
| ASTM C 972 | (2000; R 2006) Compression-Recovery of Tape Sealant |
| ASTM C 990 | (2009) Standard Specification for Joints for Concrete Pipe, Manholes and Precast Box Sections Using Preformed Flexible Joint Sealants |
| ASTM D 1784 | (2008) Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds |
| ASTM D 1785 | (2006) Standard Specification for |

| | |
|-------------|---|
| | Poly(Vinyl Chloride) (PVC), Plastic Pipe, Schedules 40, 80, and 120 |
| ASTM D 2241 | (2005) Standard Specification for Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series) |
| ASTM D 2321 | (2005) Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications |
| ASTM D 2412 | (2002; R 2008) Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading |
| ASTM D 2464 | (2006) Standard Specification for Threaded Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80 |
| ASTM D 2466 | (2006) Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40 |
| ASTM D 2467 | (2006) Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80 |
| ASTM D 2680 | (2001; R 2009) Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) and Poly(Vinyl Chloride) (PVC) Composite Sewer Piping |
| ASTM D 2751 | (2005) Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Sewer Pipe and Fittings |
| ASTM D 3034 | (2008) Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings |
| ASTM D 3139 | (1998; R 2005) Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals |
| ASTM D 3212 | (2007) Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals |
| ASTM D 4101 | (2008) Standard Specification for Polypropylene Injection and Extrusion Materials |
| ASTM D 412 | (2006ae1e2) Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers - Tension |
| ASTM D 624 | (2000; R 2007) Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers |

- ASTM F 477 (2008) Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe
- ASTM F 758 (1995; R 2007e1) Smooth-Wall Poly(Vinyl Chloride) (PVC) Plastic Underdrain Systems for Highway, Airport, and Similar Drainage
- ASTM F 949 (2006a) Poly(Vinyl Chloride) (PVC) Corrugated Sewer Pipe with a Smooth Interior and Fittings
- U.S. GENERAL SERVICES ADMINISTRATION (GSA)
- FS A-A-60005 (Basic) Frames.Covers, Gratings, Steps, Sump and Catch Basin, Manhole
- U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)
- 29 CFR 1910.27 Fixed Ladders
- UNI-BELL PVC PIPE ASSOCIATION (UBPPA)
- UBPPA UNI-B-6 (1998) Recommended Practice for Low-Pressure Air Testing of Installed Sewer Pipe

1.2 SYSTEM DESCRIPTION

1.2.1 Sanitary Sewer Gravity Pipeline

Provide new and modify existing exterior sanitary gravity sewer piping and appurtenances as indicated in the individual Task Orders. Provide each system complete and ready for operation. The exterior sanitary gravity sewer system includes equipment, materials, installation, and workmanship as specified herein more than 5 feet outside of building walls.

Replace damaged material and redo unacceptable work at no additional cost to the Government. Backfilling shall be accomplished after inspection by the Contracting Officer. Before, during, and after installation, plastic pipe and fittings shall be protected from any environment that would result in damage or deterioration to the material. Keep a copy of the manufacturer's instructions available at the construction site at all times and shall follow these instructions unless directed otherwise by the Contracting Officer. Solvents, solvent compounds, lubricants, elastomeric gaskets, and any similar materials required to install the plastic pipe shall be stored in accordance with the manufacturer's recommendation and shall be discarded if the storage period exceeds the recommended shelf life. Solvents in use shall be discarded when the recommended pot life is exceeded.

1.2.2 Sanitary Sewer Pressure Lines

Provide sanitary sewer force mains as per 33 34 00: FORCE MAINS. For water/sewer main conflict and special installation, provide sanitary sewers of pressure material as specified herein.

1.3 SUBMITTALS

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

SD-02 Shop Drawings

Drawings

Installation and As-Built drawings, as specified.

Precast concrete manhole; G
Metal items
Frames, covers, and gratings

Details, as specified.

SD-03 Product Data

Pipeline materials

Submit manufacturer's standard drawings or catalog cuts.

SD-06 Test Reports

Reports

Test and inspection reports, as specified.

SD-07 Certificates

Portland Cement

Certificates of compliance stating the type of cement used in manufacture of precast manholes.

1.4 QUALITY ASSURANCE

1.4.1 Installer Qualifications

Install specified materials by a licensed underground utility Contractor licensed for such work in the state where the work is to be performed. Installing Contractor's License shall be current and be state certified or state registered.

1.4.2 Drawings

a. Submit As-Built Drawings based on survey data for the complete sanitary sewer system showing complete detail with all dimensions, both above and below grade, including invert elevation.

1.5 DELIVERY, STORAGE, AND HANDLING

1.5.1 Delivery and Storage

1.5.1.1 Piping

Inspect materials delivered to site for damage; store with minimum of handling. Store materials on site in enclosures or under protective coverings. Store jointing materials and rubber gaskets under cover out of direct sunlight. Do not store materials directly on the ground. Keep inside of pipes and fittings free of dirt and debris.

1.5.1.2 Metal Items

Check upon arrival; identify and segregate as to types, functions, and sizes. Store off the ground in a manner affording easy accessibility and not causing excessive rusting or coating with grease or other objectionable materials.

1.5.2 Handling

Handle pipe, fittings, and other accessories in such manner as to ensure delivery to the trench in sound undamaged condition. Take special care not to damage linings of pipe and fittings; if lining is damaged, make satisfactory repairs. Carry, do not drag, pipe to trench.

PART 2 PRODUCTS

2.1 PIPELINE MATERIALS

Pipe shall conform to the respective specifications and other requirements specified below.

2.1.1 Ductile Iron Gravity Sewer Pipe and Associated Fittings

2.1.1.1 Ductile Iron Gravity Pipe and Fittings

Ductile iron pipe shall conform to [ASTM A 746](#), Thickness Class 350. Fittings shall conform to [AWWA C110/A21.10](#) or [AWWA C153/A21.53](#). Fittings with push-on joint ends shall conform to the same requirements as fittings with mechanical-joint ends, . Fittings shall have strength at least equivalent to that of the pipe. Ends of pipe and fittings shall be suitable for the joints specified hereinafter. Pipe and fittings shall have cement-mortar lining conforming to [AWWA C104/A21.4](#), standard thickness.

2.1.1.2 Ductile Iron Gravity Joints and Jointing Materials

Pipe and fittings shall have push-on joints or mechanical joints, except as otherwise specified in this paragraph. Mechanical joints only shall be used where indicated. Push-on joint pipe ends and fitting ends, gaskets, and lubricant for joint assembly shall conform to [AWWA C111/A21.11](#). Mechanical joint requirements for pipe ends, glands, bolts and nuts, and gaskets shall conform to [AWWA C111/A21.11](#).

2.1.2 Ductile Iron Pressure Piping

2.1.2.1 Ductile Iron Pressure Pipe and Fittings

Ductile-iron pipe shall conform to [AWWA C151/A21.51](#), Thickness Class 52. Flanged pipe shall conform to [AWWA C115/A21.15](#). Fittings shall conform to [AWWA C110/A21.10](#) or [AWWA C153/A21.53](#). Fittings with push-on joint ends shall conform to the same requirements as fittings with mechanical-joint ends, except that the bell design shall be modified, as approved, for push-on joint. Fittings shall have pressure rating at least equivalent to that of the pipe. Ends of pipe and fittings shall be suitable for the joints specified hereinafter. Pipe and fittings shall have cement-mortar lining conforming to [AWWA C104/A21.4](#), standard thickness.

2.1.2.2 Ductile Iron Pressure Joints and Jointing Materials

- a. Joints, general: Joints for pipe and fittings shall be push-on joints or mechanical joints except as otherwise specified in this paragraph. Joints shall be mechanical-joints where indicated. Joints shall be flanged joints where indicated.
- b. Push-on joints: Shape of pipe ends and fitting ends, gaskets, and lubricant for joint assembly shall conform to [AWWA C111/A21.11](#).
- c. Mechanical joints: Dimensional and material requirements for pipe ends, glands, bolts and nuts, and gaskets shall conform to [AWWA C111/A21.11](#).
- d. Flanged joints: Bolts, nuts, and gaskets for flanged connections shall be as recommended in the Appendix to [AWWA C115/A21.15](#). Flange for setscrewed flanges shall be of ductile iron, [ASTM A 536](#), Grade 65-45-12, and shall conform to the applicable requirements of [ASME B16.1](#), Class 250. Setscrews for setscrewed flanges shall be 190,000 psi tensile strength, heat treated, and zinc-coated steel. Gasket for setscrewed flanges shall conform to the applicable requirements for mechanical-joint gaskets specified in [AWWA C111/A21.11](#). Design of setscrewed gasket shall provide for confinement and compression of gasket when joint to adjoining flange is made.

2.1.3 PVC Plastic Gravity Sewer Piping

2.1.3.1 PVC Plastic Gravity Pipe and Fittings

[ASTM D 3034](#), SDR 35, or [ASTM F 949](#) with ends suitable for elastomeric gasket joints.

2.1.3.2 PVC Plastic Gravity Joints and Jointing Material

Joints shall conform to [ASTM D 3212](#). Gaskets shall conform to [ASTM F 477](#).

2.1.4 PVC Plastic Pressure Pipe and Associated Fittings

2.1.4.1 PVC Plastic Pressure Pipe and Fittings

- a. Pipe and Fittings Less Than 4 inch Diameter: Pipe, couplings and fittings shall be manufactured of materials conforming to [ASTM D 1784](#), Class 12454B.

(1) Screw-Joint: Pipe shall conform to dimensional requirements

of [ASTM D 1785](#), Schedule 80, with joints meeting requirements of 150 psi working pressure, 200 psi hydrostatic test pressure, unless otherwise shown or specified. Fittings for threaded pipe shall conform to requirements of [ASTM D 2464](#), threaded to conform to the requirements of [ASME B1.20.1](#) for use with Schedule 80 pipe and fittings. Pipe couplings when used, shall be tested as required by [ASTM D 2464](#).

(2) Push-On Joint: [ASTM D 3139](#), with [ASTM F 477](#) gaskets. Fittings for push-on joints shall be iron conforming to [AWWA C110/A21.10](#) or [AWWA C111/A21.11](#). Iron fittings and specials shall be cement-mortar lined (standard thickness) in accordance with [AWWA C104/A21.4](#).

(3) Solvent Cement Joint: Pipe shall conform to dimensional requirements of [ASTM D 1785](#) or [ASTM D 2241](#) with joints meeting the requirements of 150 psi working pressure and 200 psi hydrostatic test pressure. Fittings for solvent cement jointing shall conform to [ASTM D 2466](#) or [ASTM D 2467](#).

b. Pipe and Fittings 4 inch Diameter to 12 inch: Pipe shall conform to [AWWA C900](#) and shall be plain end or gasket bell end, Pressure Class 150 (DR 18), with cast-iron-pipe-equivalent OD. Fittings shall be gray-iron or ductile-iron conforming to [AWWA C110/A21.10](#) or [AWWA C153/A21.53](#) and shall have cement-mortar lining conforming to [AWWA C104/A21.4](#), standard thickness. Fittings with push-on joint ends shall conform to the same requirements as fittings with mechanical-joint ends, except that bell design shall be modified, as approved, for push-on joint suitable for use with the PVC plastic pressure pipe specified in this paragraph.

2.1.4.2 PVC Plastic Pressure Joints and Jointing Material

Joints for pipe, 4 inch to 12 inch diameter, shall be push-on joints as specified in [ASTM D 3139](#). Joints between pipe and fittings shall be push-on joints as specified in [ASTM D 3139](#) or shall be compression-type joints/mechanical-joints as respectively specified in [ASTM D 3139](#) and [AWWA C111/A21.11](#). Each joint connection shall be provided with an elastomeric gasket suitable for the bell or coupling with which it is to be used. Gaskets for push-on joints for pipe shall conform to [ASTM F 477](#). Gaskets for push-on joints and compression-type joints/mechanical-joints for joint connections between pipe and fittings shall be as specified in [AWWA C111/A21.11](#), respectively, for push-on joints and mechanical-joints.

2.1.5 Piping Beneath Railroad Right-of-Way

Where pipeline passes under the right-of-way of a commercial railroad, piping shall conform to the specifications for pipelines conveying nonflammable substances in [AREMA Eng Man](#), except as otherwise specified in this paragraph. For casing pipe provide ductile-iron pipe in lieu of cast-iron soil pipe. Ductile-iron pipe shall conform to and have strength computed in accordance with [ASTM A 746](#).

2.2 CONCRETE MATERIALS

2.2.1 Cement Mortar

Cement mortar shall conform to [ASTM C 270](#), Type M with Type II cement.

2.2.2 Portland Cement

Portland cement shall conform to ASTM C 150, Type II for concrete used in concrete pipe, concrete pipe fittings, and manholes and type optional with the Contractor for cement used in concrete cradle, concrete encasement, and thrust blocking.

2.2.3 Portland Cement Concrete

Portland cement concrete shall conform to ASTM C 94/C 94M, compressive strength of 4000 psi at 28 days, except for concrete cradle and encasement or concrete blocks for manholes. Concrete used for cradle and encasement shall have a compressive strength of 2500 psi minimum at 28 days. Concrete in place shall be protected from freezing and moisture loss for 7 days.

2.3 MISCELLANEOUS MATERIALS

2.3.1 Precast Concrete Manholes

Precast concrete manhole risers, base sections, and tops shall conform to ASTM C 478 and be manufactured in accordance with Section 03 40 00.00 10 PLANT-PRECAST CONCRETE PRODUCTS FOR BELOW GRADE CONSTRUCTION; base and first riser shall be monolithic.

2.3.2 Gaskets and Connectors

Gaskets for joints between manhole sections shall conform to ASTM C 443. Resilient connectors for making joints between manhole and pipes entering manhole shall conform to ASTM C 923 or ASTM C 990.

2.3.3 External Preformed Rubber Joint Seals

An external preformed rubber joint seal shall be an accepted method of sealing cast iron covers to precast concrete sections to prevent ground water infiltration into sewer systems. All finished and sealed manholes constructed in accordance with paragraph entitled "Manhole Construction" shall be tested for leakage in the same manner as pipelines as described in paragraph entitled "Leakage Tests." The seal shall be multi-section with a neoprene rubber top section and all lower sections made of Ethylene Propylene Di Monomer (EPDM) rubber with a minimum thickness of 60 mils. Each unit shall consist of a top and bottom section and shall have mastic on the bottom of the bottom section and mastic on the top and bottom of the top section. The mastic shall be a non-hardening butyl rubber sealant and shall seal to the cone/top slab of the manhole/catch basin and over the lip of the casting. Extension sections shall cover up to two more adjusting rings. Properties and values are listed in the following tables:

Properties, Test Methods and Minimum Values for Rubber used in Preformed Joint Seals

| Physical Properties | Test Methods | EPDM | Neoprene | Butyl mastic |
|----------------------|--------------------|------|----------|--------------|
| Tensile, psi | ASTM D 412 | 1840 | 2195 | - |
| Elongation percent | ASTM D 412 | 553 | 295 | 350 |
| Tear Resistance, ppi | ASTM D 624 (Die B) | 280 | 160 | - |

Properties, Test Methods and Minimum Values for Rubber used in Preformed Joint Seals

| Physical Properties | Test Methods | EPDM | Neoprene | Butyl mastic |
|-----------------------------|-------------------|------|----------|--------------|
| Rebound, percent, 5 minutes | ASTM C 972 (mod.) | - | - | 11 |
| Rebound, percent, 2 hours | ASTM C 972 | - | - | 12 |

2.3.4 Metal Items

2.3.4.1 Frames, Covers, and Gratings for Manholes

FS A-A-60005, cast iron; figure numbers shall be as follows:

- a. Traffic manhole: Provide in paved areas.

- Frame: Figure 1, Size 22A
 - Cover: Figure 8, Size 22A
 - Steps: Figure 19

- b. Non-traffic manhole:

- Frame: Figure 4, Size 22
 - Cover: Figure 12, Size 22
 - Steps: Figure 19

Frames and covers shall be cast iron, ductile iron or reinforced concrete. Cast iron frames and covers shall be as indicated or shall be of type suitable for the application, circular, without vent holes. The frames and covers shall have a combined weight of not less than 400 pounds. Reinforced concrete frames and covers shall be as indicated or shall conform to ASTM C 478. The word "Sewer" shall be stamped or cast into covers so that it is plainly visible.

2.3.4.2 Manhole Steps

Zinc-coated steel conforming to 29 CFR 1910.27. As an option, plastic or rubber coating pressure-molded to the steel may be used. Plastic coating shall conform to ASTM D 4101, copolymer polypropylene. Rubber shall conform to ASTM C 443, except shore A durometer hardness shall be 70 plus or minus 5. Aluminum steps or rungs will not be permitted. Steps are not required in manholes less than 4 feet deep.

2.3.4.3 Manhole Ladders

A steel ladder shall be provided where the depth of a manhole exceeds 12 feet. The ladder shall not be less than 16 inches in width, with 3/4 inch diameter rungs spaced 12 inches apart. The two stringers shall be a minimum 3/8 inch thick and 2 inches wide. Ladders and inserts shall be galvanized after fabrication in conformance with ASTM A 123/A 123M.

2.3.4.4 Septic Tank Piping

Cast iron soil pipe and fittings.

2.3.4.5 Siphon for Septic Tank

Welded steel or close-grained cast iron free from flaws, of an approved standard design, and prompt and positive in action.

2.3.5 Sewage Absorption Field Materials

a. Pipe shall be PVC plastic pipe conforming to **ASTM F 758**. Covering for open joints in drain tile lines shall be asphalt-treated paper or asphalt-covered fibrous glass cloth. Wire for fastening covering to tile shall be **No. 18 American Wire Gage**, nonferrous metal composition.

2.4 REPORTS

Submit Test Reports. Compaction and density test shall be in accordance with Section **31 00 00 EARTHWORK**. Submit Inspection Reports for daily activities during the installation of the sanitary system. Information in the report shall be detailed enough to describe location of work and amount of pipe laid in place, measured in linear **feet**.

PART 3 EXECUTION

3.1 INSTALLATION OF PIPELINES AND APPURTENANT CONSTRUCTION

3.1.1 General Requirements for Installation of Pipelines

These general requirements apply except where specific exception is made in the following paragraphs entitled "Special Requirements."

3.1.1.1 Location

The work covered by this section shall terminate at a point as indicated in the individual Task Orders.

a. Sanitary piping installation parallel with water line:

1 Normal conditions: Sanitary piping or manholes shall be laid at least **10 feet** horizontally from a water line whenever possible. The distance shall be measured edge-to-edge.

2 Unusual conditions: When local conditions prevent a horizontal separation of **10 feet**, the sanitary piping or manhole may be laid closer to a water line provided that:

(aa) The top (crown) of the sanitary piping shall be at least **18 inches** below the bottom (invert) of the water main.

(bb) Where this vertical separation cannot be obtained, the sanitary piping shall be constructed of AWWA-approved ductile iron water pipe pressure tested in place without leakage prior to backfilling.

(cc) The sewer manhole shall be of watertight construction and tested in place.

b. Installation of sanitary piping crossing a water line:

1 Normal conditions: Lay sanitary sewer piping by crossing under water lines to provide a separation of at least **18 inches** between

the top of the sanitary piping and the bottom of the water line whenever possible.

(2) Unusual conditions: When local conditions prevent a vertical separation described above, use the following construction:

(aa) Sanitary piping passing over or under water lines shall be constructed of AWWA-approved ductile iron water pipe, pressure tested in place without leakage prior to backfilling.

(bb) Sanitary piping passing over water lines shall, in addition, be protected by providing:

(1). A vertical separation of at least 18 inches between the bottom of the sanitary piping and the top of the water line.

(2). Adequate structural support for the sanitary piping to prevent excessive deflection of the joints and the settling on and breaking of the water line.

(3). That the length, minimum 20 feet, of the sanitary piping be centered at the point of the crossing so that joints shall be equidistant and as far as possible from the water line.

c. Sanitary sewer manholes: No water piping shall pass through or come in contact with any part of a sanitary sewer manhole.

3.1.1.2 Earthwork

Perform earthwork operations in accordance with Section 31 00 00 EARTHWORK.

3.1.1.3 Pipe Laying and Jointing

Inspect each pipe and fitting before and after installation; replace those found defective and remove from site. Provide proper facilities for lowering sections of pipe into trenches. Lay nonpressure pipe with the bell ends in the upgrade direction. Adjust spigots in bells to give a uniform space all around. Blocking or wedging between bells and spigots will not be permitted. Replace by one of the proper dimensions, pipe or fittings that do not allow sufficient space for installation of joint material. At the end of each work day, close open ends of pipe temporarily with wood blocks or bulkheads. Provide batterboards not more than 25 feet apart in trenches for checking and ensuring that pipe invert elevations are as indicated. Laser beam method may be used in lieu of batterboards for the same purpose.

Branch connections shall be made by use of regular fittings or solvent cemented saddles as approved. Saddles for ABS and PVC composite pipe shall conform to Figure 2 of ASTM D 2680; saddles for ABS pipe shall comply with Table 3 of ASTM D 2751; and saddles for PVC pipe shall conform to Table 4 of ASTM D 3034.

3.1.1.4 Installation of Tracer Wire

Install a continuous length of tracer wire for the full length of each run of metallic or nonmetallic pipe. Attach wire to top of pipe in such manner that it will not be displaced during construction operations.

3.1.1.5 Connections to Existing Lines

Obtain approval from the Contracting Officer before making connection to existing line. Conduct work so that there is minimum interruption of service on existing line.

3.1.2 Special Requirements

3.1.2.1 Installation of Ductile Iron Gravity Sewer Pipe

Unless otherwise specified, install pipe and associated fittings in accordance with paragraph entitled "General Requirements for Installation of Pipelines" of this section and with the requirements of [AWWA C600](#) for pipe installation and joint assembly.

- a. Make push-on joints with the gaskets and lubricant specified for this type joint and assemble in accordance with the applicable requirements of [AWWA C600](#) for joint assembly. Make mechanical-joints with the gaskets, glands, bolts, and nuts specified for this type joint and assemble in accordance with the applicable requirements of [AWWA C600](#) for joint assembly and the recommendations of Appendix A to [AWWA C111/A21.11](#).

3.1.2.2 Installation of Ductile-Iron Pressure Lines

Unless otherwise specified, install pipe and fittings in accordance with paragraph entitled "General Requirements for Installation of Pipelines" of this section and with the requirements of [AWWA C600](#) for pipe installation, joint assembly, and valve-and-fitting installation.

