

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT				1. CONTRACT ID CODE		PAGE OF PAGES 1 59	
2. AMENDMENT/MODIFICATION NO. 0004		3. EFFECTIVE DATE 01-May-2018		4. REQUISITION/PURCHASE REQ. NO.		5. PROJECT NO.(If applicable)	
6. ISSUED BY USA ENGINEER DISTRICT, JACKSONVILLE CONTRACTING DIVISION 701 SAN MARCO BLVD JACKSONVILLE FL 32207-8175		CODE W912EP		7. ADMINISTERED BY (If other than item 6) See Item 6			
8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code)				X		9A. AMENDMENT OF SOLICITATION NO. W912EP18R0013	
				X		9B. DATED (SEE ITEM 11) 22-Mar-2018	
						10A. MOD. OF CONTRACT/ORDER NO.	
						10B. DATED (SEE ITEM 13)	
CODE		FACILITY CODE					
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS							
<input checked="" type="checkbox"/> The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offer <input type="checkbox"/> is extended, <input checked="" type="checkbox"/> is not extended. Offer must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended by one of the following methods: (a) By completing Items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.							
12. ACCOUNTING AND APPROPRIATION DATA (If required)							
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.							
A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.							
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).							
C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:							
D. OTHER (Specify type of modification and authority)							
E. IMPORTANT: Contractor <input type="checkbox"/> is not, <input type="checkbox"/> is required to sign this document and return _____ copies to the issuing office.							
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.) Herbert Hoover Dike (HHD) Rehabilitation Structure Replacement, S-288 (HP-1) Reconstruction, Glades County, Florida See Continuation Sheet for complete description of changes. The Proposal due date remain unchanged (04 May 2018 @ 2:00 pm). All other conditions remain the same.							
Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.							
15A. NAME AND TITLE OF SIGNER (Type or print)				16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)			
				TEL: _____ EMAIL: _____			
15B. CONTRACTOR/OFFEROR _____ (Signature of person authorized to sign)		15C. DATE SIGNED		16B. UNITED STATES OF AMERICA BY _____ (Signature of Contracting Officer)		16C. DATE SIGNED 01-May-2018	

SECTION 00100A

SOLICITATION PROVISIONS

A. ELIGIBILITY FOR CONTRACT AWARD

In accordance with the Federal Acquisition Regulation (FAR), no contract shall be entered into unless the Contracting Officer ensures that all requirements of law, executive orders, regulations, and all other applicable procedures, including clearances and approvals, have been met. This includes the FAR requirement that no award shall be made unless the Contracting Officer makes an affirmative determination of responsibility. To be determined responsible, a prospective contractor must meet the general standards in Part FAR 9 and any special standards set forth in the solicitation.

B. SOURCE SELECTION USING LOWEST PRICE TECHNICALLY ACCEPTABLE (LPTA)

The LPTA process is selected as appropriate for this acquisition because the best value is expected to result from selection of the lowest evaluated price proposal with acceptable non-priced proposal (Technical Acceptability). In order to permit efficient competition, the following methodology will be utilized. The Government will evaluate the proposals for technical acceptability. The lowest price technically acceptable will then be evaluated to determine fair and reasonableness in accordance with FAR 15.404-1(a). That Offeror will be selected for award.

If discussions are deemed necessary by the Contracting Officer, all proposals both price and non-priced will be evaluated for the purpose of establishing a competitive range.

C. EVALUATION FACTORS FOR AWARD

The solicitation requires the evaluation of: **Factor 1 - Technical Acceptability, and Factor 2 - Price.**

Award will be made to the offeror who submits the lowest priced proposal that is determined to be technically acceptable. To be considered technically acceptable, an Offeror's proposal must be rated "Acceptable" Factor 1 - Technical Acceptability and its sub-factors.

Magnitude of Construction: The estimated cost of this project is between U.S. \$10,000,000.00 and \$25,000,000.00.

The Primary NAICS code is 237990 with a small business size of \$36.5 million.

D. PROPOSAL REQUIREMENTS, AND FORMAT

The Government will not reimburse any costs incurred or associated with preparation and submission of any responses to this solicitation. Oral explanations or instructions to Offerors are not binding. Any information given to an Offeror which impacts the solicitation and/or offer will be given in the form of a written amendment to the solicitation. In accordance with Paragraph 999.204-4003,

Section 00100 of the Solicitation, any and all amendments to the solicitation will be distributed via

The Federal Business Opportunities website. It is the Offeror's responsibility to acknowledge any and all amendments in its proposal submission.

Offerors should not modify the terms and conditions of the solicitation in either the price or non-priced proposal or add conditions, exceptions, or qualifications to their offers. Should an Offeror include terms and conditions that conflict with the terms and conditions of the solicitation, that offer may be determined to be Unacceptable for award. Any questions related to specific terms and conditions contained within the solicitation should be submitted via Bidders Inquiry in ProjNet by no later than (NLT) the date specified in Section 00010A, Attachment A, Instructions For Technical Inquires and Questions, prior to submission of an offer. Notwithstanding the above, the Offeror must clearly describe in its proposal (Price and Non-Priced) any modifications to the contractual terms and conditions of the solicitation contained in its offer.

Offerors that include information in their proposals they do not want disclosed to the public for any purpose, or used by the Government except for evaluation purposes, must clearly mark their proposals in accordance with the instructions at FAR clause 52.215-1, *Instructions to Offerors- Competitive Acquisition*, paragraph (e), *Restriction on Disclosure and Use of Data*, in Section 00100 of the Solicitation.

Offerors shall place the following notification on the bottom of each page of their proposals: "SOURCE SELECTION INFORMATION – SEE FAR 2.101 AND 3.104. DO NOT DISCLOSE ANY SOURCE SELECTION INFORMATION TO ANY UNAUTHORIZED PERSON."

Use of the words "will", "shall", or "must" indicates a mandatory requirement for which failure to comply, at the time and date for submission of proposals, shall result in the Offeror's proposal being disqualified from consideration for award, unless the Government elects to establish a competitive range and initiate discussions, thereby providing a means by which appropriate corrections by the Offeror(s) involved can be made. Failure to comply with pricing or non-pricing requirements that are annotated with the words "should" or "may" can result in an Unacceptable rating.

1. REQUIRED REGISTRATIONS

Failure to have an active and completed registration in **System for Award Management (SAM)**: <http://www.sam.gov/> database will determine an Offeror ineligible for award and removed from competition. An Acceptable offer with incomplete or expired registrations at the time of award may not be eligible for a contract. In such instances, the Government will award to the next Acceptable offer who is eligible for award.

Information contained within an Offeror's registration must be current and valid. The responsibility of maintaining current information contained in an Offeror's registration rests solely on the Offeror.

If an Offeror is a joint venture (JV), the JV entity must have a valid registration representing the JV as one business/firm/entity; this is applicable to SAM. The Government will not accept separate registrations and licenses for each separate entity representing the JV.

2. PROPOSAL CONTENT

The Offeror's proposal shall be submitted in hard copy, with accompanying compact disc (CD), see Paragraph 999.215-4003, Section 00100. The RFP shall provide the Government address and receipt date for proposal submittal.

Information required with an Offeror's priced and non-priced factors and sub-factors are described under Basis of Award and Evaluation Factors.

Offerors are required to submit proposals with the content specified herein. Proposals without the specified content may be determined Unacceptable and removed from the competition. The Government will not make assumptions concerning intent, capabilities, or experiences. Clear identification of proposal details shall be the sole responsibility of the Offeror. The Government reserves the right to reject incomplete proposals after initial evaluation without further consideration.

The proposal shall be divided into volumes as indicated below. Each set of volumes shall be submitted and sealed separately. Each volume shall be marked with the Offeror's name, the solicitation number, the volume number and stamped with "Original" or "Copy." Each respective original or copy shall be separately bound or placed in a three-ring binder. See Attachment 6 – Proposal Format.

All proposals shall contain the evaluation requirements stated herein and every binder shall also contain: Table of Contents, List of Tables (if required), List of Figures (if required), List of Appendixes, and Name/Address/Telephone Number/e-mail address of the Offeror. Proposal clarity, organization, and cross-referencing are mandatory. No material (information not physically part of proposal) shall be incorporated by reference. The Offeror shall submit in the proposal the requested information specified herein.

Offerors shall verify that the information for all forms submitted are current, correct, and complete, including names of points of contact, email addresses, and telephone numbers.

The Government will not evaluate any material that exceeds the page limits specified within each evaluation factor. Elaborately prepared proposals are not required, and any material in excess of what is requested, such as corporate marketing information, will not be considered. Failing to submit or completely fill out attachments properly may result in rejection of the offer without further evaluation. Therefore, Offerors are urged to follow instructions and raise questions through inquiries if instructions are not understood. Do not include references to material or information not found within its respective volumes. Information submitted in the wrong volumes could lead to an Offeror's proposal being determined Unacceptable if materially incomplete in any aspect.

Written proposals are due no later than what is stated in Block 13 of the SF1442 to the address specified in Block 7 of the SF 1442.

- a. **VOLUME ONE (Factor 1) – Technical Acceptability. (1 Original, 5 Copies):** Responses to Each Sub-Factor shall be organized in Volume 1. **Do not include pricing information in Volume One.** NOTE: Page Limitations Not to Exceed 150 Pages.

- b. **VOLUME TWO (Factor 2) – Price (1 Original 1 Copy)** Offerors shall verify that the information for all forms submitted are current, correct, and complete, including names of points of contact, email addresses, and telephone numbers.

All proposals shall contain the evaluation requirements stated herein and every binder shall also contain: Table of Contents, List of Tables (if required), List of Figures (if required), List of Appendixes, and Name/Address/Telephone Number/e-mail address of the Offeror. Proposal clarity, organization, and cross-referencing are mandatory. No material (information not part of proposal) shall be incorporated by reference. The offeror shall submit in the proposal the requested Information specified herein.

Offeror shall verify that the information for all forms submitted are current, correct, and complete, including names of points of contact, email addresses, and telephone numbers

The Government will not evaluate any material that exceeds the page limits specified within each evaluation factor. Elaborately prepared proposals are not required, and any material in excess of what is requested, such as corporate marketing information, will not be considered. Failing to submit or completely fill out attachments properly may result in rejection of the offer without further evaluation. Therefore, Offerors are urged to follow instructions and raise questions through inquiries if instructions are not understood. Do not include references to material or information not found within its respective volumes. Information submitted in the wrong volumes could lead to an Offeror's proposal being determined Unacceptable if materially incomplete in any aspect.

Written proposals are due no later than what is stated in Block 13 of the SF1442 to the addresses specified in Block 7 of the SF 1442:

Claurice M. Dingle
Contract Specialist
Claurice.M.Dingle@usace.army.mil

E. DEBRIEFING OF UNSUCCESSFUL OFFERORS

The Contracting Officer will ensure Offerors are debriefed, if requested, in accordance with FAR Subparts 15.5.

F. BASIS OF AWARD

Subject to the provisions contained herein, award will be made to one (1) Offeror who is deemed responsible in accordance with the FAR; who conforms to the solicitation requirements; provides the lowest evaluated price and whose proposal, judged by an overall assessment of the evaluation criteria and other considerations specified in this solicitation, meets the technically acceptable standard for the non-price factors. Prices will be evaluated to determine fair and reasonableness in accordance with FAR 15.404-1(a).

To be considered acceptable (non-priced factors), no non-priced factors/sub-factors in the proposal may be rated as "unacceptable". **The failure of a proposal to meet all of the requirements under any non-priced factor/sub-factor will result in an unacceptable rating and precluded from award.**

The LPTA process is selected as appropriate for this acquisition because the best value is expected to result from selection of the lowest evaluated price proposal with acceptable non-priced proposal (Technical and Past Performance). In order to permit efficient competition, the following methodology will be utilized. The Government will evaluate the proposals for technical and past performance acceptability. The lowest price technically acceptable proposal with acceptable past performance will then be evaluated to determine fair and reasonable in accordance with FAR 15.404- 1(a). That Offeror will be selected for award.

The Government intends to award a contract without discussions, but reserves the right to hold discussions if the Government determines that to do so would be in its best interests. If discussions are deemed necessary by the Source Selection Authority/Contracting Officer, all proposals will be evaluated for the purpose of establishing a competitive range.

Joint Ventures: A joint venture is defined as a legal business entity formed between two or more companies to undertake the performance activities of a contract together.

Offerors proposing as joint ventures shall provide evidence that the joint venture as a legal entity has been duly formed. Joint ventures shall include a copy of the legal joint venture agreement signed by an authorized officer from each of the firms comprising the joint venture, with the chief executive of each entity identified. The Government will not evaluate the capability of any firms that are not included in the joint venture agreement.

If submitting a proposal as a joint venture, the experience of each of the joint venture partners can be submitted for the joint venture entity. The experience of either joint venture partner will be considered the experience of the joint venture entity. Page and project form limits apply to the joint venture as a whole, i.e., a submission limitation of three (3) projects under the experience factor is not an allowance of three (3) projects for each of the joint venture partners. Prospective Offerors that submit proposals may not change their joint venture firms, if selected for award.

