US Army Corps
Of Engineers

January 2026

RTA Specifications

Fort Eustis
Dredge Material Management Area (FEDMMA)
Raise FY25

Ft Eustis, Virginia NAO File Number: 1139

Norfolk District U.S. Army Corps of Engineers
Engineering Division
Design Branch
803 Front Street
Norfolk, VA 23510

PROJECT TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

01 11 00	02/24, CHG 1: 05/25	SUMMARY OF WORK
01 14 00	11/22, CHG 5: 05/25	WORK RESTRICTIONS
01 20 00	11/20, CHG 4: 08/24	PRICE AND PAYMENT PROCEDURES
01 30 00	11/20, CHG 5: 02/25	ADMINISTRATIVE REQUIREMENTS
01 32 01.00 10	08/23, CHG 1: 08/24	PROJECT SCHEDULE
01 33 00	08/18, CHG 4: 02/21	SUBMITTAL PROCEDURES
01 35 26	05/24, CHG 1: 05/25	GOVERNMENTAL SAFETY REQUIREMENTS
01 42 00	05/24	SOURCES FOR REFERENCE PUBLICATIONS
01 45 00	08/23, CHG 3: 08/25	QUALITY CONTROL
01 45 00.15 10	11/23	RESIDENT MANAGEMENT SYSTEM CONTRACTOR MODE (RMS CM)
01 50 00	11/20, CHG 3: 08/24	TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS
01 57 19	08/22, CHG 1: 05/25	TEMPORARY ENVIRONMENTAL CONTROLS
01 58 00	08/19, CHG 5: 08/22	PROJECT IDENTIFICATION
01 74 19	02/19, CHG 3: 11/21	CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
01 78 00	05/19, CHG 1: 08/21	CLOSEOUT SUBMITTALS

DIVISION 03 - CONCRETE

03 30 00	02/19, CHG 8: 05/24	CAST-IN-PLACE CONCRETE

DIVISION 05 - METALS

05 12 00	08/18, CHG 2: 05/21	STRUCTURAL STEEL
05 51 33	02/16, CHG 2: 02/18	METAL LADDERS

DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES

06 10 00	08/16, CHG 2: 11/18	ROUGH CARPENTRY

DIVISION 31 - EARTHWORK

31 00 00	08/23	EARTHWORK
31 00 01		EXCAVATION, FILLING AND BACKFILLING FOR SPILLBOX STRUCTURE
31 05 22	08/08	GEOTEXTILES USED AS FILTERS

DIVISION 33 - UTILITIES

33 40 00	02/10	DRAINAGE PIPE

DIVISION 35 - WATERWAY AND MARINE CONSTRUCTION

35 42 35	01/13	POLYMERIC MARINE FILTER MATTRESS

01 14 00 -ATTACHMENT A: Fort Eustis SPECIAL INSTRUCTIONS

SUBMITTAL REGISTER

EMP 4_4_6_16 CONTRACTING ENVIRONMENTAL SPECIAL CONDITIONS

VA GENERAL VPDES for Discharges of Stormwater Permit Form (VAR10)

GEOTECHNICAL DATA REPORT

-- End of Project Table of Contents --

SECTION 01 11 00

SUMMARY OF WORK
02/24, CHG 1: 05/25

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Salvage Plan; G, RO

1.2 DEFINITIONS

Facility: The facility is located at a location to be specified by the Government at Joint Base Langley-Eustis, Fort Eustis, Virginia:

CO: Contracting Officer or their authorized representative.
U.S. Army Corps of Engineers Norfolk District

1.3 WORK COVERED BY CONTRACT DOCUMENTS

1.3.1 Project Description

The Contractor shall provide construction services, including personnel, transportation, mobilization/demobilization, equipment, and materials required in connection with the services described in this Scope of Work. The services shall be performed in accordance with the technical and special provisions contained herein. Services not specifically described herein are nevertheless required if they can be identified as an item commonly a part of normally expected and/or professional grade work of a comparable nature. The work shall be performed in accordance with the Contract, manufacturer's recommendations, and state building codes

This contract includes: 1) the partial demolition of the two existing spillboxes, 2) the construction of two new free-standing spillboxes in the sediment cell, 3) the connection of the new spillboxes to the existing spillboxes via new pipelines, 4) mixing, excavation, and hauling of material from the borrow site, and 5) material placement at the areas specified, including along the dike crest and the access road.

1.3.2 Location

The work is located at FEDMMA, approximately as indicated. The exact location will be shown by the Contracting Officer.

1.3.3 Special Base Wide Requirements

Refer to Section 01 14 00, Appendix A for specific base wide requirements. Appendix A should be considered basic requirements for the project. Other

requirements in the Specification documents are in addition to the requirements in Appendix A.

1.4 PERSONNEL RESTRICTIONS

Personnel are limited to the immediate site areas and must not enter buildings or facilities not involved in the work. All employees of the Contractor will be subject to all rules and regulations of the Facility which pertain to personnel. The Contractor must erect fences and signs as specified and be responsible for the restrictions of all personnel. The Contractor's plans for restricting personnel access to the project site must be submitted for approval as a part of the Safety Plan (Accident Prevention Plan). Facility access must be restricted. Contractor must comply with current security requirements. All vehicles must be registered with the military police. All vehicles shall be registered with the military police. See also Section 01 14 00 ATTACHMENT A paragraph 2.

1.5 TRANSPORTATION FACILITIES

The Facility is served by an all weather surfaced road network and training road trails which are all deemed to be weight rated for road legal vehicles by the installation's Civil Engineering Division. Road(s) within the Facility and vicinity of the site are for construction activities such as materials delivery and hauling proposed to be used by the Contractor. These roads shall be subject to prior approval of the Facility authorities and such roads, if used, shall be maintained throughout construction and shall be restored to as good condition as existed prior to their use. The Contractor shall also construct, subject to approval, such temporary haul roads and bridges (such as temporary causeway for construction of the taxiway bridge) as may be necessary for conducting his work. Any such temporary construction shall be removed and the affected area restored to its original condition. All costs for the use of existing transportation facilities, for the construction of temporary facilities, and for maintenance, repair, removal and restoration shall be borne by the Contractor.

1.5.1 Use of Roads

Hard-surfaced roads from major and primary municipal roads serve the Facility. The movement of all vehicles within the Facility shall be confined to the roads designated in the plans or as approved by the Contracting Officer and shall comply with traffic regulations within the Facility. The Contractor shall keep all roads clear of all obstructions and free of mud and other foreign materials resulting from operations. The Contractor's vehicles shall at no time follow a vehicle closer than 50 feet, and all vehicles shall pull off the road and come to a complete stop when meeting emergency vehicles, or vehicles with flashing lights. Facility speed limits and traffic controls shall be observed.

Trails and training roads paved with aggregate link the construction site to hard surfaced roads. Aggregrate surfaces shall be maintained in a manner where they can be used by military training vehicles throughout the construction period. Closure of roads for construction purposes shall only occur if a schedule for such closure is submitted and approved in advance by the Contracting Officer.

1.5.2 Road Restrictions

The movement of all vehicles within the Facility shall be confined to the roads designated and shall comply with traffic regulations within the Facility. Other roads may be used only with the approval of the CO.

1.5.3 Cleated Vehicles

Cleated vehicles shall not be moved over surfaced roads except at the immediate site of the area where they are to be used.

1.6 SPECIAL CONTRACTOR REQUIREMENTS

1.6.1 NOTIFICATION OF WORK IN DOMINION VIRGINIA POWER (DVP) ZONE

It shall be the responsibility of the Contractor to submit a "Notification of Work" form prior to performance of work that may come into contact with electrical distribution system components within DVP's zone of responsibility. Submission shall be required a minimum of 48 hours in advance of the scheduled work. DVP's zone of responsibility is defined as all primary lines (600 volts and above) and down to the first point of positive disconnection past the distribution transformer reducing the supply voltage below 600 volts. Provide copies of this notification to the COR, DVP Regional Operation Center (ROC)-757-857-2633(fax), DVP Kenneth Schutz-703-359-3210(fax) and the designated representative for the installation.

1.6.2 Coordination in Work Areas

1.6.2.1 Maintenance of Utilities

Any active utilities, including but not limited to electricity, gas, communications, water, sanitary sewer, storm sewer, heating, air conditioning, or any like service, that will require interruption or replacement in any occupied area affected as a result of the Contractors scheduled work activities, shall be temporarily provided by the Contractor at his own expense until the affected service is fully and permanently restored. All temporary method(s) of service replacement the Contractor proposes for use on this Contract shall be approved by the CO prior to commencing the work.

1.6.2.2 Hours of Work

The normal work hours for construction shall be permitted to occur between 7:30 A.M. to 5:00 P.M., Monday through Saturday, unless as established and approved by the Contracting Officer in the Contractor's Project Schedule. Any request to change these hours shall be made in writing to the Contracting Officer at least two calendar days prior to the desired day on which the change is to go into effect. The changed hours shall not go into effect until written permission has been received from the Contracting Officer.

1.6.2.3 Existing Utility Location

Existing utilities must be located before doing any digging work on Facility. The Contractor shall be responsible to contact Miss Utility, obtain all necessary existing utility locations, which may be necessary to accomplish his work, and mark any utility lines in the immediate vicinity of his work. It shall be the responsibility of the Contractor to contact

Miss Utilities at 1-800-552-7110 for locating commercial utilities 48 hours prior to digging operations.

1.6.2.4 Digging Permits

Contractor is responsible for obtaining all digging permits, including associated locating and marking services, in accordance with installation and local requirements, at no additional cost to the Government. "Clearance Permits for Digging', must be obtained before doing any work on Facility. The Contractor shall be responsible to obtain all necessary digging permits and pay costs associated with the permit, which may be necessary to accomplish his work. All permits will be obtained through Miss Utilities at 1-800-552-7110.