- a. Make push-on joints with the gaskets and lubricant specified for this type joint and assemble in accordance with the applicable requirements of [AWWA C600](#) for joint assembly. Make mechanical-joints with the gaskets, glands, bolts, and nuts specified for this type joint; assemble in accordance with the applicable requirements of [AWWA C600](#) for joint assembly and the recommendations of Appendix A to [AWWA C111/A21.11](#). Make flanged joints with gaskets, bolts, and nuts specified for this type joint. Make flanged joints up tight, taking care to avoid undue strain on flanges, fittings, and other accessories. Align bolt holes for each flanged joint. Use full size bolts for the bolt holes; use of undersized bolts to make up for misalignment of bolt holes or for any other purpose will not be permitted. Do not allow adjoining flange faces to be out of parallel to such degree that the flanged joint cannot be made watertight without overstraining the flange. When flanged pipe or fittings have dimensions that do not allow the making of a proper flanged joint as specified, replace it by one of proper dimensions. Assemble joints made with sleeve-type mechanical couplings in accordance with the recommendations of the coupling manufacturer, as approved.

- b. Pipe anchorage: Provide concrete thrust blocks (reaction backing) for pipe anchorage. Size and position thrust blocks as indicated. Use concrete conforming to [ASTM C 94/C 94M](#) having a minimum compressive strength of 2,000 psi at 28 days; or use concrete of a mix not leaner than one part cement, 2 1/2 parts sand, and 5 parts gravel, having the same minimum compressive strength.

3.1.2.3 Installation of PVC Plastic Piping

Install pipe and fittings in accordance with paragraph entitled "General Requirements for Installation of Pipelines" of this section and with the requirements of [ASTM D 2321](#) for laying and joining pipe and fittings. Make joints with the gaskets specified for joints with this piping and assemble in accordance with the requirements of [ASTM D 2321](#) for assembly of joints. Make joints to other pipe materials in accordance with the recommendations of the plastic pipe manufacturer.

3.1.2.4 Installation of PVC Plastic Pressure Pipe and Fittings

Unless otherwise specified, install pipe and fittings in accordance with paragraph entitled "General Requirements for Installation of Pipelines" of this section; with the requirements of [AWWA C605](#) for laying of pipe, joining PVC pipe to fittings and accessories, and setting of hydrants, valves, and fittings; and with the recommendations for pipe joint assembly and appurtenance installation in [AWWA M23](#), Chapter 7, "Installation."

a. Pipe Less Than 4 Inch Diameter:

1 Threaded joints shall be made by wrapping the male threads with joint tape or by applying an approved thread lubricant, then threading the joining members together. The joints shall be tightened with strap wrenches which will not damage the pipe and fittings. The joint shall be tightened no more than 2 threads past hand-tight.

2 Push-On Joints: The ends of pipe for push-on joints shall be beveled to facilitate assembly. Pipe shall be marked to indicate when the pipe is fully seated. The gasket shall be lubricated to prevent displacement. Care shall be exercised to ensure that the gasket remains in proper position in the bell or coupling while making the joint.

3 Solvent-weld joints shall comply with the manufacturer's instructions.

b. Pipe 4 Inch Diameter Joints: Make push-on joints with the elastomeric gaskets specified for this type joint, using either elastomeric-gasket bell-end pipe or elastomeric-gasket couplings. For pipe-to-pipe push-on joint connections, use only pipe with push-on joint ends having factory-made bevel; for push-on joint connections to fittings, cut spigot end of pipe off square and re-bevel pipe end to a bevel approximately the same as that on ductile-iron pipe used for the same type of joint. Use an approved lubricant recommended by the pipe manufacturer for push-on joints. Assemble push-on joints for pipe-to-pipe joint connections in accordance with the requirements of [AWWA C605](#) for laying the pipe and the recommendations in [AWWA M23](#), Chapter 7, "Installation," for pipe joint assembly. Assemble push-on joints for connection to fittings in accordance with the requirements of [AWWA C605](#) for joining PVC pipe to fittings and accessories and with the applicable requirements of [AWWA C600](#) for joint assembly. Make compression-type joints/mechanical-joints with the gaskets, glands, bolts, nuts, and internal stiffeners specified for this type joint and assemble in accordance with the requirements of [AWWA C605](#) for joining PVC pipe to fittings and accessories, with the applicable requirements of [AWWA C600](#) for joint assembly, and with the recommendations of Appendix A to [AWWA C111/A21.11](#). Cut off spigot end of pipe for

compression-type joint/mechanical-joint connections and do not re-bevel.

c. Pipe anchorage: Provide concrete thrust blocks (reaction backing) for pipe anchorage. Size and position thrust blocks as indicated. Use concrete conforming to [ASTM C 94/C 94M](#) having a minimum compressive strength of 2,000 psi at 28 days; or use concrete of a mix not leaner than one part cement, 2 1/2 parts sand, and 5 parts gravel, having the same minimum compressive strength.

3.1.2.5 Pipeline Installation Beneath Railroad Right-of-Way

Where pipeline passes under the right-of-way of a commercial railroad, install piping in accordance with the specifications for pipelines conveying nonflammable substances in [AREMA Eng Man](#).

3.1.3 Concrete Work

Cast-in-place concrete is included in Section [03 30 53 MISCELLANEOUS CAST-IN-PLACE CONCRETE](#). The pipe shall be supported on a concrete cradle, or encased in concrete where indicated or directed.

3.1.4 Manhole Construction

Construct base slab of cast-in-place concrete or use precast concrete base sections. Make inverts in cast-in-place concrete and precast concrete bases with a smooth-surfaced semi-circular bottom conforming to the inside contour of the adjacent sewer sections. For changes in direction of the sewer and entering branches into the manhole, make a circular curve in the manhole invert of as large a radius as manhole size will permit. For cast-in-place concrete construction, either pour bottom slabs and walls integrally or key and bond walls to bottom slab. No parging will be permitted on interior manhole walls. For precast concrete construction, make joints between manhole sections with the gaskets specified for this purpose; install in the manner specified for installing joints in concrete piping. Parging will not be required for precast concrete manholes. Cast-in-place concrete work shall be in accordance with the requirements specified under paragraph entitled "Concrete Work" of this section. Make joints between concrete manholes and pipes entering manholes with the resilient connectors specified for this purpose; install in accordance with the recommendations of the connector manufacturer. Where a new manhole is constructed on an existing line, remove existing pipe as necessary to construct the manhole. Cut existing pipe so that pipe ends are approximately flush with the interior face of manhole wall, but not protruding into the manhole. Use resilient connectors as previously specified for pipe connectors to concrete manholes.

3.1.5 Miscellaneous Construction and Installation

3.1.5.1 Connecting to Existing Manholes

Pipe connections to existing manholes shall be made so that finish work will conform as nearly as practicable to the applicable requirements specified for new manholes, including all necessary concrete work, cutting, and shaping. The connection shall be centered on the manhole. Holes for the new pipe shall be of sufficient diameter to allow packing cement mortar around the entire periphery of the pipe but no larger than 1.5 times the diameter of the pipe. Cutting the manhole shall be done in a manner that will cause the least damage to the walls.

3.1.5.2 Metal Work

a. Workmanship and finish: Perform metal work so that workmanship and finish will be equal to the best practice in modern structural shops and foundries. Form iron to shape and size with sharp lines and angles. Do shearing and punching so that clean true lines and surfaces are produced. Make castings sound and free from warp, cold shuts, and blow holes that may impair their strength or appearance. Give exposed surfaces a smooth finish with sharp well-defined lines and arises. Provide necessary rabbets, lugs, and brackets wherever necessary for fitting and support.

b. Field painting: After installation, clean cast-iron frames, covers, gratings, and steps not buried in concrete to bare metal of mortar, rust, grease, dirt, and other deleterious materials and apply a coat of bituminous paint. Do not paint surfaces subject to abrasion.

3.1.6 Sewage Absorption Trench Construction

Grade pipe lines uniformly downward to the outlet. Lay perforated pipe with the perforations downward. Lay drain tile with 1/4 inch open joints. Cover open joints of drain tile with the cover material specified so that it extends not less than 100 degrees on each side of the vertical center line of the tile. Wire covering in place.

3.1.7 Installations of Wye Branches

Cutting into piping for connections shall not be done except in special approved cases. When the connecting pipe cannot be adequately supported on undisturbed earth or tamped backfill, the pipe shall be encased in concrete backfill or supported on a concrete cradle as directed. Concrete required because of conditions resulting from faulty construction methods or negligence by the Contractor shall be installed at no additional cost to the Government. The installation of wye branches in an existing sewer shall be made by a method which does not damage the integrity of the existing sewer. One acceptable method consists of removing one pipe section, breaking off the upper half of the bell of the next lower section and half of the running bell of wye section. After placing the new section, it shall be rotated so that the broken half of the bell will be at the bottom. The two joints shall then be made with joint packing and cement mortar.

3.2 FIELD QUALITY CONTROL

3.2.1 Field Tests and Inspections

The Contracting Officer will conduct field inspections and witness field tests specified in this section. Perform field tests and provide labor, equipment, and incidentals required for testing. Be able to produce evidence, when required, that each item of work has been constructed in accordance with the drawings and specifications.

3.2.2 Tests for Nonpressure Lines

Check each straight run of pipeline for gross deficiencies by holding a light in a manhole; it shall show a practically full circle of light through the pipeline when viewed from the adjoining end of line. When pressure piping is used in a nonpressure line for nonpressure use, test this piping as specified for nonpressure pipe.

3.2.2.1 Leakage Tests

Test lines for leakage by either infiltration tests or exfiltration tests, or by low-pressure air tests. Prior to testing for leakage, backfill trench up to at least lower half of pipe. When necessary to prevent pipeline movement during testing, place additional backfill around pipe sufficient to prevent movement, but leaving joints uncovered to permit inspection. When leakage or pressure drop exceeds the allowable amount specified, make satisfactory correction and retest pipeline section in the same manner. Correct visible leaks regardless of leakage test results.

a. Infiltration tests and exfiltration tests: Perform these tests for sewer lines made of the specified materials, not only concrete, in accordance with [ASTM C 969](#). Make calculations in accordance with the Appendix to [ASTM C 969](#).

b. Low-pressure air tests: Perform tests as follows:

1 Ductile-iron pipelines: Test in accordance with the applicable requirements of [ASTM C 924](#). Allowable pressure drop shall be as given in [ASTM C 924](#). Make calculations in accordance with the Appendix to [ASTM C 924](#).

2 PVC plastic pipelines: Test in accordance with [UBPPA UNI-B-6](#). Allowable pressure drop shall be as given in [UBPPA UNI-B-6](#). Make calculations in accordance with the Appendix to [UBPPA UNI-B-6](#).

3.2.2.2 Deflection Testing

Perform a deflection test on entire length of installed plastic pipeline on completion of work adjacent to and over the pipeline, including leakage tests, backfilling, placement of fill, grading, paving, concreting, and any other superimposed loads determined in accordance with [ASTM D 2412](#).

Deflection of pipe in the installed pipeline under external loads shall not exceed 4.5 percent of the average inside diameter of pipe. Determine whether the allowable deflection has been exceeded by use of a pull-through device or a deflection measuring device.

a. Pull-through device: This device shall be a spherical, spheroidal, or elliptical ball, a cylinder, or circular sections fused to a common shaft. Circular sections shall be so spaced on the shaft that distance from external faces of front and back sections will equal or exceed diameter of the circular section. Pull-through device may also be of a design promulgated by the Uni-Bell Plastic Pipe Association, provided the device meets the applicable requirements specified in this paragraph, including those for diameter of the device, and that the mandrel has a minimum of 9 arms. Ball, cylinder, or circular sections shall conform to the following:

1 A diameter, or minor diameter as applicable, of 95 percent of the average inside diameter of the pipe; tolerance of plus 0.5 percent will be permitted.

2 Homogeneous material throughout, shall have a density greater than 1.0 as related to water at [39.2 degrees F](#), and shall have a surface Brinell hardness of not less than 150.

3 Center bored and through-bolted with a [1/4 inch](#) minimum

diameter steel shaft having a yield strength of not less than 70,000 psi, with eyes or loops at each end for attaching pulling cables.

4 Each eye or loop shall be suitably backed with a flange or heavy washer such that a pull exerted on opposite end of shaft will produce compression throughout remote end.

b. Deflection measuring device: Sensitive to 1.0 percent of the diameter of the pipe being tested and shall be accurate to 1.0 percent of the indicated dimension. Deflection measuring device shall be approved prior to use.

c. Pull-through device procedure: Pass the pull-through device through each run of pipe, either by pulling it through or flushing it through with water. If the device fails to pass freely through a pipe run, replace pipe which has the excessive deflection and completely retest in same manner and under same conditions.

d. Deflection measuring device procedure: Measure deflections through each run of installed pipe. If deflection readings in excess of 4.5 percent of average inside diameter of pipe are obtained, retest pipe by a run from the opposite direction. If retest continues to show a deflection in excess of 4.5 percent of average inside diameter of pipe, replace pipe which has excessive deflection and completely retest in same manner and under same conditions.

3.2.3 Tests for Pressure Lines

Test pressure lines in accordance with the applicable standard specified in this paragraph, except for test pressures. For hydrostatic pressure test, use a hydrostatic pressure 50 psi in excess of the maximum working pressure of the system, but not less than 100 psi, holding the pressure for a period of not less than one hour. For leakage test, use a hydrostatic pressure not less than the maximum working pressure of the system. Leakage test may be performed at the same time and at the same test pressure as the pressure test. Test ductile-iron pressure lines in accordance with the requirements of AWWA C600 for hydrostatic testing. Leakage on ductile-iron pipelines with mechanical-joints or push-on joints shall not exceed the amounts given in AWWA C600; allow no leakage at joints made by other methods. Test PVC plastic pressure lines in accordance with the requirements of AWWA C605 for pressure and leakage tests, using the allowable leakage given therein.

3.2.4 Field Tests for Concrete

Field testing requirements are covered in Section 03 30 53 MISCELLANEOUS CAST-IN-PLACE CONCRETE

-- End of Section --

SECTION 33 32 13.14

GRINDER PUMP REPAIR/REPLACEMENT

01/08

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN WATER WORKS ASSOCIATION (AWWA)

| | |
|------------------|--|
| AWWA C104/A21.4 | (2013) Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water |
| AWWA C110/A21.10 | (2012) Ductile-Iron and Gray-Iron Fittings for Water |
| AWWA C111/A21.11 | (2012) Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings |
| AWWA C115/A21.15 | (2011) Flanged Ductile-Iron Pipe With Ductile-Iron or Gray-Iron Threaded Flanges |
| AWWA C151/A21.51 | (2009) Ductile-Iron Pipe, Centrifugally Cast, for Water |
| AWWA C500 | (2009) Metal-Seated Gate Valves for Water Supply Service |
| AWWA C509 | (2009) Resilient-Seated Gate Valves for Water Supply Service |
| AWWA C600 | (2010) Installation of Ductile-Iron Water Mains and Their Appurtenances |
| AWWA M23 | (2002; 2nd Ed) Manual: PVC Pipe - Design and Installation |

ASME INTERNATIONAL (ASME)

| | |
|--------------|---|
| ASME B1.20.1 | (1983; R 2006) Pipe Threads, General Purpose (Inch) |
| ASME B16.1 | (2010) Gray Iron Pipe Flanges and Flanged Fittings Classes 25, 125, and 250 |
| ASME B16.11 | (2005) Forged Fittings, Socket-Welding and Threaded |
| ASME B16.3 | (2006) Malleable Iron Threaded Fittings, Classes 150 and 300 |

ASTM INTERNATIONAL (ASTM)

| | |
|-------------------|--|
| ASTM A 123/A 123M | (2009) Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products |
| ASTM A 53/A 53M | (2007) Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless |
| ASTM A 536 | (1984e1; R 2004) Standard Specification for Ductile Iron Castings |
| ASTM D 1784 | (2008) Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds |
| ASTM D 1785 | (2006) Standard Specification for Poly(Vinyl Chloride) (PVC), Plastic Pipe, Schedules 40, 80, and 120 |
| ASTM D 2241 | (2005) Standard Specification for Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series) |
| ASTM D 2464 | (2006) Standard Specification for Threaded Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80 |
| ASTM D 2466 | (2006) Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40 |
| ASTM D 2467 | (2006) Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80 |
| ASTM D 3139 | (1998; R 2005) Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals |
| ASTM F 477 | (2008) Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe |

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

| | |
|-----------|--|
| NEMA MG 1 | (2007; Errata 2008) Standard for Motors and Generators |
|-----------|--|

1.2 DESCRIPTION OF WORK

The work includes providing pickup, cost estimates for repairs, conducting repairs, or the replacement of submersible sewage grinder pumps and accessories located in lift stations on the center.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation;

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

SD-03 Product Data

Submersible sewage grinder pumps; G

Pump Motor; G

SD-10 Operation and Maintenance Data

Submersible Sewage Grinder Pumps Data Package 3; G

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

Include pumps, alarms, and motors. Include all information on all equipment, alarm panel and controls, pumps and pump performance curves, and station layout in data for submersible sewage grinder pump station.

1.4 DELIVERY, STORAGE, AND HANDLING OF MATERIALS

1.4.1 Delivery and Storage

Inspect materials delivered to site for damage. Unload and store with minimum handling. Store materials in enclosures or under protective covering. Store rubber gaskets not to be installed immediately under cover, out of direct sunlight. Do not store materials directly on the ground. Keep interior of pipes and fittings free of dirt and debris.

1.4.2 Handling

Handle pipe, fittings, valves, and other accessories in such manner as to ensure delivery to the trench in sound, undamaged condition. Avoid injury to coatings and linings on pipe and fittings; make satisfactory repairs if coatings or linings are damaged. Carry pipe to the trench; do not drag it.

1.5 EXCAVATION, TRENCHING, AND BACKFILLING

Provide in accordance with Section 31 00 00 EARTHWORK, except as specified herein.

PART 2 PRODUCTS

2.1 PIPE AND FITTINGS

Provide pressure piping, air release valves, and related accessories for force main piping outside the sewage wet well and valve vault in accordance with Section 33 30 00 SANITARY SEWERS.

2.1.1 Ductile-Iron Pipe

AWWA C151/A21.51, thickness Class 52.

2.1.1.1 Flanged Pipe

AWWA C115/A21.15, ductile iron.

2.1.1.2 Fittings

AWWA C110/A21.10, flanged. Provide flanged joint fittings within wet well and valve vault as indicated. Provide mechanical joint fittings outside valve vault enclosure as indicated. Use fittings with pressure rating at least equivalent to that of the pipe.

2.1.1.3 Joints

AWWA C115/A21.15 for flanged joints. Use bolts, nuts, and gaskets for flanged connections recommended in the Appendix to AWWA C115/A21.15. Flange for setscrewed flanges must be of ductile iron, ASTM A 536, Grade 65-45-12, conforming to the applicable requirements of ASME B16.1, Class 250. Setscrews for setscrewed flanges must be 190,000 psi tensile strength, heat treated, and zinc-coated steel. Conform to the applicable requirements for mechanical-joint gaskets specified in AWWA C111/A21.11 for setscrewed flange gaskets. Use setscrewed gasket designed to provide for confinement and compression of gasket when joint to adjoining flange is made.

2.1.2 PVC Plastic Pressure Pipe and Associated Fittings

2.1.2.1 Pipe and Fittings Less Than 4 inch Diameter

Use pipe, couplings and fittings manufactured of materials conforming to ASTM D 1784, Class 12454-B.

- (1) Screw-Joint: Use pipe conforming to dimensional requirements of ASTM D 1785 Schedule 80, with joints meeting requirements of 150 psi working pressure, 200 psi hydrostatic test pressure, unless otherwise shown or specified. Use threaded pipe fittings conforming to requirements of ASTM D 2464, threaded to conform to the requirements of ASME B1.20.1 for use with Schedule 80 pipe and fittings. Test pipe couplings when used, as required by ASTM D 2464.
- (2) Push-On Joint: ASTM D 3139, with ASTM F 477 gaskets. Fittings for push-on joints: AWWA C110/A21.10 or AWWA C111/A21.11. Iron fittings and specials: cement-mortar lined (standard thickness) in accordance with AWWA C104/A21.4.
- (3) Solvent Cement Joint: Use pipe conforming to dimensional requirements of ASTM D 1785 or ASTM D 2241 with joints meeting the requirements of 150 psi working pressure and 200 psi hydrostatic test pressure. Use fittings for solvent cement jointing conforming to ASTM D 2466 or ASTM D 2467.

2.1.3 Insulating Joints

Provide between pipes of dissimilar metals a rubber gasket or other approved type of insulating joint or dielectric coupling to effectively prevent metal-to-metal contact between adjacent sections of piping.

2.1.4 Accessories

Provide flanges, connecting pieces, transition glands, transition sleeves, and other adapters as required.

2.1.5 Flexible Flanged Coupling

Provide flexible flanged coupling applicable for sewage as indicated. Use flexible flanged coupling designed for a working pressure of 350 psi.

2.2 VALVES AND OTHER PIPING ACCESSORIES

2.2.1 Gate Valves in Valve Vault

Conform to AWWA C500 for valves with outside-screw-and-yoke rising-stem type with double disc gates and flanged ends. Conform to AWWA C509 for valves with outside-screw-and-yoke rising-stem type with flanged ends. Provide valves with handwheels that open by counterclockwise rotation of the valve stem. Bolt and construct stuffing boxes to permit easy removal of parts for repair. Use valves from one manufacturer.

2.2.2 Check Valves Less Than 4 Inch Diameter

Neoprene ball check valve with integral hydraulic sealing flange, designed for a hydraulic working pressure of 175 psi.

2.2.3 Identification Tags and Plates

Provide valves with tags or plates numbered and stamped for their usage. Use plates and tags of brass or nonferrous material and mounted or attached to the valve.

2.2.4 Pipe Support

Use pipe support schedule 40 galvanized steel piping conforming to ASTM A 53/A 53M. Provide either ASME B16.3 or ASME B16.11 galvanized threaded fittings.

2.2.5 Miscellaneous Metals

Use stainless steel bolts, nuts, washers, anchors, and supports for installation of equipment.

2.2.6 Quick Disconnect System with Hydraulic Sealing Flange

Use quick disconnect system consisting of a steel base plate for supporting the pumps, a hydraulic sealing flange, pump guide rails and the discharge pipe supports. Use two guide rails of galvanized steel in accordance with ASTM A 123/A 123M. Provide a steel lifting chain for raising and lowering the pump in the basin. Build guides onto pump housing to fit the guide post to assure perfect alignment between pump and guide rails.