Subcontractors: If any portion of the work provided under Factor 1 is subcontracted, clearly identify that work as such and provide the required experience of that subcontractor as it relates to work the subcontractor will be performing for this requirement. In accordance with the non-substitution clause in Section 00800, Paragraph 999.215-4001, Limitations on Substitutions for Certain Positions and/or Subcontractors, provide a letter of commitment using **Attachment 2** for any subcontractor proposed to be used. Prime contractor will not be allowed to substitute a subcontractor's experience for its own; unless the subcontractor will be a team member in this requirement.

G. DEFINITIONS:

Joint Venture: If submitting a proposal as a joint venture, the experience of each of the joint venture partners can be submitted for the joint venture entity. The experience of either joint venture partner will be considered the experience of the joint venture entity.

A major subcontractor is defined as any subcontractor that has been identified under Factor 1. Additionally, a major subcontractor can be identified as one that is crucial for the successful completion of the project.

A letter of commitment is defined as a letter from a major subcontractor on official Company letterhead (1) addressed to the prime contractor, (2) identifying the work they intend to perform, and (3) stating that they W912EP-18-R-0013 00100A-6 Amendment 0004

are willing to be bound to perform the identified work if the prime receives this contract. Failure to provide a letter of commitment from a proposed major subcontractor will cause any non-priced factor to be rated Unacceptable, if applicable.

H. EVALUATION FACTORS

FACTORS AND SUB-FACTORS TO BE EVALUATED

1. Factor 1 – Technical Acceptability

a. Sub-Factor 1 – Demonstrated Experience

A Sub-Element A-Cofferdam System Experience

B. Sub-Element B-Dewatering System Experience

C. Sub-Element C-Construction of Gated Hydraulic Control Structure Experience

D.Sub-Element D-Permanent Earthen Dam Experience

b. Sub-Factor 2 – Past Performance

2. Factor 2 – Price: The Price factor is not rated. It is evaluated for reasonableness.

FACTOR SUBMISSION REQUIREMENTS AND EVALUATION METHODS

FACTOR 1 – TECHNICAL ACCEPTABILITY

In responding to this factor, the objective should be to instill confidence that the offeror has the knowledge and experience required to meet or exceed the terms and conditions of the specifications and the ability to successfully complete the project within the required timeframe, as defined in specification Section 01 11 00, Summary of Work.

Offerors must receive a rating of Acceptable for ALL Sub-Factors and Sub-Elements to receive an overall proposal rating of Technically Acceptable.

SUB-FACTOR 1 – DEMONSTRATED EXPERIENCE

Submission Requirements

Provide two (2) examples of completed construction projects or close to complete projects for sub-elements A, B and D; provide three (3) examples of completed hydraulic control structure construction projects or close to complete projects for Sub-Element C. It is not necessary that all sub-factors and/or sub-elements below be performed on the same project. A project may be utilized for multiple sub-elements as long as the project meets the criteria for that sub-element.

The projects submitted under Sub-Factor 1 Demonstrated Experience must have a corresponding submission under Sub-Factor 2 Past Performance. In addition, projects submitted under Sub-Factor 1, Demonstrated Experience must be a complete project or a close to complete project.

A complete project is defined as work performed under a “project” that was physically completed within the last (10) years preceding the date of this solicitation and has been accepted by the customer.

A close to complete project is defined as work performed under a “project” that is over 75% physically complete or embankment work has been accepted by the customer.

SUB-ELEMENT A – Install a cofferdam system, with a minimum 10 foot hydraulic head differential, maintained across the structure, from the head water to the tail water (or dewatered water level), immediately adjacent to or within a body of water.

- *The cofferdam systems must be sheetpile cofferdam systems.*
- *Clearly state the type of cofferdam system used to retain body of water.*
- *Clearly state the head differential maintained by each cofferdam system.*

SUB-ELEMENT B – Install, operate, and maintain a dewatering system, with a minimum head differential of 10 feet maintained during dewatering operations, immediately adjacent to or within a body of water.

- *The dewatering systems must include pre-drainage, defined as dewatering prior to excavation (To include but not limited to: deeps wells, well point systems and/or ejectors).*
- *Clearly state the type of dewatering system used.*
- *Clearly state the head differential maintained by each system submitted.*
- *Clearly describe the soil/rock (in terms of ASTM D2487 – the Unified Soil Classification System) in which each dewatering system was installed.*

SUB-ELEMENT C – Construction of gated concrete hydraulic control structures (i.e. water control structure such as a pump station, spillway, outlet works, or culvert) with water control gates with a minimum 10 foot hydraulic head differential across the structure.

- *The submitted experiences must be for a completed hydraulic control structure including reinforced concrete, hydraulic steel structures (gates) and controls.*
- *The submitted experiences must include the coordination, installation a designed and fabricated hydraulic steel structures (steel water control gates) and controls.*
- *Each demonstrated experience shall include a minimum gated hydraulic opening of 49 square feet per opening.*
- *Clearly state the operating head differential (headwater minus tailwater) across the gate.*
- *Provide at least one experience involving placement and instrumentation of mass structural concrete.*

SUB-ELEMENT D – Construction of permanent earthen dam or new (non-modified)

permanent levee embankments (water retaining structure) at least 15 feet in height, as measured from the toe of the constructed embankment to the embankment crest.

The Project Information Sheet at Attachment 1 must be utilized to provide project information in response to Sub-Element A, B, C, and D. The offeror shall ensure that all information required by the Project Information Sheet is provided and all descriptions and explanations are in great detail to provide the technical evaluation team with a clear understanding of the work completed and how it is similar to this project.

The technical evaluation team will evaluate each of the projects submitted to determine if they are similar to this project and whether or not these projects demonstrate that the offeror has the knowledge and experience required to meet or exceed the terms and conditions of the specifications, and the ability to successfully accomplish and complete the project within the required timeframe, as defined in specification Section 01 11 00, Summary of Work.

All of the offeror provided projects must have been completed in the last ten (10) years for Sub- Element A, B, C, and D as described above and demonstrate that the offeror has the knowledge and experience required to meet or exceed the terms and conditions of the specifications, and the ability to successfully complete the project within the required timeframe to be determined to meet the minimum requirements of the solicitation.

Offerors must receive a demonstrated experience rating of Acceptable for all submitted demonstrated experiences to receive an overall rating of Acceptable for this sub-factor.

NOTE 1: Do not submit more than two (2) projects for sub-elements A, B and D or more than three (3) projects for sub-elements C as no additional consideration or evaluation will be given for the submission of more than two (2) projects on sub-elements A, B and D and three (3) sub-elements C and only two (2) projects for sub-elements A, B and D and three (3) projects for sub-element C will be evaluated.

NOTE 2: If any portion of the work provided as demonstrated experience was subcontracted, clearly identify that work as it relates to this project. This Subcontractor is also required to be identified as the subcontractor performing this effort as such and provide the required experience of that subcontractor as it relates to work the subcontractor is performing on this project.

NOTE 3: Any demonstrated experience (to include subcontractors) provided for consideration in this sub-factor shall also have a corresponding submission in the Past Performance Factor. If Past Performance information is not provided for a demonstrated experience that demonstrated experience will not be evaluated.

NOTE 4: For Sub-Element C, offerors are required to submit two (2) projects that include: completed hydraulic control structure including reinforced concrete, hydraulic steel structures (gates) and controls, experiences with fabrication of hydraulic steel structures (steel water control gates) and controls, demonstrated experiences with a minimum gated hydraulic opening of 49 square feet per opening and operating head differential of 10 feet (headwater minus tailwater) across the gate. In addition, offerors are required to submit one (1) experience involving placement and instrumentation of mass structural concrete.

Ratings for this sub-factor are defined below:

Acceptable - Proposal clearly meets the minimum requirements of the solicitation.

Unacceptable - Proposal does not clearly meet the minimum requirements of the solicitation.

Sub-Factor 2 – Past Performance

The projects submitted for Past Performance must have a corresponding submission under Sub-Factor 1 Demonstrated Experience.

The past performance evaluation is an assessment of the offeror's probability of meeting the minimum past performance solicitation requirements. This assessment is based on the offeror's record of relevant and recent past performances that pertain to the solicitation requirements. There are two aspects to the past performance evaluation.

The first aspect of the past performance evaluation is to evaluate whether the offeror's present/past performance is relevant or not relevant to the effort to be acquired. If a demonstrated experience submitted in Sub-Factor 1 is determined to be Acceptable, it will also be determined to be relevant and recent in this sub-factor.

The second aspect of the past performance evaluation is to determine how well the contractor performed a demonstrated experience submitted in Sub-Factor 1. This will be determined by utilizing the NAVFAC/USACE Past Performance Questionnaire at Attachment 2, CCASS records or official performance evaluation from a non-federal entity. The offeror must receive a past performance rating of Satisfactory or better to be considered technically acceptable. If an overall past performance rating is not received, a possible recommendation for similar requirements in the future would be considered Satisfactory. A Satisfactory Rating is defined in the NAVFAC/USACE Past Performance Questionnaire.

Once relevancy has been determined and past performance ratings have been verified, a rating of Acceptable or Unacceptable will be assigned based on the results. Offeror's must receive a Past Performance rating of Acceptable for ALL submitted demonstrated experiences to receive and overall rating of Acceptable for this sub-factor.

Ratings for this sub-factor are defined below:

Acceptable - Based on the offeror's performance record, the Government has a reasonable expectation that the offeror will successfully perform the required effort, (i.e. the offeror received a rating of Acceptable in Sub-Factor 1 and received a rating of Satisfactory or better from an offeror provided POC) or the offeror's performance record is unknown.

Unacceptable - Based on the offeror's performance record, the Government has no reasonable expectation that the offeror will be able to successfully perform the required effort. (I.e. the offeror DID NOT receive a rating of Acceptable in Sub-Factor 1 or the offeror DID NOT receive a rating of Satisfactory or better from an offeror provided POC).

Note: If an offeror's provided NAVFAC/USACE Past Performance Questionnaires cannot be verifiable with the POC, the offeror may not be evaluated favorably or unfavorably on

Past performance (see FAR 15.305 (a)(2)(iv)). Therefore, the offeror shall be determined to have unknown past performance. In the context of acceptability/unacceptability, “unknown” shall be considered “acceptable.”

FACTOR 2 – PRICE

Submission Requirements

The Offeror’s volume for this factor shall be fully completed. Offeror completeness addresses the extent to which the elements of the price proposal are consistent with the requirements of the RFP.

This volume will also include price and price related information:

- a.* Standard Form 1442 (Solicitation, Offer and Award) and Section 00010A (Line Items and Pricing Schedule) Include the completed Standard Form 1442 for the RFP, along with the completed Pricing Schedule. The total cost for the construction will be considered for evaluation, including all options and alternates (if applicable).
- b.* Section 00101, Representations, Certifications, and Other Statements of Offerors.
- c.* In accordance with FAR Clause 52.228-1, Bid Guarantee (Original bid guarantee).
- d.* Attachment 4, Proposal Data Sheet.
- e.* Attachment 5, Proposed Small Business Participation Plan
- f.* Attachment 6, Determination of Responsibility.

Evaluation Method:

Price is not rated. It will be evaluated for fairness and reasonableness through the use of a price analysis in accordance with FAR 15.404-1(b). The price analysis will also check for the appearance of unbalanced line item prices.

Additionally, Offerors’ price proposals may be evaluated for price realism to determine if there are proposals that are unrealistically low in terms of overall price or reflective of an inherent lack of management and/or technical competence or comprehension of the requirements. Therefore, Offerors are advised that their business decision to submit a low-priced proposal can be considered in assessing their understanding or the risk associated with their proposal.

Prices will be reviewed for minor or clerical errors. If necessary, Offerors will be afforded an opportunity to resolve any such errors. Any exchange with Offerors under this subparagraph shall be for the purpose of clarification (FAR 15.306(a)) and shall not constitute negotiations as defined at FAR 15.306(d). In the event of discrepancy between a unit price and the extended amount, the unit price shall be controlling.

ATTACHMENTS

Attachment 1 – Demonstrated Experience

Attachment 2 – Letter of Commitment from Key Subcontractor

Attachment 3 - NAVFAC/USACE Past Performance Questionnaire

Attachment 4 - Proposal Data Sheet

Attachment 5 – Proposed Small Business Participation Plan

Attachment 6 - Determination of Responsibility Attachment 6 – Proposal Format

ATTACHMENT
DEMONSTRATED EXPERIENCE

Provide the following information to show examples of projects your company and/or its team members (IE: major subcontractors) constructed within the last ten (10) years indicating experience with projects of similar type and scope. Use one form per project. NOTE: Use additional pages as necessary to provide the information requested.

Type of Project

Represented Your Firm's

Name

Project Name and Contract Number, Location of Project and Conditions, Owner, General Scope.

Describe how this project is relevant and similar to the elements of the solicited (Herbert Hoover Dike Rehabilitation, Structure Replacements S-288 (HP-1) Reconstruction, Glades County, Florida). Use additional pages as necessary to provide this information, and to address all required elements of the sub-element/sub-factors.