1.6.2.5 Personnel Escort

An authorized Contractor representative must escort all personnel attempting to obtain a badge to Security. The representative shall sign documentation that the employee meets Security criteria and is suitable for a badge to be issued.

1.7 TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER

This provision specifies the procedure for the determination of time extensions for unusually severe weather in accordance with the Contract. In order for the Contracting Officer to award a time extension under this clause, the following conditions must be satisfied:

a. The weather experienced at the project site during the Contract period must be found to be unusually severe, that is, more severe than the adverse weather anticipated for the project location during any given month.

b. The unusually severe weather must actually cause a delay to the completion of the project. The delay must be beyond the control and without the fault or negligence of the Contractor.

1.7.1 Schedule

The following schedule of monthly anticipated adverse weather delays is based on National Oceanic and Atmospheric Administration (NOAA) or similar data for the project location and will constitute the base line for monthly weather time evaluations. The Contractor's progress schedule must reflect these anticipated adverse weather delays in all weather dependent activities.

MONTHLY ANTICIPATED ADVERSE WEATHER DELAY WORK DAYS
BASED ON (5) DAY WORK WEEK AT PROJECT LOCATION

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
JBLE-Eustis	10	9	8	6	7	7	9	6	5	5	6	9

1.7.2 Records

Upon acknowledgement of the Notice to Proceed and continuing throughout

the Contract, the Contractor will record on the daily CQC report, the occurrence of adverse weather and resultant impact to normally scheduled work. Actual adverse weather delay days must prevent work on critical activities for 50 percent or more of the Contractor's scheduled work day.

1.7.3 Impacted Days

The number of actual adverse weather days shall include days impacted by actual adverse weather (even if adverse weather occurred in previous month), be calculated chronologically from the first to the last day in each month, and be recorded as full days. If the number of actual adverse weather delay days exceeds the number of days anticipated in the schedule of monthly anticipated adverse weather delays, above, the Contracting Officer will convert any qualifying delays to calendar days, giving full consideration for equivalent fair weather work days, and issue a modification in accordance with the Contract .

1.8 COOPERATION WITH USING AGENCY AND OTHER CONTRACTORS

During the period of this Contract, other contracts may be in force for the construction of other features of work on or adjacent to the site of work being accomplished under this Contract. It shall be the responsibility of the Contractor on this Contract to be fully informed of the extent of the limits of work to be performed by other Contractors. Should there be any conflict between these limits, it shall be brought to the attention of the Contracting Officer(CO)and the CO's decision shall be final. Also, prior to completion of work under this Contract, members of the Using Agency may be performing work or occupying facilities on or adjacent to the area. The Contractor shall arrange his plant and shall schedule and perform this work so as to effectively cooperate with all other Contractors and Government agencies.

1.9 EXISTING WORK

Remove or alter existing work in such a manner as to prevent injury or damage to any portions of the existing work which remain.

Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, as approved by the Contracting Officer. At the completion of operations, existing work must be in a condition equal to or better than that which existed before new work started.

1.10 LOCATION OF UNDERGROUND UTILITIES

Scan the construction site with dual frequency Ground Penetrating Radar (GPR), electromagnetic, or sonic equipment, and mark the surface of the ground or paved surface where existing underground utilities are discovered. Verify the elevations of existing piping, utilities,and any type of underground obstruction not indicated, or specified to be removed, that is indicated or discovered during scanning, in locations to be traversed by piping, ducts, and other work to be conducted or installed. Verify elevations before installing new work closer than nearest manhole or other structure at which an adjustment in grade can be made.

1.10.1 Notification Prior to Excavation

Notify the Contracting Officer at least 15 days prior to starting excavation work.

1.11 SALVAGE MATERIAL AND EQUIPMENT

Items designated by the Contracting Officer to be salvaged,including trees to be removed from the site identified by the Government as suitable for harvest,shall remain the property of the Government. It is expected that the Government will have cleared the site of harvestable timber stock prior to commencement of construction. Clearing and grubbing shall be the responsibility of the Contractor.

Items designated by the Contracting Officer to be salvaged remain the property of the Government. Segregate, itemize, deliver and off-load the salvaged property at the storage area located within the installation as designated and approved by the Contracting Officer.

Provide a salvage plan, listing material and equipment to be salvaged, and their storage location. Maintain property control records for material or equipment designated as salvage. Provide a system for property control in the salvage plan. Store and protect salvaged materials and equipment until disposition by the Contracting Officer.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 14 00

WORK RESTRICTIONS
11/22, CHG 5: 05/25

PART 1 GENERAL

1.1 REFERENCES

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

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1 (2024) Safety -- Safety and Occupational Health (SOH) Requirements

1.2 SUBMITTALS

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

List of Contact Personnel

1.3 SPECIAL SCHEDULING REQUIREMENTS

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

1.4 CONTRACTOR ACCESS AND USE OF PREMISES

See specification Section 01 14 00, Attachment A, Paragraph 18.

Contractor must refer to ANTITERRORISM SECURITY CHECKLIST table below to use as a quick checklist.

AT Level I Training	Contractor and subcontractor employees requiring access to controlled installations. (Must be completed within 30 days)
Suspicious Activity Reporting Training	Contractor and subcontractor employees requiring access to controlled installations. (Must be completed within 30 days)
Army Training Cert Tracking System (ACTS)	Contractor employees who require access to government information systems.

DoD Information Assurance Awareness Training	Contractor employees who require access to government information systems.
OPSEC SOP/Plan	Contractors performing classified contracts or has access to critical information. (Must be completed within 90 days of contract)
Level I OPSEC Training	All contractor employees. (Must be completed within 30 days)
Escort required	All contractor employees when not in possession of appropriate security clearances.
Facility Clearance	Required by prime contractor. Contractor personnel performing work under contract must have required security clearance prior to start of period of performance.
E-verify Program	Contractor must pre-screen candidates is E-verify Program website. http://www.uscis.gov/e-verify
Threat Awareness Reporting Program (TARP)	All contractors with security clearances.

Opsec Requirements

a. AT Level I training. This provision/contract text is for contractor employees with an area of performance within a controlled installation, facitliy or area. All contractor employees, to include subcontractor employees, requiring access to installations, facilities, controlled access areas, or require network access, must complete AT Level I awareness training within 30 calendar days after contract start date or effective date of incorporation of this requirement into the contract, whichever is applicable. Upon request, the contractor must submit certificates of completion for each affected contractor employee and subcontractor employee, to the COR or to the contracting officer within 5 calendar days after completion of training by all employeees and subcontractor personnel. AT Level I awareness training is available at the following website: https://jko.jten.mil/courses/AT-level1/launch.html; or it can be provided by the RA ATO in presentation form which will be documented via memorandum.

b. Access and general protection/security policy and procedures. This standard language text is for contractor employees with an area of performance within a controlled installation, facility or area. All contractor and all associated subcontractor's employees must comply with applicable installation, facility and area commander installation/facility access and local security policies and procedures (provided by government representative). The contractor must also provide all information required for background checks to meet installation/facility access requirements to be accomplished by installation Provost Marshal Office, Director of Emergency Services or Security Office. Contractor workforce must comply with all personal

identity verification requirements (FAR clause 52.204-9, Personal Identity Verification of Contractor Personnel) as directed by DOD, HQDA and/or local policy. In addition to the changes otherwise authorized by the changes clause of this contract, should the Force Protection Condition (FPCON) at any installation or facility change, the Government may require changes in contractor security matters or processes.

c. Suspicious activity reporting training (e.g. iWATCH, CorpsWatch, or See Something, Say Something). This standard language is for contractor employees with an area of performance within a controlled installation, facility or area. The contractor and all associated subcontractors must receive a brief/training (provided by the RA) on the local suspicious activity reporting program. This locally developed training will be used to inform employees of the types of behavior to watch for and instruct employees to report suspicious activity to the project manager, security representative or law enforcement entity. This training must be completed within 30 calendar days of contract award and within 30 calendar days of new employees commencing performance with the results reported to the COR NLT 5 calendar days after the completion of the training.

d. For contracts that require OPSEC Training. Per AR 530-1 (Operations Security), contractor employees must complete Level I OPSEC Training within 30 calendar days of contract award. All new contractor employees will complete Level I OPSEC Training within 30 calendar days of their reporting for duty. Additionally, all contractor employees must complete annual OPSEC awareness training. The contractor must submit certificates of completion for each affected contractor and subcontractor employee, to the COR or to the Contracting Officer within 5 calendar days after completion of training. OPSEC awareness training is available at the following websites: http://www.cdse.edu/catalog/operations-security.html; or it can be provided by the RA OPSEC Officer in presentation form which will be documented via memorandum.

1.4.1 Activity Regulations

Ensure that Contractor personnel employed on the Activity become familiar with and obey Activity regulations including safety, fire, traffic and security regulations. Keep within the limits of the work and avenues of ingress and egress. Wear appropriate personal protective equipment (PPE) in designated areas. Do not enter any restricted areas unless required to do so and until cleared for such entry. Ensure all Contractor equipment, include delivery vehicles, are clearly identified with their company name.

1.4.1.1 Subcontractors and Personnel Contacts

Provide a list of contact personnel of the Contractor and subcontractors including addresses and telephone numbers for use in the event of an emergency. As changes occur and additional information becomes available, correct and change the information contained in previous lists. See specification Section 01 14 00 Attachment A, Paragraph 1.