2.2.7 Wet Well Vent

Galvanized ASTM A 53/A 53M pipe with insect screening.

2.3 SUBMERSIBLE SEWAGE GRINDER PUMPS

Provide submersible sewage pumps with grinder units as shown on the drawings. Provide submersible, centrifugal sewage pumps and grinder units capable of grinding all materials found in normal domestic sewage, including plastics, rubber, sanitary napkins, disposable diapers, and wooden articles into a finely ground slurry with particle dimensions no greater than 1/4 inch. Pump capacity and motor characteristics as

indicated. Design pump to operate in a submerged or partially submerged condition. Provide an integral sliding guide bracket and two guide bars capable of supporting the entire weight of the pumping unit.

2.3.1 Casing

Provide hard, close-grained cast iron casing which is free from blow holes, porosity, hard spots, shrinkage defects, cracks, and other injurious defects. Design casings to permit replacement of wearing parts. Design passageways to permit smooth flow of sewage and to be free of sharp turns and projections.

2.3.2 Impeller

Provide non-clogging type cast-iron impeller. Make impeller with smooth surfaces, free flowing with the necessary clearance to permit objects in the sewage to pass. Fit and key, spline, or thread impeller on shaft, and lock in such manner that lateral movement will be prevented and reverse rotation will not cause loosening.

2.3.3 Shaft and Shaft Seals

Provide shaft of stainless steel. Provide mechanical seal of double carbon and ceramic construction with mating surfaces lapped to a flatness tolerance of one light band. Hold rotating ceramics in mating position with stationary carbons by a stainless steel spring. Oil lubricate bearings.

2.3.4 Bearings

Provide heavy duty ball thrust bearing or roller type bearing of adequate size to withstand imposed loads. Oil lubricate bearings.

2.3.5 Pump and Motor

Use pump and motor assembled on a single stainless steel shaft in a heavy duty cast-iron shell. Use free standing pump support legs of cast-iron providing enough clearance for the solids to get into the grinder.

2.4 PUMP MOTOR

Provide submersible sewage pumps in wet well NEMA MG 1, RPM, voltage and phase as indicated in the individual Task Orders. volt, for submersible pumps. Motor horsepower must be not less than pump horsepower at any point on the pump performance curve (non-overloaded pumps). Fit motors with lifting "eyes" capable of supporting entire weight of pump and motor.

2.5 PUMP CONTROL SYSTEM

Provide a sealed mercury float switch control system as indicated. Automatically alternate operation from one pump to the other and start second pump in the event first pump cannot handle incoming flow. Provide manual "on-off" switch for each pump. Provide independent adjustable high and low water level switches. Provide floats, supports, and alarm. Metal parts, if used, must be of bronze or equivalent corrosion resistant material.

2.5.1 Float Assembly Description

Use a direct acting float switch consisting of a normally-open mercury switch enclosed in a float. Use pipe mounted float assembly. Use float molded of rigid high-density polyurethane foam, color-coded and coated with a durable, water and corrosion-resistant jacket of clear urethane. Provide connecting cable and support pole in accordance with manufacturers recommendations. Provide a cast aluminum NEMA Type 4 junction box to connect float assembly. Use box with a gasketed cover with tapped float fitting and conduit entrance pipe threaded opening. Mount floats at fixed elevations as shown. Use floats designed to tilt and operate their switches causing sequential turn-on turn-off of the pump, when the liquid level being sensed rises or falls past the float.

2.5.2 Alternator

Provide an alternator control switch to operate in connection with each float. Use alternator control switch to alternate the operation of the pumps and operate both pumps if the water level rises above the second high water level. Incorporate time delay function and devices in the alternator controls such that both sewage pumps cannot be started simultaneously for an adjustable period of 10 to 120 seconds after shutdown. Use delay function designed to operate in any condition of start-up in either normal or emergency operational mode.

2.5.3 Sewage Pump Alarm and Control Panel

Enclose alarm panel in NEMA IV enclosure and with a flashing red light with long life bulb in guarded enclosure and 6 inch diameter horn. Horn must emit 120 DB at 10 feet. Power alarm horn and light from 12V DC power supply with battery backup. Provide a rechargeable battery rated to power both the horn and light for a minimum of two hours upon loss of main power. Provide circuitry to automatically recharge the battery after main power is restored. Full charge of battery must take no more than 20 hours. Use panel switch with power on light, push to test button for horn and light and push to silence button for horn and light with automatic reset for next alarm. Use alarm designed to activate under the following conditions:

- a. High liquid level as sensed by float switch
- b. Loss of main power
- c. No flow light as sensed by limit switch on the check valve

2.5.4 Electrical Requirements

Furnish motors with their respective pieces of equipment. Furnish internal wiring for components of packaged equipment as an integral part of the equipment. Provide power wiring and conduit for field installed equipment.

Provide provisions for the connection and operation of the lift station by emergency generator.

2.5.5 Electric Motor

Use hermetically sealed electric motor. Seal the power cable inside the motor end bell. Provide a neoprene covered cable with a flexible metal cover over it for its full length.

PART 3 EXECUTION

3.1 INSTALLATION

An inventory list of the typical pumps to be repair and purchases is enclosed for your reference for historical data information only. The repairs and purchase of new pumps both fluctuate.

The contractor shall provide pump components for all the various pump manufactures. The components may include but limited to rail guides, rails, pipe flanges, floats, control panels and other miscellaneous components.

The contractor shall pick up all pumps to be repaired at the Naval Support Activity Crane, IN Building 56 (line item E672). The government may choose to deliver and pick up pumps on a case by case basis. The contractors shall deliver all repaired pumps or new pumps back to Naval Support Activity Crane, IN Building 56. The government will accept or reject the work upon delivery.

3.1.1 Cost estimates

The contractors shall provide cost estimates (line item E673) for submersible pump repairs. The pumps include various manufactures and pumps ranging in 2 horsepower to 40 horse power with various volts. The estimate shall include a description of failure, detailed parts list with cost, machining cost, labor, inspection cost and estimated repair time.

3.1.2 Repairs

Mechanical repairs will include but not limited to cleaning, painting, replacing bearing, seals, machine repairs, impellers, shafts, damaged pump housings and performance testing. Electrical repairs may include but not limited to cord replacement, winding testing, dynamic balancing, rewinding motors and rotor repairs. The contractor must perform any and all repairs with qualified mechanics and electricians and all pumps shall meet or exceed the pump manufactures performance standards.

The repairs made to any pump shall be made in a reasonable time except in an emergency the repairs must be expedited. Repaired pumps shall have a minimum warranty of one year after installation.

3.1.3 Pump Replacement

The contractor will be responsible to furnish new pumps when the government determines the cost of repairs exceed a reasonable and expected cost. All new pumps will have the normal manufacture's warranty starting at installation. The contractor will provide two copies of O&M manuals with each new pump purchased.

3.1.4 Installation of Ductile-Iron Pressure Lines

Unless otherwise specified, install pipe and fittings in accordance with paragraph entitled, "General Requirements for Installation of Pipelines" of Section 33 30 00 SANITARY SEWERS, and with the requirements of AWWA C600 for pipe installation, joint assembly, and valve-and-fitting installation.

- a. Make flanged joint with gaskets, bolts, and nuts specified for this type joint. Make flanged joints up tight, taking care to avoid undue strain on flanges, fittings, and other accessories.

Align bolt holes for each flanged joint. Use size bolts for the bolt holes; use of undersized bolts to make up for misalignment of bolt holes or for any other purpose will not be permitted. Do not allow adjoining flange faces to be out of parallel to such degree that the flanged joint cannot be made watertight without overstraining the flange.

3.1.5 Installation of PVC Plastic Pressure Pipe and Fittings

Unless otherwise specified, install pipe and fittings in accordance with paragraph entitled "General Requirements for Installation of Pipelines" of this section and with the recommendations for pipe joint assembly and appurtenance installation in [AWWA M23](#), Chapter 7, "Installation."

a. Pipe Less than 4 Inch Diameter:

(1) Make threaded joints by wrapping the male threads with joint tape or by applying an approved thread lubricant, than threading the joining members together. Tighten joints with strap wrenches that will not damage the pipe and fittings. Do not tighten joint more than 2 threads past hand-tight.

(2) Push-On Joints: Bevel ends of pipe for push-on joints to facilitate assembly. Mark pipe to indicate when the pipe is fully seated. Lubricate gasket to prevent displacement. Exercise care to ensure that the gasket remains in proper position in the bell or coupling while making the joint.

(3) Solvent-weld joints: comply with the manufacturer's instructions.

3.1.6 Valves

Installation of Valves: Install gate valves conforming to [AWWA C500](#) in accordance with [AWWA C600](#) for valve-and-fitting installation and with the recommendations of the Appendix ("Installation, Operation, and Maintenance of Gate Valves") to [AWWA C500](#). Install gate valves conforming to [AWWA C509](#) in accordance with [AWWA C600](#) for valve-and-fitting installation and with the recommendations of the Appendix ("Installation, Operation, and Maintenance of Gate Valves") to [AWWA C509](#). Install check valves in accordance with the applicable requirements of [AWWA C600](#) for valve-and-fitting installation. Make and assemble joints to gate valves and check valves as specified for making and assembling the same type joints between pipe and fittings.

3.1.7 Force Main

Provide in accordance with Section [33 34 00](#) FORCE MAINS.

3.1.8 Equipment Installation

Install equipment in accordance with these specifications and the manufacturer's installation instructions. Grout equipment mounted on concrete foundations before installing piping. Install piping to avoid imposing stress on any equipment. Match flanges accurately before securing bolts.

3.2 FIELD TESTS AND INSPECTIONS

Perform all field tests, and provide all labor, equipment, and incidentals required for testing, except that water and electric power needed for field tests will be furnished as set forth in Division 01. Produce evidence, when required, that any item of work has been constructed in accordance with contract requirements. Allow concrete to cure a minimum of 5 days before testing any section of piping where concrete thrust blocks have been provided.

3.2.1 Testing Procedure

Test piping in accordance with the Section 33 30 00 SANITARY SEWERS. Test in operation all equipment to demonstrate compliance with the contract requirements.

3.2.2 Sewage Grinder Pump Lift Station

Test pumps and controls, in operation, under design conditions to insure proper operation of all equipment. Provide all appliances, materials, water, and equipment for testing, and bear all expenses in connection with the testing. Conduct testing after all equipment is properly installed, electrical services and piping are installed, liquid is flowing, and the pump station is ready for operation. Correct all defects discovered to the satisfaction of the Contracting Officer, and all tests repeated, at the expense of the Contractor, until the equipment is in proper working order.

-- End of Section --

SECTION 33 34 00

FORCE MAINS; SEWER
04/08

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 HB-17 (2002; Errata 2003; Errata 2005, 17th Edition) Standard Specifications for Highway Bridges

AMERICAN PETROLEUM INSTITUTE (API)

API Spec 6D (2008; Errata 2008; Errata 2008; Errata 2009) Specification for Pipeline Valves

AMERICAN WATER WORKS ASSOCIATION (AWWA)

AWWA C110/A21.10 (2012) Ductile-Iron and Gray-Iron Fittings for Water

AWWA C111/A21.11 (2012) Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings

AWWA C115/A21.15 (2011) Flanged Ductile-Iron Pipe With Ductile-Iron or Gray-Iron Threaded Flanges

AWWA C151/A21.51 (2009) Ductile-Iron Pipe, Centrifugally Cast, for Water

AWWA C200 (2005) Steel Water Pipe - 6 In. (150 mm) and Larger

AWWA C203 (2008) Coal-Tar Protective Coatings and Linings for Steel Water Pipelines - Enamel and Tape - Hot-Applied

AWWA C207 (2007) Standard for Steel Pipe Flanges for Waterworks Service-Sizes 100 mm through 3600 mm 4 in. through 144 in.

AWWA C210 (2007) Standard for Liquid Epoxy Coating Systems for the Interior and Exterior of Steel Water Pipelines

AWWA C500 (2009) Metal-Seated Gate Valves for Water Supply Service

AWWA C508 (2009; Addenda A 2011) Swing-Check Valves for Waterworks Service, 2 In. (50 mm) Through 24 In. (600 mm) NPS

AWWA C600 (2010) Installation of Ductile-Iron Water Mains and Their Appurtenances

AWWA C900 (2007; Errata 2008) Polyvinyl Chloride (PVC) Pressure Pipe, and Fabricated Fittings, 4 In. Through 12 In. (100 mm Through 300 mm), for Water Distribution

ASME INTERNATIONAL (ASME)

ASME B16.1 (2010) Gray Iron Pipe Flanges and Flanged Fittings Classes 25, 125, and 250

ASTM INTERNATIONAL (ASTM)

ASTM C 478 (2009) Standard Specification for Precast Reinforced Concrete Manhole Sections

ASTM D 2241 (2005) Standard Specification for Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series)

ASTM D 2464 (2006) Standard Specification for Threaded Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80

ASTM D 2564 (2004e1) Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems

ASTM D 2774 (2008) Underground Installation of Thermoplastic Pressure Piping

ASTM D 3139 (1998; R 2005) Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals

ASTM D 3308 (2006) PTFE Resin Skived Tape

ASTM F 477 (2008) Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe

DUCTILE IRON PIPE RESEARCH ASSOCIATION (DIPRA)

DIPRA TRD (2002) Thrust Restraint Design for Ductile Iron Pipe

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

MSS SP-78 (2005a) Cast Iron Plug Valves, Flanged and Threaded Ends

1.2 SUBMITTALS

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

SD-06 Test Reports

Hydrostatic Tests.

Copies of test results.

1.3 DELIVERY, STORAGE, AND HANDLING

Do not damage pipe, fittings and accessories, and pipe coatings during delivery, handling, and storage.

PART 2 PRODUCTS

2.1 PIPE AND FITTINGS

Piping for force mains less than 4 inches in diameter shall be polyvinyl chloride (PVC) plastic. Piping less than 4 inches in diameter inside pump stations shall be galvanized steel.

Piping for force mains 4 inches in diameter and larger shall be ductile iron, or PVC plastic. Piping 4 inches in diameter and larger inside pump stations shall be ductile iron pipe with bolted flange joints. Pipe shall conform to the respective specifications and other requirements specified below.

2.1.1 Plastic Pipe

2.1.1.1 PVC Pipe

- a. PVC Pipe and Fittings Less Than 4 inches Diameter: ASTM D 2241, SDR 21, with screw joints, push-on joints, or solvent weld joints.
- b. PVC Pipe and Fittings 4 inches Diameter and Larger: ASTM D 2241, SDR 21, or AWWA C900, Class 150, with push-on joints.

2.1.2 Ductile Iron Pipe

- a. Ductile Iron Pipe: AWWA C151/A21.51, working pressure not less than 150 psi, unless otherwise shown or specified.
- b. River Crossing Pipe: AWWA C151/A21.51, minimum thickness Class 54 with joints in compliance with applicable requirements of AWWA C110/A21.10.
- c. Fittings, Mechanical: AWWA C110/A21.10, rated for 150 psi.
- d. Fittings, Push-On: AWWA C110/A21.10 and AWWA C111/A21.11, rated for 150 psi.

2.2 JOINTS

2.2.1 PVC Piping

- a. Screw Joint Fittings: [ASTM D 2464](#), Schedule 80.
- b. Push-On Joint Fittings: [ASTM D 3139](#), with [ASTM F 477](#) gaskets.
- c. Solvent Cement: [ASTM D 2564](#).
- d. Couplings for use with plain end pipe shall have centering rings or stops to ensure the coupling is centered on the joint.

2.2.2 Ductile Iron Piping

- a. Push-on Joints: [AWWA C111/A21.11](#).
- b. Mechanical Joints: [AWWA C111/A21.11](#) as modified by [AWWA C151/A21.51](#).
- c. Flanged Joints: [AWWA C115/A21.15](#).

2.2.3 Steel Piping

- a. Push-on Joints: [AWWA C200](#).
- b. Mechanical Joints: [AWWA C200](#).
- c. Flanged Joints: [AWWA C207](#).

2.3 VALVES

2.3.1 Gate Valves

Gate valves [3 inches](#) and larger shall comply with [AWWA C500](#). Valves for buried service shall be non-rising stem (NRS), [2 inch](#) square nut operated with joints applicable to the pipe or installation. Buried valves shall be furnished with extension stems comprising socket, extension stem and operating nut, and shall be of an appropriate length to bring operating nut to within [6 inches](#) of grade. One [4 foot](#) "T" handle valve wrench shall be furnished for each quantity of 6 buried valves. Gate valves that are exposed or installed inside shall be outside screw and yoke (OS&Y), handwheel operated with flange ends unless otherwise indicated. Gate valve operating nuts and handwheels shall have an arrow and the word "OPEN" cast in raised letters to indicate the direction of opening. Gate valves [14 inches](#) and larger shall be equipped with gearing to reduce operating effort. Gate valves [14 inches](#) and larger installed in horizontal lines in horizontal position with stems horizontal shall be equipped with bronze track, roller and scrapers to support the weight of the gate for its full length of travel. Gate valves [14 inches](#) and larger installed in vertical pipe lines with stems horizontal shall be fitted with slides to assist the travel of the gate assembly.

2.3.2 Check Valves

Provide check valves that permit free flow of sewage forward and provide a positive check against backflow. Design check valves for a minimum working pressure of [150 psi](#) or as indicated. The body shall be iron. The manufacturer's name, initials, or trademark and also the size of the valve, working pressure, and direction of flow shall be directly cast on the body.

- a. Ball Check Valves shall be iron body, shall have flanged ends, and shall be the non-slam type. Flanges shall be the 125 pound type complying with ASME B16.1. Ball shall be stainless steel unless otherwise specified.
- b. Swing Check Valves shall comply with AWWA C508 and shall be iron body, bronze mounted, and shall have flanged ends. Flanges shall be the 125 pound type complying with ASME B16.1.

2.3.3 Plug Valves

Cast iron valves shall comply with MSS SP-78. Steel plug valves shall comply with API Spec 6D.

2.3.4 Pinch Valves

Pinch valves shall be double acting, jam-proof type with unobstructed streamlined flows and built-in operator. The body shall be iron with a non-rising handwheel. The sleeve shall be of pure gum rubber, neoprene, Buna N or hypalon as required for service. The valve shall have flanged ends. Flanges shall be of the 125 pound type complying with ASME B16.1.

2.3.5 Air Release Valves

Air release valves shall be designed to permit release of air from an empty pipe during filling and shall be capable of discharging accumulated air in the line while the line is in operation and under pressure. Valves shall be attached by means of threaded pipe connections. Valves shall be vented to the atmosphere.

- a. Manual Air Release Valves: Manual air release valves shall consist of a 3 inch gate valve and 3 inch ductile iron pipe and fittings. The valve shall be installed with its line of flow in the horizontal position.
- b. Automatic Air Release Valve: Automatic air release valves shall be of the compound lever type capable of withstanding operating pressures of 150 psi. The valves shall have a 1/2 inch outlet. The body and cover of the valve shall be of iron with a stainless steel float. All internal parts shall be stainless steel or bronze. The valve shall be specifically adapted for use with sewage. Each valve shall be complete with hose and blow-off valves to permit backflushing without dismantling the valve.

2.4 VALVE VAULTS

Concrete: design concrete vaults installed in locations subject to vehicular traffic to withstand AASHTO loads designation specified in the individual Task Order and as outlined in AASHTO HB-17. The vault length shall be adaptable, without full extension, to the depth of cover over the pipe at the valve locations. Manufacture concrete vaults accordance with Section 03 40 00.00 10 PLANT-PRECAST CONCRETE PRODUCTS FOR BELOW GRADE CONSTRUCTION. Cast the word "SEWER" in the cover.

2.5 VALVE VAULTS

Valve vaults shall be precast concrete units manufactured in accordance with Section 03 40 00.00 10 PLANT-PRECAST CONCRETE PRODUCTS FOR BELOW GRADE

CONSTRUCTION and conforming to ASTM C 478.

2.6 MISCELLANEOUS MATERIALS

Miscellaneous materials shall comply with the following requirements:

2.6.1 Pipe Coatings and Linings

- a. Steel, interior: AWWA C203 or AWWA C210.
- b. Steel, exterior, buried: AWWA C203.
- c. Steel, exterior, exposed: AWWA C210.

2.6.2 Joint Lubricants

Joint lubricants shall be as recommended by the pipe manufacturer.

2.6.3 Bolts, Nuts and Glands

AWWA C111/A21.11.

2.6.4 Joint Compound

A stiff mixture of graphite and oil or inert filler and oil.

2.6.5 Joint Tape

ASTM D 3308.

2.6.6 Bond Wire

Bond wire type RHW or USE, Size 1/0 AWG, neoprene jacketed copper conductor shaped to stand clear of the joint.

PART 3 EXECUTION

3.1 INSTALLATION

Pipe, pipe fittings, and appurtenances shall be installed at the locations indicated. Excavation, trenching, and backfilling shall be as specified in Section 31 00 00 EARTHWORK.

3.1.1 Adjacent Facilities

Installation of force mains and inverted siphons near adjacent facilities shall be as specified in Section 33 30 00 SANITARY SEWERS.

3.1.2 Cutting

Pipe shall be cut in a neat manner with mechanical cutters. Wheel cutters shall be used where practicable. Sharp and rough edges shall be ground smooth and loose material removed from the pipe before laying.

3.1.3 Laying

Except where otherwise authorized, pipe shall be laid with bells facing the direction of laying. Before lowering and while suspended, the pipe shall be inspected for defects. Defective material shall be rejected. Pipe

shall be laid in compliance with the following:

- a. Ductile Iron: [AWWA C600](#).
- b. Steel: [AWWA C600](#).
- c. Concrete: Manufacturer's instructions.
- d. Polyvinyl Chloride: Manufacturer's instructions.
- e. Polyethylene: [ASTM D 2774](#).
- f. Polypropylene: [ASTM D 2774](#).
- g. Reinforced Thermosetting Resin: Manufacturer's instructions.
- h. Reinforced Plastic Mortar: Manufacturer's Instructions.

3.1.4 Jointing

3.1.4.1 Joints for PVC Pipe

- a. Threaded joints shall be made by wrapping the male threads with joint tape or by applying an approved thread lubricant, then threading the joining members together. The joint shall be tightened with strap wrenches which will not damage the pipe and fittings. The joint shall be tightened no more than 2 threads past hand-tight.
- b. Push-on joints: The ends of pipe for push-on joints shall be beveled to facilitate assembly. Pipe shall be marked to indicate when the pipe is fully seated. The gasket shall be lubricated to prevent displacement. The gasket shall remain in proper position in the bell or coupling while the joint is made.
- c. Solvent-weld joints shall comply with the manufacturer's instructions.