Your Role (Prime, Joint Venture, or Subcontractor, etc.) and Work Your Company Self-

Performed: Construction Cost: Extent and Type of Work You Subcontracted Out Dates

Construction: Began Completed_____

Your Performance Evaluation by Owner and Awards and Recognitions (if any)

Were You Terminated or Assessed Liquidated Damages? (If either is "Yes", attach an Explanation) Owner's Point of Contact for Reference (Name and Company)

Current Telephone Number and email address of Owner

Reference Any unusual conditions/requirements

Problems encountered and corrective action taken to successfully complete the project

ATTACHMENT 2

**LETTER OF COMMITMENT OF KEY
SUBCONTRACTOR (USE
SUBCONTRACTOR'S COMPANY
LETTERHEAD)**

TO: Name of Offeror

SUBJECT: Letter of Commitment for Proposed Contract for _____

Dear Sir or Madam:

I hereby make the unequivocal commitment that, in the event of an award of a contract to (Fill in name of Offeror), that (insert name of subcontractor firm) will fulfill the duties of (state role on a project)

Sincerely, (Authorized

Subcontractor Official) Date: _____

ATTACHMENT 3

NAVFAC/USACE PAST PERFORMANCE QUESTIONNAIRE	
CONTRACT INFORMATION	
1. Contractor Information <div style="display: flex; justify-content: space-between;"> <div style="width: 60%;"> Firm Name: Address: Phone Number: </div> <div style="width: 35%;"> CAGE Code: DUNs Number: </div> </div>	
2. Work Performed as: <input type="checkbox"/> Prime Contractor <input type="checkbox"/> Sub Contractor <input type="checkbox"/> Joint Venture <input type="checkbox"/> Other (Explain) Percent of project work performed: If subcontractor, who was the prime (Name/Phone #):	
3. Contract Information Contract Number: <input type="checkbox"/> Delivery/Task Order Number (if applicable): <input type="checkbox"/> Contract Type: Firm Fixed Price Cost Reimbursement Other (Please specify): Contract Title: Contract Location: Award Date (mm/dd/yy): Contract Completion Date (mm/dd/yy): Actual Completion Date (mm/dd/yy): Explain Differences: Original Contract Price (Award Amount): Final Contract Price (to include all modifications, if applicable): Explain Differences:	
4. Project Description: Complexity of Work High Med Routine How is this project relevant to project of submission? <i>(Please provide details such as similar equipment, requirements, conditions, etc.)</i>	
CLIENT INFORMATION (Client to complete Blocks 5-8)	
5. Client Information Name: Title:	
6. Describe the client's role in the project:	
7. Date Questionnaire was completed (mm/dd/yy):	
8. Client's Signature:	

PLEASE PROVIDE THE ADJECTIVE RATING WHICH BEST REFLECTS

YOUR EVALUATION OF THE CONTRACTOR'S PERFORMANCE.

1. QUALITY:	
a) Quality of technical data/report preparation efforts	E VG S M U N
b) Ability to meet quality standards specified for technical	E VG S M U N
c) Timeliness/effectiveness of contract problem resolution without extensive customer guidance	E VG S M U N
d) Adequacy/effectiveness of quality control program and adherence to contract quality assurance requirements (without adverse effect on performance)	E VG S M U N
2. SCHEDULE/TIMELINESS OF PERFORMANCE:	
a) Compliance with contract delivery/completion schedules including any significant intermediate milestones. <i>(If liquidated damages were assessed or the schedule was not met, please address below)</i>	E VG S M U N
b) Rate the contractor's use of available resources to accomplish tasks identified in the contract	E VG S M U N
3. CUSTOMER SATISFACTION:	
a) To what extent were the end users satisfied with the project?	E VG S M U N
b) Contractor was reasonable and cooperative in dealing with your staff (including the ability to successfully resolve disagreements/disputes; responsiveness to administrative reports, businesslike and communication)	E VG S M U N
c) To what extent was the contractor cooperative, businesslike, and concerned with the interests of the customer?	E VG S M U N
d) Overall customer satisfaction	E VG S M U N
4. MANAGEMENT/ PERSONNEL/ LABOR	
a) Effectiveness of on-site management, including management of subcontractors, suppliers, materials, and/or labor force?	E VG S M U N
b) Ability to hire, apply, and retain a qualified workforce to this effort	E VG S M U N
c) Government Property Control	E VG S M U N
d) Knowledge/expertise demonstrated by contractor personnel	E VG S M U N
e) Utilization of Small Business concerns	E VG S M U N
f) Ability to simultaneously manage multiple projects with multiple disciplines	E VG S M U N
g) Ability to assimilate and incorporate changes in requirements and/or priority, including planning, execution	E VG S M U N

h) Effectiveness of overall management (including ability to effectively lead, manage and control the program)	E	VG	S	M	U	N
5. COST/FINANCIAL MANAGEMENT						
a) Ability to meet the terms and conditions within the contractually agreed price(s)?	E	VG	S	M	U	N

b) Contractor proposed innovative alternative methods/processes that reduced cost, improved	E VG S M U N
c) If this is/was a Government cost type contract, please rate the Contractor's timeliness and accuracy in submitting monthly invoices with appropriate back- up documentation, monthly status reports/budget variance reports, compliance with established budgets and avoidance of significant and/or unexplained variances (under runs or overruns)	E VG S M U N
d) Is the Contractor's accounting system adequate for management and tracking of costs? <i>If no, please explain in Remarks section.</i>	Yes No
e) If this is/was a Government contract, has/was this contract been partially or completely terminated for default or convenience or are there any pending terminations? <i>Indicate if show cause or cure notices were issued, or any default action in comment section below.</i>	Yes No
f) Have there been any indications that the contractor has had any financial problems? <i>If yes, please explain below.</i>	Yes No
6. SAFETY/SECURITY	
a) To what extent was the contractor able to maintain an environment of safety, adhere to its approved safety plan, and respond to safety issues? (Includes: following the users rules, regulations, and requirements regarding housekeeping, safety, correction of noted deficiencies, etc.)	E VG S M U N
b) Contractor complied with all security requirements for the project and personnel security requirements.	E VG S M U N
7. GENERAL	
a) Ability to successfully respond to emergency and/or surge situations (including notifying COR, PM or Contracting Officer in a timely manner regarding urgent contractual issues).	E VG S M U N
b) Compliance with contractual terms/provisions (<i>explain if specific issues</i>)	E VG S M U N
c) Would you hire or work with this firm again? (<i>If no, please explain below</i>)	Yes No
d) In summary, provide an overall rating for the work performed by this contractor.	E VG S M U N

END OF QUESTIONNAIRE

ATTACHMENT 4 PROPOSAL DATA SHEET
Solicitation No. W912EP-18-R-0013

Name of Firm:

Address:

Phone:

E-mail:

DUNS # (used for assessing the Contractor Performance Assessment Reporting System (CPARS). Also provide any other assigned number that identifies the member firm(s) Construction Contractor Appraisal Support System CCASS/CPARS database. If a separate DUNS has been created for a joint venture (J-V) it must also be submitted if the firm is a joint venture, list the individual firms and briefly describe the nature of the association. Provide DUNS for each.

Provide DUNS for any firm identified as a major subcontractor for which demonstrated experience has been submitted under Factor 1. Also, list the firm and briefly describe the nature of the association.

Firm 1:

Firm 2:

Firm 3:

Nature of Association:

AUTHORIZED NEGOTIATORS. FAR 52.215-11

The Offeror represents that the following persons are authorized to negotiate on its behalf with the Government in connection with this Request for Proposals (RFP).

[List names, titles and telephone number of the authorized negotiator.] Name of Person Authorized to Negotiate:

Negotiator's Address:

Negotiator's Telephone:

Negotiator's E-mail:

ATTACHMENT 5

PROPOSED SMALL BUSINESS PARTICIPATION PLAN (Vol. 3)

Proposed Small Business Participation Plan

(1) Check the applicable size and categories for the **PRIME** offeror -- Check all applicable boxes:

☐ Large Prime

OR

☐ Small Business Prime; also categorized as a

☐ Small Disadvantaged Business

☐ Woman-Owned Small Business

☐ HUB Zone Small Business

☐ Veteran Owned Small Business

☐ Service Disabled Veteran Owned Small Business

(2) Percentage of Total Contract Dollars/Price

(a) Total Contract Value: (Include options, etc) \$ _

(b) Dollar Value of your participation as a Prime Contractor: \$

(c) Submit the total combined percentage (must equal 100%) and dollars (must equal total contract value (2(a))) of work to be performed by both large and small businesses (include the percentage of work to be performed both by Prime and Subcontractors):

Example: If Prime proposes a price of \$1,000,000 (including all options), and small business(es) will provide \$250,000 in services/supplies as a prime or subcontractor, the % planned for small businesses is 25%; and 75% for large business equaling 100%.

Total percentage planned for Large Business(es) % = \$

Total Percentage planned for Small Business(es) % = \$

Total of both large and small and business 100% = \$

3. Indicate the total percentage of participation to be performed by each type of small business. The percentage of work performed by Small Businesses that qualify in multiple small business categories may be counted in each category:

Example: Victory Prop Mgt (WOSB and SDVOSB) performing 2%; and Gentleman Concierge (HubZ and WOSB) performing 3%. Results equate to: HubZone 3%; WOSB 5%; SDVOSB 2%; VOSB 2%;). SDVOSBs are also VOSBs automatically; however VOSBs are not automatically SDVOSBs.

Dollar Value and Percentage of Total Contract Value of Subcontracts Planned For:

Dollar
Value

Percentage of Total
Contract Value

Small Disadvantaged	\$	%
Woman-Owned Small	\$	%
HUB Zone Small	\$	%
Veteran Owned Small	\$	%
Service Disabled Veteran Owned Small	\$	%

(4) List principle supplies/services to be performed by Small Businesses:

Example: If a Small Business qualifies also as a WOSB and a SDVOSB, and you can add them to each category below in which they qualify.

	Name of Company	Identify Type of Service/Supply
Large:		
Small:		
Small		
Disadvantage:		
Women-Owned		
Small: HUB Zone		
Small: Veteran		
Owned Small:		
Service Disabled Veteran Owned Small:		

(5) Describe the extent of commitment to use each of the identified small business. Offerors do not need to submit copies of commitment instruments in their proposals. Rather, identify what types of commitments are in place with each company —i.e. a written contract, letter of commitment, verbal agreement, joint venture, mentor-protégé agreement, including how long agreement in place.

Additional Important Note for Large Businesses only. Small Business Sub-Contracting Plans (FAR 52.219-9 Alt II (Dev 2016-O0009))

Separate from the Small Business Participation Plan, large business offerors must also submit a Subcontracting Plan (Individual Contract Plan) meeting the requirements of FAR 52.219-9 Alt II (Dev 2016-O0009) and DFARS 252.219-7003. Large businesses will not be eligible for award if they fail to submit an acceptable Subcontracting Plan. Subcontracting Plans shall reflect and be consistent with the commitments offered in the Small Business Participation Plan. In accordance with DFARS 215.304(c), when an evaluation assesses the extent that small businesses are specifically identified in proposals, the small businesses considered in the evaluation shall be listed in any subcontracting plan submitted.

Note: Subcontracting plans must be submitted in Volume 4 Pricing and Price Related Information.

ATTACHMENT 6

DETERMINATION OF RESPONSIBILITY

The following information is provided to assist the contracting officer in determining whether or not the proposed contractor meets the general standards of responsibility enumerated at FAR 9.104-1, DFARS 209.104-1, and FAR 9.104-1 General Standards. To be determined responsible, a prospective contractor must:

(a) HAVE ADEQUATE FINANCIAL RESOURCES TO PERFORM THE CONTRACT, OR THE ABILITY TO OBTAIN THEM (SEE 9.104-3(b))

Banking References

Provide letters from the banking references to confirm this information.

*1st bank's name: _____
Telephone #: _____
Address: _____
Person: _____
Title: _____
Length of time with bank: _____
Credit Rating: _____
Number/type of accounts: _____
Amount in each account (# of figures): _____
Credit line: _____ Secured/Unsecured
Outstanding loans: _____
_____ Secured/Unsecured Comments:

*2nd bank's name: _____
Telephone #: _____
Address: _____
Person: _____
Title: _____
Length of time with bank: _____
Credit Rating: _____
Number/type of accounts: _____
Amount in each account (# of figures): _____
Credit line: _____ Secured/Unsecured
Outstanding loans: _____
_____ Secured/Unsecured Comments:

*** Provide letters from the bank in references to confirm this information.

**(b) HAVE A SATISFACTORY RECORD OF INTEGRITY AND
BUSINESS ETHICS**

Trade References

***1st company:** _____
Telephone #: _____
Address: _____
Name: _____
Title: _____
Length of time with company: _____
Credit line: _____
Average monthly business: _____
High credit: _____
Payment history: _____
Takes discounts: _____
Comments: _____

***2ND Company:** _____
Telephone #: _____
Address: _____
Name: _____
Title: _____
Length of time with company: _____
Credit line: _____
Average monthly business: _____
High credit: _____
Payment history: _____
Takes discounts: _____
Comments: _____

Workman's Compensation Experience

Modification Rate (EMR) 2015: 2016:___ 2017___

ATTACHMENT 6

PROPOSAL FORMAT

PROPOSAL IN RESPONSE TO SOLICITATION NO:

W912EP-18-R-0013

OFFEROR'S NAME: [Offeror enter] OFFEROR'S

ADDRESS: [Offeror enter]

OFFEROR'S POINT OF CONTACT (POC): [Offeror enter]

POC's TELEPHONE: [Offeror enter] POC's

FAX: [Offeror enter]

POC's EMAIL: [Offeror enter]

THIS OFFER IS SUBMITTED IN SEPARATE VOLUMES AS FOLLOWS: [Offeror
Check each applicable item and enter NA for non-applicable items.]