1.4.1.2 Identification Badges and Installation Access

Application for and use of badges will be as directed. Obtain access to the installation by completing Fort Eustis defense biometric identification system (DBIDS) spread sheet for all personnel.

Spreadsheets are due to resident office clerk 2 weeks prior to the day access is needed with all columns in light blue filled out. The spreadsheet can be found as an attachment.

a. Failure to obtain entry approval will not affect the contract price or time of completion.

b. One-Day Passes: Personnel may obtain one-day passes at the main visitor center but may be subject to daily mandatory vehicle inspection, and will have limited access to the installation. The Government will not be responsible for any cost or lost time associated with obtaining daily passes or added vehicle inspections.

1.4.1.3 No Smoking Policy

1.4.2 Working Hours

Regular working hours will be between 7:30 a.m. and 5:00 p.m., Monday through Friday, excluding Government holidays.

When the Installation Commander closes the installation for any reason, including but not limited to days of inclement weather, the Contractor shall not provide services.

1.4.3 Work Outside Regular Hours

Work outside regular working hours requires Contracting Officer approval. Make application 15 calendar days prior to such work to allow arrangements to be made by the Government for inspecting the work in progress, giving the specific dates, hours, location, type of work to be performed, contract number and project title. Based on the justification provided, the Contracting Officer may approve work outside regular hours. During periods of darkness, the different parts of the work must be lighted in accordance with requirements of EM 385-1-1. Make utility cutovers after normal working hours or on Saturdays, Sundays, and Government holidays unless directed otherwise.

1.4.4 Occupied Buildings

Work will be around existing buildings which are occupied. Do not enter the buildings without prior approval of the Contracting Officer.

1.4.5 Utility Cutovers and Interruptions

a. See specification Section 01 14 00 Attachment A Paragraph 11 and Paragraphs 22, 23 and 24 for utility owners.

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

c. Interruption to water, sanitary sewer, storm sewer, telephone service, electric service, air conditioning, heating, fire alarm, compressed air are considered utility cutovers pursuant to the paragraph WORK OUTSIDE REGULAR HOURS.

d. Operation of Station Utilities: The Contractor must not operate nor disturb the setting of control devices in the station utilities system, including water, sewer, electrical, and steam services. The Government will operate the control devices as required for normal

conduct of the work. The Contractor must notify the Contracting Officer giving reasonable advance notice when such operation is required.

1.5 SECURITY REQUIREMENTS

See specification Section 01 14 00 Attachment A Paragraph 2.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

ATTACHMENT A – to Specification Section 01 14 00

FORT EUSTIS SPECIAL INSTRUCTIONS 19 Apr 2019

SPECIAL WORK REQUIREMENTS AND RESTRICTIONS:

1. GENERAL INTENTIONS:

1.1. The Contractor and his employees and subcontractors shall become familiar with and obey all Fort Eustis regulations, including fire, traffic, and security regulations. The Contractor's employees and subcontractors shall keep within the limits of the work (and avenues of ingress and egress), and shall not enter restricted areas unless previously approved to do so. The Contractor and subcontractors shall take precautions to protect occupants and government personnel while construction is in progress and protect areas overnight. Contractor will take necessary precautions to protect adjacent areas from damage during construction. The Contractor shall restore all structures, grounds, and appurtenances damaged during the course of the work to original condition prior to the start of work at the Contractor's expense.

1.2. All work shall be done in accordance with Department of Defense (DoD) Unified Facilities Criteria (UFC), the International Building Code, and The Code of Virginia, Title 54.1, Licensing requirements for architects, professional engineers, and land surveyors. All equipment and installations will also be in accordance with the manufacturer's literature. In the event a conflict should arise concerning specific requirements, the more stringent requirement shall be the mandatory requirement.

2. BASE REGULATIONS:

The site of the work is on a military reservation, and all rules and regulations issued by the Commanding Officer, Fort Eustis covering safety and sanitary requirements, shall be observed by the Contractor.

2.1 Personnel Restrictions:

Personnel will be limited to the immediate site area and shall under no circumstances enter buildings or facilities not involved in the work. All employees of the Contractor will be subject to all rules and regulations of Fort Eustis, which pertain to personnel. The Contractor shall erect any necessary fences or signs and be responsible for the restrictions of all personnel.

2.2 Transportation Facilities:

The facility is served by an all-weather surfaced road network. Road(s) within the military reservation proposed to be used by the Contractor, shall be subject to prior approval of the Base authorities and such roads, if used, shall be maintained throughout construction and shall be restored to as good condition as existed prior to their use.

2.3 Base Entry Requirements:

The contractor shall request installation visitor passes directly through the Contracting Officer (CO). An attendee (or work personnel) list from

contractor shall be submitted via e-mail no less than 72 business hours/three full business days in advance. For attendee (or work personnel) lists with 10 or more individuals, the Contractor shall submit attendee list no less than two weeks in advance. The attendee (or work personnel) list shall include each attendee's full name as it appears on their driver's license/identification card, Sex, Race, Date of Birth, Social Security Number, Driver's License Number, Government Agency, Sponsor Name, Sponsor DoD ID Number, Sponsor phone/email, Length of pass/ Hours of Operation/Days for Access, FPCON Access Requirement and Visitor Category (See Attached "DBIDS Request Spreadsheet"). The attached spreadsheet should be submitted to the 733 Security Forces Squadron at Shardae.m.guest.civ@mail.mi . Failure to provide this information will result in exclusion from access to the installation.

See sample below of the "DBIDS Request Spreadsheet" (separated to fit this sheet).

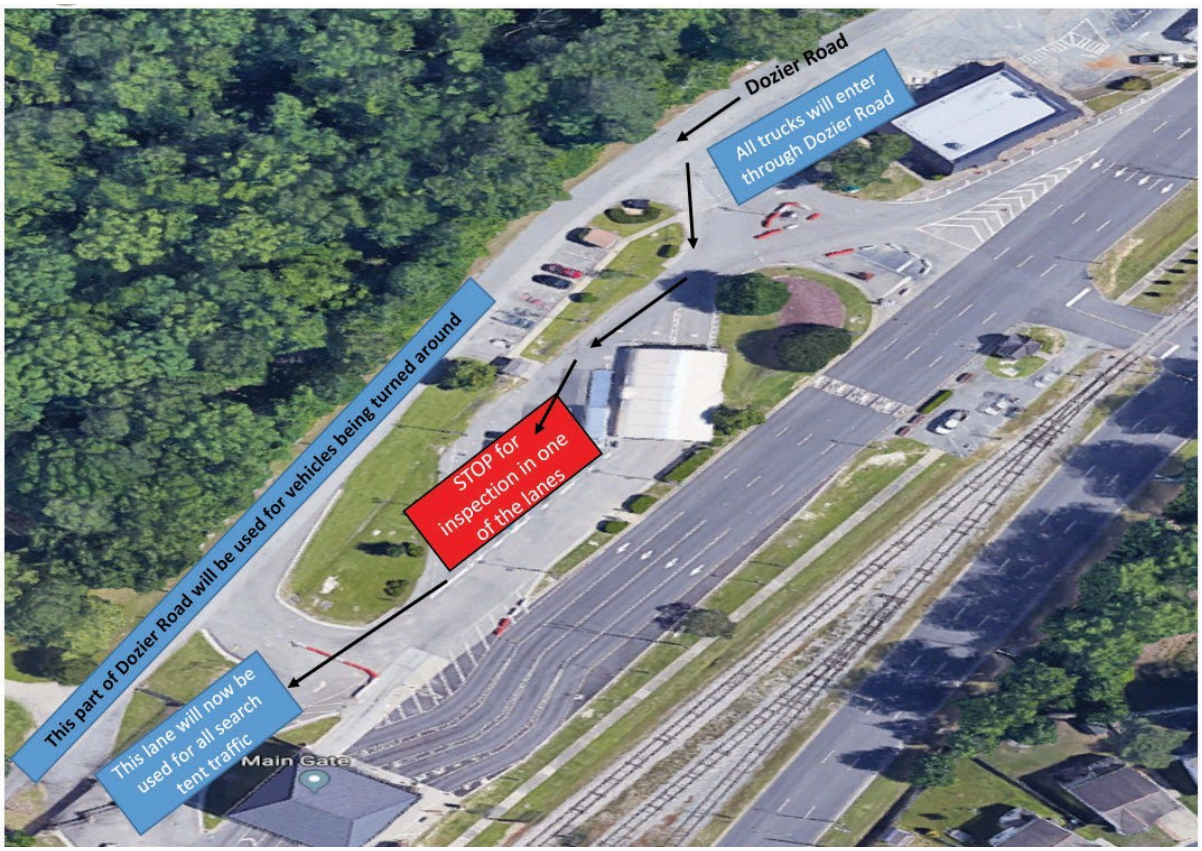
DO NOT CHANGE TH					
LAST, FIRST MI	SEX	RACE	DOB M/D/Y	SSN	DL #/STATE (If Provided)
(EXAMPLE) DOE, JOHN	M	WHITE	11/4/1985	123-45-6789	T12345678/VA