3.1.4.2 Joints for Ductile Iron Pipe

Installation of mechanical and push-on type joints shall comply with [AWWA C600](#) and the manufacturer's instructions. Installation of flanged joints shall comply with manufacturer's instructions.

3.1.4.3 Joints for Steel Pipe

Screw joints shall be made tight with joint tape or joint compound applied with a brush to the male threads only. Installation of mechanical joints, push-on joints, and flanged joints shall comply with the manufacturer's instructions.

3.1.5 Coating and Lining

Field coating of non-galvanized steel pipe shall comply with [AWWA C203](#). The applied materials shall be tested by means of a spark-type electrical device in compliance with [AWWA C203](#). Flaws and holidays in the coating or lining of the pipe and the pipe joints shall be repaired; the repaired areas shall be at least equal in thickness to the minimum required for the pipe.

3.1.6 Installation of Valves

Prior to installation, valves shall be cleaned of all foreign matter and inspected for damage. Valves shall be fully opened and closed to ensure that all parts are properly operating. Valves shall be installed with the stem in the vertical position.

3.1.7 Installation of Valve Boxes

Valve boxes shall be installed over each outside gate valve, unless otherwise indicated. Valve boxes shall be centered over the valve. Fill shall be carefully tamped around each valve box to a distance of 4 feet on all sides or to undisturbed trench face, if less than 4 feet.

3.1.8 Installation of Valve Vaults

Valve vaults shall be installed as indicated.

3.1.9 Drain Lines

Drain lines shall be installed where indicated. The drain line shall consist of a tee in the main line with a 4 inch diameter branch, a 4 inch diameter elbow, and a 4 inch gate valve.

3.1.10 Thrust Restraint

Thrust Restraint shall be as specified in Section 33 11 00 WATER DISTRIBUTION, and as defined in the drawing attachments. Plugs, caps, tees and bends deflecting 11-1/4 degrees or more, either vertically or horizontally, shall be provided with thrust restraint. Valves shall be securely anchored or shall be provided with thrust restraints to prevent movement. Thrust restraints shall be either thrust blocks or, for ductile-iron pipes, restrained joints.

3.1.10.1 Thrust Blocks

Thrust blocking shall be concrete of a mix not leaner than: 1 cement, 2-1/2 sand, 5 gravel; and having a compressive strength of not less than 2000 psi after 28 days. Blocking shall be placed between solid ground and the fitting to be anchored. Unless otherwise indicated or directed, the base and thrust bearing sides of thrust blocks shall be poured directly against undisturbed earth. The sides of thrust blocks not subject to thrust may be poured against forms. The area of bearing shall be as shown or as directed. Blocking shall be placed so that the fitting joints will be accessible for repair. Steel rods and clamps, protected by galvanizing or by coating with bituminous paint, shall be used to anchor vertical down bends into gravity thrust blocks.

3.1.10.2 Restrained Joints

For ductile iron pipe, restrained joints shall be designed by the Contractor or the pipe manufacturer in accordance with DIPRA TRD.

3.1.11 Grout

Grout for exterior joint protection on concrete pipes shall be a mix of 1 part portland cement, 2 parts sand, and of sufficient liquid consistency to flow into the joint recess beneath the diaper. Grout for interior joint protection shall be a mix of 1 part portland cement and 1 part sand. A

polyurethane foam loop, impregnated with portland cement, may be substituted for grout for exterior joints.

3.1.12 Bonded Joints

Where indicated, a metallic bond shall be provided at each joint, including joints made with flexible couplings or rubber gaskets, of ferrous-metallic piping to effect continuous conductivity. The bond shall be of the thermal-weld type.

3.2 HYDROSTATIC TESTS

The pipeline shall be subjected to both a pressure test and a leakage test. The method proposed for disposal of waste water from hydrostatic tests shall be approved by the Contracting Officer. Testing is the responsibility of the Contractor. The test may be witnessed by the Contracting Officer. The Contracting Officer shall be notified at least 7 days in advance of equipment tests. The final test report shall be delivered to the Contracting Officer within 30 days of the test.

3.2.1 Pressure Test

After the pipe has been installed, joints completed, thrust blocks have been in place for at least five days, and the trench has been partially backfilled, leaving the joints exposed for examination, the pipe shall be filled with water to expel all air. The pipeline shall be subjected to a test pressure of 100 psi or 150 percent of the working pressure, whichever is greater, for a period of at least one hour. Each valve shall be opened and closed several times during the test. The exposed pipe, joints, fitting, and valves shall be examined for leaks. Visible leaks shall be stopped or the defective pipe, fitting, joints, or valve shall be replaced.

3.2.2 Leakage Test

The leakage test may be conducted subsequent to or concurrently with the pressure test. The amount of water permitted as leakage for the line shall be placed in a sealed container attached to the supply side of the test pump. No other source of supply will be permitted to be applied to the pump or line under test. The water shall be pumped into the line by the test pump as required to maintain the specified test pressure as described for pressure test for a 2 hour period. Exhaustion of the supply or the inability to maintain the required pressure will be considered test failure. PE pipe can experience diametric expansion and pressure elongation during initial testing. The manufacturer shall be consulted prior to testing for special testing considerations. Allowable leakage shall be determined by the following I-P formula:

$L = NDP/K$ Where:

L = Allowable leakage in gallons per hour.

N = Number of joints in length of pipeline tested.

D = Nominal diameter of the pipe in inches.

P = Square root of the test pressure in psig.

K = 7400 for pipe materials.

At the conclusion of the test, the amount of water remaining in the container shall be measured and the results recorded in the test report.

3.2.3 Retesting

If any deficiencies are revealed during any test, such deficiencies shall be corrected and the tests shall be reconducted until the results of the tests are within specified allowances, without additional cost to the Government.

-- End of Section --

SUBMITTAL REGISTER

CONTRACT NO.
N40085-15-R-7905

| TITLE AND LOCATION UTILITIES MAINTENANCE & REPAIR | | | | | | CONTRACTOR | | | | | | | | | | | |
|--|----------------|----------------|----------------------------------|-----------|------------------------------|-------------------------------|--------------------|--------------------|----------------------|----------------|---|----------------------------|----------------------------|-------------|----------------|--|---------|
| ACTIVITY NO | TRANSMITTAL NO | SPEC SECT | DESCRIPTION ITEM SUBMITTED | PARAGRAPH | GOVTOR CLASSIFICATION REVIEW | CONTRACTOR: SCHEDULE DATES | | | CONTRACTOR ACTION | | APPROVING AUTHORITY | | | | | MAILED TO CONTR/ DATE RCD FRM APPR AUTH | REMARKS |
| | | | | | | SUBMIT | APPROVAL NEEDED BY | MATERIAL NEEDED BY | ACTION CODE | DATE OF ACTION | DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR | DATE FWD TO OTHER REVIEWER | DATE RCD FROM OTH REVIEWER | ACTION CODE | DATE OF ACTION | | |
| (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) | (m) | (n) | (o) | (p) | (q) | (r) |
| | | 01 11 00 | SD-07 Certificates | | | | | | | | | | | | | | |
| | | | Energy Performance Rating | 1.5.1.1 | | | | | | | | | | | | | |
| | | 01 20 00.00 20 | SD-01 Preconstruction Submittals | | | | | | | | | | | | | | |
| | | | Schedule of Prices | 1.3 | G | | | | | | | | | | | | |
| | | 01 22 00.00 10 | SD-03 Product Data | | | | | | | | | | | | | | |
| | | | Weight Certificates | 1.3.9.2 | | | | | | | | | | | | | |
| | | | Weight Certificates | 1.3.10.2 | | | | | | | | | | | | | |
| | | | Weight Certificates | 1.3.25.1 | | | | | | | | | | | | | |
| | | | Weight Certificates | 1.3.26.1 | | | | | | | | | | | | | |
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| | | 02 82 16.00 20 | SD-03 Product Data | | | | | | | | | | | | | | |
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| | | | Vacuums | 3.1.5 | G | | | | | | | | | | | | |
| | | | Respirators | 3.1.1.1 | G | | | | | | | | | | | | |
| | | | Pressure differential automatic recording instrument | 3.1.4 | G | | | | | | | | | | | | |
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| | | 02 82 16.00 20 | Employee training | 1.3.3 | G | | | | | | | | | | | | |
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| | | | Waste shipment records | 1.3.11 | G | | | | | | | | | | | | |
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| | | | Protective clothing | 1.5.8 | G | | | | | | | | | | | | |
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| | | | Occupational and Environmental Assessment Data Report | 1.5.2.3 | G | | | | | | | | | | | | |
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| | | | Training Certification | 1.5.1.2 | G | | | | | | | | | | | | |
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| | | | Third Party Consultant | 1.5.1.4 | G | | | | | | | | | | | | |
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| | | | Lead Waste Management Plan | 1.5.2.8 | G | | | | | | | | | | | | |
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| | | | Medical Examinations | 1.5.2.4 | G | | | | | | | | | | | | |
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| | | | Conveying and Placing Concrete | 3.2 | | | | | | | | | | | | | |
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| | | | Aggregates | 2.1.2 | G | | | | | | | | | | | | |
| | | | Compressive Strength Testing | 3.9.3 | G | | | | | | | | | | | | |
| | | | Slump | 3.9.3 | | | | | | | | | | | | | |
| | | | SD-07 Certificates | | | | | | | | | | | | | | |
| | | | Cementitious Materials | 2.1.1 | G | | | | | | | | | | | | |
| | | | Aggregates | 2.1.2 | | | | | | | | | | | | | |
| | | | Delivery Tickets | 2.2 | | | | | | | | | | | | | |

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| | | 03 40 00.00 10 | SD-01 Preconstruction Submittals | | | | | | | | | | | | | | |
| | | | Quality Control Procedures | 1.5.2.2 | | | | | | | | | | | | | |
| | | | SD-02 Shop Drawings | | | | | | | | | | | | | | |
| | | | Standard Precast Units | 1.4.1 | | | | | | | | | | | | | |
| | | | Custom-Made Precast Units | 1.4.2 | G | | | | | | | | | | | | |
| | | | SD-03 Product Data | | | | | | | | | | | | | | |
| | | | Standard Precast Units | 1.4.1 | | | | | | | | | | | | | |
| | | | Proprietary Precast Units | 1.4.3 | | | | | | | | | | | | | |
| | | | Embedded Items | 3.1.3 | | | | | | | | | | | | | |
| | | | Accessories | 2.1.10 | | | | | | | | | | | | | |
| | | | SD-05 Design Data | | | | | | | | | | | | | | |
| | | | Design Calculations | 1.4.2 | | | | | | | | | | | | | |
| | | | Concrete Mix Proportions | 1.4.5.1 | | | | | | | | | | | | | |
| | | | SD-06 Test Reports | | | | | | | | | | | | | | |
| | | | Test Reports | 1.5.2.2 | | | | | | | | | | | | | |
| | | | SD-07 Certificates | | | | | | | | | | | | | | |
| | | | Quality Control Procedures | 1.5.2.2 | | | | | | | | | | | | | |
| | | 22 05 83.63 | SD-03 Product Data | | | | | | | | | | | | | | |
| | | | Installation Equipment | 2.1 | | | | | | | | | | | | | |
| | | | CIPP Lining Tube | 2.2.1 | G | | | | | | | | | | | | |
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| | | | Liner Materials | 2.1 | G | | | | | | | | | | | | |
| | | | SD-08 Manufacturer's Instructions | | | | | | | | | | | | | | |
| | | | CIPP Manufacturer's Written Installation Instructions | 3.2 | G | | | | | | | | | | | | |
| | | | SD-11 Closeout Submittals | | | | | | | | | | | | | | |

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| | | 22 05 83.63 | Report Summarizing The Extent Of Pipe Lining Performed | 3.2 | G | | | | | | | | | | | | |
| | | | Pre-Lining Inspection | 3.2 | G | | | | | | | | | | | | |
| | | | Post-Lining Inspection | 3.2 | G | | | | | | | | | | | | |
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| | | | Record Drawings | 3.2 | G | | | | | | | | | | | | |
| | | 23 07 00 | SD-02 Shop Drawings | | | | | | | | | | | | | | |
| | | | Pipe Insulation Systems | 2.3 | | | | | | | | | | | | | |
| | | | Pipe Insulation Systems | 3.2 | | | | | | | | | | | | | |
| | | | SD-03 Product Data | | | | | | | | | | | | | | |
| | | | Pipe Insulation Systems | 2.3 | G | | | | | | | | | | | | |
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| | | | Pipe Insulation Systems | 2.3 | G | | | | | | | | | | | | |
| | | | Pipe Insulation Systems | 3.2 | G | | | | | | | | | | | | |
| | | 31 00 00 | SD-01 Preconstruction Submittals | | | | | | | | | | | | | | |
| | | | Shoring and Sheeting Plan | 3.6.1 | G | | | | | | | | | | | | |
| | | | Dewatering Work Plan | 3.3.6 | | | | | | | | | | | | | |
| | | | Trenching Plan | 3.3.2 | G | | | | | | | | | | | | |
| | | | SD-03 Product Data | | | | | | | | | | | | | | |
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| | | | Opening of any Excavation or Borrow Pit | 3.5 | | | | | | | | | | | | | |
| | | | SD-06 Test Reports | | | | | | | | | | | | | | |
| | | | Pipe bedding materials tests | 2.6 | | | | | | | | | | | | | |
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| | | 31 00 00 | Test for moisture-density relation | 3.15.1 | | | | | | | | | | | | | |
| | | | Borrow Site Testing | | | | | | | | | | | | | | |
| | | | SD-07 Certificates | | | | | | | | | | | | | | |
| | | | Testing | 3.15 | | | | | | | | | | | | | |
| | | 32 12 16 | SD-03 Product Data | | | | | | | | | | | | | | |
| | | | Mix Design | 2.4 | G | | | | | | | | | | | | |
| | | 32 92 19 | SD-03 Product Data | | | | | | | | | | | | | | |
| | | | Wood cellulose fiber mulch | 2.6.3 | | | | | | | | | | | | | |
| | | | Fertilizer | 2.5 | | | | | | | | | | | | | |
| | | | SD-06 Test Reports | | | | | | | | | | | | | | |
| | | | Topsoil composition tests | 2.3.3 | | | | | | | | | | | | | |
| | | | SD-07 Certificates | | | | | | | | | | | | | | |
| | | | seed | 2.1 | | | | | | | | | | | | | |
| | | | SD-08 Manufacturer's Instructions | | | | | | | | | | | | | | |
| | | | Erosion Control Materials | 2.8 | | | | | | | | | | | | | |
| | | 33 11 00 | SD-02 Shop Drawings | | | | | | | | | | | | | | |
| | | | As-Built Drawings | 3.2.5 | | | | | | | | | | | | | |
| | | | SD-03 Product Data | | | | | | | | | | | | | | |
| | | | Piping Materials | 2.1.1 | G | | | | | | | | | | | | |
| | | | Valves | 2.1.2 | G | | | | | | | | | | | | |
| | | | Hydrants | 2.1.2.7 | G | | | | | | | | | | | | |
| | | | Water distribution main | 2.1 | | | | | | | | | | | | | |
| | | | Water service line | 2.2 | | | | | | | | | | | | | |
| | | | Indicator posts | 2.1.2.8 | | | | | | | | | | | | | |
| | | | Corporation stops | 2.2.2.1 | | | | | | | | | | | | | |
| | | | Valve boxes | 2.1.2.9 | | | | | | | | | | | | | |

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| | | 33 11 00 | Valve boxes | 2.2.2.10 | | | | | | | | | | | | | |
| | | | SD-06 Test Reports | | | | | | | | | | | | | | |
| | | | Disinfection | 2.2.2.12 | G | | | | | | | | | | | | |
| | | | Contractor's Material and Test Certificate for Underground Piping | 3.2.4 | G | | | | | | | | | | | | |
| | | | SD-07 Certificates | | | | | | | | | | | | | | |
| | | | Water distribution main | 2.1 | | | | | | | | | | | | | |
| | | | Water service line | 2.2 | | | | | | | | | | | | | |
| | | | lining and coating | | | | | | | | | | | | | | |
| | | | Lining | 2.1.1.1 | | | | | | | | | | | | | |
| | | | Lining | 2.1.1.2 | | | | | | | | | | | | | |
| | | | hydrants | 2.1.2.7 | | | | | | | | | | | | | |
| | | | Displacement Type Meters | 2.1.2.11 | | | | | | | | | | | | | |
| | | | Turbine Type Meters | 2.1.2.12 | | | | | | | | | | | | | |
| | | | SD-08 Manufacturer's Instructions | | | | | | | | | | | | | | |
| | | | Delivery, storage, and handling | 1.4 | | | | | | | | | | | | | |
| | | | Installation | 3.1.1 | | | | | | | | | | | | | |
| | | 33 30 00 | SD-02 Shop Drawings | | | | | | | | | | | | | | |
| | | | Drawings | 1.4.2 | | | | | | | | | | | | | |
| | | | Precast concrete manhole | 2.3.1 | G | | | | | | | | | | | | |
| | | | Metal items | 2.3.4 | | | | | | | | | | | | | |
| | | | Frames, covers, and gratings | 2.3.4.1 | | | | | | | | | | | | | |
| | | | SD-03 Product Data | | | | | | | | | | | | | | |
| | | | Pipeline materials | 2.1 | | | | | | | | | | | | | |
| | | | SD-06 Test Reports | | | | | | | | | | | | | | |
| | | | Reports | 2.4 | | | | | | | | | | | | | |

ATTACHMENT A

Attachment A

NAVFAC MIDLANT Minimum Standards for Utility Line Surveys

Surveys for Utility line installations shall be done in accordance with the current version of the "Minimum Standard Detail Requirements for ALTA/ACSM Land Title Surveys" as adopted by American Land Title Association (ALTA) and National Society of Professional Surveyors (See attached at the end of this document).

Listed below are specific items required for the survey in addition to the ALTA/ACSM and recordation requirements.

Geographic Information System (GIS)

1. PURPOSE: NAVFAC MIDLANT utilizes a GIS to display facilities, and attribute information about those facilities, for decision making purposes. Therefore the Surveyor must provide location information in a form suitable for the GIS.
2. THE SURVEY: The Surveyor shall select the proper equipment and methods necessary to achieve at least a Minimum Horizontal Accuracy of +/- twelve (12) inches and a Vertical Accuracy of +/- twelve (12) inches. **Sewer manhole inlet and outfall inverts (bottom of flow line elevation) shall be measured to a Minimum Horizontal Accuracy of +/- one-half (1/2) inch.**
3. The survey work will be executed in a professional manner by the Surveyor or by personnel under the direct personal supervision of the Surveyor. Global Positioning System (GPS) data on the location of utility points and other features should be captured at the centroid of the feature unless signal obstruction or access prohibits; otherwise points will be captured at a uniform distance and direction from the centroid and the offset captured in the metadata for that feature.
4. COORDINATE SYSTEM AND DATUM: Coordinate values should be in the appropriate State Plane coordinate system. Horizontal coordinate values should be in the North American Datum of 1983 (NAD 83). Vertical coordinate values should be in the North American Vertical Datum of 1988 (NAVD 88). Coordinates shall be given in English units. Unless otherwise defined by state statutes, the preferred English unit is the U.S. Survey foot.
5. THE SURVEY REPORT: The results of the survey shall be transmitted to the Contracting Officer in a digital format. The following information shall be included as Metadata:
 - a. The accuracy classification to which the data was gathered.
 - b. The methods used to obtain the data (such as Electronic Distance Measurement (EDM), GPS, etc.)
 - c. Date of the survey work.
 - d. Datum used for the survey.
6. GOVERNMENT FURNISHED DATA: The Contracting Officer will provide an AUTOCAD 2010 drawing file with the Delivery Order Scope of work. This file will include 2 foot contour lines and such buildings and utilities as are within the project area.
7. DELIVERABLES:

DRAWINGS

An entire Line must be shown on one drawing sheet (if possible). Format shall be AutoCad 2010. This will be shown on the provided AUTOCAD 2010 electronic file.

- A. The word "Line" means the new work of installed water, sewer, or force main and all accessories included in the Delivery Order and required for the operation of the line. In the event the Line is spliced into an existing utility, at least 10' of the existing line shall be included in the survey.
- B. The entire length of a line(s) must be shown on the drawing.
- C. The following items are to be included in the survey in addition to the above requirements:
 - 1. Permanent structures or parts of permanent structures located within 50' perpendicular to the line.
 - 2. GPS data on the location of the Delivery Order installed utility lines shall be captured at a minimum every 100ft.
 - 3. Each of the following line features shall be captured and shown on the drawing:
 - a. Elbow and fitting.
 - b. Manholes. Manholes should be identified as 'sewer', 'air relief valve', 'air admittance valve', or as otherwise identified in the Individual Delivery Orders.
 - c. Valve box lids.
 - d. Corporation stops.
 - e. Curb stops
 - f. Meter pits.
 - g. Hydrants.
 - h. Splice (EXAMPLE: new AWWA PVC connected to old transite pipe)
 - i. Pipeline location every 100' minimum.
 - j. Inverts of all sewer manhole inlets and outlets (vertical accuracy +/- 1/2")

DATA

All survey-grade data collected shall also be provided to the Government in a digital format with an attached Survey Report identifying survey method, equipment list, calibration documentation, survey layout, description of control points, control diagrams, quality control report and field survey data.

The Narrative and the Electronic Data required under the Survey Submittal section, the Final Drawing shall be provided on CD ROM or DVD ROM disk(s) in **AUTOCAD 2010.**

SURVEY SUBMITTAL

In addition to the printed drawing and narrative, the feature locations and descriptions shall be provided in separate electronic text files capable of being imported into word processing software, such as Microsoft Word. Each feature shall be expressed in the following format:

```
n dd^mm'ss"  
e dd^mm'ss"  
description.↵  
↵  
(next feature)
```

Each feature (manhole, valve, etc) shall be expressed a point and a description

Where: **d** = distance in feet **n** = north
 s = south **e** = east
 w = west **dd** = degrees
 mm = minutes **ss** = seconds
 r = radius **a** = arc length in feet
 ↵ = carriage return

Drawings/Narratives/Electronic Copies to Be Provided

- | | |
|--------------------------|--|
| 1. Final Survey drawing: | As-built drawing with survey date <u>2 sets paper drawing</u> (in addition to as-built Mylar drawing) <u>CD or DVD ROM - AUTOCAD 2010 File</u> |
| 1. Final Survey Data: | <u>CD or DVD ROM</u> |

**MINIMUM STANDARD DETAIL REQUIREMENTS FOR
ALTA/ACSM LAND TITLE SURVEYS**
(Effective February 23, 2011)

1. Purpose - Members of the American Land Title Association (ALTA) have specific needs, unique to title insurance matters, when asked to insure title to land without exception as to the many matters which might be discoverable from survey and inspection, and which are not evidenced by the public records.