____ Volume One (Technical Acceptability) is submitted in 1 Original and 5 Copies.
There is no pricing information in this package.

____ Volume Two (Price) is submitted in 1 Original and 1 Copy.

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EMBANKMENT CONSTRUCTION

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 C136	(2006) Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM C142/C142M	(2017) Standard Test Method for Clay Lumps and Friable Particles in Aggregates
ASTM C294	(2012) Standard Descriptive Nomenclature for Constituents of Concrete Aggregates
ASTM C33/C33M	(2016) Standard Specification for Concrete Aggregates
ASTM C88	(2013) Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM D1556	(2007) Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D1557	(2012; E 2015) Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft ³) (2700 kN-m/m ³)
ASTM D2216	(2010) Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
ASTM D2487	(2011) Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D2974	(2014) Moisture, Ash, and Organic Matter of Peat and Other Organic Soils
ASTM D422	(1963; R 2007; E 2014; E 2014) Particle-Size Analysis of Soils
ASTM D4253	(2016) Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table
ASTM D4318	(2010; E 2014) Liquid Limit, Plastic

Limit, and Plasticity Index of Soils

ASTM D4373	(2014) Standard Test Method for Rapid Determination of Carbonate Content of Soils
ASTM D4643	(2017) Standard Test Method for Determination of Water Content of Soil and Rock by Microwave Oven Heating
ASTM D6938	(2017) Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	Safety and Health Requirements Manual
ER 1110-1-1807	(2014) Engineering and Design -- Drilling in Earth Embankment Dams and Levees

1.2 DEFINITIONS

1.2.1 Clearing

Clearing consists of the removal and satisfactory disposal of all trees, downed timber, snags, slash, brush, garbage, trash, debris, fencing, rock larger than 3 inches in diameter and other items occurring in the designated areas to be cleared.

1.2.2 Stripping

Stripping consists of the removal and satisfactory disposal of crops, weeds, grass, and other vegetative materials to the ground surface and topsoil to a depth of at least 6 inches.

1.2.3 Grubbing

Grubbing shall consist of the removal and disposal of stumps, roots larger than 3 inches in diameter, and matted roots from the designated grubbing areas. Material to be grubbed, together with logs and other organic or metallic debris not suitable for foundation purposes, shall be removed to a depth of not less than 18 inches below the original surface level of the ground in areas indicated to be grubbed and in areas indicated as construction areas under this contract, such as areas for buildings, and areas to be paved. Depressions made by grubbing shall be filled with Embankment Fill and compacted to make the surface conform to the original adjacent surface of the ground.

1.2.4 Topsoil

Topsoil is defined in Section 32 92 23 SODDING.

1.2.5 Embankment Fill

Satisfactory materials for Embankment Fill shall consist of materials classified in accordance with ASTM D2487 as SP-SM, SW-SM, SP-SC, SW-SC, or SM, with a Uniformity Coefficient (C_u) greater than 2 (ASTM D422), and shall have a gradation no finer than as shown in the table below.

Embankment fill shall be free from contamination from hazardous, toxic or radiological substances; trash, and debris. Note that SM soils may retain excess moisture and may be difficult to compact unless proper measures to control moisture are taken. Embankment Fill shall not contain particle sizes greater than 4 inches in any direction. Organic content shall be less than 3 percent in accordance with [ASTM D2974](#). The proportion of gravel (material larger than the U.S. No. 4 Standard Sieve) shall not exceed 40 percent by weight, but shall have less 30 percent or less retained on the ¾-inch sieve.

U.S. Standard Sieve Size	Maximum Percent Passing
50	90
70	65
100	35
200	20

1.2.6 Select Fill

Select fill consists of satisfactory materials classified in accordance with [ASTM D2487](#) as SP or SW, and with a Uniformity Coefficient greater than 3 ([ASTM D422](#)).

1.2.7 Filter Soil

Filter Soil, composed of the material silica sand, in-place shall meet the quality requirements of [ASTM C33/C33M](#) grading for fine aggregate. The allowable gradations are specified in paragraph TYPES OF FILL MATERIALS. Silica minerals (quartz) are defined in [ASTM C294](#) (Section 5.1), a referenced document in [ASTM C33/C33M](#). The provided Filter Soil shall contain no more than 2 percent calcareous and/or carbonaceous materials tested in accordance with [ASTM D4373](#). Particle shapes must be angular, and must not be well rounded, rounded or sub-rounded. Friable particle content must be no greater than 3 percent per [ASTM C33/C33M](#), Table 1, and tested in accordance with [ASTM C142/C142M](#). Therefore, the provided fine aggregate material must be composed of at least 95 percent silica sand, with no more than 2 percent silica fines (particles passing the No. 200 sieve) and 3 percent friable particles, to meet the project specification requirements. Laboratory testing must be performed as outlined in [ASTM C33/C33M](#), Sections 5 through 8, and must include, but is not limited to, particle size distribution ([ASTM C136](#)), test method for soundness ([ASTM C88](#)), standard test method for rapid determination of carbonate content of soils ([ASTM D4373](#)), and percent of friable particles ([ASTM C142/C142M](#)). All testing must be representative of the materials delivered to the project site. Test results must be signed and sealed by a licensed Professional Engineer or Geologist, licensed in the state from which the material is tested, and must clearly state that the fine aggregate to be furnished is silica sand (per this specification).

1.2.8 Soil-Bentonite Fill

Soil-Bentonite Fill shall be in accordance with Section [35 42 00](#)
SOIL-BENTONITE FILL

1.2.9 Unsatisfactory Materials

Unsatisfactory materials shall not be used in any embankment or other required fill and shall not be allowed to remain beneath embankment or

structures. Unsatisfactory materials includes all other materials that are not defined as satisfactory materials.

1.2.10 Satisfactory Materials

Satisfactory materials shall consist of all fill and soil needed for construction which includes Embankment Fill, Select Fill, Soil-Bentonite Fill, Filter Soil, Filter Gravel, Bedding Stone and Riprap.

1.2.11 Embankment

The terms "levee" or "embankment" as used in these specifications are defined as the earth fill portions of the embankment structure or other fills, including the temporary earthen plugs and earthen cofferdam, related to the embankment structure.

1.2.12 Backfill

Backfill as used in this section is defined as that fill material which cannot be placed around or adjacent to a structure until the structure is completed or until a specified time interval has elapsed after completion.

1.2.13 Excavation

Excavation consists of removal of material to the lines and grades shown on the drawings, or as otherwise directed or approved by the Contracting Officer and as described in the paragraph EXCAVATION in PART 3 EXECUTION.

1.2.14 Classification of Soils

Materials used to construct the embankments and for backfills shall be classified in accordance with [ASTM D2487](#) (Unified Soil Classification System). Cohesionless materials include materials classified in [ASTM D2487](#) as GW, GP, SW, SP-SM, SP-SC 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.

1.2.15 Degree of Compaction

Degree of compaction for all fill types except Filter Soil is expressed as a percentage of the maximum dry density obtained by the test procedure presented in [ASTM D1557](#), abbreviated hereinafter as percent of the maximum dry density. Degree of compaction for Filter Soil is expressed as a percentage of the maximum dry density obtained in accordance with [ASTM D4253](#), abbreviated hereinafter as relative compaction.

1.2.16 Hard/Unyielding Materials

Hard unyielding materials comprise weathered rock, dense consolidated deposits, or conglomerate materials with stones greater than 8 inches in any dimension. These materials usually require the use of heavy excavation equipment, ripper teeth or jack hammers for removal.

1.3 SYSTEM DESCRIPTION

The work covered by this section consists of furnishing all equipment, labor, materials, and incidentals, and performing all operations necessary for the clearing, grubbing, and stripping of the areas specified herein or indicated on the drawings, and for the removal and disposal of cleared,

grubbed, and stripped materials, removal of existing drainage structures, and refilling of holes resulting from grubbing; excavation of existing levees, and for all other excavations incidental to the construction of levees as specified and shown; foundation preparation and the construction of levee embankments, including new levee, enlargement of existing levee, backfill of berms, road crossings, backfill at drainage structures, and other incidental earthwork as may be necessary to complete the construction as specified herein and as shown on the drawings. All work under this section shall comply with the requirements of COE EM 385-1-1.

1.3.1 Embankment and Backfill Materials

Materials for embankment and backfill construction shall be obtained from offsite sources provided by the Contractor, or if the Contractor chooses to use in situ onsite materials obtained from excavations, the material shall be processed to meet the requirements described herein. The Government will not be responsible for assumptions made by the Contractor regarding the suitability of materials obtained nor the quantity of suitable materials available after processing. No additional compensation over the bid price for imported borrow material from offsite sources will be given for processing or transportation of onsite materials from required excavations.

1.3.2 Stockpiling

Any on-site stockpiling of embankment materials shall be in accordance with paragraph STOCKPILES below. No payment will be made for such stockpiling nor for the reloading and hauling of these materials to their final position.

1.3.3 Slides and Foundation Failures

When sliding occurs in any part of the embankment and backfills prescribed in this section after they have been placed, but prior to final acceptance of all work under the contract, repair the slide as directed by the Contracting Officer. When the slide is caused through the fault of the Contractor, the repair shall be made at no cost to the Government. When the slide is not the fault of the Contractor, an equitable adjustment in the contract price shall be made pursuant to the Contract Clause CHANGES to cover the cost of the repairs.

1.3.4 Drainage Requirements

The Contractor shall not block or restrict the flow in a natural drain, existing culvert, ditch or channel at any time without obtaining prior written approval from the Contracting Officer. This approval will not relieve the Contractor from responsibility for any damage caused by the operation. Diversion ditches, dikes, and grading shall be provided and maintained as necessary during construction. Excavated slopes and backfill surfaces shall be protected to prevent erosion and sloughing. Excavation shall be performed so that the site and the area immediately surrounding the site and affecting operations at the site shall be continually and effectively drained.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. 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-02 Shop Drawings

Dewatering Work Plan; G, DO

A Dewatering Work Plan detailing how surface and groundwater will be controlled throughout construction shall be submitted within 30 calendar days after receiving Notice to Proceed. The Contractor shall demonstrate a minimum of ten (10) years experience in the construction of dewatering systems including, but not limited to, sheet pile, pumping, well point installation and extraction, and earthen cofferdams. For proposed drilling work, the Contractor shall submit a Drilling Program Plan as required in Section 01 57 50 DRILLING PROGRAM PLAN. The dewatering system design engineer shall be a Florida licensed professional engineer with a minimum of ten (10) years experience in performing similar work. Surface and/or groundwater control will require as a minimum the use of a single stage or multistage well point or deep well system. The use of temporary diversion ditches, containment berms, sloping the subgrade, and unwatering by the use of pumping and sumps may also be required to maintain a dry excavation. Well installation with the aid of water jetting is not allowed within 20 feet of proposed or newly constructed structural features, excluding temporary sheet piling. Use of this method is limited to a depth of 10 feet below excavation subgrade. All wells shall be decommissioned in accordance with Section 33 29 00 DECOMMISSIONING WELLS. The information submitted in the dewatering plan shall be in accordance with Federal, State and local laws and regulations, F.A.C. Rule Chapters 40E-2 and 40E-20, and the STOF permit indicated in Section 01 57 20 ENVIRONMENTAL PROTECTION.

The following information shall be included in the Dewatering Work Plan:

- a. Qualifications of the design professional(s) responsible for design and operation of the dewatering system and safety inspection procedures. The dewatering plans and calculations for the dewatering system shall be signed and sealed by a registered professional engineer licensed in the State of Florida.
- b. Site plan of the project component with a description of the dewatering system and equipment, layout including the location of sumps, wells, well points, backup pumps, temporary containment berms, cofferdams, or diversion ditches as necessary; installation methods; description and layout of the onsite water detention system; location of the proposed discharge point(s), discharge rate flow meters, and the associated water quality monitoring locations; and re-watering procedures. All effluent generated during dewatering operations shall be discharged into the Harney Pond Canal (C-41).
- c. A detailed description of the sequence of construction and dewatering, including a description of control elevations during cofferdam/stability berm construction, and control elevations during construction.

- d. The location and type of turbidity control devices and methods necessary to ensure State Water Quality will be met.
- e. Calculations estimating the area of influence of dewatering, depth of dewatering, pumpage rates, duration and volumes, and stability of system, consistent with planned construction activities.
- f. A plan for construction of each temporary cofferdam system. The plan shall contain a description of the type of cofferdam, a list of materials to be used, and a detailed installation and removal sequence.
- g. An operational plan, which demonstrates that the discharge to the receiving water body meets all applicable State Water Quality standards prior to discharge, and also contains the proposed sampling locations and daily turbidity measurements.
- h. A contingency plan, which includes procedures for ceasing dewatering operations and corrective actions (to include a contingency plan in the event proper dewatering as per the Contractor's own design is not achieved) until water quality standards are met.
- i. A plan for rewatering the site so that no adverse impacts to the structure occur. At a minimum, include the proposed rate of groundwater level rise.