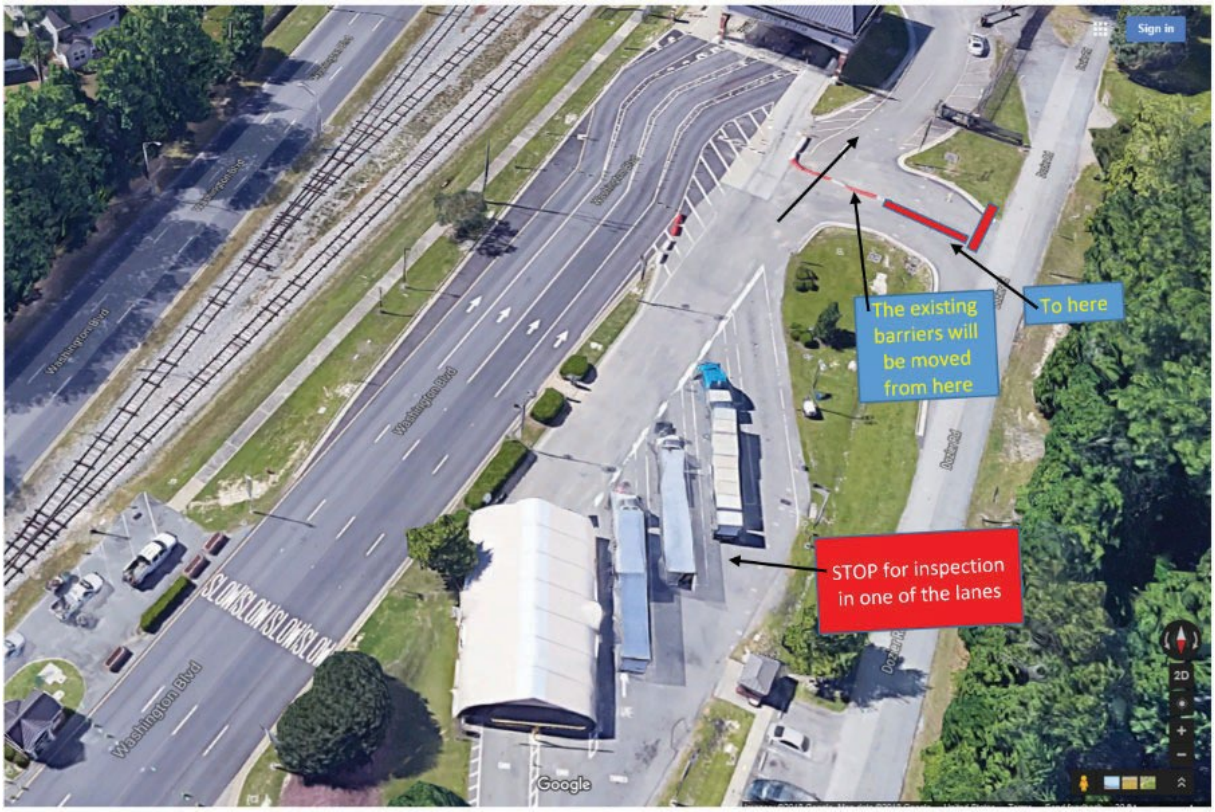
E FORMAT OF THIS SHEET. STICK TO THE EXAMPLE FORMAT. ENCRYPT YOUR EMAIL WHEN YOU SEND IT.				
GOVERNMENT AGENCY	SPONSOR NAME LAST, FIRST	SPONSOR DOD ID NUMBER	SPONSOR PHONE AND EMAIL/ALTERNATE POC/SECURITY MANAGER	LENGTH OF CONTRACT/PASS
TRADOC	Doe, Jane	123456789	757-878-1234 jane.d.doe.civ@mail.mil	1 Jan 17 - 1 Mar 17

HOURS OF OPERATION/DAYS FOR ACCESS	Langley Access Also Required? Yes/No	FPCON ACCESS REQUIRED	VISITOR'S CATEGORY (click on arrow for drop down options)
0800 - 1700 / M-F	NO	ALPHA	US Gov Civilian

2.4 Entry of Large Vehicles:

In general, non-MILCON contractors with large equipment that won't fit under the inspection tent or the roof over the guard shacks (or any vehicle towing a trailer) will not be allowed into the front gate prior to 08:30, per the Installation Defense Plan (IDP).


Dozier Road
All trucks will enter through Dozier Road
STOP for inspection in one of the lanes
This part of Dozier Road will be used for vehicles being turned around
This lane will now be used for all search tent traffic
Main Gate



2.5 Road Restriction:

The movement of all vehicles within the Base shall be confined to the roads designated and shall comply with traffic regulations within the Base. Other roads may be used only with the approval of the QAI. The Contractor shall keep all roads free of mud and other foreign material resulting from his operations. Parts of Fort Eustis are restricted access where private owned vehicles are not allowed and special identification for each person's entry is required.

2.6 Personnel Transportation:

Contractor owned vehicles shall be used to transport workers from the approved staging areas to work sites.

2.7 Parking and Staging Areas:

2.7.1 The Contractor staging area(s) shall be at a designated location approved by the QAI. The Contractor shall store approved trash receptacles, construction materials and equipment in these area(s). The Contractor shall maintain these area(s) in a clean and safe manner as approved by the Contracting Officer. The Contractor's construction trailer, toilet facilities for workers use, and a parking area for personal vehicles will be designated in the vicinity of the Contractor staging area(s). The Government is making this area available to the contractor for the convenience of the contractor. The Government cannot guarantee the security of this staging area, therefore the contractor has responsibility to insure any contractor

materials and facilities are secure. The Government will not reimburse the contractor for any losses the contractor may suffer for equipment stored at this or any other site on the installation.

2.7.2 The contractor shall submit for approval a site plan indicating the proposed location and dimension of any area(s) to be fenced and used by the Contractor for review by the Government. No trailers, materials, or equipment shall be place or stored outside the fenced area(s). All areas used by the Contractor, for the storage of equipment or materials, or other use, shall be restored to the original or better condition upon completion of the project. Utilities connections to contractor temporary office trailer shall be accomplished by the Contractor, and payment for utility use shall be paid by the Contractor.

2.8 Use of Roads:

Loading shall be limited to five tons axle unless approved otherwise. The Contractor shall keep all roads clear of all obstructions and free of mud and other foreign materials resulting from operations. Base speed limits and traffic controls shall be observed.

3. INSPECTION:

Government representatives will conduct inspections during the work process. Defective Contractor furnished materials and/or deficiencies in workmanship in progress shall be replaced or corrected to the satisfaction of the Contracting Officer at no additional cost to the Government.

3.1 Hold Point Inspections:

Project hold points will be identified at the kick-off meeting, and at a minimum, conform to hold points listed in the IBC (Sec 109), International Plumbing Code (Sec 107), and the International Mechanical Code (Sec 107). Inspections will be annotated on the project schedule. Contractor shall notify the QAI one day in advance for each hold point inspection. All work related to subject inspection shall not continue until the inspection has been completed and approved.

4. SAFETY STANDARDS:

The Contractor shall comply with the "Occupational Safety and Health Administration (OSHA)" Safety and Health Regulations for Construction, Part 1926, for the performance of all work under this contract.

4.1 ACCIDENT REPORTS:

The Contractor shall comply with accident reporting requirements as outlined in US Army Transportation Center Fort Eustis Regulation 385-10 Safety - Occupational Safety And Health Program. All accident reports will be reported immediately to the QAI/COR/PM. See Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS.

4.2. FIRE PREVENTION AND PROTECTION:

The Contractor shall comply with all safety requirements outlined in US Army Transportation Center Fort Eustis Regulation 385-10 Safety - Occupational Safety And Health Program, Fort Eustis Regulation 420-90, Facilities Engineering: Fire and Emergency Services, Fire Prevention Program, and all rules and regulations issued by the National Fire Protection Association covering storage and use of inflammable mixtures of materials which might constitute a fire hazard.

5. ENVIRONMENTAL REQUIREMENTS:

All contractors shall comply with Environmental Management Procedures (EMPs) to meet all Federal, State, local, and Air Force regulations, laws, and instructions. EMPs cover all environmental programs and can be found on the public website, https://www.jble.af.mil/About-Us/Units/Army/Eustis-Enviromental/EMPs/

All Hazardous Waste (HW), Non-hazardous Waste (NHW), and Universal Wastes (UWs) must be coordinated through the Hazardous Waste Accumulation Facility (HWAF).

All contractors must utilize HWAF services to the maximum extent offered. Contractors are prohibited from utilizing non-HWAF services to dispose of HW.

6. CLEAN UP:

6.1 Remove rubbish, debris, and construction materials daily. All rags, cotton waste or materials which might constitute a fire hazard shall be placed in metal containers or destroyed at the end of each day. Upon completion of the work, all staging, scaffolding and containers shall be removed from the site. The Contractor shall not deposit or place any cloths, rags, waste, trash or debris in Government owned trash cans, containers or receptacles. The Contractor shall furnish adequate trash cans for his use on this contract. All these materials shall be disposed of off base at the Contractor's expense.

6.2 Debris and rubbish shall be removed from all work areas daily. Debris shall be removed and transported in a manner that prevents spillage on streets or adjacent areas. Local regulating hauling and disposal shall apply. All vehicles for hauling debris shall be covered.

7. HOT WORK PERMIT:

Before using any spark producing devices or open flames either inside or outside of work areas, the Contractor shall obtain a Hot Work permit from the Base Fire Department at least three (3) days in advance.

8. PROTECTION AND USE OF EXISTING FACILITIES:

8.1 The Contractor shall protect and maintain service to existing telephone, CATV, data, wiring, piping fixtures, equipment, utilities and structures; and any damages shall be repaired or restored at the expense of the Contractor. Repairs to existing utilities damaged by the Contractor shall be the responsibility of the Contractor to repair at no additional cost to the Government.

8.2 Use of tenant owned items by Contractor personnel will not be allowed in any building facilities, including but not limited to phones, toilets, kitchen facilities or parking spaces. The Contractor shall maintain unobstructed access and egress from occupied portions of the site and shall not interrupt heating/air conditioning or any utility service to the occupied unit without written approval for the duration of the contract.