For a survey of real property, and the plat, map or record of such survey, to be acceptable to a title insurance company for the purpose of insuring title to said real property free and clear of survey matters (except those matters disclosed by the survey and indicated on the plat or map), certain specific and pertinent information must be presented for the distinct and clear understanding between the insured, the client (if different from the insured), the title insurance company (insurer), the lender, and the surveyor professionally responsible for the survey.

In order to meet such needs, clients, insurers, insureds, and lenders are entitled to rely on surveyors to conduct surveys and prepare associated plats or maps that are of a professional quality and appropriately uniform, complete and accurate. To that end, and in the interests of the general public, the surveying profession, title insurers and abstracters, the ALTA and the National Society of Professional Surveyors, Inc. (NSPS) jointly promulgate the within details and criteria setting forth a minimum standard of performance for ALTA/ACSM Land Title Surveys. A complete 2011 ALTA/ACSM Land Title Survey includes the on-site fieldwork required under Section 5 herein, the preparation of a plat or map showing the results of the fieldwork and its relationship to record documents as required under Section 6 herein, any information in Table A herein that may have been negotiated with the client, and the certification outlined in Section 7 herein.

2. Request for Survey - The client shall request the survey or arrange for the survey to be requested, and shall provide a written authorization to proceed from the person or entity responsible for paying for the survey. Unless specifically authorized in writing by the insurer, the insurer shall not be responsible for any costs associated with the preparation of the survey. The request shall specify that an "**ALTA/ACSM LAND TITLE SURVEY**" is required and which of the optional items listed in Table A herein, if any, are to be incorporated. Certain properties, including, but not limited to, marinas, campgrounds, trailer parks and leased areas, may present issues outside those normally encountered on an ALTA/ACSM Land Title Survey. The scope of work related to such properties should be discussed with the client, lender and insurer, and agreed upon in writing prior to requesting the survey. The client may need to secure permission for the surveyor to enter upon the property to be surveyed, adjoining properties, or offsite easements.

3. Surveying Standards and Standards of Care

A. Effective Date - The 2011 Minimum Standard Detail Requirements for ALTA/ACSM Land Title Surveys are effective February 23, 2011. As of that date, all previous versions of the Minimum Standard Detail Requirements for ALTA/ACSM Land Title Surveys are superseded by these standards.



- B. Other Requirements and Standards of Practice** - Some Federal agencies, many states and some local jurisdictions have adopted statutes, administrative rules and/or ordinances that set out standards regulating the practice of surveying within their jurisdictions. In addition to the standards set forth herein, surveyors shall also conduct their surveys in accordance with all applicable jurisdictional requirements and standards of practice. Where conflicts between the standards set forth herein and any such jurisdictional requirements and standards of practice occur, the more stringent shall apply.
- C. The Normal Standard of Care** - Surveyors should recognize that there may be unwritten local, state, and/or regional standards of care defined by the practice of the 'prudent surveyor' in those locales.
- D. Boundary Resolution** - The boundary lines and corners of any property being surveyed as part of an ALTA/ACSM Land Title Survey shall be established and/or retraced in accordance with appropriate boundary law principles governed by the set of facts and evidence found in the course of performing the research and survey.
- E. Measurement Standards** - The following measurement standards address Relative Positional Precision for the monuments or witnesses marking the corners of the surveyed property.
- i. "Relative Positional Precision" means the length of the semi-major axis, expressed in feet or meters, of the error ellipse representing the uncertainty due to random errors in measurements in the location of the monument, or witness, marking any corner of the surveyed property relative to the monument, or witness, marking any other corner of the surveyed property at the 95 percent confidence level (two standard deviations). Relative Positional Precision is estimated by the results of a correctly weighted least squares adjustment of the survey.
 - ii. Any boundary lines and corners established or retraced may have uncertainties in location resulting from (1) the availability, condition, history and integrity of reference or controlling monuments, (2) ambiguities in the record descriptions or plats of the surveyed property or its adjoining, (3) occupation or possession lines as they may differ from the written title lines, and (4) Relative Positional Precision. Of these four sources of uncertainty, only Relative Positional Precision is controllable, although due to the inherent errors in any measurement, it cannot be eliminated. The magnitude of the first three uncertainties can be projected based on evidence; Relative Positional Precision is estimated using statistical means (see Section 3.E.i. above and Section 3.E.v. below).
 - iii. The first three of these sources of uncertainty must be weighed as part of the evidence in the determination of where, in the surveyor's opinion, the boundary lines and corners of the surveyed property should be located (see Section 3.D. above). Relative Positional Precision is a measure of how precisely the surveyor is able to monument and report those positions; it is not a substitute for the application of proper boundary law principles. A boundary corner or line may have a small Relative Positional Precision because the survey measurements were precise, yet still be in the wrong position (i.e. inaccurate) if it was established or retraced using faulty or improper application of boundary law principles.
 - iv. For any measurement technology or procedure used on an ALTA/ACSM Land Title Survey, the surveyor shall (1) use appropriately trained personnel, (2) compensate for systematic errors, including those associated with instrument calibration, and (3) use appropriate error propagation and measurement design theory (selecting the proper instruments, geometric layouts, and field and computational procedures) to control random errors such that the maximum allowable Relative Positional Precision outlined in Section 3.E.v. below is not exceeded.



- v. The maximum allowable Relative Positional Precision for an ALTA/ACSM Land Title Survey is 2 cm (0.07 feet) plus 50 parts per million (based on the direct distance between the two corners being tested). It is recognized that in certain circumstances, the size or configuration of the surveyed property, or the relief, vegetation or improvements on the surveyed property will result in survey measurements for which the maximum allowable Relative Positional Precision may be exceeded. If the maximum allowable Relative Positional Precision is exceeded, the surveyor shall note the reason as explained in Section 6.B.ix below.

4. Records Research - It is recognized that for the performance of an ALTA/ACSM Land Title Survey, the surveyor will be provided with appropriate data which can be relied upon in the preparation of the survey. The request for an ALTA/ACSM Land Title Survey shall set forth the current record description of the property to be surveyed or, in the case of an original survey, the current record description of the parent parcel that contains the property to be surveyed. Complete copies of the most recent title commitment, the current record description of the property to be surveyed (or, in the case of an original survey, the parent parcel), the current record descriptions of adjoining, any record easements benefiting the property, the record easements or servitudes and covenants burdening the property (all hereinafter referred to collectively as "Record Documents"), documents of record referred to in the Record Documents, documents necessary to ascertain, if possible, the junior/senior relationship pursuant to Section 6.B.vii. below, and any other documents containing desired appropriate information affecting the property being surveyed, and to which the ALTA/ACSM Land Title Survey shall make reference, shall be provided to the surveyor for use in conducting the survey. Reference is made to Section 3.B. above.

5. Field Work - The Survey shall be performed on the ground (except as otherwise negotiated pursuant to Table A, Item 15 below, if selected by the client), and the field work shall include the following:

A. Monuments

- i. The location and description of any monuments or lines that control the boundaries of the surveyed property.
- ii. The location, size and type of any monuments found (or set, if Table A, Item 1 is requested by the client, or if otherwise required – see Section 3.B. above) on the boundary of the surveyed property.

B. Rights of Way and Access

- i. The distance from the appropriate corner or corners of the surveyed property to the nearest right of way line, if the surveyed property does not abut a right of way.
- ii. The name of any street, highway or other public or private way abutting the surveyed property, and the width and location of the travelled way relative to the nearest boundary line of the surveyed property.
- iii. Visible evidence of physical access (such as, but not limited to, curb cuts and driveways) to any abutting streets, highways or other public ways.
- iv. The location and character of vehicular, pedestrian or other forms of access by other than the apparent occupants of the surveyed property to or across the surveyed property, including, but not limited to driveways, alleys, private roads, sidewalks and footpaths observed in the process of conducting the survey.
- v. Without expressing a legal opinion as to ownership or nature, the location and extent of any potentially encroaching driveways, alleys, and other ways of access from adjoining properties onto the surveyed property observed in the process of conducting the survey.



- vi. Where documentation of the width or location of any abutting street, road or highway right of way was not disclosed in Record Documents provided to the surveyor or was not otherwise available from the controlling jurisdiction (see Section 6.C.iv. below), the evidence and location of parcel corners recovered which might indicate the width or location of such right of way lines.
- vii. Evidence of access to and from waters adjoining the surveyed property, such as paths, boat slips, launches, piers and docks observed in the process of conducting the survey.

C. Lines of Possession, and Improvements along the Boundaries

- i. The character and location of evidence of possession or occupation along the perimeter of the surveyed property, both by the occupants of the surveyed property and by adjoining, observed in the process of conducting the survey.
- ii. The character and location of all walls, buildings, fences, and other improvements within five feet of each side of the boundary lines, observed in the process of conducting the survey.
- iii. Without expressing a legal opinion as to the ownership or nature of the potential encroachment, the evidence, location and extent of potentially encroaching structural appurtenances and projections observed in the process of conducting the survey, such as fire escapes, bay windows, windows and doors that open out, flue pipes, stoops, eaves, cornices, areaways, steps, trim, etc., by or onto adjoining property, or onto rights of way, easements or setback lines disclosed in Record Documents provided to the surveyor.

D. Buildings

Based on the normal standard of care, the location of all buildings on the surveyed property shown perpendicular to the nearest perimeter boundary line(s) and expressed to the appropriate degree of precision.

E. Easements and Servitudes

- i. Evidence of any easements or servitudes burdening the surveyed property, disclosed in the Record Documents provided to the surveyor and observed in the process of conducting the survey.
- ii. Evidence of easements or servitudes not disclosed in the Record Documents provided to the surveyor, but observed in the process of conducting the survey, such as those created by roads; rights of way; water courses; ditches; drains; telephone, fiber optic lines, or electric lines; water, sewer, oil or gas pipelines on or across the surveyed property and on adjoining properties if they appear to affect the surveyed property.
- iii. Surface indications of underground easements or servitudes on or across the surveyed property observed in the process of conducting the survey.
- iv. Evidence of use of the surveyed property by other than the apparent occupants observed in the process of conducting the survey.

F. Cemeteries

As accurately as the evidence permits, the location of cemeteries, gravesites, and burial grounds (i) disclosed in the Record Documents provided to the surveyor, or (ii) observed in the process of conducting the survey.

G. Water Features

- i. The location of springs, together with the location of ponds, lakes, streams, and rivers bordering on or running through the surveyed property, observed during the process of conducting the survey. See Table A, Item 19 for wetlands locations.



- ii. The location of any water boundary on the surveyed property. The attribute(s) of the water feature located (e.g. top of bank, edge of water, high water mark, etc.) should be congruent with the boundary as described in the record description or, in the case of an original survey, in the new description. (See Section 6.B.vi. below).

6. Plat or Map - A plat or map of an ALTA/ACSM Land Title Survey shall show the following information. Where dimensioning is appropriate, dimensions shall be in accordance with the appropriate standard of care.

A. The evidence and locations gathered during the field work as outlined in Section 5 above.

B. Boundary, Descriptions, Dimensions and Closures

- i. The current record description of the surveyed property, and any new description of the surveyed property that was prepared in conjunction with the survey, including a statement explaining why the new description was prepared. Preparation of a new description should be avoided unless deemed necessary or appropriate by the surveyor and insurer. Preparation of a new description should also generally be avoided when the record description is a lot or block in a platted, recorded subdivision.
- ii. The location and description of any monuments, lines or other evidence that control the boundaries of the surveyed property or that were otherwise relied upon in establishing or retracing the boundaries of the surveyed property, and the relationship of that evidence to the surveyed boundary. In some cases, this will require notes on the plat or map.
- iii. All distances and directions identified in the record description of the surveyed property (and in the new description, if one was prepared). Where a measured or calculated dimension differs from the record by an amount deemed significant by the surveyor, such dimension shall be shown in addition to, and differentiated from, the corresponding record dimension.
- iv. The directional, distance and curve data necessary to compute a mathematical closure of the surveyed boundary. A note if the record description does not mathematically close. The basis of bearings and, when it differs from the record basis, the difference.
- v. The remainder of any recorded lot or existing parcel, when the surveyed property is composed of only a portion of such lot or parcel, shall be graphically depicted. Such remainder does not need to be included as part of the actual survey, except to the extent necessary to locate the lines and corners of the surveyed property, and it need not be fully dimensioned or drawn at the same scale as the surveyed property.
- vi. When the surveyed property includes a water boundary, a note on the face of the plat or map noting the date the boundary was measured, which attribute(s) of the water feature was/were located, and the caveat that the boundary is subject to change due to natural causes and that it may or may not represent the actual location of the limit of title. When the surveyor is aware of natural or artificial realignments or changes in such boundaries, the extent of those changes and facts shall be shown or explained.
- vii. The relationship of the boundaries of the surveyed property (i.e. contiguity, gaps, or overlaps) with its adjoiners, where ascertainable from Record Documents and/or from field evidence gathered during the process of conducting the survey of the property being surveyed. If the surveyed property is composed of multiple parcels, the extent of any gaps or overlaps between those parcels shall be identified. Where gaps or overlaps are identified, the surveyor shall, prior to preparation of the final plat or map, disclose this to the insurer and client for determination of a course of action concerning junior/senior rights.



- viii. When, in the opinion of the surveyor, the results of the survey differ significantly from the record, or if a fundamental decision related to the boundary resolution is not clearly reflected on the plat or map, the surveyor shall explain this information with notes on the face of the plat or map.
- ix. A note on the face of the plat or map explaining the site conditions that resulted in a Relative Positional Precision that exceeds the maximum allowed under Section 3.E.v. of these standards.
- x. A note on the face of the plat or map identifying the title commitment/policy number, effective date and name of the insurer for any title work provided to the surveyor.

C. Easements, Servitudes, Rights of Way, Access and Record Documents

- i. The width and recording information of all plottable rights of way, easements and servitudes burdening and benefitting the property surveyed, as evidenced by Record Documents which have been provided to the surveyor.
- ii. A note regarding any right of way, easement or servitude evidenced by a Record Document which has been provided to the surveyor (a) the location of which cannot be determined from the record document, or (b) of which there was no observed evidence at the time of the survey, or (c) that is a blanket easement, or (d) that is not on, or does not touch, the surveyed property, or (e) that limits access to an otherwise abutting right of way, or (f) in cases where the surveyed property is composed of multiple parcels, which of such parcels the various rights of way, easements, and servitudes cross.
- iii. A note if no physical access to a public way was observed in the process of conducting the survey.
- iv. The width of abutting rights of way and the source of such information (a) where available from the controlling jurisdiction or (b) where disclosed in Record Documents provided to the surveyor.
- v. The identifying titles of all recorded plats, filed maps, right of way maps, or similar documents which the survey represents, wholly or in part, with their recording or filing data.
- vi. For non-platted adjoining land, names and recording data identifying adjoining owners according to current public records. For platted adjoining land, the recording data of the subdivision plat.
- vii. Platted setback or building restriction lines which appear on recorded subdivision plats or which were disclosed in Record Documents provided to the surveyor.

D. Presentation

- i. The plat or map shall be drawn on a sheet of not less than 8 ½ by 11 inches in size at a legible, standard engineering scale, with that scale clearly indicated in words or numbers and with a graphic scale. When recordation or filing of a plat or map is required by law, such plat or map shall be produced in recordable form. The boundary of the surveyed property drawn in a manner that distinguishes it from other lines on the plat or map. A north arrow (with north to the top of the drawing when practicable), a legend of symbols and abbreviations, and a vicinity map showing the property in reference to nearby highway(s) or major street intersection(s).
- ii. Supplementary or detail diagrams when necessary.
- iii. If there are no visible buildings on the surveyed property, a note stating “*No buildings existing on the surveyed property*” shall appear on the face on the survey.



- iv. The surveyor's project number (if any), and the name, registration or license number, signature, seal, street address, telephone number, and email address of the surveyor who performed the survey. The date(s) of any revisions made by said surveyor.
- v. Sheet numbers where the plat or map is composed of more than one sheet.
- vi. The caption "ALTA/ACSM Land Title Survey."

7. **Certification** - The plat or map of an ALTA/ACSM Land Title Survey shall bear only the following certification, unaltered, except as may be required pursuant to Section 3.B. above:

To (name of insured, if known), (name of lender, if known), (name of insurer, if known), (names of others as negotiated with the client):

This is to certify that this map or plat and the survey on which it is based were made in accordance with the 2011 Minimum Standard Detail Requirements for ALTA/ACSM Land Title Surveys, jointly established and adopted by ALTA and NSPS, and includes Items _____ of Table A thereof. The field work was completed on _____.

Date of Plat or Map: _____ (Surveyor's signature, printed name and seal with Registration/License Number)

8. **Deliverables** - The surveyor shall furnish copies of the plat or map of survey to the insurer and client, and as otherwise negotiated with the client. Hard copies shall be on durable and dimensionally stable material of a quality standard acceptable to the insurer. Digital copies of the plat or map may be provided in addition to, or in lieu of, hard copies in accordance with the terms of the contract. When required by law or requested by the client, the plat or map shall be produced in recordable form and recorded or filed in the appropriate office or with the appropriate agency.



TABLE A

OPTIONAL SURVEY RESPONSIBILITIES AND SPECIFICATIONS

NOTE: The items of Table A must be negotiated between the surveyor and client. It may be necessary for the surveyor to qualify or expand upon the description of these items (e.g., in reference to Item 6(b), there may be a need for an interpretation of a restriction). The surveyor cannot make a certification on the basis of an interpretation or opinion of another party. Notwithstanding Table A Items 5 and 11(b), if an engineering design survey is desired as part of an ALTA/ACSM Land Title Survey, such services should be negotiated under Table A, item 22.

If checked, the following optional items are to be included in the ALTA/ACSM LAND TITLE SURVEY, except as otherwise qualified (see note above):

1. _____ *Monuments placed (or a reference monument or witness to the corner) at all major corners of the boundary of the property, unless already marked or referenced by existing monuments or witnesses.*
2. _____ *Address(es) if disclosed in Record Documents, or observed while conducting the survey.*
3. _____ *Flood zone classification (with proper annotation based on federal Flood Insurance Rate Maps or the state or local equivalent) depicted by scaled map location and graphic plotting only.*
4. _____ *Gross land area (and other areas if specified by the client).*
5. _____ *Vertical relief with the source of information (e.g. ground survey or aerial map), contour interval, datum, and originating benchmark identified.*
6. _____ *(a) Current zoning classification, as provided by the insurer.*
_____ *(b) Current zoning classification and building setback requirements, height and floor space area restrictions as set forth in that classification, as provided by the insurer. If none, so state.*
7. _____ *(a) Exterior dimensions of all buildings at ground level.*
(b) Square footage of:
_____ *(1) exterior footprint of all buildings at ground level.*
_____ *(2) other areas as specified by the client.*
_____ *(c) Measured height of all buildings above grade at a location specified by the client. If no location is specified, the point of measurement shall be identified.*



8. _____ *Substantial features observed in the process of conducting the survey (in addition to the improvements and features required under Section 5 above) such as parking lots, billboards, signs, swimming pools, landscaped areas, etc.*
9. _____ *Striping, number and type (e.g. handicapped, motorcycle, regular, etc.) of parking spaces in parking areas, lots and structures.*
10. _____ *(a) Determination of the relationship and location of certain division or party walls designated by the client with respect to adjoining properties (client to obtain necessary permissions).*
- _____ *(b) Determination of whether certain walls designated by the client are plumb (client to obtain necessary permissions).*
11. _____ *Location of utilities (representative examples of which are listed below) existing on or serving the surveyed property as determined by:*
- _____ *(a) Observed evidence.*
- _____ *(b) Observed evidence together with evidence from plans obtained from utility companies or provided by client, and markings by utility companies and other appropriate sources (with reference as to the source of information).*
- *Railroad tracks, spurs and sidings;*
 - *Manholes, catch basins, valve vaults and other surface indications of subterranean uses;*
 - *Wires and cables (including their function, if readily identifiable) crossing the surveyed property, and all poles on or within ten feet of the surveyed property. Without expressing a legal opinion as to the ownership or nature of the potential encroachment, the dimensions of all encroaching utility pole crossmembers or overhangs; and*
 - *utility company installations on the surveyed property.*
- Note - With regard to Table A, item 11(b), source information from plans and markings will be combined with observed evidence of utilities to develop a view of those underground utilities. However, lacking excavation, the exact location of underground features cannot be accurately, completely and reliably depicted. Where additional or more detailed information is required, the client is advised that excavation may be necessary.*
12. _____ *Governmental Agency survey-related requirements as specified by the client, such as for HUD surveys, and surveys for leases on Bureau of Land Management managed lands.*
13. _____ *Names of adjoining owners of platted lands according to current public records.*
14. _____ *Distance to the nearest intersecting street as specified by the client.*
15. _____ *Rectified orthophotography, photogrammetric mapping, airborne/mobile laser scanning and other similar products, tools or technologies as the showing the location of certain features (excluding where ground measurements are not*

basis for the boundaries)



otherwise necessary to locate those features to an appropriate and acceptable accuracy relative to a nearby boundary. The surveyor shall (a) discuss the ramifications of such methodologies (e.g. the potential precision and completeness of the data gathered thereby) with the insurer, lender and client prior to the performance of the survey and, (b) place a note on the face of the survey explaining the source, date, precision and other relevant qualifications of any such data.