Earthwork operations shall not commence until the Dewatering Work Plan is approved. The Contractor shall allow 45 calendar days in the schedule for the Government's review. No adjustment for time or money will be made if resubmittal of the Dewatering Work Plan is required due to deficiencies in the plan.

Dewatering Well Screen Filter Media

In addition to the dewatering work plan submittals, the Contractor shall also obtain and test four (4) representative samples of the filter sand material to be used in the screened portion of dewatering wells and piezometers. This laboratory testing will consist of carbonated content (ASTM D4373) and Sieve Analysis (ASTM D422).

Shoring, Sheet piling, and Bracing; G, DO

Submit a detailed shoring, sheet piling and bracing plan 30 days prior to the beginning of installation of such features or any excavation so supported, whichever occurs first. The plan for shoring, sheet piling and bracing shall be prepared and certified by a Florida licensed professional engineer. Include in the plan drawings and design computations of the proposed shoring, sheet piling, and bracing, and documentation, showing details of the coordination and approval of shoring, sheet piling, and bracing by the applicable parties. Approval of the detailed plan shall be obtained from the Contracting Officer prior to starting the work. If necessary, modify the plan as required to meet field conditions, and the modifications shall be approved prior to use.

Excavation; G, DO

Submit a written excavation plan 30 days prior to the beginning of any excavation. Approval of the detailed plan shall be obtained from the Contracting Officer prior to starting the work. If necessary, modify the plan as required to meet field conditions, and the modifications shall be approved prior to use. As a minimum, the plan shall contain, the following:

- a. Proposed methods for preventing interference with, or damage to, existing underground or overhead utility lines, trees designated to remain and other man-made facilities or natural features designated to remain within or adjacent to the construction rights-of-way.
- b. Provision for coordinating the work with other Contractors working in the construction rights-of-way or on facilities crossing or adjacent to this work.
- c. Stockpiling plan for reusable excavated soil on site (meeting the criteria for Embankment Fill) showing locations, stockpile heights, slopes, limits, and drainage around the stockpile areas.
- d. Stockpiling plan for Embankment Fill before it is transported to the project site showing locations, stockpile heights, slopes, limits, and drainage around the stockpile areas.
- e. A complete listing of equipment used for excavation and to transport the excavated material.
- f. The Contractor's proposed road pattern, and plan for implementing dust control measures.

Excavation Access Plan; G, DO

Submit a plan 30 days prior to the beginning of any excavation. Approval of the detailed plan shall be obtained from the Contracting Officer prior to starting the work. If necessary, modify the plan as required to meet field conditions, the modifications shall be approved prior to use. As a minimum, the plan shall contain, the following:

- a. A detailed description with plan drawings describing and showing how equipment and materials will be transported from the top of excavation to the bottom of excavation. Ramps, cranes or other mechanical or non-mechanical means of transportation (here forward called "engineered system") shall be designed by a Professional Engineer registered in the State of Florida. Access roads to the bottom of the excavation shall comply with the EM 385-1-1. The engineered system shall be designed to accommodate the Contractor's construction equipment and means and methods.
- b. The engineered system shall demonstrate safe passage of equipment and materials from the top of excavation to the bottom of excavation. The engineered system shall account for and include critical phases of construction and include provisions for changes in site conditions and phases of construction.

Plan of Operations; G, DO

Thirty (30) days prior to commencement of haul road construction or placing embankment and backfill whichever is earlier, submit for approval a Plan of Operations for accomplishing all embankment and backfill construction and for the location and construction of haul roads. This plan shall include, but not be limited to, the proposed sequence of construction for embankment and backfill items, and methods and types of equipment to be utilized for all embankment and backfill operations, including transporting, placing, and compaction. This plan shall also include the names and addresses of the commercial testing labs which will perform the soil testing and inspection and describe how all required soils testing will be performed.

Embankment and Backfill Materials; G, DO

At least 30 days prior to delivery of any Contractor-furnished material to the site of the work, submit soil classification test results, moisture-density curves, gradation curves, and laboratory results of the required tests of the proposed material.

Survey of Restored Embankment; G, DO

After placement of fill to required grades and prior to placement of sod and other surface treatment, perform a topographic survey of the restored embankment. Submit the topographic survey (drawings) for approval by the Government prior to removal of the cofferdam system.

SD-06 Test Reports

Foundation Inspection Checklist; G, RO

Submit a Foundation Inspection Checklist notifying the Government that the foundation is ready for inspection. Approval of this checklist by the Contracting Officer will serve as notification from the Contractor that the foundation is ready for mapping and inspection. Notify the Contracting Officer at least seven (7) days before foundation preparation will be completed and ready for inspection by the Government. The checklist shall include, but is not limited to the following:

- a. Contractor is responsible for shaping the excavation to promote drainage at all times. Excavation bottom and side slopes are approximately to the lines and grades indicated on the drawings. Excavation and side slopes shall be to the required lines and grade the day of the inspection.
- b. Dewatering system is fully installed and operational and all dewatering requirements outlined in these specifications are met. Surfaces of excavation bottom and side slopes shall be dry and free from standing water, seepage, sloughing, boils, uplift or heave. Groundwater monitoring via open pipe piezometers shall be ongoing.
- c. Temporary ramps covering excavated side slopes are removed such that the excavated side slopes can be documented and mapped.
- d. Equipment for foundation excavation and mapping are on site

and provisions for equipment operating personnel have been coordinated.

e. Foundation profile of the headwalls and wingwalls are clearly marked.

Nuclear Density; G, RO

Use nuclear density testing equipment in accordance with ASTM D6938. In addition, the following condition shall apply:

a. Prior to using the nuclear density testing equipment on the site, submit to the Contracting Officer a certification that the operator has completed a training course approved by the nuclear density testing equipment manufacturer, the most recent data sheet from the manufacturer's calibration, and a copy of the most recent statistical check of the standard count precision.

b. The nuclear density testing equipment shall be capable of extending a probe a minimum of 12 inches down into a hole.

Measurement of Fill Material; G, RO

Submit a copy of the records of each compliance survey the next work day following the survey.

Testing

Within 24 hours of conclusion of physical tests, 3 copies of test results, including calibration curves and results of calibration tests.

SD-07 Certificates

Testing; G, RO

Qualifications of the Contractor's COE validated commercial testing laboratory.

1.5 REGULATORY REQUIREMENTS

The state statutory and regulatory requirements are indicated in Section 01 57 20 ENVIRONMENTAL PROTECTION.

1.6 PERMITS

In accordance with Contract Clause PERMITS AND RESPONSIBILITIES, obtain all necessary permits required for disposal, hauling, erosion control, burning, and pay all fees associated with permitting and compliance.

1.7 BLASTING

Blasting will not be permitted.

1.8 PROJECT SITE CONDITIONS

1.8.1 Protection of Cultural and Natural Resources

All work and operations shall comply with the requirements of Section

01 57 20 ENVIRONMENTAL PROTECTION and with the requirements of this section.

1.8.2 Protection of Man-Made Facilities and Natural Features

Trees within the clearing area shall be felled in such a manner as to avoid damage to trees left standing and trees outside the clearing area, existing buildings, man-made facilities and natural features, with due regard to the safety of employees and others, and in compliance with COE EM 385-1-1. Excavation shall follow the same requirements specified above for felling trees and shall be in compliance with COE EM 385-1-1.

1.8.3 Subsurface Data

Subsurface soil boring logs are included in these specifications. Subsurface investigation reports and samples of materials obtained from subsurface investigations may be examined at the Jacksonville District Office as indicated in Section 00 31 32 GEOTECHNICAL DATA REPORT. These data represent subsurface information at the boring locations; however, variations may exist in the subsurface between boring locations. Groundwater levels indicated on the soil boring logs were levels found at the time of exploration. The groundwater table can vary significantly depending on time of year, variation from normal precipitation, and river stage, lake stage or tide level.

PART 2 PRODUCTS

2.1 TYPES OF FILL MATERIALS

2.1.1 Embankment Fill

The embankment fill material shall consist of satisfactory materials classified in accordance with subparagraph "Embankment Fill" of paragraph DEFINITIONS, and subparagraph "Embankment and Backfill Materials" of paragraph SYSTEM DESCRIPTION above.

2.1.2 Select Fill

Fill shall consist of satisfactory materials classified in accordance with subparagraph "Select Fill" of paragraph DEFINITIONS, above.

2.1.3 Filter Soil

Filter soil material shall consist of material classified in accordance with subparagraph "Filter Soil" of paragraph DEFINITIONS above, and shall meet one of the gradations listed below. In no case shall the Filter Soil gradations listed below be mixed. Note that gradations 1 and 2 are variations of ASTM C33/C33M Fine Aggregate and gradation 3 meets the requirements of FDOT 902-2.1 Silica Sand.

2.1.3.1 Gradation

Furnish following gradation:

Gradation 1

Sieve	Percent Passing
3/8"	100
#4	95-100

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Sieve	Percent Passing
#8	80-100
#16	50-85
#30	25-60
#50	10-30
#100	2-10
#200	0-2 when measured at the source and 0-5 when measured as fill in the embankment after proper compaction.

Gradation 2

Sieve	Percent Passing
3/8"	100
#4	95-100
#8	80-100
#16	50-90
#30	25-60
#50	10-35
#100	1-10
#200	0-2 when measured at the source and 0-5 when measured as fill in the embankment after proper compaction.

Gradation 3

Sieve	Percent Passing
3/8"	100
#4	95-100
#8	85-100
#16	65-92
#30	25-70
#50	5-35
#100	0-7
#200	0-2 when measured at the source and 0-5 when measured as fill in the embankment after proper compaction.

2.1.3.2 Contamination

Filter Soil shall be protected from contamination from equipment traffic, runoff or any other source throughout construction. Any Filter Soil contaminated by other soil types or debris shall be wasted and replaced at no expense to the Government.

2.2 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 inches 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
Yellow:	Gas, Propane, Dangerous Materials
Orange:	Telephone and Other Communications

2.2.1 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.

2.2.2 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 feet deep. Encase metallic element of the tape in a protective jacket or provide with other means of corrosion protection.

2.3 DETECTION WIRE FOR NON-METALLIC PIPING

Insulate a single strand, solid copper detection wire with a minimum of 12 AWG.

PART 3 EXECUTION

3.1 CONSTRUCTION

3.1.1 Lines and Grades

The embankment and backfill shall be constructed to the lines, grades, and cross sections indicated on the drawings, unless otherwise directed by the Contracting Officer. The Government reserves the right to increase or decrease the foundation widths and embankment slopes or to make such other changes in the embankment or backfill sections as may be deemed necessary to produce a safe structure. Increases in height of section, made to compensate for settlement or consolidation of the embankment material subsequent to the completion of the embankment, shall not exceed 24 inches or 5 percent (whichever is less) of the height above the foundation at the centerline of the project feature indicated on the drawings.

3.1.2 Conduct of the Work

Maintain and protect the embankment and backfill in a satisfactory condition at all times until final completion and acceptance of all work under the Contract. If, in the opinion of the Contracting Officer, the hauling equipment causes horizontal shear planes or slicken sides, rutting, quaking, heaving, cracking, or excessive deformation of the embankment or backfill, limit the type, load, or travel speed of the hauling equipment on the embankment or backfill and repair any damaged areas at no additional cost to the Government. The Contractor may be required to remove, at no additional payment, any embankment material placed outside of prescribed slope lines. Any approved embankment or backfill material which is lost in transit or rendered unsuitable after being placed in the embankment or backfill and before final acceptance of the work shall be replaced in a satisfactory manner and no additional payment will be made therefor. Excavate and remove from the embankment or backfill any material which is unsatisfactory, dispose of such material, and refill the excavated area as directed, all at no cost to the Government.

3.2 CLEARING AND GRUBBING

All clearing, including any grubbing work, shall be completed prior to embankment construction. If regrowth of vegetation or trees occurs after clearing and grubbing and before placement of embankment, the Contractor shall clear again prior to embankment construction. Clearing and grubbing shall be accomplished in all areas requiring earthwork and any others necessary to complete construction. Trees and vegetation designated to be left standing or to remain shall be protected from damage from construction operations. Cleared varieties of oak, cypress, or pine shall be stockpiled onsite in their whole (i.e. not cut into pieces) in a designated area. Clear all riprap rock greater than 3 inches and stockpile for reuse. Clear all remaining debris including gabions, remove from the site, and dispose in accordance with paragraph DISPOSITION OF CLEARED, GRUBBED, AND STRIPPED MATERIAL below.

3.3 STRIPPING

After inspection and acceptance of cleared and grubbed areas, stripping shall proceed. All stripping work shall be completed not more than 250 feet in advance of embankment construction. The entire area within the limits of existing ground to receive embankment fill shown on the drawing shall be stripped to remove weeds, grass, and other vegetative materials to the ground surface and topsoil to a depth of at least 6 inches. Topsoil shall be completely stripped where greater depths are encountered.