9. SUBCONTRACTS AND WORK COORDINATION:

9.1 Cooperation with Using Agency and Other Contractors:

During the period of this contract, other contracts may be in force for the construction of other features of work on or adjacent to the site of work being accomplished under this contract. Also, prior to completion of work under this contract, members of the Using Agency may be performing work or occupying facilities on or adjacent to the area. The Contractor shall arrange his plant and shall schedule and perform this work so as to effectively cooperate with all other Contractors and Government agencies.

9.2 Coordinate between Contractors:

It shall be the responsibility of the prime Contractor to be fully informed of the extent of limits of work to be performed by other prime Contractors. Should there be any conflict between these limits, it shall be brought to the attention of the Contracting Officer and the Contracting Officer's decision shall be final.

10. HOURS OF WORK:

10.1 The normal work day for construction shall be from 7:30 A.M. to 5:00 P.M., Monday through Friday of each week. Any request to change these hours must be coordinated in advance with the QAI and customer.

10.2 The Contractor shall schedule all work done by his employees and subcontractors as to cause the least amount of interference with Fort Eustis employees and residents as possible. The Contractor’s work schedule shall be subject to the approval of the Contracting Officer.

10.3 If the Contractor desires to perform work outside of normal duty hours on Saturdays, Sundays, or holidays, he shall coordinate in advance with the QAI.

11. INTERRUPTIONS OF UTILITIES:

11.1 Approval:

No utility services shall be interrupted by the Contractor to make connections, or for any purpose without approval of the CED.

11.2 Request for permission to shut down services shall be submitted in writing to the QAI and CED Service Order Desk not less than 14 calendar days

prior to date of proposed interruption. The request shall give the following information:

(1) Nature of Utility (Gas, Elect, Water, Etc.)
(2) Size of line and location of shutoff.
(3) Building and services affected.
(4) Hours and date of shutoff.
(5) Estimated length of time service will be interrupted.

11.3 Services Shutoff:

Services shall not be shut off until receipt of approval of the proposed hours and date from the CED.

11.4 Service Interruption:

11.4.1 Shutoffs which will cause interruption of Government work operations as determined by the CED shall be accomplished during regular non work hours or non work days of the Using Agency without any additional cost to the Government.

11.5 Valve Operation:

Where shutoff of water lines interrupts service to fire hydrants or fire sprinkler systems, the Contractor shall arrange his operations and have sufficient material and personnel available to complete the work without undue delay or restore service without delay in event of emergency. This will not be done without prior coordination and approval of the Fort Eustis Fire Dept.

11.6 Gas Mains:

Flow in gas mains which have been shut off shall not be restored until the Government inspector has coordinated that all items serviced by the gas line have been shut off.

11.7 Call Miss Utility:

Call Miss Utility prior to digging.

12. AS BUILT DRAWING

12.1 The Contractor shall provide the QAI as-built record contract drawings in AutoCAD format and PDF format on a compact data disk upon Final inspection of construction. Drawing names on the compact data disk shall begin with FE and the facility number.

12.2 During the progress of the job, the Contractor shall keep careful records at the job site of all construction changes and corrections from the layouts and details and conditions shown on the drawings. These as-built contract drawings shall be a record of the construction as indicated and completed by the Contractor.

12.3 GPS coordinates: GPS coordinate points, of the corners of the new

facility, and termination points of utilities, shall be provided for new facility construction.

13. FACILITY INVENTORY

13.1 INTRODUCTION
13.1.1 The Contractor shall provide the government with a complete inventory of Real Property Installed Equipment (RPIE) including pictures for all new construction and renovation projects. The contract shall also be required to capture all demolished equipment and report same to the government representative.

13.1.2 *REAL PROPERTY INSTALLED EQUIPMENT (RPIE)
RPIE is permanently attached or generally installed as part of a construction or capital improvement project. RPIE cannot be removed without physically damaging the structural integrity or the asset or degrading the functionality of the asset. Included are those items of government-owned or leased accessory equipment, apparatus and fixtures that are essential to the function of the facility. To be considered RPIE, the equipment must be necessary to make the facility complete and usable. If this equipment is removed, it would reduce the designed usefulness, prohibit operation of the facility or decertify from performing its designed function.

13.2 SCOPE OF SERVICES
13.2.1 Demolished equipment: The contractor shall be required to itemize all demolished equipment that is directly listed under its contract to be demolished and report this equipment on the spreadsheet provided. The information to be provided to the government is stated in the demolition tab of the excel spreadsheet. In the event where an equipment is proposed to be reused, the Contractor is required under this contract to capture the equipment on the excel spreadsheet. The attached barcodes that is associated with the equipment shall all be disposed with the equipment where it is required and if this piece of equipment is reinstalled at another building, the associated barcode with that equipment can be re-used where the equipment is called to be re-used.

13.2.2 Inventory will consist of completing the BUILDER Data Collection Spreadsheet and the DD Form 1354. Contractor shall provide Inventory and warranty information for all Real Property and Real Property Installed Equipment (RPIE). The data format uses Uniformat II nomenclature. Systems to be inventoried include but are not limited to Exterior Enclosure; Roofing; Interior Construction; Plumbing; HVAC; Electrical; Foundation; Fire Alarm; and Fire Suppression.

13.2.3 Bar Codes for Real Property Installed Equipment (RPIE): Contractor shall install new bar-code labels on all new Real Property Installed Equipment components during project construction and renovation. New bar-code labels shall be provided by CED Operations Flight which includes adhesive backing. Any old barcodes shall be demolished and disposed of. The preferred installed location is next to the unit’s name plate/manufacturer label that includes model number, etc. Labels shall be placed to provide maximum durability and resistance to heat and chemical exposure.

13.2.4 Photographs: The Contractor shall provide the government a minimum of two (2) clear pictures of each new and old RPIE component being

installed and/or removed. One (1) that captures the entire unit as a whole and one (1) close-up of the RIPE label and name plate attached to the component, ensuring the label can be read. The Contractor shall comply with all photography regulations specific to each Building and confirm with the Project Manager/Inspector prior to conducting fieldwork if taking photographs will be permitted. The Contractor may be required to obtain camera passes and have all photographs reviewed by Installation Security. Be aware that removable memory cards may be confiscated or specific photographs deleted that are determined to compromise base security. It is recommended that the Contractor not rely solely on photographs for documenting model plate information, inventory, etc. as they may be later confiscated (e.g. use hand-written or tablet computer notes as a primary source for documentation and photographs as a backup). It is the responsibility of the Contractor to determine what the requirements are for each Building but typical photograph etiquette across all sites includes:

- Do not photograph people (especially children).
- Do not photograph identification cards/badges.
- Do not photograph weapons or parts of weapons.
- Do not photograph vehicles or airplanes.
- Do not photograph signs that would identify the Installation location.
- Do not photograph fire evacuation route floor plans posted in the facilities.
- Only photograph the inventory item needing to be captured.

13.3 WORK MANAGEMENT AND CONTROL

13.3.1 Software Requirements: The Contractor shall utilize the most current versions of the BUILDER Data Collection Spreadsheet for the execution of all Task Orders as assigned unless otherwise directed by the Contracting Officer. The Microsoft Excel Spreadsheet shall be submitted on a CD(s) in an Excel File Format with the as-builts and photos, or emailed per direction of project manager/inspector.

13.3.3.1 See sample below of the "BUILDER DATA COLLECTION FORM – NEW COMPONENTS" (separated to fit this sheet).

BUILDER DATA COLLECTION FORM

Project Source:

Project Manager:

NEW EQUIPMENT INFORMATION

Date	Build Num.	Project Num.	Description	Qty	UM	ID Number	Bar Code	Location	Manufacturer	Model	Serial No.	Capacity	Picture Filenam

WARRANTY

Workmanship Warranty Duration	Workmanship Warranty expiry date	Manufacturer's Warranty Durati	Manufacturer's Warranty expiry date	Comments

13.3.3.2 See sample below of the "BUILDER DATA COLLECTION FORM – OLD COMPONENTS".

BUILDER DATA COLLECTION FORM

Project Source:	
Project Manager:	

DEMOLISHED EQUIPMENT INFORMATION

Date	Building Num.	Project Num.	Description	Qty	UM	ID Numbe	Bar Code	Location	Manufacture	Model	Serial N	Capacity	Comments

13.3.2 Data Rights: The Government shall have unlimited rights to all documents/material produced under this contract. All documents and materials, to include all data source files, produced under this contract shall be Government owned and are the property of the Government with all rights and privileges of ownership/copyright belonging exclusively to the Government. These documents and materials may not be used or sold by the Contractor without written permission. All materials supplied to the Government shall be the sole property of the Government and may not be used for any other purpose.

13.3.3 System and Data reports: The Contractor shall submit both draft and final Reports of the BUILDER Data Collection Spreadsheet concurrently with the submission of Draft, Interim, and Final DD Form 1354s.

14 Preparation of DD form 1354 (Transfer of Real Property)

14.1 Form 1354 itemizes the types, quantities and costs of various equipment and systems that comprise the project. The Government will furnish the Contractor a blank DD Form 1354 to use to produce a draft Form 1354 for review by CED/RP. The approved draft Form DD1354 shall be submitted with the 100 % design in the Design Analysis. Final DD1354 shall be provided by the contractor upon Final inspection of construction. This final DD 1354 shall also include the make, model and serial number and capacities of all installed equipment for the project and total cost for major equipment upgrade.

15. WARRANTY OF CONSTRUCTION:

15.1 In addition to any other warranties in this contract, the Contractor warrants that the work performed under this contract conforms to the contract requirements and is free of any defect in equipment, materials, or design furnished, or workmanship performed by the Contractor or any subcontractor or supplier at any tier. This warranty shall not limit the Government's rights under the Inspection and Acceptance clause of this contract with respect to latent defects, gross mistakes, or fraud.