16. _____ *Observed evidence of current earth moving work, building construction or building additions.*
17. _____ *Proposed changes in street right of way lines, if information is available from the controlling jurisdiction. Observed evidence of recent street or sidewalk construction or repairs.*
18. _____ *Observed evidence of site use as a solid waste dump, sump or sanitary landfill.*
19. _____ *Location of wetland areas as delineated by appropriate authorities.*
20. _____ *(a) Locate improvements within any offsite easements or servitudes benefitting the surveyed property that are disclosed in the Record Documents provided to the surveyor and that are observed in the process of conducting the survey (client to obtain necessary permissions).*
- _____ *(b) Monuments placed (or a reference monument or witness to the corner) at all major corners of any offsite easements or servitudes benefitting the surveyed property and disclosed in Record Documents provided to the surveyor (client to obtain necessary permissions).*
21. _____ *Professional Liability Insurance policy obtained by the surveyor in the minimum amount of \$_____ to be in effect throughout the contract term. Certificate of Insurance to be furnished upon request.*
22. _____ _____

*Adopted by the Board of Governors, American Land Title Association, on October 13, 2010.
American Land Title Association, 1828 L St., N.W., Suite 705, Washington, D.C. 20036.*

*Adopted by the Board of Directors, National Society of Professional Surveyors, on November 15, 2010.
National Society of Professional Surveyors, Inc., a member organization of the American Congress on Surveying and Mapping, 6 Montgomery Village Avenue, Suite 403, Gaithersburg, MD 20879*



ATTACHMENT B

**TECHNICAL REQUIREMENTS AND SPECIFICATIONS
REHABILITATION OF CONCRETE AND MASONRY
MANHOLES OR UNDERGROUND VAULTS
WITH A PROTECTIVE COATING**

FOREWORD

This specification covers work, materials and equipment required for protecting and/or rehabilitating concrete and masonry manholes and other underground vaults by monolithic spray-application of a high-build, solvent-free epoxy coating to eliminate infiltration, provide corrosion protection, repair voids and enhance structural integrity. Procedures for surface preparation, cleaning, application and testing are described herein.

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Requirements for surface preparation, repairs and solvent-free epoxy coating application to specified surfaces.

1.02 RELATED SECTIONS

- A. Concrete Repair.
- B. Environmental, Health and Safety.

1.03 REFERENCES

- A. ASTM D638 - Tensile Properties of Plastics.
- B. ASTM D790 - Flexural Properties of Unreinforced and Reinforced Plastics.
- C. ASTM D695 - Compressive Properties of Rigid Plastics.
- D. ASTM D4541 - Pull-off Strength of Coatings Using a Portable Adhesion Tester.
- E. ASTM D2584 - Volatile Matter Content.
- F. ASTM D2240 - Durometer Hardness, Type D.
- G. ASTM D543 - Resistance of Plastics to Chemical Reagents.
- H. ASTM C109 - Compressive Strength Hydraulic Cement Mortars.

- I. ACI 506.2-77 - Specifications for Materials, Proportioning, and Application of Shotcrete.
- J. ASTM C579 - Compressive Strength of Chemically Setting Silicate and Silica Chemical Resistant Mortars.
- K. ASTM - The published standards of the American Society for Testing and Materials, West Conshohocken, PA.
- L. NACE - The published standards of National Association of Corrosion Engineers (NACE International), Houston, TX.
- M. SSPC - The published standards of the Society of Protective Coatings, Pittsburgh, PA.

1.04 SUBMITTALS

- A. The following items shall be submitted:
 - 1. Technical data sheet on each product used, including ASTM test results indicating the product conforms to and is suitable for its intended use per these specifications.
 - 2. Material Safety Data Sheets (MSDS) for each product used.
 - 3. Project specific guidelines and recommendations.
 - 4. Applicator Qualifications:
 - a. Manufacturer certification that Applicator has been trained and approved in the handling, mixing and application of the products to be used.
 - b. Certification that the equipment to be used for applying the products has been manufactured or approved by the protective coating manufacturer and Applicator personnel have been trained and certified for proper use of the equipment.
 - c. Five (5) recent references of Applicator (projects similar size and scope) indicating successful application of a high-build solvent-free epoxy coating by plural component spray application.
 - d. Proof of any necessary federal, state or local permits or licenses necessary for the project.
 - 5. Design details for any additional ancillary systems and equipment to be used in site and surface preparation, application and testing.

1.05 QUALITY ASSURANCE

- A. Applicator shall initiate and enforce quality control procedures consistent with applicable ASTM, NACE and SSPC standards and the protective coating manufacturer's recommendations.
- B. (OPTIONAL) A NACE Certified Coating Inspector shall be provided by Owner. The Inspector will observe surface preparation, application and material handling procedures to ensure adherence to the specifications.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Materials are to be kept dry, protected from weather and stored under cover.
- B. Protective coating materials are to be stored between 50 deg F and 90 deg F. Do not store near flame, heat or strong oxidants.
- C. Protective coating materials are to be handled according to their material safety data sheets.

1.07 SITE CONDITIONS

- A. Applicator shall conform with all local, state and federal regulations including those set forth by OSHA, RCRA and the EPA and any other applicable authorities.
- B. Method statements and design procedures are to be provided by the Contractor when confined space entry, flow diversion or bypass is necessary in order for Applicator to perform the specified work.

1.08 WARRANTY

- A. Applicator shall warrant all work against defects in materials and workmanship for a period of one (1) year, unless otherwise noted, from the date of final acceptance of the project. Applicator shall, within a reasonable time after receipt of written notice thereof, repair defects in materials or workmanship which may develop during said one (1) year period, and any damage to other work caused by such defects or the repairing of same, at his own expense and without cost to the Government.

PART 2 - PRODUCTS

2.01 EXISTING PRODUCTS

- A. Standard Portland cement or new concrete (not quick setting high strength cement) must be well cured prior to application of the protective coating. Generally, 28 days is adequate cure time for standard Portland. If earlier application is desired, compressive or tensile strength of the concrete can be tested to determine if acceptable cure has occurred. (Note: Bond strength of the coating to the concrete surface is generally limited to the tensile strength of the concrete itself. Engineer may require Elcometer pull tests to determine suitability of concrete for coating)
- B. Cementitious patching and repair materials should not be used unless their manufacturer provides information as to its suitability and procedures for top coating with an epoxy coating. Project specific submittals should be provided including application, cure time and surface preparation procedures, which permit optimum bond strength with the epoxy coating.
- C. Remove existing coatings prior to application of the new protective coating. Applicator is to maintain strict adherence to applicable NACE and SSPC recommendations with regard to proper surface preparation and compatibility with existing coatings.

2.02 MANUFACTURER

- A. Raven Lining Systems, Inc. or equal, Tulsa, Oklahoma 800-324-2810 or 918-584-2810 or FAX 918-582-4311.

2.03 REPAIR MATERIALS

- A. Repair materials shall be used to fill voids, structurally reinforce and/or rebuild surfaces, etc. as determined necessary by the engineer and protective coating applicator. Repair materials must be compatible with the specified epoxy coating and shall be applied in accordance with the manufacturer's recommendations.
- B. The following products may be accepted and approved as compatible repair basecoat materials for epoxy top coating for use within the specifications:
 - 1. 100% solids, solvent-free epoxy grout specifically formulated for epoxy top coating compatibility. The epoxy grout manufacturer shall provide instructions for trowel or spray application and for epoxy top coating procedures.
 - 2. Factory blended, rapid setting, high early strength, fiber reinforced, non-shrink repair mortar that can be trowelled or pneumatically spray applied may be approved if specifically formulated to be suitable for epoxy top coating. Such repair

mortars should not be used unless their manufacturer provides information as to its suitability for top coating with an epoxy coating. Project specific submittals should be provided including application, cure time and surface preparation procedures, which permit optimum bond strength with the epoxy coating.

2.04 PROTECTIVE COATING MATERIAL

- A. Raven 405 Lining System epoxy coating system or equal - a 100% solids, solvent-free two-component epoxy resin system thixotropic in nature and filled with select fillers to minimize permeability and provide sag resistance acceptable to these specifications. (up to {depends on product} mils in a single coat).

| | |
|--------------------------|---|
| Product type | Amine cured epoxy |
| Color | White |
| Solids Content (vol %) | 100 |
| Mix Ratio | 1:1 <i>Aquatapoxy</i> 3:1 <i>Raven or equal</i> |
| Compressive Strength | ASTM D695 (18,000psi) |
| Tensile Strength, psi | ASTM D638 (7,600psi) |
| Tensile Elongation, % | ASTM D638 (1.5%) |
| Flexural Modulus, psi | ASTM D790 (13,000psi) |
| Hardness, Type D | ASTM D2240 (88) |
| Bond Strength - Concrete | >Tensile Strength of Concrete |

2.05 PROTECTIVE COATING APPLICATION EQUIPMENT

- A. Manufacturer approved heated plural component spray equipment shall be used in the application of the specified protective coating.

2.06 REPAIR MORTAR SPRAY APPLICATION EQUIPMENT (if spray applied)

- A. Spray applied repair mortars shall be applied with manufacturer approved equipment.

PART 3 - EXECUTION

3.01 ACCEPTABLE APPLICATORS

- A. Repair mortar applicators shall be trained to properly apply the cementitious mortar according to manufacturer's recommendations.
- B. Protective coating must be applied by a Certified Applicator of the protective coating manufacturer and according to manufacturer specifications.

3.02 EXAMINATION

- A. All structures to be coated shall be readily accessible to Applicator.
- B. Appropriate actions shall be taken to comply with local, state and federal regulatory and other applicable agencies with regard to environment, health and safety.
- C. Any active flows shall be dammed, plugged or diverted as required to ensure that the liquid flow is maintained below the surfaces to be coated. Flows should be totally plugged and/or diverted when coating the invert. All extraneous flows into the manhole or vaults at or above the area coated shall be plugged and/or diverted until the epoxy has set hard to the touch. As an option, hot air may be added to the manhole to accelerate set time of the coating.
- D. No leaks may be present prior to commencing and during work.
- E. Installation of the protective coating shall not commence until the concrete substrate has properly cured in accordance with these specifications.
- F. Temperature of the surface to be coated should be maintained between 40 deg F and 120 deg F during application. Prior to and during application, care should be taken to avoid exposure of direct sunlight or other intense heat source to the structure being coated. Where varying surface temperatures do exist, care should be taken to apply the coating when the temperature is falling versus rising (i.e. late afternoon into evening vs. morning into afternoon).

3.03 SURFACE PREPARATION

- A. Applicator shall inspect all surfaces specified to receive a protective coating prior to surface preparation. Applicator shall notify Contracting Officer of any noticeable disparity in the surfaces, which may interfere with the proper preparation, or application of the repair mortar and protective coating.
- B. All contaminants including: oils, grease, incompatible existing coatings, waxes, form release, curing compounds, efflorescence, sealers, salts, or other contaminants shall be removed.

- C. All concrete or mortar that is not sound or has been damaged by chemical exposure shall be removed to a sound concrete surface or replaced.
- D. Surface preparation method(s) should be based upon the conditions of the substrate, service environment and the requirements of the epoxy protective coating to be applied.
- E. Surfaces to receive protective coating shall be cleaned and abraded to produce a sound surface with adequate profile and porosity to provide a strong bond between the protective coating and the substrate. Generally, this can be achieved with high-pressure water cleaning using equipment capable of 5,000 psi at 4 gpm. Other methods such as high-pressure water jetting (refer to NACE Standard No. 5/SSPC-SP12), abrasive blasting, shot blasting, grinding, scarifying or acid etching may also be used. Detergent water cleaning and hot water blasting may be necessary to remove oils, grease or other hydrocarbon residues from the concrete. Whichever method(s) are used, they shall be performed in a manner that provides a uniform, sound clean neutralized surface that is not excessively damaged.
- F. Infiltration shall be stopped by using a material, which is compatible with the specified repair mortar and is suitable for top coating with the specified epoxy protective coating.
- G. The area between the manhole and the manhole ring and any other area that might exhibit movement or cracking due to expansion and contraction, shall be grouted with a flexible grout or gel.
- H. Castings can be abrasive blasted and coated to prevent corrosion if desired.
- I. All surfaces should be inspected by the Inspector during and after preparation and before the repair material is applied.

3.04 APPLICATION OF REPAIR MATERIALS

- A. Areas where structural steel has been exposed or removed shall be repaired in accordance with the Contracting Officer's recommendations.
- B. Repair materials shall meet the specifications herein. The materials shall be trowel or spray applied utilizing proper equipment on to specified surfaces. The material thickness shall be 150 mils.
- C. If using approved cementitious repair materials, such shall be trowel led to provide a smooth surface with an average profile equivalent to coarse sandpaper to optimally receive the protective coating. No bugholes or honeycomb surfaces should remain after the final trowel procedure of the repair mortar.

- D. The repair materials shall be permitted to cure according to manufacturer recommendations. Curing compounds should not be used unless approved for compatibility with the specified protective coating.
- E. Application of the repair materials, if not performed by the coating certified applicator, should be inspected by the protective coating certified applicator to ensure proper finishing for suitability to receive the specified coating.
- F. After abrasive blast and leak repair is performed, all surfaces shall be inspected for remaining laitance prior to protective coating application. Any evidence of remaining contamination or laitance shall be removed by additional abrasive blast, shot blast or other approved method. If repair materials are used, refer to these specifications for surface preparation. Areas to be coated must also be prepared in accordance with these specifications after receiving a cementitious repair mortar and prior to application of the epoxy coating.
- G. All surfaces should be inspected during and after preparation and before the protective coating is applied.

3.05 APPLICATION OF PROTECTIVE COATING

- A. Application procedures shall conform to the recommendations of the protective coating manufacturer, including material handling, mixing, environmental controls during application, safety, and spray equipment.
- B. The spray equipment shall be specifically designed to accurately ratio and apply the specified protective coating materials and shall be regularly maintained and in proper working order.
- C. The protective coating material must be spray applied by a Certified Applicator of the protective coating manufacturer.
- D. Specified surfaces shall be coated by spray application of moisture tolerant, solvent-free, 100% solids, epoxy protective coating as further described herein. Spray application shall be to a minimum dry film thickness of 150 mils.
- E. Airless spray application equipment approved by the coating manufacturer shall be used to apply each coat of the protective coating. Air assisted spray application equipment may be acceptable, especially for thinner coats (<10 mils), only if the air source is filtered to completely remove all oil and water.
- F. If necessary, subsequent top coating or additional coats of the protective coating should occur as soon as the basecoat becomes tack free, ideally within 12 hours but no later than the recoat window for the specified products. Additional surface preparation procedures will be required if this recoat window is exceeded.
- G. Fiberglass woven-roving fabric may be rolled into the resin or chopped glass spray applied with the resin for added tensile and flexural strength

where desired. Sloped surfaces of the floor may be made non-skid by broadcasting aluminum oxide or silica sand into the surface prior to gelation.

- H. Depending on flow levels and how long flow can be stopped, inverts may be lined with an approved 100% solids, fast setting epoxy coating material.

3.06 TESTING AND INSPECTION

- A. During application a wet film thickness gage, such as those available through Paul N. Gardner Company, Inc. meeting ASTM D4414 - Standard Practice for Measurement of Wet Film Thickness of Organic Coatings by Notched Gages, shall be used to ensure a monolithic coating and uniform thickness during application.
- B. (Optional – Note that this procedure is sometimes difficult or impossible to perform in tight manhole or vault structures) After the protective coating has set hard to the touch it shall be inspected with high-voltage holiday detection equipment. Surface shall first be dried; an induced holiday shall then be made on to the coated concrete surface and shall serve to determine the minimum/maximum voltage to be used to test the coating for holidays at that particular area. The spark tester shall be initially set at 100 volts per 1 mil (25 microns) of film thickness applied but may be adjusted as necessary to detect the induced holiday (refer to NACE RPO188-99). All detected holidays shall be marked and repaired by abrading the coating surface with grit disk paper or other hand tooling method. After abrading and cleaning, additional protective coating material can be hand applied to the repair area. All touch-up/repair procedures shall follow the protective coating manufacturer's recommendations.
- C. Measurement of bond strength of the protective coating to the substrate can be measured in accordance with ASTM D4541. The Contracting Officer shall evaluate any areas detected to have inadequate bond strength. Further bond tests may be performed in that area to determine the extent of potentially deficient bonded area and repairs shall be made by Applicator in strict accordance with manufacturer's recommendations.
- D. Manhole Testing - Type A: Manholes lined in their entirety may be vacuum tested. All pipes entering the manhole should be plugged, taking care to securely place the plug from being drawn into the manhole. The test head shall be placed and the seal inflated in accordance with the manufacturer's recommendations. A vacuum pump of ten (10) inches of mercury shall be drawn and the vacuum pump shut off. With the valves closed, the time shall be measured for the vacuum to drop to nine (9) inches. Following are minimum allowable test times for manhole acceptance at the specified vacuum drop:

| DEPTH (FEET) | TIME (SECONDS) | | |
|--------------------------|---------------------|---------------------|---------------------|
| | <u>48" diameter</u> | <u>60" diameter</u> | <u>72" diameter</u> |
| 4 | 10 | 13 | 16 |
| 8 | 20 | 26 | 33 |
| 12 | 30 | 39 | 49 |
| 16 | 40 | 52 | 67 |
| 20 | 50 | 65 | 81 |
| 24 | 59 | 78 | 97 |
| Add for 2ft. more depth: | 5 | 6.66 | 8 |

Note: These numbers have been taken from ASTM C 1244-93 (reapproved 2000).

If the manhole fails the initial test, repairs and adjustments necessary due to extenuating circumstances (i.e. pipe joint, liner, plug sealing) should be made. Retesting shall proceed until a satisfactory test is obtained.

Manhole Testing - Type B: Manholes lined in their entirety (including invert) may be subjected to an exfiltration test. Incoming and outgoing sewer and service lines shall be plugged, the plugs restrained and the manhole filled with water to the top of the manhole frame. A soaking period of up to 1 hour will be allowed if bypassing of the sewage is not required or has been provided for. At the end of this optional soaking period, the manhole shall be refilled with water and the test begun. If the water loss exceeds that shown in the following table, the manhole will have failed the test. Repairs and adjustments necessary due to extenuating circumstances (i.e. pipe joint, liner, plug sealing) should be made. Retesting shall proceed until a satisfactory test is obtained. Maximum Allowable Loss is determined assuming a standard 4-foot diameter manhole.

| <u>Depth of Manhole</u> | <u>Maximum Allowable Loss</u> |
|-------------------------|-------------------------------------|
| Under 8 feet deep | 1 inch in 5 minutes |
| Over 8 feet deep | 1/8" per foot of depth in 5 minutes |

- E. A final visual inspection shall be made by the Inspector and Applicator. Any deficiencies in the finished coating shall be marked and repaired according to the procedures set forth herein by Applicator.
- F. The municipal sewer system may be put back into non-severe operational service as soon as the final inspection has taken place. However, for severe corrosion duty such as high concentrations of acids, bases or solvents, 3 to 7 days and/or force cure by heat induction to the coated surfaces may be necessary prior to returning to service. Consult coating manufacturer for further details.

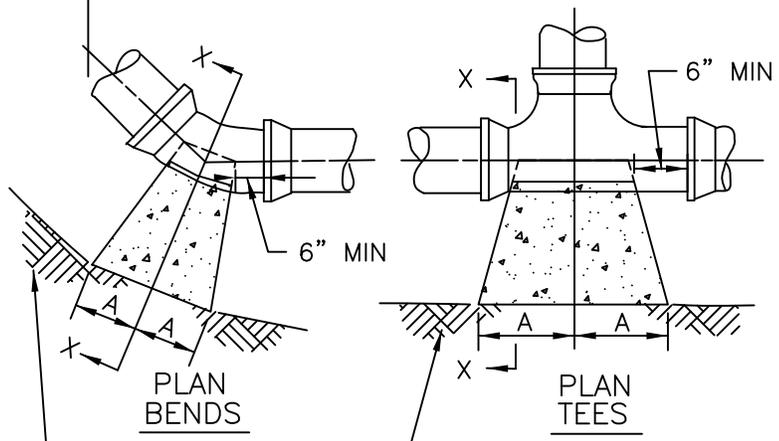
PART 4 - PAYMENT

4.0 Unit price shall be per vertical foot of line item as installed. The unit price shall include all incidentals such as bypass pumping, mobilization and demobilization, and sample testing in the line item vertical foot price.

END OF SECTION

ATTACHMENT C

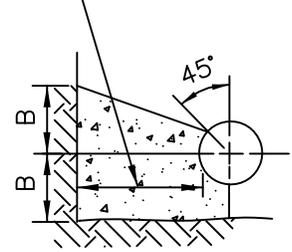
| REVISIONS | | | | |
|-----------|-----|-------------|------|----------|
| ZONE | REV | DESCRIPTION | DATE | APPROVED |



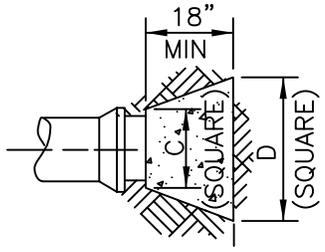
COMPACTED OR UNDISTURBED EARTH (TYPICAL)

PHOTOGRAPH EACH THRUST BLOCK BEFORE COVERING

24" MIN 12" & LARGER PIPE
18" MIN 10" & SMALLER PIPE



SECTION X-X
BENDS & TEES



PLAN & ELEVATION
PLUGS

| SIZE | 1/4 BENDS | | 1/8 BENDS | | 1/16 BENDS | | TEES | | PLUGS | |
|------|-----------|-----|-----------|-----|------------|-----|------|-----|-------|-----|
| | A | B | A | B | A | B | A | B | C | D |
| 6" | 16" | 10" | 9" | 10" | 6" | 8" | 10" | 12" | 10" | 21" |
| 8" | 22" | 13" | 12" | 13" | 8" | 10" | 13" | 16" | 12" | 29" |
| 10" | 26" | 17" | 14" | 17" | 10" | 13" | 16" | 20" | 14" | 36" |
| 12" | 29" | 21" | 16" | 21" | 11" | 16" | 18" | 24" | 16" | 41" |
| 14" | 35" | 24" | 19" | 24" | 12" | 20" | 22" | 27" | 18" | 48" |
| 16" | 38" | 27" | 21" | 27" | 12" | 24" | 24" | 30" | 20" | 54" |

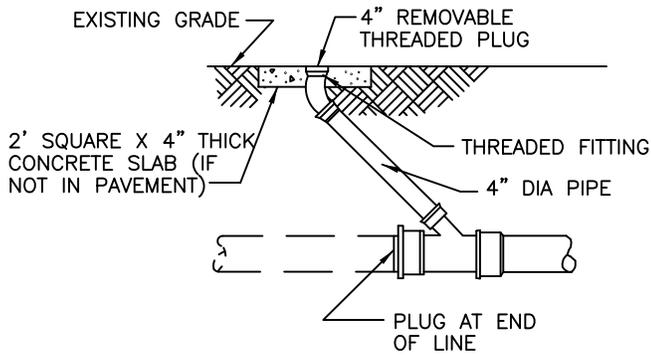
THRUST BLOCKS

NOT TO SCALE



| | | | |
|---|----------|---------------|-----|
| UTILITIES MAINTENANCE AND REPAIR CONTRACT N40085-15-R-7905 | | | |
| THRUST BLOCKS STANDARD DETAILS | | | |
| SIZE | FSCM NO. | DWG NO. | REV |
| SCALE NONE | | SHEET 1 OF 11 | |

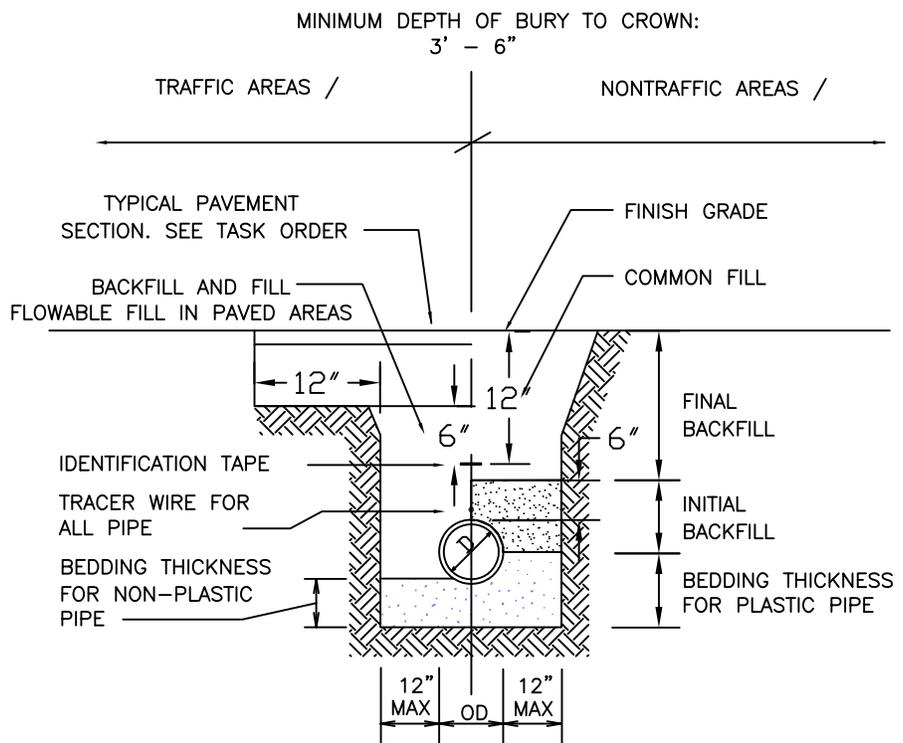
| REVISIONS | | | | |
|-----------|-----|-------------|------|----------|
| ZONE | REV | DESCRIPTION | DATE | APPROVED |



FOR PAVED AREAS UNLESS NOTED IN TASK ORDER:
 2" OF INDOT SPEC # 11 (9.5MM) UNDER
 4" OF INDOT SPEC # 5 (25MM)

CLEANOUT DETAIL

NOT TO SCALE



NOTE: PROVIDE BEDDING IN ACCORDANCE WITH THE SPECIFICATIONS.