3.4 DISPOSITION OF CLEARED, GRUBBED, AND STRIPPED MATERIAL

Except as otherwise specified or indicated on the drawings, all materials resulting from clearing and grubbing operations shall, at the Contractor's option, be disposed of either by windrowing or stockpiling within construction limits, chipping, removal from the site, or a combination thereof. In no case shall any material resulting from clearing and grubbing operations be buried or permanently placed within any embankment or levee foundation or any structural foundation. Make a reasonable effort to channel merchantable material into the commercial market and to make beneficial use of the materials resulting from clearing and grubbing. The topsoil material resulting from the stripping operations shall be temporarily stockpiled within the rights-of-way. Keep topsoil separate from other excavated materials, brush, litter, objectionable weeds, roots, stones larger than 2 inches in diameter and other materials that would interfere with planting and maintenance operations.

3.4.1 Windrows

Cleared, grubbed and stripped material shall be placed in a neat windrow or in piles with tree limbs trimmed sufficiently to make the windrow as small as practicable. No cleared, grubbed or stripped material shall extend beyond the construction limits.

3.4.2 Removal from Site

The Contractor may elect to remove all or part of the cleared and grubbed materials from the site in accordance with Section 01 57 20 ENVIRONMENTAL PROTECTION. The Contractor may opt either to retain any such materials of value or dispose of them by sale or otherwise. The Contractor shall not sell such material on site. The Government is not responsible for the protection and safekeeping of any materials retained by the Contractor. Such materials shall be removed from the site before the date of

completion of the work.

3.5 DEWATERING AND DIVERSION

The Contractor is responsible for the design, construction, installation and operation of the dewatering system. The contractor shall refer to specification Section 00 33 50 for historic lake stage elevations for use in dewatering system design and planning. It is the Contractor's responsibility to complete all groundwater sampling and analysis that will provide adequate data for dewatering system design, including periodic scheduled maintenance and cleaning programs. The Contractor shall dewater the coffered area to a minimum of 24 inches below the bottom of excavation, at least one foot below localized excavations, and a minimum of 36 inches below side slopes. At all locations within the coffered area, surface or groundwater flowing toward or into the excavation shall be controlled to prevent seepage, sloughing, boils, uplift or heave, sediment transport, ground pumping, standing water or areas weakened by seepage forces, and to prevent interference with the orderly progress of construction. The presence of any of these conditions is not acceptable. The dewatering system shall be designed and constructed to prevent such conditions. Should these situations occur, the Government shall be notified immediately and the Contractor shall take immediate measures to correct the issues so as to not jeopardize dam safety. The area shall remain dewatered until at least 2 feet of compacted fill is placed above native groundwater level. Surface and groundwater control shall be accomplished in coordination with the required excavation and embankment construction. Groundwater and surface water control may necessitate the use of deep wells, well points, temporary diversion ditches, cofferdams, sumps, and any other practical means that would meet the requirements. All wells, well points, sumps, ditches and all water collection features shall include properly designed filter materials that will prevent the movement of soil particles into the dewatering system components. Given that Herbert Hoover Dike is a dam, penetrations of dewatering features into the excavation shall be kept to a minimum; similarly, the Contractor shall not install piling within the footprint of Herbert Hoover Dike, except as shown on drawings. Methods for care and control of surface and groundwater levels shall be subject to Contracting Officer approval. It shall be understood that the steel sheet pile cofferdam will not be water tight, unless the Contractor takes measures to that effect. Therefore, the Contractor's [Dewatering Work Plan](#) shall accommodate or consider all possible sources of seepage, including water seeping through any and all joints of the sheet pile cofferdam, whether above or below the level of the excavation. Any and all borings, wells, well points, monitoring wells or piezometers, or similar penetrations into the embankment or its foundation shall first be authorized by the Contracting Officer (refer to Section 01 57 50 DRILLING PROGRAM PLAN, and shall be in accordance with [ER 1110-1-1807](#)). Well installation with the aid of a water jetting is not allowed within 20 feet of proposed or newly constructed structural features, excluding temporary sheet piling. Use of this method is limited to a depth of 10 feet below excavation subgrade. Wells installed into the dam foundation with the aid of water jetting cannot be abandoned in place and must be extracted to allow for grout permeation into the adjacent soils during well abandonment.

3.5.1 Dewatering for Headwall and Endwall Excavations

Dewatering efforts for excavations shown from EL. 0.0 to EL. -8.0 shall be that required to safely facilitate work in the dry. Contractor shall determine depth of drawdown that will prevent seepage, sloughing, boils,

uplift or heave, sediment transport, or areas weakened by seepage forces, and to prevent interference with the orderly progress of construction.

3.5.2 Diversion Ditches

Rim ditches, diversion ditches, trenches or swales; known as diversion ditches in this section, can be used to collect and divert rainwater runoff from the excavation bottom and side slopes only and shall not be used for groundwater lowering. Groundwater seepage into these diversion ditches is not permitted. The invert of all diversion ditches shall not exceed 24 inches in depth, as measured from the prevailing excavation grade. Prior to backfilling and compacting the diversion ditches, prepare excavation slopes to 3H: 1V, maximum. Diversion ditches are localized excavations that require ground water to be maintained a minimum of one foot below the ditch invert in order to facilitate placement and compaction of Embankment Fill in the dry. Diversion ditches shall not be continuous transverse to the embankment centerline (upstream to downstream) so as to minimize potential creation of a preferential seepage path.

3.5.3 Groundwater Level Monitoring in Coffered Area

Groundwater levels shall be monitored via the use of open pipe piezometers. A minimum of 5 piezometers shall be installed at such locations as to permit the measurement near the ends of the excavation (e.g. headwalls areas, the center of excavation and side slope(s)). Additional piezometers may be required at the discretion of the Contracting Officer to demonstrate proper dewatering across the site.

3.5.4 Inspection of Cofferdam and Coffered Area

The Contractor shall inspect the excavation bottom and side slopes and dewatering system each morning and immediately following any rain event. This inspection shall be made by a qualified individual experienced in dewatering, soil classification and slope stability. The Contractor's inspector shall have the authority to stop work and direct remedial action.

3.5.5 Dewatering Equipment and Equipment Capacity

All dewatering equipment shall be in prime condition and shall at all times be maintained and operated at the efficiency and capacity necessary for maintaining the coffered area free from standing water or wet conditions. The Contractor shall provide dewatering facilities with stand-by pumps for 25 percent stand-by capacity. Contractor shall also provide 100 percent backup power so that pumping operation may continue in the event of loss of the primary power system. The backup pumping and backup power systems shall be tested and proven fully operational prior to starting excavation. Once excavation and dewatering operations begin, the system will operate continuously, without interruption; until backfill is complete to a point that dewatering is no longer needed. No power source will be provided by the Government for dewatering. Provide backup pumping and backup power systems configured to automatically start upon failing of the primary system. Dewatering pumps shall not be used for bypass pumping until dewatering operations cease.

3.5.6 Removal of Dewatering System and Cofferdams

All wells shall be decommissioned in accordance with Section 33 29 00 DECOMMISSIONING WELLS. The Contractor shall remove the dewatering system

in such a manner as to allow groundwater to slowly return to natural elevations. The Contractor shall slowly flood the dewatered area to establish water surface elevations upstream of the structure and equal to tailwater downstream of the structure prior to removal of temporary cofferdam. Rewatering shall be addressed as part of the [Dewatering Work Plan](#).

3.6 EXCAVATION

Excavation shall consist of removal of material in preparing the foundations to the lines and grades shown on the drawings, removal of material from ditches and channels to the lines and grades shown on the drawings, removal of objectionable materials and obtaining required fill materials from the borrow areas. Over excavation outside the limits of embankment foundations or structures shall be backfilled to grade with similar over excavated material that are free of organics or satisfactory material and compacted to a density of at least that of the surrounding material.

The headwall and endwall excavations from EL. 0.0 to EL. -8.0 shown on the plans are intended to remove soft clay soils and replace with compacted backfill. Since this clay layer could possibly vary slightly in depth and thickness from what was encountered by the soil borings. Contractor should coordinate with the contracting officer representative to observe the excavation. The clay material shall be completely removed from the excavation before backfilling. It is the contractor's responsibility to ensure that the full vertical and horizontal extent of the clay is removed from beneath the headwall and endwall footprints.

3.6.1 Over Excavation

3.6.1.1 Within Limits of Embankment Foundations or Structures

Over excavation within the limits of the foundations of embankments or structures shall be backfilled to grade in accordance with paragraph PREPARATION OF FOUNDATION, PARTIAL FILL SURFACES AND ABUTMENTS.

3.6.2 Structures

Excavations for structures shall conform to the dimensions and elevations indicated for each structure, except as specified herein, and shall include trenching for utility and foundation drainage systems, and all incidental work. Excavation shall extend a sufficient distance from walls and footings to allow for placing and removal of forms. Satisfactory material removed below the depths indicated without specific direction of the Contracting Officer shall be replaced at no additional cost to the Government and filled in accordance with the subparagraph "Over Excavation" above. During the Foundation Inspection and Geologic Mapping, if the Contracting Officer determines that unsatisfactory materials have been encountered, the material shall be excavated to a minimum depth of 24 inches and a minimum of 5 feet from the foundation footprint and replaced with an initial 6-inch thick bridging lift (above the water table) of Select Fill and the remaining lifts compacted in accordance with all applicable paragraphs for Embankment Fill until elevation matches with the surrounding grades. Excavations shown below the headwall and endwall structures from EL 0.0 to EL. -8.0 shall be immediately backfilled with an initial 24-inch bridging lift (above the water table) of Select Fill and the remaining lifts with Embankment Fill placed in accordance with the applicable paragraphs for Embankment Fill. The excavation bottoms at EL.

-8.0 and the bridging lift of Select Fill shall be compacted by a minimum of four passes of a vibratory roller acting in static mode; no proof rolling or density testing is required for the excavation bottom at EL. -8.0 or the bridging lift.

3.6.3 Slopes and Surcharges

Temporary excavation slopes for any channel, structure excavation, or other required excavation shall not be steeper than the specified finished slope or the specified construction slope, as applicable, and subject to the approval of the Contracting Officer. Where undefined, slopes shall be no steeper than 1V on 3H, and height shall be no greater than 5 feet. This may be accomplished by benching the temporary slope so that the average slope is not steeper than the specified slope. In addition, no temporary, permanent, or construction slope shall be surcharged with excavated or stockpiled material or with heavy construction equipment which would have the same effect as the surcharge material. The toe of stockpiled material shall be maintained a minimum distance back from the top of the finished excavation equal to the depth of the excavation. Determine the maximum height of such stockpile without causing instability of the excavation slope. Any slide or other adverse conditions caused by failure of the Contractor to maintain these conditions shall be considered the responsibility of the Contractor and remedial measures shall be at the Contractor's expense.

3.6.4 Existing Embankments and Spoil Banks

Existing embankment shall be removed as shown on the drawings. Existing embankment located within the rights-of-way landward of the embankment and berms to be constructed, may be utilized as borrow material if satisfactory, but only after equal protection has been provided by construction of the cofferdams. When excavated for borrow material, the existing embankment shall be removed to the adjacent ground surface in a uniform manner, and shaped to maintain drainage.

3.6.5 Riprap and Bedding

Excavations for riprap and bedding shall be performed at the locations and to the lines and grades shown. Riprap and bedding shall be placed as specified in Section 35 31 19 STONE PROTECTION FOR STRUCTURES.

3.7 TOLERANCES

Finish the surface of excavations, embankments, and backfills to a smooth and compact surface in accordance with the lines, grades, and cross sections or elevations shown. Provide the degree of finish for graded embankment areas with plus 4 inches and minus 0 inches of the grades and elevations indicated, prior to the placement of surface treatments (sod, limerock base, asphalt, etc.). The degree of finish for underwater excavation shall be plus 0 feet and minus 1 foot of the grades and elevations indicated on the drawings. The degree of finish for temporary excavation surfaces shall be plus 0 inches and minus 6 inches. The degree of finish for Filter Soil shall be plus 3 inches and minus 0 inches. Finish Embankment Fill 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. Contractor shall repair graded, topsoiled, or backfilled areas prior to acceptance of the work, and re-established grades to the required elevations and slopes at no additional cost to the Government.

3.8 SLIDES

In case sliding occurs in any part of the excavations prescribed in this section after they have been excavated, but prior to final acceptance of all work under the contract, repair the slide as directed by the Contracting Officer. In case the slide is caused through the fault of the Contractor, it shall be repaired at no cost to the Government. In case the slide is due to no fault of the Contractor, an equitable adjustment in the contract price will be made for the repairs in accordance with the Contract Clause CHANGES.

3.9 STOCKPILES

Provisions of paragraph SLOPES AND SURCHARGES are applicable to all stockpiled materials. Upon completion of construction operations, all remaining stockpiled material shall be removed and disposed of by the disposal methods specified in paragraph DISPOSITION OF EXCAVATED MATERIALS.

3.10 SURFACE DRAINAGE OF COMPLETED AREAS

The areas shown on the drawings designated as "GRADE FOR SURFACE DRAINAGE", the borrow areas, and the finished embankment areas shall be graded to the lines and grades shown on the drawings. The surface shall be free from sharp ridges, gullies, potholes, sinkholes, and any other surface irregularities. A tolerance of 4 inches above the prescribed grade will be allowed provided that the surface drains in the direction as indicated on the drawings.