15.2 This warranty shall continue for a period of one year from the date of final acceptance of the work. If the Government takes possession of any part of the work before final acceptance, this warranty shall continue for a period of one year from the date the Government takes possession.

15.3 The Contractor shall remedy at the Contractor's expense any failure to conform, or any defect. In addition, the Contractor shall remedy, at the Contractor's expense, any damage to Government owned or controlled real or personal property, when that damage is the result of:

a. The Contractor's failure to conform to contract requirements.

b. Any defect in equipment, material, workmanship or furnished designs.

15.4 The Contractor shall restore any work damaged in fulfilling the terms and conditions of this clause. The Contractor's warranty with respect to work repaired or replaced will run for one year from the date of repair or replacement.

15.5 The Government will notify the Contractor, by phone or in writing, within a reasonable time after the discovery of any failure, defect or damage.

15.6 If the Contractor fails to remedy any failure, defect, or damage within two days after receipt of notice, the Government shall have the right to replace, repair, or otherwise remedy the failure, defect, or damage at the Contractor's expense.

15.7 This warranty shall not limit the Government's rights under the inspection and acceptance clause of this contract.

15.8 EQUIPMENT GUARANTEE LIST:

The Contractor shall obtain and furnish to the Contracting Officer written guarantees for all equipment furnished under the contract and shall prepare a complete listing of all such equipment. This equipment list shall state the specification section applicable to the equipment, duration of the warranty there of, start date of the warranty, ending date of the warranty, and point of contact for fulfillment of the warranty. This listing shall be fully executed and delivered to the Contracting Officer prior to final acceptance of the entire contract, and such acceptable listing shall be a condition to final acceptance of the entire contract.

15.9 EQUIPMENT WARRANTY TAGS AND GUARANTOR'S LOCAL REPRESENTATIVE:

The Contractor shall furnish with each guarantee the name, address, and telephone number of the guarantor's representative nearest to the location where the equipment and appliances are installed. The Contractor shall tag each item of warranted equipment with a data tag, enclosed in a durable, oil and water resistant clear plastic envelope approved by the Contracting Officer. Tag shall be attached to the equipment in clear sight with a metal wire. The date of acceptance and inspector’s signature shall be left blank until project is accepted for beneficial occupancy. The tag shall show the following information:

EQUIPMENT WARRANTY TAG

Contractor.
.....

Building No.
.....

Type of Equipment .....

Accepted Date

.....

Contract Completion Date .....

Warranted Until

.....

Under Contract No. .....

Telephone /Address. .....

Inspector's Signature .....

16. PRECONSTRUCTION CONFERENCE:

16.1 Scheduling:

After award of the construction contract and prior to the start of any construction work, an authorized representative of the Contracting Officer will schedule and conduct a preconstruction conference. The Contractor's Project Manager, Superintendent and his Quality Control System Manager shall attend this meeting. The Contractor is encouraged to have an officer of his company (Project Manager could be this person) and a representative from each of his subcontractors at the conference. This conference will be held at a location and time as specified by the Contracting Officer's Representative.

17. QUALITY CONTROL PLAN:

Contractor Quality Control is means by which the Contractor ensures that the construction, including that of subcontractors and suppliers, complies with the requirements of the contract. The controls shall be adequate to cover all construction operations, including both on-site and off-site fabrication, and will be keyed to the proposed construction sequence. At the completion of all work or any increment thereof established by a completion time, the Contractor shall conduct a Pre-Final Inspection of the work with the Government inspector to develop a "punch list" of items which do not conform to the approved plans and specifications. Such a list of deficiencies shall include the estimated date by which the deficiencies will be corrected. Upon notification from the Contractor that all deficiencies have been satisfactorily corrected a joint final inspection will be scheduled by the Contractor.

18. BUILDING KEY CONTROL PROCEDURE:

When receiving control of existing building, Contractor shall sign for control and Key from Real Property, CED (current POC: Ms. Arlene Sauve 757-878-4129) using the "Real Property Key Transfer Form DA 5513. https://armypubs.army.mil/pub/eforms/DR_a/pdf/ARN3557_A5513_Final_1.pdf

Key control procedure for new lockers: Contractor shall contact Best Locks or Best Locks Official Dealer and give them the quantity of cores. Best Locks will contact CED locksmith (current POC: Darrell Lane 757-536-2062), who will give Best Locks the correct keying for the cores. Best Locks will send the keyed cores (and key) to Fort Eustis CED locksmith. Contractor shall order a minimum (4) keys per core. The CED locksmith will come to the building and

install the cores in the locksets, retain the contractor cores, and transfer the keys to real property. Contractor shall provide building access to the locksmith, if it is under contractor control. Contractor shall pick up their contractor cores from the locksmith, or notify Locksmith that they may be recycled. The building POC will go to Real Property/CED and sign out the keys using the "Real Property Key" transfer from DD5513.

19. POST ACCEPTANCE TESTS:

Should completion of the project occur at such time that the required performance test must be conducted and test data recorded and submitted during a season when both heating and cooling system performance cannot be checked, the Contractor shall perform the tests and record all such data as is available with system operating automatically under the prevailing weather conditions. That part of the system operation which cannot be recorded because of the prevailing weather shall be delayed until the weather is appropriate at which time the remaining part of the required tests shall be conducted and data recorded accordingly. Portions of the tests may not be delayed without written consent of the Contracting Officer. Dates for the final tests will be set at the project final inspection.

20. CONTROL DIAGRAM:

Provide framed drawings under laminated plastic showing complete instrumentation and HVAC system control diagrams, for all equipment furnished and interfaces to all new and existing equipment, at each respective equipment location. Condensed operating instructions explaining preventive maintenance procedures methods of checking the system for normal safe operation, and procedures for safety starting and stopping the system manually shall be prepared in typed form, framed as specified for wiring and control diagrams and posted beside the diagrams. Proposed diagrams, instructions, and other sheets shall be submitted prior to posting. The framed instructions shall be posted before acceptance testing of the systems. Provide a reproducible copy of each revised diagram in addition to the framed copy.

21. FIELD TRAINING:

Upon completion of the work and final acceptance of contract, the contractor, at no cost the government, will provide instruction to Government operating personnel on the proper operation and maintenance of the equipment. O&M manuals shall be provided before the training.

22. EXTERIOR ELECTRICAL : All electrical service on Ft Eustis is owned by Dominion Energy (DE). Contractors will coordinate directly with DE to acquire preliminary electrical cost estimates. Upon project funding, contractor will coordinate with the CED PM for a formal cost proposal from DE. Contractor shall coordinate with DE all electrical connections or disconnections to insure proper feed to building is provided.

23. EXTERIOR WATER/SEWER: All water and sewer service on Ft Eustis is owned by American States Utility Services, Inc. (ASUS). Contractors will coordinate directly with ASUS to acquire preliminary cost estimates. Upon project funding, contractor will coordinate with the CED PM for a formal cost proposal from ASUS. Contractor shall coordinate with ASUS all water and

sewage connections or disconnections to insure proper feed to building is provided.

24. EXTERIOR GAS PIPING SYSTEM : All natural gas service on Ft Eustis is owned by Virginia Natural Gas (VNG). Contractors will coordinate directly with VNG to acquire preliminary cost estimates. Upon project funding, contractor will coordinate with the CED PM for a formal cost proposal from VNG (if necessary). Contractor shall coordinate with VNG all natural gas connections or disconnections.

25. CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT
All military construction, renovation, and demolition projects shall include contract performance requirements for a 50% minimum diversion of construction and demolition waste by weight, from landfill disposal. Contract specifications will include submission of a contractors' C&D Waste Management Plan, prior to the start of site clearance in accordance with Environmental Management Procedure (EMP) 4.4.6.16

25.1 Project planning and execution shall fully comply with the following:

25.1.1 JBLE Instruction 32-101, Environmental Management (Eustis Only), which can also be found at https://www.jble.af.mil/Units/Army/Eustis-Enviromental under the Fort Eustis Required Reading section, Environmental Management 28 Jan 14 (JBLE 32-101).

25.1.2 Environmental Management Procedure (EMP) 4.4.6.16, which can also be found at https://www.jble.af.mil/Units/Army/Eustis-Enviromental under the Contracting Compliance tab, then select "Contracting Compliance" to obtain the latest information.

25.1.3 JBLE-Eustis Assessment Management Special Conditions and Affirmative Procurement (EMP) 4.4.6.16 Tab 1, which can be found at https://www.jble.af.mil/Units/Army/Eustis-Enviromental under the Contracting Compliance tab, then select "JBLE-Eustis Assessment Management Special Conditions and Affirmative Procurement" to obtain the latest information.

25.2 GOVERNMENT POLICY

Government policy is to apply sound environmental principles in the design, construction and use of facilities. As part of the implementation of that policy the Contractor shall: (1) practice efficient waste management when sizing, cutting, and installing products and materials and (2) use all reasonable means to divert construction and demolition waste from landfills and incinerators and to facilitate their recycling or reuse.