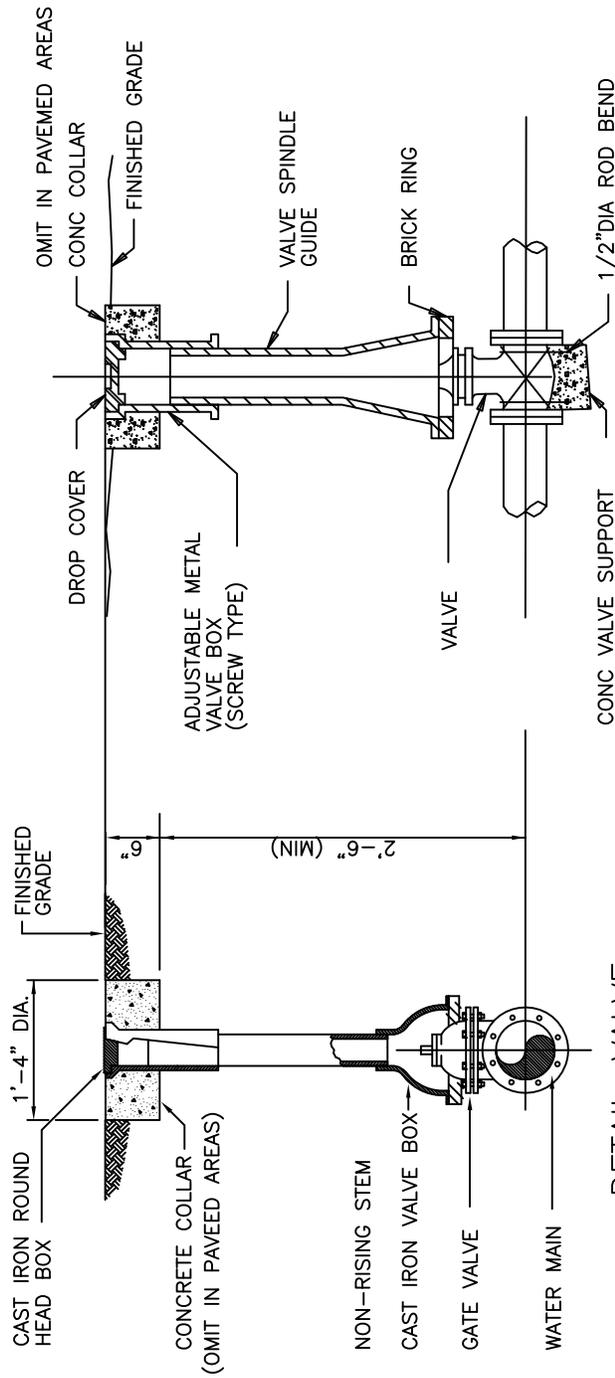
**TRENCH CROSS SECTION
 PLASTIC/NON-PLASTIC PIPE**

NOT TO SCALE



| | | | |
|---|----------|---------------|-----|
| UTILITIES MAINTENANCE AND REPAIR CONTRACT N40085-15-R-7905 | | | |
| UTILITY TRENCH STANDARD DETAILS | | | |
| SIZE | FSCM NO. | DWG NO. | REV |
| SCALE | NONE | SHEET 2 OF 11 | |

| REVISIONS | | | | |
|-----------|-----|-------------|------|----------|
| ZONE | REV | DESCRIPTION | DATE | APPROVED |



SECTION

VALVE BOX
NOT TO SCALE

PHOTOGRAPH EACH VALVE
BEFORE COVERING

DETAIL-VALVE
NOT TO SCALE



UTILITIES MAINTENANCE AND REPAIR CONTRACT
N40085-15-R-7905

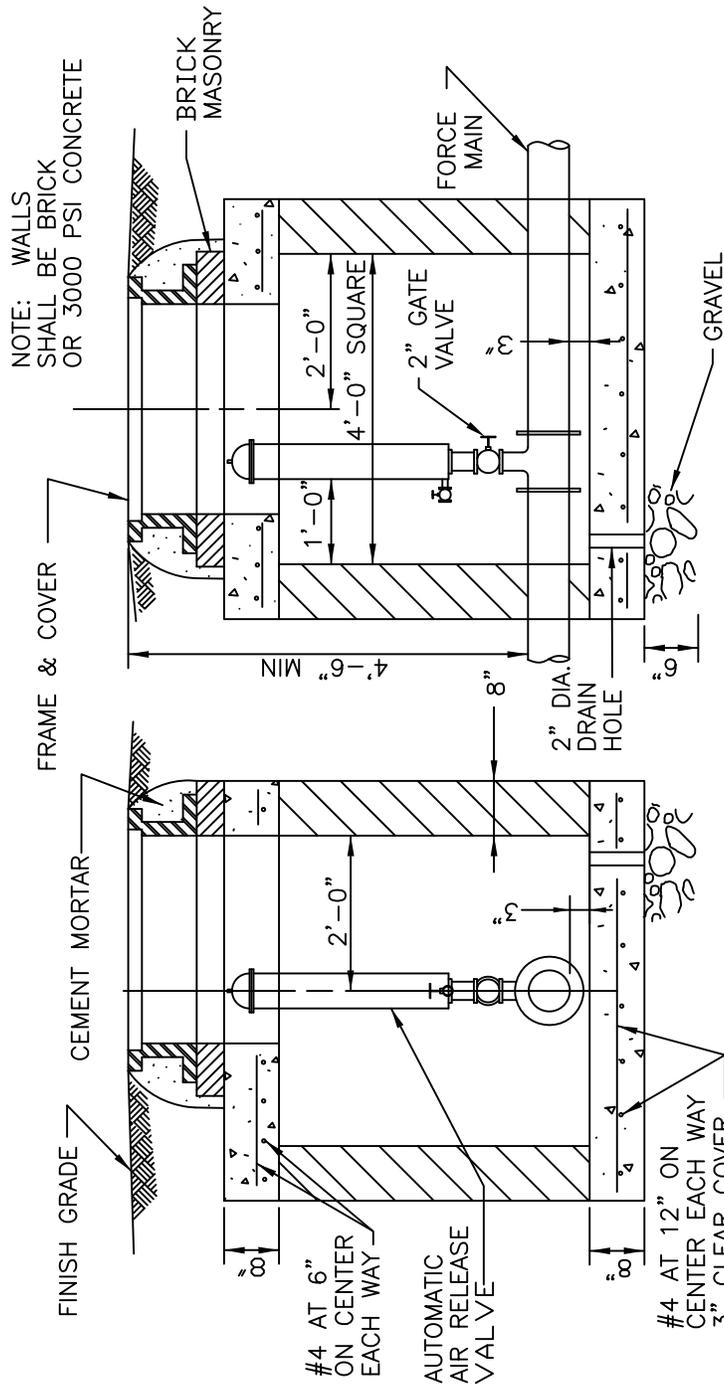
VALVE AND BOX STANDARD DETAILS

| | | | |
|------|----------|---------|-----|
| SIZE | FSCM NO. | DWG NO. | REV |
|------|----------|---------|-----|

SCALE NONE

SHEET 3 OF 11

| REVISIONS | | | | |
|-----------|-----|-------------|------|----------|
| ZONE | REV | DESCRIPTION | DATE | APPROVED |
| | | | | |



ELEVATION SECTION

AIR RELEASE VALVE & VAULT

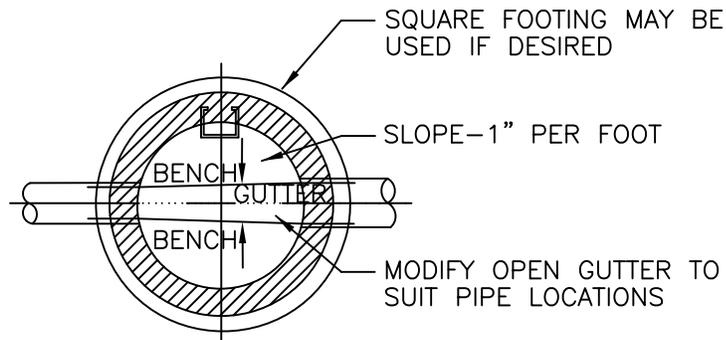
NOT TO SCALE



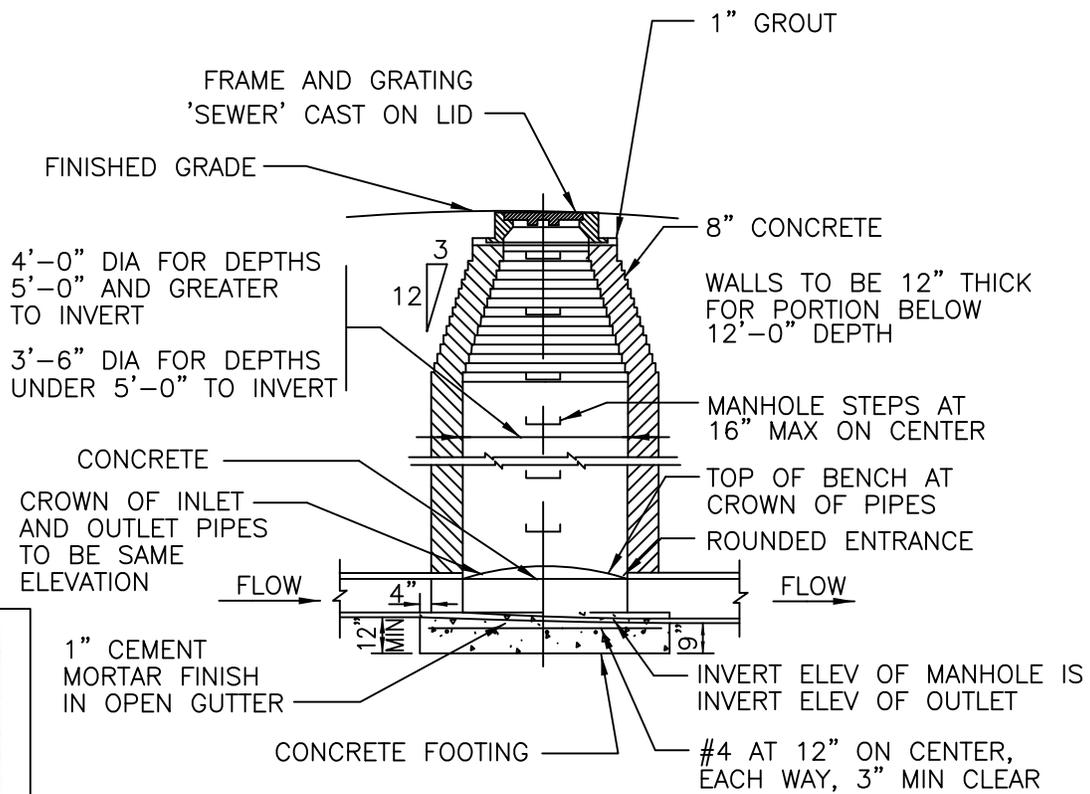
UTILITIES MAINTENANCE AND REPAIR CONTRACT
 N40085-15-R-7905
 AIR RELEASE VALVE STANDARD DETAILS

| | | | |
|-------|----------|---------|---------|
| SIZE | FSCM NO. | DWG NO. | REV |
| SCALE | NONE | SHEET | 4 OF 11 |

| REVISIONS | | | | |
|-----------|-----|-------------|------|----------|
| ZONE | REV | DESCRIPTION | DATE | APPROVED |
| | | | | |



PLAN



SECTION

MANHOLE

NOT TO SCALE



UTILITIES MAINTENANCE AND REPAIR CONTRACT
N40085-15-R-7905

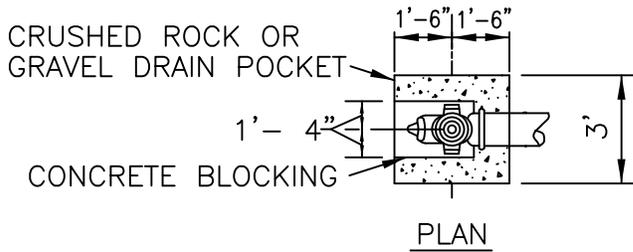
MANHOLE STANDARD DETAILS

| | | | |
|------|----------|---------|-----|
| SIZE | FSCM NO. | DWG NO. | REV |
|------|----------|---------|-----|

SCALE NONE

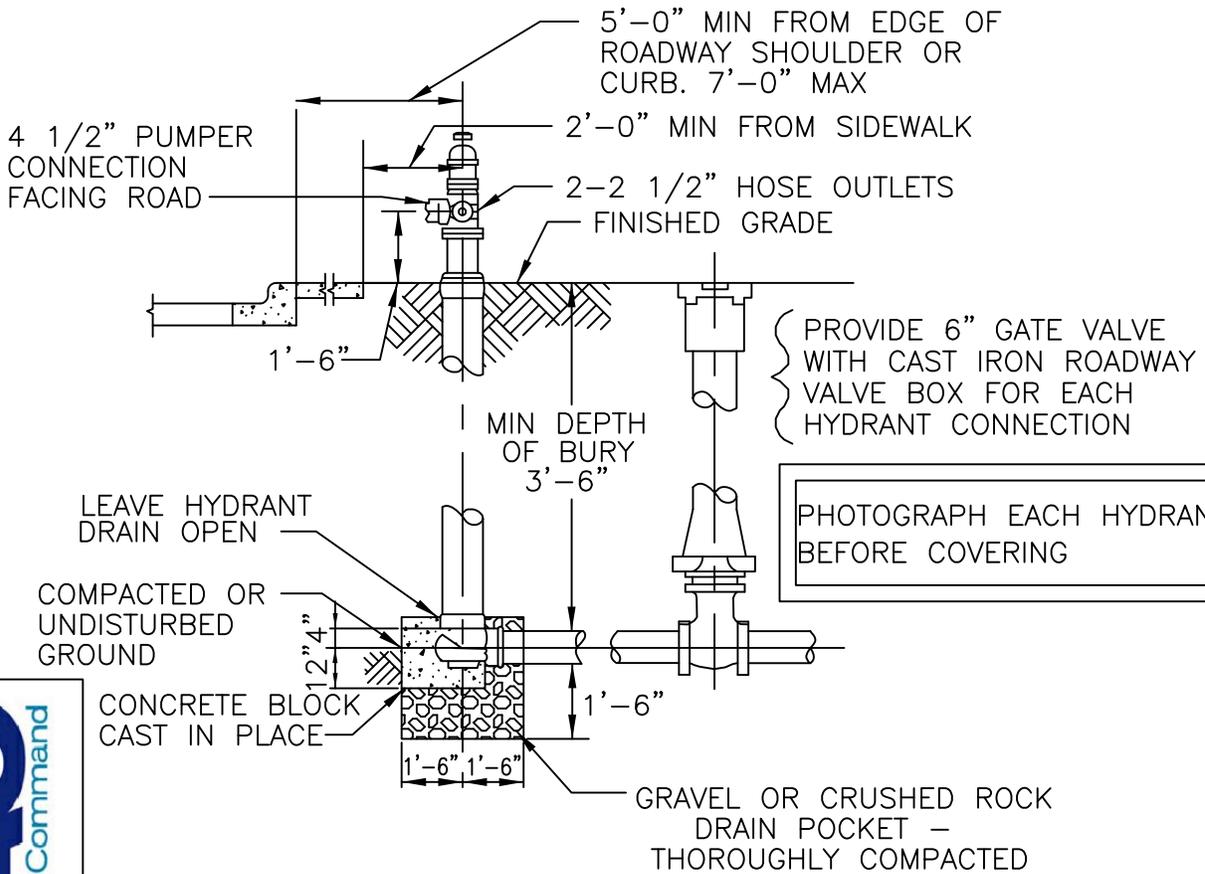
SHEET 5 OF 11

| REVISIONS | | | | |
|-----------|-----|-------------|------|----------|
| ZONE | REV | DESCRIPTION | DATE | APPROVED |



Fire hydrants shall be Kennedy K81-D, Waterous Pacer, or American Flow Control B-84-B unless otherwise specified in the individual Task Order.

Retain old tag if replacement hydrant. Arrange for flow test and paint accordingly.



PHOTOGRAPH EACH HYDRANT BEFORE COVERING

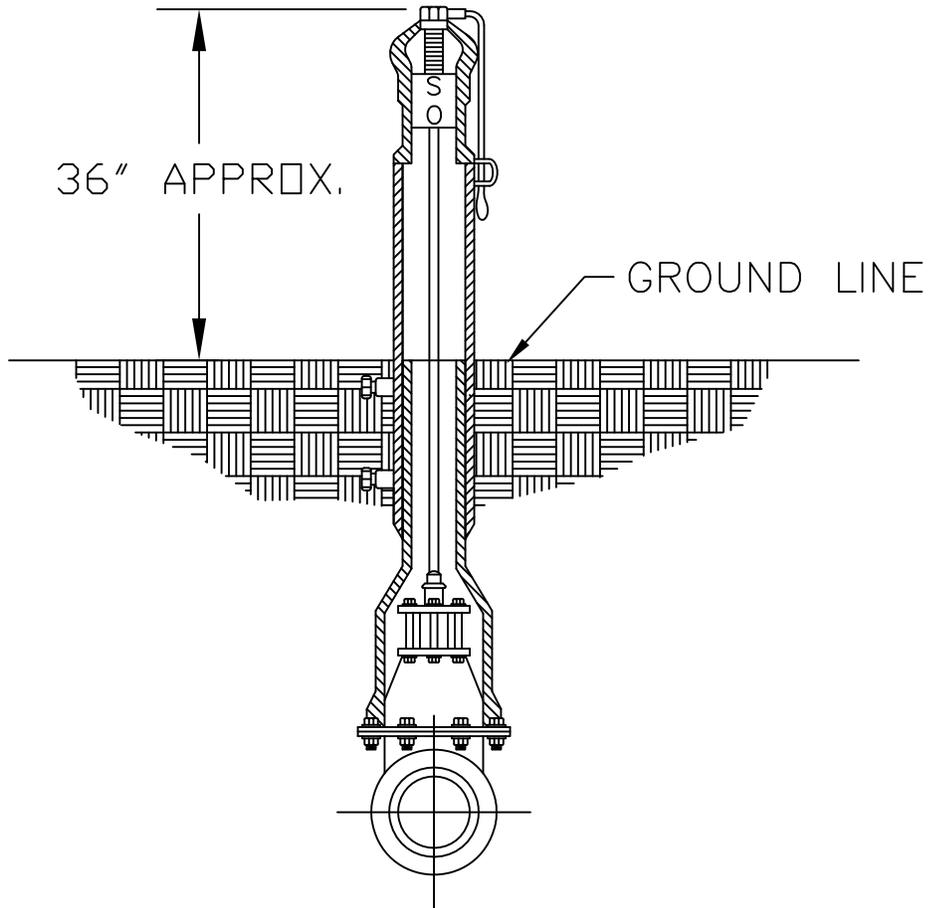
FIRE HYDRANT

NOT TO SCALE



| | | | |
|---|----------|---------------|-----|
| UTILITIES MAINTENANCE AND REPAIR CONTRACT N40085-15-R-7905 | | | |
| DRY BARREL FIRE HYDRANT STANDARD DETAILS | | | |
| SIZE | FSCM NO. | DWG NO. | REV |
| SCALE NONE | | SHEET 6 OF 11 | |

| REVISIONS | | | | |
|-----------|-----|-------------|------|----------|
| ZONE | REV | DESCRIPTION | DATE | APPROVED |



POST INDICATOR VALVE
N.T.S.