3.11 MAINTENANCE OF WORK

3.11.1 Debris Removal

Maintain all ditch and channel excavations free from leaves, brush, sticks, trash, and other debris until final acceptance of all work under the contract at no additional cost to the Government.

3.11.2 Sediment Removal

Prior to final acceptance of all work under this contract, the removal of sediments from ditch or channel excavations shall be required to restore design grade and section at no additional cost to the Government.

3.12 DISPOSITION OF EXCAVATED MATERIALS

3.12.1 Satisfactory Materials

Satisfactory materials in excess of the quantity necessary to construct backfills and embankments, shall remain the property of the Government.

3.12.2 Unsatisfactory Materials

Unsatisfactory materials shall be as defined in paragraph DEFINITIONS, subparagraph UNSATISFACTORY MATERIALS. Unsatisfactory materials from the excavations prescribed in this section shall be permanently disposed of by removal from the site to a Contractor-furnished disposal area in accordance with federal, state and local laws and regulations (see Section 01 57 20 ENVIRONMENTAL PROTECTION). No additional payment will be made for Contractor-furnished disposal areas. See Section 01 57 20

ENVIRONMENTAL PROTECTION.

3.13 PREPARATION OF FOUNDATION, PARTIAL FILL SURFACES AND ABUTMENTS

3.13.1 Earth

After clearing, grubbing, stripping and excavation of the embankment foundation to the extent indicated or otherwise required, the sides of stump holes, test pits, and other similar cavities or depressions shall be broken down so as to flatten out the slopes, and the sides of the cut or hole shall be scarified to provide bond between the foundation material and the fill. The surface for any lift of fill placed adjacent to slopes 4 horizontal on 1 vertical or steeper shall be scarified to a minimum depth of 6 inches prior to placement. Unless otherwise directed, any depression shall be filled with the same material type that is to be placed immediately above the foundation. The fill shall be placed in layers, moistened, and compacted in accordance with the applicable provisions of paragraphs PLACEMENT, MOISTURE CONTROL, and COMPACTION for the specific material type. Materials which cannot be compacted by roller equipment because of inadequate clearances shall be compacted with power tampers in accordance with the paragraph COMPACTION for the specific material type. After filling of depressions and immediately prior to placement of compacted fill in any section of the embankment, the foundation of such section shall be loosened thoroughly by scarifying, plowing, discing or harrowing to a minimum depth of 6 inches, and the moisture content shall be adjusted to the amount specified in paragraph MOISTURE CONTROL for the appropriate type of material. Immediately prior to placement of compacted fill on or against the surfaces of any partial fill section, remove all soft or loose material, all material containing cracks or gullies, and all material that does not conform with the specified zoning of the embankment shall be removed. The remaining surface of the partial fill shall be loosened by scarifying, plowing, discing or harrowing to a minimum depth of 6 inches, and the moisture content shall be adjusted as specified in paragraph MOISTURE CONTROL for the appropriate type of material. The surface of the partial fill section upon which fill is to be placed shall then be compacted as hereinafter specified for the appropriate type of fill. No separate payment will be made for loosening and rolling the foundation area, the abutment area, or the surfaces of partial fill sections, but the entire cost thereof shall be included in the applicable contract price for fill.

3.13.2 Settlement of Embankment Foundation

The Contractor may elect to furnish and install settlement gages for determination of settlement of the embankment foundation during construction. The Contractor shall monitor settlement of the concrete structures' foundations as required in Section 13 51 00 INSTRUMENTATION. A written description shall be included in the Plan of Operations submittal showing location of gages, settlement gage details, placement procedures and surveys.

3.13.3 Hard/Unyielding Materials Below Structures

3.13.3.1 Preliminary Cleanup

When hard/unyielding material is found at the excavation bottom, the Contracting Officer will require that the excavation be continued until a satisfactory foundation surface is reached free of uneven surfaces so that a uniform lift of fill material can be placed.

3.14 FOUNDATION INSPECTION AND GEOLOGIC MAPPING

Notify the Contracting Officer at least seven (7) days before foundation preparation will be completed and ready for evaluation by the Government. As used in this section, evaluation shall mean inspection, testing, geologic mapping, exploratory test pits, interpretation, and decision making. Maintain the foundation in a cleaned condition for Government evaluation. Allow 5 working days for Government evaluation. Contractor is responsible for shaping the excavation to promote drainage at all times. The excavation and side slopes shall be to the required lines and grade the day the inspection is to be performed. Coordinate with the COR to determine the date Government inspectors will perform then inspection.

Foundation shall mean any area of the excavation to receive concrete, fill or backfill, including the entire excavation bottom and side slopes. Inspections to determine the adequacy of the foundations will be performed by the Contracting Officer in all foundation areas prior to placement of any fill or concrete. The Contractor will cooperate to the extent necessary to assist in the inspection. This will include having equipment and personnel available to assist excavating, compacting, proof rolling, etc. The plan area of all structure footings shall be clearly marked with spray paint or stakes. The Contractor shall coordinate his schedule for foundation preparation and inspection and mapping with the Contracting Officer to ensure that the preparation and inspection proceed in an orderly manner.

Foundation mapping will require excavated surfaces to be closely inspected and documented. The Government will require surfaces to be cleaned by the Contractor to facilitate mapping. Cleaning will require cutting of fresh surface on the excavation bottom and on excavated slopes to expose in-situ material. Areas that have been over excavated shall remain over excavated until foundation mapping is complete. During evaluation, any temporary ramps covering side slopes shall be removed such that the excavation side slopes can be documented and mapped by the Government. The Contractor shall provide equipment to perform test pits as deemed necessary by the Government geologist and engineers performing the evaluation.

The Contractor will not be entitled to any compensation for delays, standby time, reduced efficiencies, or other similar costs due to the time required for foundation inspection and mapping.

Immediately following the foundation inspection and mapping period, the Contracting Officer will either approve the foundation section for permanent construction or will direct the Contractor to perform additional excavation.

- a. Government will conduct an evaluation of foundation surfaces to receive backfill or structures.
- b. Permit and facilitate safe access to the excavation by Government personnel for evaluation.
- c. The foundation shall be proof rolled by a fully loaded dump truck or approved roller to detect soft spots in the foundation.
- d. During evaluation, if the Contracting Officer determines that additional excavation is required to improve foundation conditions, perform additional excavation as directed. Clean the areas of

additional excavation. The Government will evaluate the surfaces of additional excavation.

3.14.1 Equipment for Foundation Excavation and Mapping

The Contractor shall have on site and make available to Government personnel performing mapping and inspection the following equipment with equipment operators to aid in performing excavations for test pits, sampling, inspection and cutting fresh surfaces for inspection and mapping:

- a. Excavating equipment - Backhoe with smooth edge bucket and bulldozer.
- b. Proof roller - Fully loaded dump truck or approved roller.
- c. Hand tools/supplies - Shovels, bars, picks, wedges, orange marking paint, survey flags, tape measures, and brooms.

3.15 PLACEMENT AND SPREADING

Prior to beginning embankment placement on the embankment foundation, notify the Contracting Officer that the foundation is ready to receive fill. No embankment or backfill shall be placed on or against concrete until the concrete has reached design strength without prior approval by the Contracting Officer. Fill shall be brought up in lifts evenly on both sides of culvert and headwall structures with no more than 2 feet difference in elevation on opposing sides of the structure.

3.15.1 Gradation and Distributions

The gradation and distribution of materials throughout each zone of the embankment shall be such that the embankment will be free from lenses, pockets, streaks, and layers of material differing substantially in texture or gradation from surrounding material of the same class. If lenses, pockets, or layers of materials differing substantially in texture or gradation from surrounding material occur in the spread material, the layer shall be mixed by harrowing or any other approved method to blend the materials. During the placing and spreading process, maintain at all times a force of workers adequate to remove all roots, debris, and oversize stone from all embankment materials. All stones and rock fragments larger than 4 inches in any dimension shall be removed from the fill.

3.15.2 Foundations and Partial Embankment Fills

The foundations and all partial embankment receiving fills shall be kept thoroughly drained. Placing operations will be such as to avoid mixing of materials from adjacent sections as much as practicable.

3.15.2.1 Fill in Wet Areas

Where fill is required in the wet, place Select Fill first by end-dumping and advancing with a V-shaped leading edge such that the center of fill is most advanced, thereby displacing ~~silt~~ sediment and soft material to both sides. Refer to the applicable Geotechnical Data Report (referenced in Section 01 11 00 SUMMARY OF WORK) for ~~silt/muck~~ sediment and soft thickness at each of the boring and muck probe locations. Select Fill shall be placed by this method to a height of 2 feet above the water level existing at the time of construction.

Proof rolling shall then be performed using safe methods, after which Embankment Fill shall be placed and compacted as described herein. No fill shall be placed in the wet within the limits of the cofferdam without Contracting Officer Approval.

3.15.3 Equipment Traffic

Equipment traffic on any embankment zone shall be routed to distribute the compactive effort as much as practicable. Ruts formed in the surface of any layer of spread material will be filled before that material is compacted. If, in the opinion of the Contracting officer, the compacted surface of any layer of material is too smooth to bond properly with the succeeding layer, the surface shall be loosened by scarifying or other approved methods before material from the succeeding layer is placed. No equipment except approved compaction equipment shall operate on Filter Soil or filter gravel.

3.15.4 Fill

Fill material shall be placed and spread in layers not more than 12 inches in non compacted thickness when compacted with a vibratory roller with a minimum weight of 5 tons and exerting a vertical vibrating force of not less than 20,000 pounds at a minimum frequency of 1,200 times per minute or by equivalent approved method. Non compacted lift thickness shall not exceed 6 inches when a hand operated (walk behind) plate compactor is used or in areas where such is required. Walk behind compactors shall only be used in confined spaces not accessible by vibratory roller. Layers should be started full out to the slope stakes and shall be carried substantially horizontal and parallel to the embankment centerline with sufficient crown or slope to provide satisfactory drainage during construction. Contractor may have to decrease the loose lift thickness or use different equipment to attain the required degree of compaction.

3.16 MOISTURE CONTROL

3.16.1 General

Satisfactory subgrade and fill materials shall contain the amount of moisture at the time of compaction, within the limits specified below or as directed by the Contracting Officer, necessary to obtain the required compaction. Material that is not within the specified moisture content limits or is observed to be pumping after compaction shall be reworked to obtain the specified moisture content, regardless of density.

3.16.1.1 Insufficient Moisture for Suitable Bond

If the top or contact surfaces of a partial fill section becomes too dry to permit suitable bond between these surfaces and the additional fill to be placed thereon, the Contractor shall loosen the dried materials by scarifying or discing to such depths as may be directed by the Contracting Officer, shall dampen the loosened material to an acceptable moisture content, and shall compact this layer in accordance with the applicable requirements of paragraph COMPACTION.

3.16.1.2 Excessive Moisture for Suitable Bond

If the top or contact surfaces of a partial fill section becomes too wet to permit suitable bond between these surfaces and the additional fill to be placed thereon, the wet material shall be scarified and permitted to

dry, assisted by discing or harrowing, if necessary, to such depths as may be directed by the contracting officer. The material shall be dried to an acceptable moisture content, and shall be compacted in accordance with the applicable requirements of paragraph COMPACTION.

3.16.1.3 Drying Wet Material

Material that is too wet shall be permitted to dry, be assisted by discing or harrowing, if necessary, until the moisture content is reduced to an amount within the specified limits. Material with high fines content may be difficult to dry or require additional time to dry and compact if excessively wet due to close proximity to the water table, wetted from rainfall or surface water control is inadequate.

3.16.1.4 Increasing Moisture in Dry Material

The moisture content of material that is too dry, will be adjusted on the embankment. The Contractor shall add water to the fill material and by harrowing, or other approved methods, work the moisture into the material until a uniform distribution of moisture within the specified limits is obtained. Water applied on a layer of fill on the embankment shall be accurately controlled in amount so that free water will not appear on the surface during or subsequent to rolling. Should too much water be added to any part of the embankment, the rolling on that section of the embankment shall be delayed until the moisture content of the materials is reduced to an amount within the specified limits. If it is impracticable to obtain the specified moisture content by wetting or drying the fill material, the Contractor may be required to pre-wet or dry back the material at the source of excavation or in the borrow area.

3.16.2 Moisture Tolerance of Fill and Subgrade Material

a. The moisture content of Embankment Fill and subgrade material during compaction shall be within the limits of 3 percentage points above optimum to 2 percentage points below optimum moisture content as determined by [ASTM D1557](#). Material that is not within the specified moisture content limits or is observed to be pumping shall be reworked to obtain the moisture content appropriate for that material type, regardless of density.

b. Filter Soil shall be wet during compaction. Each lift of Filter Soil shall be saturated immediately prior to compaction.

3.17 COMPACTION

Lift thickness shall be in accordance with subparagraph "Fill" of paragraph PLACEMENT AND SPREADING above. Compaction equipment shall be operated such that the strip being traversed by the vibratory roller shall overlap the rolled adjacent strip by not less than [3 feet](#). In areas which are not accessible by roller, the fill shall be compacted with an approved hand operated compactor to a density equal to that obtained in other areas which are accessible to rollers.

3.17.1 Compaction of Filter Gravel

Compaction of Filter Gravel shall be in accordance with Section [35 42 35](#) FILTER GRAVEL.