25.3 MANAGEMENT

The Contractor shall take a pro-active, responsible role in the management of construction and demolition waste and require all subcontractors, vendors, and suppliers to participate in the effort. Construction and demolition waste includes products of demolition or removal, excess or unusable construction materials, packaging materials for construction products, and other materials generated during the construction process but not incorporated into the work. In the management of waste consideration shall be given to the availability

of viable markets, the condition of the material, the ability to provide the material in suitable condition and in a quantity acceptable to available markets, and time constraints imposed by internal project completion mandates. The Contractor shall be responsible for implementation of any special programs involving rebates or similar incentives related to recycling of waste. Revenues or other savings obtained for salvage, or recycling shall accrue to the Contractor. Firms and facilities used for recycling, reuse, and disposal shall be appropriately permitted for the intended use to the extent required by federal, state, and local regulations in accordance with Environmental Management Procedure (EMP) 4.4.6.16

25.4 PLAN

A waste management plan shall be submitted within 15 days after [contract award] [notice to proceed] and prior to initiating any site preparation work. The plan shall include the following:

a. Name of individuals on the Contractor's staff responsible for waste prevention and management.

b. Actions that will be taken to reduce solid waste generation.

c. Description of the specific approaches to be used in recycling/reuse of the various materials generated, including the areas and equipment to be used for processing, sorting, and temporary storage of wastes.

d. Characterization, including estimated types and quantities, of the waste to be generated.

e. Name of landfill and/or incinerator to be used and the estimated costs for use, assuming that there would be no salvage or recycling on the project.

f. Identification of local and regional reuse programs, including non-profit organizations such as schools, local housing agencies, and organizations that accept used materials such as materials exchange networks and Habitat for Humanity.

g. List of specific waste materials that will be salvaged for resale, salvaged and reused, or recycled. Recycling facilities that will be used shall be identified.

h. Identification of materials that cannot be recycled/reused with an explanation or justification.

i. Anticipated net cost savings determined by subtracting Contractor program management costs and the cost of disposal from the revenue generated by sale of the materials and the incineration and/or landfill cost avoidance.

24.5 RECORDS

Records shall be maintained to document the quantity of waste generated; the quantity of waste diverted through sale, reuse, or recycling; and the quantity of waste disposed by landfill or incineration. The records shall be made available to the Contracting Officer during construction, and a copy of

the records shall be delivered to the Contracting Officer upon completion of the construction.

25.6 COLLECTION

The necessary containers, bins and storage areas to facilitate effective waste management shall be provided and shall be clearly and appropriately identified. Recyclable materials shall be handled to prevent contamination of materials from incompatible products and materials and separated by one of the following methods:

25.6.1 Source Separated Method.

Waste products and materials that are recyclable shall be separated from trash and sorted into appropriately marked separate containers and then transported to the respective recycling facility for further processing.

25.6.2 Co-Mingled Method.

Waste products and recyclable materials shall be placed into a single container and then transported to a recycling facility where the recyclable materials are sorted and processed.

25.6.3 Other Methods.

Other methods proposed by the Contractor may be used when approved by the Contracting Officer.

25.7 DISPOSAL

Except as otherwise specified in other sections of the specifications, disposal shall be in accordance with the following:

25.7.1 Reuse.

First consideration shall be given to salvage for reuse since little or no re-processing is necessary for this method, and less pollution is created when items are reused in their original form. Sale or donation of waste suitable for reuse shall be considered. Salvaged materials, other than those specified in other sections to be salvaged and reinstalled, shall not be used in this project.

25.7.2 Recycle.

Waste materials not suitable for reuse, but having value as being recyclable, shall be made available for recycling whenever economically feasible.

25.7.3 Waste.

Materials with no practical use or economic benefit shall be disposed at a landfill or incinerator.

-- End of Section --

SECTION 01 20 00

PRICE AND PAYMENT PROCEDURES
11/20, CHG 4: 08/24

PART 1 GENERAL

1.1 SINGLE JOB PAYMENT ITEMS

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

1.1.1 BASE BID - 0001 Mobilization and Demobilization

1.1.1.1 Payment

Payment will be made for costs associated with operations necessary to Raise the Dike at the Fort Eustis Dredge Material Management Area (FEDMMA), to include mobilization, demobilization, permitting, quality control, safety, erosion control, excavation and handling of fill material, and all other work necessary to raise the dike.

1.1.1.2 Unit of Measure

Unit of measure: job.

1.1.2 BASE BID - 0002 Demolition of Spill Box at Sta 23+69.71 and Installation of New Spill Box and Walkway

1.1.2.1 Payment

Payment will be made for costs associated with the Partial Demolition of Existing Spill Box at Sta 23+69.71, extension of the outfall pipe to the new Spill Box location, and construction of a new Spill Box and walkway as shown in detail J17 on sheet VH-301 and Structural drawings S-302 through S305.

1.1.2.2 Unit of Measure

Unit of measure: job.

1.1.3 BID OPTION - 0003 Demolition of Spill Box at Sta 39+12.59 and Installation of New Spill Box and Walkway

1.1.3.1 Payment

Payment will be made for costs associated with the Partial Demolition of Existing Spill Box at Sta 39+12.59, extension of the outfall pipe to the

new Spill Box location, and construction of a new Spill Box and walkway as shown in detail J17 on sheet VH-301 and Structural drawings S-302 through S305.

1.1.3.2 Unit of Measure

Unit of measure: job.

1.1.4 BID OPTION - 0004 Regrade Ramp as detailed on sheet VH-304.

1.1.4.1 Payment

Payment will be made for costs associated with operations necessary to regrade the existing access ramp as detailed on sheet VH-304, complete as shown on the drawings and as specified.

1.1.4.2 Unit of Measure

Unit of measure: job.

1.2 BASIS OF PAYMENTS

The Contractor's cost loaded progress schedule will be used as the basis for all payments as indicated in Section 01 32 01.00 10, PROJECT SCHEDULE. An initial payment for Bonds and Mobilization may be made based on the Preliminary 90-day schedule, but any payments beyond that will be made based on monthly schedule updates. Upon completion of each schedule update, the Contractor will upload an SDEF file from their scheduling software into RMS, which will be used to generate a Pay Request, and Prompt Pay Certification. A signed copy of the Prompt Pay Certification will also need to be uploaded before the Pay Request can be processed.

1.3 Final Invoice

a. A final invoice must be accompanied by the certification required by DFARS 252.247.7023 Transportation of Supplies by Sea, and the Contractor's Final Release. If the Contractor is incorporated, the Final Release must contain the corporate seal. An officer of the corporation must sign and the corporate secretary must certify the Final Release.
b. Final invoices not accompanied by the Contractor's Final Release and required certification of Transportation of Supplies by Sea will be considered incomplete and will be returned to the Contractor

1.4 PAYMENT FOR ONSITE AND OFFSITE MATERIALS

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

a. FAR 52.232-5(b) Payments Under Fixed Price Construction Contracts.

b. Materials delivered on the site but not installed, including completed preparatory work, and off-site materials to be considered for progress payment must be major high cost, long lead, special order, or specialty items, not susceptible to deterioration or physical damage

in storage or in transit to the construction site. Examples of materials acceptable for payment consideration include, but are not limited to, structural steel, non-magnetic steel, non-magnetic aggregate, equipment, machinery, large pipe and fittings, precast/prestressed concrete products, plastic lumber (e.g., fender piles/curbs), and
high-voltage electrical cable. Materials not acceptable for payment include consumable materials such as nails, fasteners, conduits, gypsum board, glass, insulation, and wall coverings.

c. On-site stored materials to be considered for progress payment prior to installation must be specifically and separately identified in the Contractor's schedule and approved Contracting Officer's Representative. Requests for progress payment consideration for such items must be supported by documents establishing their value and that the title requirements of the clause at FAR 52.232-5 Payments Under Fixed-Price Construction Contracts have been met.

d. The following materials are authorized for payment as OFF-SITE stored materials: NONE

e. If the Contractor anticipates a need to be paid for off-site stored materials for any particular materials not identified above, they should request that said materials be added to the list during the pre-bid question and answer period.

f. If the Contractor discovers the need to be paid for OFF-SITE stored materials after award, a contract modification will be required to add it to the list, and the modification will have to be signed by the Contracting Officer.

g. Materials must be adequately insured and protected from theft and exposure.

h. Provide a written consent from the surety company with each payment request for offsite materials.

i. Materials to be considered for progress payments prior to installation must be stored either in Hawaii, Guam, Puerto Rico, or the Continental United States. Other locations are subject to written approval by the Contracting Officer.

j. Off site stored materials must be clearly labeled as to what they are and what project they are for, they must be segregated from materials for other job, and they must be available for Government inspection at all times.

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

k.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 01 30 00

ADMINISTRATIVE REQUIREMENTS
11/20, CHG 5: 02/25

PART 1 GENERAL

1.1 REFERENCES

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

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2024) Safety -- Safety and Occupational Health (SOH) Requirements

1.2 SUBMITTALS

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

View Location Map

Progress and Completion Pictures

1.3 VIEW LOCATION MAP

Submit, prior to or with the first digital photograph submittals, a sketch or drawing indicating the required photographic locations. Update as required if the locations are moved.

1.4 PROGRESS AND COMPLETION PICTURES

Photographically document site conditions prior to start of construction operations. Include aerial photographs. Provide monthly, and within one month of the completion of work, digital photographs, 1600x1200x24 bit true color minimum resolution in JPEG file format showing the sequence and progress of work. Take a minimum of 20 digital photographs each week throughout the entire project from a minimum of ten different viewpoints selected by the Contractor unless otherwise directed by the Contracting Officer. Submit with the monthly invoice two sets of digital photographs, each set on a separate compact disc (CD) or data versatile disc (DVD), cumulative of all photos to date. Indicate photographs demonstrating environmental procedures. Provide photographs for each month in a separate monthly directory and name each file to indicate its location on the view location sketch. Also provide the view location sketch on the CD or DVD as a digital file. Include a date designator in file names. Photographs provided are for unrestricted use by the Government.

1.5 MINIMUM INSURANCE REQUIREMENTS

Provide the minimum insurance coverage required by FAR 28.307-2 Liability, during the entire period of performance under this contract. Provide other insurance coverage as required by State of Virginia law.