UTILITIES MAINTENANCE AND REPAIR CONTRACT
N40085-15-R-7905

POST INDICATOR VALVE
STANDARD DETAILS

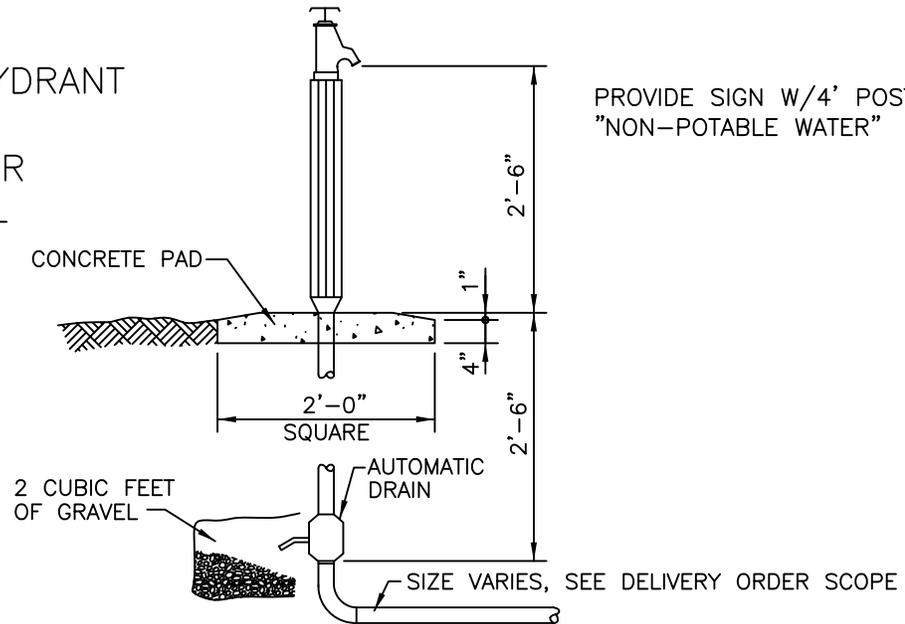
| | | | |
|------|----------|---------|-----|
| SIZE | FSCM NO. | DWG NO. | REV |
|------|----------|---------|-----|

SCALE NONE SHEET 7 OF 11

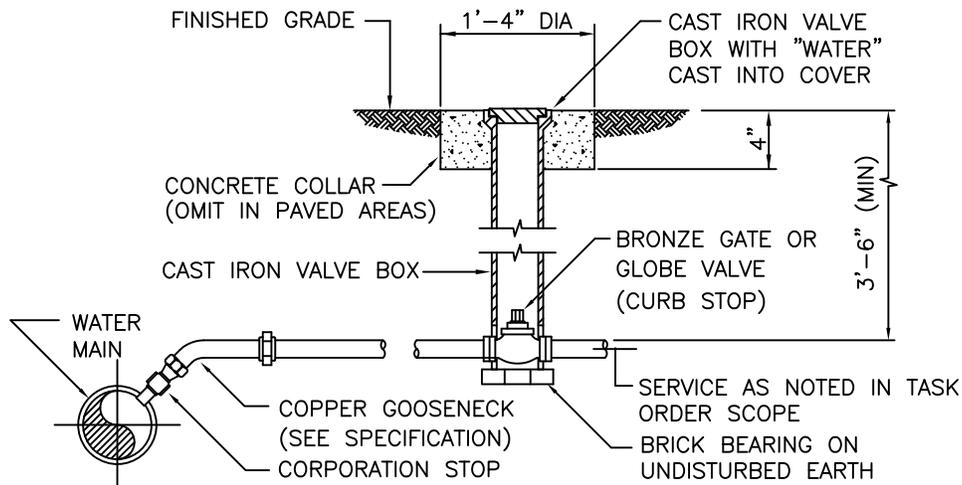
| REVISIONS | | | | |
|-----------|-----|-------------|------|----------|
| ZONE | REV | DESCRIPTION | DATE | APPROVED |

FOR SANITARY HYDRANT
(ASSE 1057)
WOODFORD S3 OR
APPROVED EQUAL

PROVIDE SIGN W/4' POST:
"NON-POTABLE WATER"



YARD HYDRANT
NOT TO SCALE



DETAIL-WATER CONNECTION
NOT TO SCALE



UTILITIES MAINTENANCE AND REPAIR CONTRACT
N40085-15-R-7905

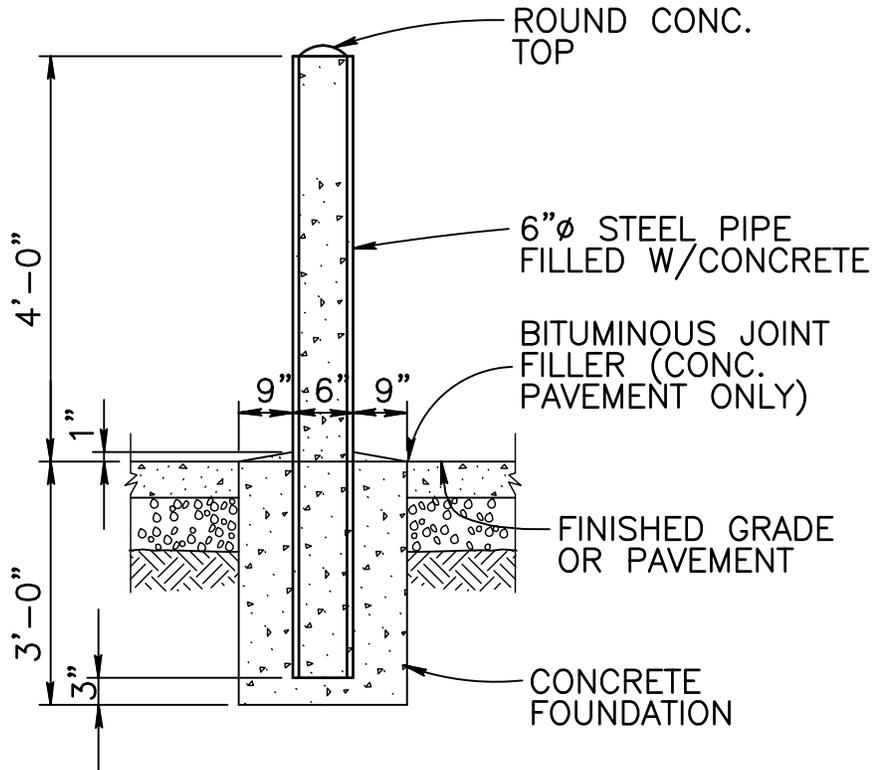
WATER CONECTIONS
STANDARD DETAILS

| | | | |
|------|----------|---------|-----|
| SIZE | FSCM NO. | DWG NO. | REV |
|------|----------|---------|-----|

SCALE NONE

SHEET 8 OF 11

| REVISIONS | | | | |
|-----------|-----|-------------|------|----------|
| ZONE | REV | DESCRIPTION | DATE | APPROVED |
| | | | | |



PIPE BOLLARD DETAIL

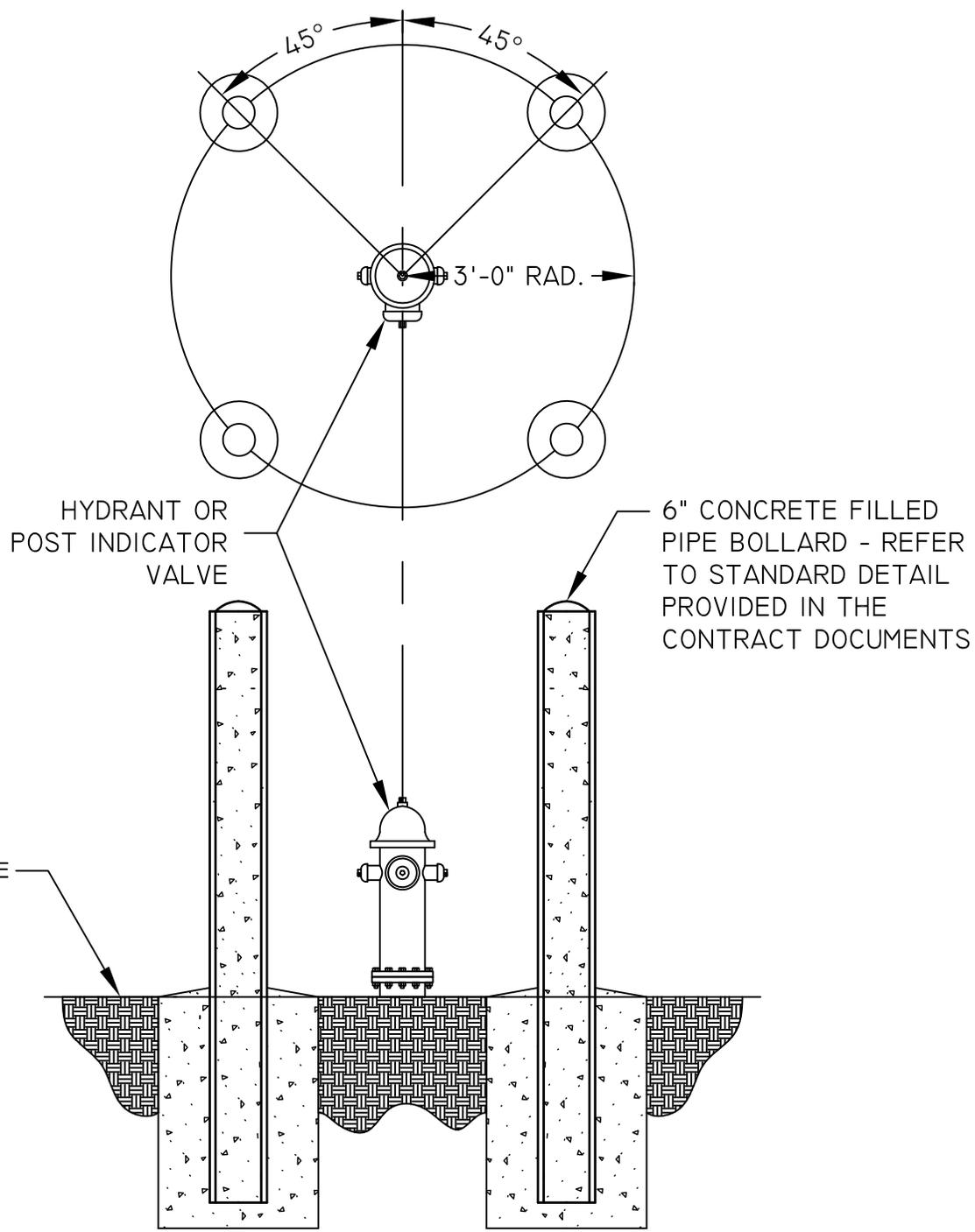
N.T.S.

NOTE: STEEL PIPE SHALL BE GALVANIZED (2.0 OZ. ZINC/SQ. FT.) & HAVE A MINIMUM WALL THICKNESS OF 0.28 INCHES.



| | | | |
|---|----------|---------------|-----|
| UTILITIES MAINTENANCE AND REPAIR CONTRACT N40085-15-R-7905 | | | |
| 6" PIPE BOLLARD, CONCRETE FILLED STANDARD DETAILS | | | |
| SIZE | FSCM NO. | DWG NO. | REV |
| SCALE | NONE | SHEET 9 OF 11 | |

| REVISIONS | | | | |
|-----------|-----|-------------|------|----------|
| ZONE | REV | DESCRIPTION | DATE | APPROVED |



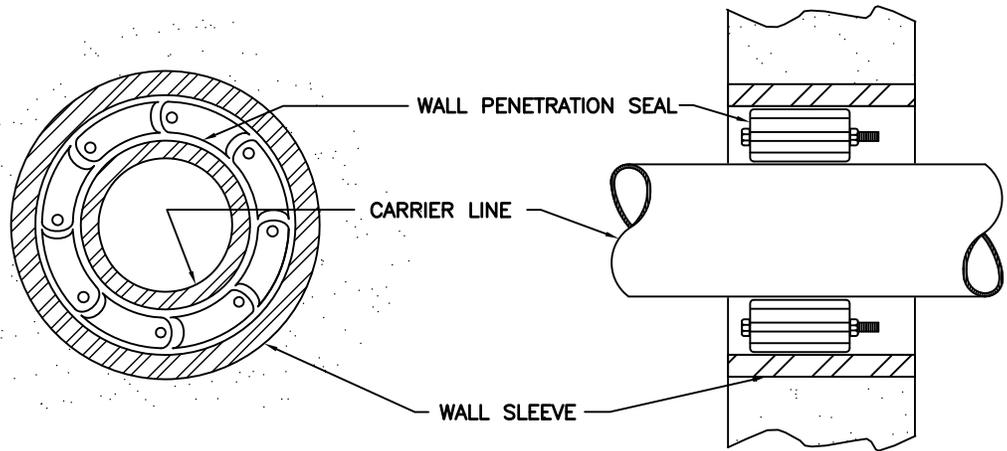
UTILITIES MAINTENANCE AND REPAIR CONTRACT
N40085-15-R-7905

BOLLARD LAYOUT, HYDRANT OR POST INDICATOR VALVE
STANDARD DETAILS

| | | | |
|------|----------|---------|-----|
| SIZE | FSCM NO. | DWG NO. | REV |
|------|----------|---------|-----|

SCALE NONE SHEET 10 OF 11

| REVISIONS | | | | |
|-----------|-----|-------------|------|----------|
| ZONE | REV | DESCRIPTION | DATE | APPROVED |



WALL SLEEVE DETAIL
(END VIEW)
N.T.S.

WALL SLEEVE DETAIL
N.T.S.

NOTES:

1. PIPE PASSING THROUGH THE CONCRETE WALL SHALL BE PROVIDED WITH A DUCTILE IRON OR SCH40 STEEL WALL SLEEVE. THE SLEEVE SHALL BE LONG ENOUGH TO PASS THROUGH THE ENTIRE WALL AND SHALL BE LARGE ENOUGH TO PROVIDE A MINIMUM CLEAR DISTANCE OF 1 1/4 -INCH BETWEEN THE PIPE AND SLEEVE. THE SLEEVE SHALL BE ACCURATELY LOCATED ON CENTER WITH THE PIPE AND SHALL BE SECURELY FASTENED IN PLACE.
2. A MODULAR MECHANICAL TYPE SEALING ASSEMBLY SHALL BE INSTALLED IN ANNULAR SPACE BETWEEN THE PIPE AND SLEEVE. THE SEALS SHALL CONSIST OF INTERLOCKING SYNTHETIC RUBBER LINKS SHAPED TO CONTINUOUSLY FILL THE ANNULAR SPACE BETWEEN THE PIPE AND SLEEVE WITH CORROSION-PROTECTED CARBON STEEL BOLTS, NUTS, AND PRESSURE PLATES. THE LINKS SHALL BE LOOSELY ASSEMBLED WITH BOLTS TO FORM A CONTINUOUS RUBBER BELT AROUND THE PIPE 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 PIPE AND SLEEVE.



| | | | |
|---|----------|----------------|-----|
| UTILITIES MAINTENANCE AND REPAIR CONTRACT | | | |
| N40085-15-R-7905 | | | |
| BOLLARD LAYOUT, HYDRANT OR POST INDICATOR VALVE | | | |
| STANDARD DETAILS | | | |
| SIZE | FSCM NO. | DWG NO. | REV |
| SCALE NONE | | SHEET 11 OF 11 | |

ATTACHMENT D

**PERFORMANCE SPECIFICATION
GUIDELINE
FOR
PIPE CONDITION ASSESSMENT USING
CCTV**

October, 2014

PART 1 - GENERAL

1.1 SCOPE OF SERVICES AND WORK PHASING

A. The purpose of this bid is to obtain competitive unit prices for all labor, material, and equipment necessary to inspect, via closed-circuit television (CCTV), existing sewers. The work includes remote televising and recording of the sewer. All project locations will be within the Contract Officer's service area and will be indicated in the individual Delivery Orders that may be executed on this contract.

B. The work to be completed on each section of sewer will be performed in phases as defined in the following:

1. Phase 1: Inspection.
 - a. Sewer sections shall be inspected by means of remote CCTV. If a blockage hampers the inspection of the sewer in one direction, then the Contractor shall attempt to complete the section by televising from the other manhole to complete the section. The Contractor must immediately report the obstruction to the NAVFAC Contract Officer. All CCTV work shall conform to Current NASSCO-PACP standards.
 - b. CCTV inspections will be delivered entirely in electronic format.
 1. All PACP Header information shall be completed in accordance with PACP Guidelines. In addition to mandatory Header fields, additional fields are required as noted on the attached Header Field Matrix.
 2. The documentation of the work shall consist of PACP CCTV Reports, PACP database, logs, electronic reports, etc. noting important features encountered during the inspection. The speed of travel shall be slow enough to inspect each pipe joint, tee connection, structural deterioration, infiltration and inflow sources, and deposits, but should not, at any time, be faster than 30 feet per minute, except as noted otherwise in this document.
 3. The camera must be centered in the pipe to provide accurate distance measurements to provide locations of features in the sewer and these footage measurements shall be displayed and documented on the video. All PACP Observations shall be identified by audio and on PACP log. All video must be continuously metered from manhole.

1.2 CONTRACT OFFICER

This contract will be administered and performed under the direction and inspection of the NAVFAC Contract Officer or designated representative. Ref

1.3 COMPLIANCE AND ACCEPTANCE

A. Compliance with this contract shall be complete when all conditions set forth in these specifications have been met. The following defines each work item, the level of effort, and quality of work that will be necessary to meet the intent of this specification.

B. Television Inspection

1. As in the initial survey television inspection pay item, CCTV inspections will be delivered entirely in electronic format.
2. All CCTV work shall conform to the most current NASSCO PACP standards. The documentation of the work shall consist of NASSCO PACP CCTV Reports, NASSCO PACP database, logs, electronic reports, etc. noting defects and observations encountered during the inspection.

1.5 REFERENCED DOCUMENTS

A. All work must also conform to the latest edition of the following specifications (as required in advance by the Contract Officer)

1. NASSCO PACP Standards

B. Notification

1. If observed defects are believed to be such that further operations may compromise the structural integrity and/or cause the pipe to become unusable, the Contractor must provide written communication to the NAVFAC Contract Officer of the observed condition(s) and reason to believe that continued operations may cause substantial damage. The Contract Officer will then direct the Contractor as to what services, precautions, etc., the Contract Officer will require of the Contractor. If the contract documents do not address this potential, then the Contract Officer and Contractor will negotiate in good faith, the conditions under which the work is to continue or cease to continue.
2. This exception may only be used to prevent asset damage and shall not be used to eliminate difficult or adverse areas that were previously documented in these documents or by prior written communication with the Contract Officer.

PART 2 – EXECUTION

2.1 GENERAL

A. The Contractor shall furnish and maintain, in good condition, all cleaning and televising equipment necessary for proper execution of the work.

B. Maintaining Flow: It will be the responsibility of the Contractor to provide and maintain sufficient flow at all times to pass any flash of storm flow of drainage ditches and prevent any backwater flooding due to obstruction caused by cleaning or CCTV equipment.

C. Retrieval of Materials and Equipment: It shall be the Contractor's responsibility to remove materials and equipment that has been lodged in the sewer from cleaning, television inspection, or point repair excavations.

D. Work Schedule. This schedule shall outline the sequence in which the Contractor proposes to conduct his operations and shall be approved by the Contract Officer before work is started. The Contractor shall use a time-scaled logic diagram format. The level of detail of activities shall provide clear, concise communication of the plan of work. At a minimum, activities showing initial mobilization, start-up, cleaning and televising shall be included.

E. Original and updated schedules must be provided to the Contract Officer in writing.

F. The Contract Officer may require additional updates to the schedule as changes occur. These additional updates will be submitted to the Contract Officer within 24 hours of the request. Changes to the schedule are subject to approval of the Contract Officer.

4.2 TELEVISION INSPECTION AND COMPUTERIZED EQUIPMENT

A. The Contractor shall use a color pan and tilt camera or a side wall scanning (panoramic) camera specifically designed and constructed for sewer inspection. Each sewer to be televised shall be suitably isolated to control flow during the inspection. The Contractor shall provide a recording of the televised sewer inspection, locating each sewer service connection entering the sewer.

B. Lighting for the pan and tilt camera or side wall scanning camera shall provide a clear picture of the entire periphery of the existing sewer.

C. The pan and tilt camera shall pause, pan, and visually inspect all service connections, pipe ends, and maintenance or structural defects. If utilizing a camera with side wall scanning capabilities, pausing and panning of each lateral is not necessary during the inspection if the image clearly depicts the inside of the lateral for post processing. If a blockage cannot be removed and hampers the televising of the sewer in one direction then the Contractor shall attempt to complete the section by televising from the other manhole to complete the section, this reversal should immediately follow the initial direction. The Contractor must immediately report the obstruction to the Contract Officer.

D. Side wall scanning inspection systems are imaging cameras that are capable of a continuous 360 degree image capture of the wall of the pipeline being inspected. These systems may have one or multiple cameras to capture the complete interior view of the pipeline. Due to the high resolution of the image quality, the inspections may be conducted at a higher speed than color pan and tilt CCTV method. Once the pipeline inspections are completed, the captured images can be linked with a companion software package that allows for identifying and coding defects and features in the pipeline. Typically these systems provide a fold flat view and a perspective view (typical of CCTV) of the pipeline.

E. If the image quality is not adequate for post-inspection coding, the Contractor shall be required to repeat the survey at the Contractor's expense.

F. The Contractor shall perform all CCTV inspections in accordance with NASSCO's Pipeline Assessment Certification Program (PACP). CCTV inspections will be delivered entirely in electronic format. The entire survey shall be recorded in an approved electronic format submitted with electronic links between the data and the video. All television inspection reports shall be with-in +/- two (2) feet of the measured linear footage between manholes along the existing sewer centerline from the start of pipe to end of pipe. All Contract Officer and PACP required header information must be fully and

accurately entered on all CCTV reports. Work not following these specifications may be rejected for payment and the Contractor may be required to re do the work.

G. The Contractor shall provide a PACP certified operator on site at all times during the entire survey. If video is to be coded separately from the actual recording, both the onsite Operator and the individual performing the PACP coding shall be PACP certified. The Contractor shall provide proof of certification prior to commencement of work, prior to a change in personnel involved in data collection, and as requested by the Contract Officer

H. CCTV Reports, logs, electronic reports, and worksheets must include the following information and conform to the applicable guidelines:

1. CCTV Reports, NASSCO PACP Certified Database, and electronic worksheets must accompany all inspection work.
2. All Contract Officer and NASSCO PACP required header information must be fully and accurately entered on all CCTV reports.

****END OF SECTION****