3.17.2 Compaction of Embankment Fill

After a layer of material has been dumped and spread, it shall be harrowed to break up and blend the fill materials and to obtain uniform moisture distribution. Harrowing shall be performed with a heavy disk plow, or other approved harrow, to the full depth of the layer. If one pass of the harrow does not accomplish the breaking up and blending of the materials, additional passes of the harrow shall be required, but in no case will more than three passes of the harrow on any one layer be required for this purpose. When the moisture content and the condition of the layer are satisfactory, the lift shall be compacted by use of vibratory roller to a minimum of 95 percent of the maximum dry density as determined by the Contractor in accordance with [ASTM D1557](#). Dumping, spreading, sprinkling, and compacting may be performed at the same time at different points along a section when there is sufficient area to permit these operations to proceed simultaneously. Each completed compacted lift shall be scarified a minimum of 2 inches before placement of subsequent loose lifts. For each compacted lift, the compaction and moisture requirements must be maintained to the standards stated above before placement of the next successive lift and throughout the process of backfilling.

When placing embankment fill against highly organic material, such as peat, that material shall be cut vertically, creating a bench within the suitable underlying material. The vertical cut, or near-vertical cut if required for safety reasons, within the peat shall itself be benched if it exceeds 3 feet in height.

3.17.3 Compaction of Filter Soil

All compaction level measurements shall be based on the maximum dry density obtained in accordance with [ASTM D4253](#). For the areas outside the limits of concrete placement, such as the chimney drain, the drainage blanket and portions of the Filter Collar, compaction of Filter Soil shall be accomplished using the compaction equipment described in subparagraph FILL of paragraph PLACEMENT AND SPREADING above using a smooth drum vibratory roller. The roller shall make a minimum of two (2) passes, acting in vibratory mode, across the initial lift of Filter Soil. Upon completion of these first two passes, the density of the Filter Soil shall be checked in accordance with [ASTM D1556](#). Additional passes of the vibratory roller shall be made until a relative compaction between 90 and 96% is attained. The number of passes required to achieve a relative compaction of 90% shall be the minimum required number of passes on subsequent lifts of Filter Soil. Additional density tests shall be conducted on intervals as required in subparagraph MATERIALS TESTING of paragraph FIELD QUALITY CONTROL.

For the areas under concrete, compaction of Filter Soil shall be such as to attain a minimum relative compaction of 95% of the maximum dry density obtained in accordance with [ASTM D4253](#).

Compaction equipment shall be clean and free from other fill types or debris and shall not result in contamination of the Filter Soil.

Adjacent lifts of other fill types shall be sloped slightly to drain away from the Filter Soil. Any contaminated Filter Soil shall be removed and replaced by the contractor at no additional cost. Placement methods shall not result in segregation of the Filter Soil (such as but not limited to placement via conveyor or chute).

3.17.4 Compaction Above and Adjacent to Internal HDPE Drain Pipe

Within 3 feet of the perforated internal drainage pipe and up to 3 feet of cover above the pipe, compaction shall be made with walk behind plate compactor. Non compacted lift thickness within this area shall be restricted to 6 inches. A minimum of 2 complete passes of this compaction equipment will be required for each lift of material within this area. Contractor shall ensure that compaction equipment used does not result in excessive deformation or collapse of the drainage pipe.

3.17.5 Subgrade Compaction

Upon completion of excavation, removal of unsatisfactory materials and preparation of subgrade, compact the top 12 inches of subgrade below the excavation limit to 95 percent of the maximum dry density as determined by the Contractor in accordance with [ASTM D1557](#). Unsatisfactory material encountered within the excavation side slope shall be cut vertical and will not require compaction. The vertical cut on unsatisfactory material shall not exceed 2 feet in height per cut.

3.17.6 Compaction Adjacent to Structures

Crawler-type tractors, vibratory roller equipment and other similar compaction equipment shall not be used within 10 feet of the temporary sheet pile cofferdam. Compaction within this zone shall be accomplished by the use of mechanical hand tampers, vibrating plates or other approved methods and equipment. The Contractor shall ensure that compaction operations do not damage any existing utilities or structures. Any damage caused by the Contractor's operation shall be repaired at no additional expense to the Government. Backfill shall not be placed adjacent to any concrete prior to reaching 80 percent of its design strength. All Embankment Fill placed adjacent to the culvert shall be placed on a 6-horizontal to 1-vertical (6:1) slope, sloping downward away from the culvert.

3.17.7 Compaction above Conduit Monoliths

Backfill shall not be placed over concrete conduit monoliths prior to reaching 100 percent of its design strength. The initial 36-inches of compacted fill shall have restrictions on non compacted lift thickness and compaction equipment, as specified below. All other specified requirements remain unchanged.

- a. 0 to 18-inches: Compaction shall be made with a hand operated (walk behind) plate compactor using non compacted lift thickness of 6 inches maximum. If proximity to concrete causes unreliable in-place density test results using ASTM D6938, ASTM D1556 shall be used.
- b. 18-inches to 36-inches: Up to a 5-ton static roller compactor can be used with a non compacted lift thickness of 8 inches maximum.

3.18 PLACING TOPSOIL

Place topsoil in accordance with Section [32 92 23](#) SODDING.

3.19 FIELD QUALITY CONTROL

3.19.1 Clearing, Grubbing, and Stripping

Establish and maintain quality control for clearing, grubbing, and stripping operations to assure compliance with contract requirements, and maintain records of the quality control for all construction operations including but not limited to the items indicated below. These records, as well as the records of corrective actions taken, shall be furnished to the Government in accordance with Section 01 45 04 CONTRACTOR QUALITY CONTROL.

3.19.1.1 Clearing

Station to station limits, transverse clearing limits from applicable centerline; percentage of area complete; types of materials cleared.

3.19.1.2 Grubbing

Station to station limits, transverse grubbing limits from applicable centerline; percentage of area complete; type of material; filling of grubbed holes.

3.19.1.3 Stripping

Station to station limits, transverse stripping limits from applicable centerline; percentage of area complete; type of material; depth of stripping.

3.19.2 Excavation

Establish and maintain quality control for excavation operations to assure compliance with contract requirements, and maintain records of the Contractor's quality control for all construction operations including but not limited to the following:

- a. Lines, grades and tolerances,
- b. Segregation of materials,
- c. Disposal and/or stockpiling of materials,
- d. Unsatisfactory materials,
- e. Conditions that may induce seepage or weaken the foundation or embankment,
- f. Stability of excavations.

Records of inspections and tests, as well as the records of corrective actions taken, shall be furnished to the Government in accordance with Section 01 45 04 CONTRACTOR QUALITY CONTROL.

3.19.3 Embankment

3.19.3.1 General

As a part of the Resident Management System (RMS) system required by Section 01 45 04 CONTRACTOR QUALITY CONTROL, establish and maintain field quality control for foundation preparation, embankment and backfill

operations to ensure compliance with contract requirements and maintain detailed records of field quality control for all operations including but not limited to the following:

a. Earthwork Equipment

Type, size, number of units and suitability for construction of the prescribed work.

b. Foundation Preparation

Methods of preparing the foundations in advance of embankment and backfill construction and methods for providing drainage of the foundation and partially completed fills.

3.19.3.2 Materials Testing

The Contractor shall perform sufficient testing to ensure that the fill is being constructed as specified. The testing program specified below shall be considered the minimum acceptable frequency of testing. This does not relieve the Contractor from the responsibility of performing additional testing, if required to ensure compliance with these specifications.

a. Soil Classification Tests for Fill Material

Soil classification tests shall be performed in accordance with [ASTM D2487](#). One initial classification test shall be required for each different classification of material to be utilized as embankment fill or backfill. As prescribed in [ASTM D2487](#), grain size analyses in accordance with [ASTM D422](#) and Atterberg limits in accordance with [ASTM D4318](#) shall be performed on each different classification. The Contractor shall submit additional tests for every 2,500 cubic yards of embankment or backfill material as well as compaction tests, as described below in subparagraph "Compaction Testing". Soil classification tests shall be performed on foundation material as required to determine the acceptability of the in-situ soils. Additional tests will be required if noticeable changes in the material occur.

b. Soil Classification Tests for Filter Soil

Soil classification tests shall be performed in accordance with [ASTM C33/C33M](#), Sections 5 through 8, and shall include, but is not limited to, particle size distribution ([ASTM C136](#)), test method for soundness ([ASTM C88](#)), and percentage of friable particles ([ASTM C142/C142M](#)). Testing shall be performed by a testing laboratory validated by the U.S. Army Corps of Engineers (USACE) within the last 12 months, and results shall be provided to the Contracting Officer. During delivery, subsequent testing shall be performed, by an USACE validated lab, for every 250 tons (or fraction thereof) of aggregate to be delivered. All testing shall be representative of the materials delivered to the project site. Test results shall be signed and sealed by a licensed Professional Engineer or Geologist, licensed in the state from which the material is tested, and shall clearly state that the fine aggregate to be furnished is silica sand (per this specification).

c. Compaction Testing

(1) Compaction Tests.

(a) Embankment Fill: Run not less than one modified proctor test (ASTM D1557) for every 2,500 cubic yards or whenever a new source or soil type is used.

(b) Filler Soil: Run not less than three vibratory table tests (ASTM D4253) per source or per culvert location.

(2) In-Place Density Tests.

(a) Embankment Fill: The in-place density shall be determined in accordance with ASTM D1556 or ASTM D6938. When the nuclear method is used for in-place density testing according to ASTM D6938, the first daily test and every tenth test thereafter for each material type shall include a sand cone correlation test in accordance with ASTM D1556. The sand cone test shall be performed adjacent to the location of the nuclear test, and shall include a nominal 6 inch diameter sand cone, and shall include a minimum wet soil weight of 6 pounds extracted from the hole. The density correlations shall be submitted with test results.

Embankment Fill areas outside of concrete structure footprint: The excavation shall be divided into a quadrant at the approximate centerlines of the conduit and embankment. In each quadrant, run not less than one (1) in-place density test on each lift of material or every 60 cubic yards of completed embankment fill or backfill, whichever is more stringent, evenly distributed within the quadrant. Horizontal locations shall be randomly staggered in the fill.

Embankment Fill areas beneath structure footprint: Perform at least 3 in-place density tests per lift below each culvert headwall and endwall/wingwall structure, and at least 5 in-place density tests per lift below the alignment of each culvert barrel.

(b) Filter Soil: The in-place density shall be determined in accordance with ASTM D1556. Perform at least one Sand Cone test per lift on Filter Soil. In-place density using the nuclear method will not be allowed in Filter Soil.

Each transmittal for each material type that includes density test data shall be submitted electronically as an Excel Spreadsheet (.xls) file in addition to PDF format and must include a summary of all density correlations for the job neatly prepared on a summary sheet and must include at a minimum:

- (i) Meter serial number and operators initials.
- (ii) Standard count for each test.
- (iii) Material description (including USCS classification and color description).
- (iv) Probe depth.
- (v) Moisture content by each test method and the deviation.
- (vi) Wet and dry density by each test method and the deviation.
- (vii) Detailed Test location - State plane coordinates (x and y), elevation, and date.
- (viii) Corresponding Laboratory Density and Moisture Test (e.g. Mod. Proctor) for field density test results included w/ the submittal.

(ix) Whether material passed or failed.

(3) Water (Moisture) Content Tests. Determination of water content shall be performed in accordance with ASTM D6938 when nuclear density test method is used. When nuclear method is used for in-place moisture content, the first and every tenth test thereafter for each material type shall include determination of moisture content based on ASTM D2216. ASTM D4643 may be used when rapid moisture content results are needed or as a substitute to ASTM D6938 or if it is determined that the latter is not reliable. All rapid results obtained by ASTM D4643 shall be confirmed by a test on a duplicate sample performed in accordance with ASTM D2216. In the event of significant disagreement (more than 2%) between the ASTM D6938 and ASTM D2216 tests, ASTM D2216 shall govern and ASTM D6938 shall no longer be used until calibration tests show agreement between methods. In the event that ASTM D6938 cannot be calibrated to provide accurate results, ASTM D4643 and ASTM D2216 shall be used exclusively to determine moisture. One (1) moisture content test will be performed each time a density test is performed on any given lift.

d. Additional Testing

The Contracting Officer may request additional tests if there is reason to doubt the adequacy of the compaction, or special compaction procedures are being used, or materials change or if the Contracting Officer determines that the Contractor's testing is inadequate or the Contractor is concentrating backfill and fill operations in a relatively small area.

3.19.3.3 Testing by the Government

During the life of this contract, the Government or its QA Contractor(s) will perform quality assurance tests. The Contractor shall make materials available for testing and expose materials for testing at the request of the Contracting Officer for the duration of this contract. Provide safe access at no additional time or cost to the Government. The Contractor will provide a minimum of 72 hour notice prior to conducting sample collection at material provider site, to allow government the ability to schedule resources for any split sampling during the duration of the contract.

3.19.3.4 Reporting

On a daily basis, furnish the inspection records and all material testing results, the quantity of fill placed, as well as the records of corrective action taken, in accordance with Section 01 45 04 CONTRACTOR QUALITY CONTROL. Also, provide monthly summary of all density/compaction tests.

-- End of Section --