1.6 SUPERVISION

1.6.1 Superintendent Qualifications

Provide project superintendent with a minimum of 10 years experience in construction with at least 5 of those years as a superintendent on projects similar in size and complexity. The individual must be familiar with the requirements of EM 385-1-1 and have experience in the areas of hazard identification and safety compliance. The individual must be capable of interpreting a critical path schedule and construction drawings. The qualification requirements for the alternate superintendent are the same as for the project superintendent. The Contracting Officer may request proof of the superintendent's qualifications at any point in the project if the performance of the superintendent is in question.

For projects where the superintendent is permitted to also serve as the Quality Control (QC) Manager as established in Section 01 45 00 QUALITY CONTROL, the superintendent must have qualifications in accordance with that section.

1.6.2 Minimum Communication Requirements

Have at least one qualified superintendent, or competent alternate, capable of reading, writing, and conversing fluently in the English language, on the job-site at all times during the performance of Contract work. In addition, if a Quality Control (QC) representative is required on the Contract, then that individual must also have fluent English communication skills.

1.6.3 Duties

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

1.6.4 Non-Compliance Actions

The Project Superintendent is subject to removal by the Contracting Officer for non-compliance with requirements specified in the contract and for failure to manage the project to ensure timely completion. Furthermore, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders is acceptable as the subject of claim for extension of time for excess costs or damages by the Contractor.

1.7 PRECONSTRUCTION CONFERENCE

Immediately after award, prior to commencing any work at the site,

coordinate with the Contracting Officer a time and place to meet for the Preconstruction Conference. The conference must take place within 30 calendar days after award of the contract, but prior to commencement of any work at the site. The purpose of this conference is to discuss and develop a mutual understanding of the administrative requirements of the Contract including but not limited to: daily reporting, invoicing, value engineering, safety, base-access, outage requests, hot work permits, schedule requirements, quality control, schedule of prices or earned value report, shop drawings, submittals, cybersecurity, prosecution of the work, government acceptance, final inspections and contract close-out. Contractor must present and discuss their basic approach to scheduling the construction work and any required phasing.

1.7.1 Attendees

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

1.8 FACILITY TURNOVER PLANNING MEETINGS (Red Zone Meetings)

Meet with the Government to identify strategies to ensure the project is carried to expeditious closure and turnover to the Client. Start planning the turnover process at the Pre-Construction Conference meeting with a discussion of the Red Zone process and convene at regularly scheduled Red Zone Meetings beginning at approximately 80 percent of project completion. Include the following in the facility Turnover effort:

1.8.1 Red Zone Checklist

a. Contracting Officer's Technical Representative (COTR) will provide the Contractor a copy of the Red Zone Checklist template.

b. Prior to 80 percent completion, modify the Red Zone Checklist template by adding or deleting critical activities applicable to the project and assign planned completion dates for each activity. Submit the modified Red Zone Checklist to the Contracting Officer. The Contracting Officer may request additional activities be added to the Red Zone Checklist at any time as necessary.

1.8.2 Meetings

a. Conduct regular Red Zone Meetings beginning at approximately 80 percent project completion, or three to six months prior to Beneficial Occupancy Date (BOD), whichever comes first.

b. The Contracting Officer will establish the frequency of the meetings, which is expected to increase as the project completion draws nearer. At the beginning, Red Zone meetings may be every two weeks then increase to weekly towards the final month of the project.

c. Using the Red Zone Checklist as a Plan of Action and Milestones (POAM) and basis for discussion, review upcoming critical activities and strategies to ensure work is completed on time.

d. During the Red Zone Meetings discuss with the COTR any upcoming activities that require Government involvement.

e. Maintain the Red Zone Checklist by documenting the actual completion

dates as work is completed and update the Red Zone Checklist with revised planned completion dates as necessary to match progress. Distribute copies of the current Red Zone Checklist to attendees at each Red Zone Meeting.

1.9 PARTNERING

To most effectively accomplish this Contract, the Contractor and Government must form a cohesive partnership with the common goal of drawing on the strength of each organization in an effort to achieve a successful project without safety mishaps, conforming to the Contract, within budget and on schedule. The partnering team must consist of personnel from both the Government and Contractor including project level and corporate level leadership positions. Key Personnel from the supported command, end user, Contractor, key subcontractors and the Designer of Record are required to participate in the Partnering process.

1.9.1 Team-Led (Informal) Partnering

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

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

c. The Initial Team-Led Partnering Session will be conducted and facilitated using electronic media (a video and accompanying forms) provided by Contracting Officer.

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

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

1.10 ELECTRONIC MAIL (E-MAIL) ADDRESS

The Contractor shall establish and maintain electronic mail (e-mail) capability along with the capability to open various electronic attachments in Microsoft, Adobe Acrobat, and other similar formats. Within 10 days after contract award, the Contractor shall provide the Contracting Officer a single (only one) e-mail address for electronic communications from the Contracting Officer related to this contract including, but not limited to contract documents, invoice information, request for proposals, and other correspondence. The Contracting Officer may also use email to notify the Contractor of base access conditions when emergency conditions warrant, such as hurricanes, terrorist threats, etc. Multiple email address will not allowed.

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

1.11 PHYSICAL DATA

The physical conditions indicated on the drawings and in the specifications are the result of site visits, and surveys and borings. See Drawings Sheets for boring logs and data.

1.12 SITE CONTAMINATION

No contaminated soils were found on the site during investigations performed as part of an Environmental Assessment (April 2014) prepared under the requirements of the National Environmental Policy Act.

1.12.1 Contamination Removal

In the event that contamination beyond that shown or specified is encountered, the Contracting Officer must be advised immediately. The contamination must be removed as directed and replaced with satisfactory material. Payment therefore will be made in conformance with the CHANGES clause of the CONTRACT CLAUSES.

1.12.2 Compliance Requirements

The Contractor must comply with applicable Federal, state and local laws, codes, ordinances and regulations (including the obtaining of licenses and permits) in connection with any hazardous material, substance or waste.

1.12.3 Requirements

The requirements of this clause and any act or failure to act by the Government must not relieve the Contractor of any responsibility or liability for the safety of Government, Contractor or subcontractor personnel or property.

1.13 WORK IN QUARANTINED AREA

The work called for by this contract involves activities in counties quarantined by the Department of Agriculture to prevent the spread of certain plant pests which may be present in the soil. The Contractor agrees that all construction equipment and tools to be moved from such counties must be thoroughly cleaned of all soil residues at the construction site with water under pressure and that hand tools must be thoroughly cleaned by brushing or other means to remove all soil. In addition, if this contract involves the identification, shipping, storage, testing, or disposal of soils from such a quarantined area, the Contractor agrees to comply with the provisions of ER 1110-1-5 and attachments, a copy of which will be made available by the Contracting Officer upon request. The Contractor agrees to assure compliance with this obligation by all subcontractors.

1.14 HISTORICAL AND ARCHAEOLOGICAL FINDS

Federal legislation provides for the protection, preservation, and collection of scientific, prehistoric, historical, and archaeological data, including relics and specimens which might otherwise be lost due to alteration of the terrain or building features as a result of any Federal construction project. Should the Contractor, or any of the Contractor's employees, or parties operating or associated with the Contractor, in the performance of this contract discover evidence of possible scientific, prehistoric, historical, or archaeological data, the Contractor must

immediately cease work at that location, avoid further disturbance, and notify the Contracting Officer, giving the location and nature of the findings. The Contractor must forward written confirmation to the Contracting Officer as directed. The Contractor must exercise care so as not to disturb or damage artifacts or fossils uncovered during excavation operations, and must provide such cooperation and assistance as may be necessary to preserve the findings for removal or other disposition. Any person who, without permission, injures, destroys, excavates, appropriates, or removes any historical or prehistoric artifact, object of antiquity, or archaeological resource on the public lands of the United States is subject to arrest and penalty of law. Where appropriate by reason of discovery, the Contracting Officer may order delays in the time of performance or changes in the work, or both. If such delays or changes are ordered, an equitable adjustment will be made in the contract in accordance with the applicable clauses of the contract.

1.15 EQUIPMENT-IN-PLACE LIST:

The Contractor must maintain a list of equipment installed under the terms of the contract. In the event that the contract includes more than one building or facility, a list must be maintained for each and delivered to the Contracting Officer upon acceptance of each building or facility. Forms to be used for this purpose must be obtained from the Area Engineer's Office. The list must include the following:

a. Contract number
b. Description of item
c. Model number
d. Serial number
e. Capacity
f. Name of manufacturer
g. Address of manufacturer
h. Condition of item
i. Replacement cost
j. Name of person who checked item

1.16 EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE

1.16.1 Allowable Costs

Allowable cost for construction and marine plant and equipment in sound workable condition owned or controlled and furnished by a Contractor or subcontractor at any tier must be based on actual cost data when the Government can determine both ownership and operating costs for each piece of equipment or equipment groups of similar serial and series from the Contractor's accounting records. When both ownership and operating costs cannot be determined from the Contractor's accounting records, equipment costs must be based upon the applicable provisions of EP 1110-1-8, "Construction Equipment Ownership and Operating Expense Schedule," Region II. Working conditions must be considered to be average for determining equipment rates using the schedule unless specified otherwise by the Contracting Officer. For equipment not included in the schedule, rates for comparable pieces of equipment may be used or a rate may be developed using the formula provided in the schedule. For forward pricing, the schedule in effect at the time of negotiations must apply. For retrospective pricing, the schedule in effect at the time the work was performed must apply.

1.16.2 Rental Costs

Equipment rental costs are allowable, subject to the applicable provisions of the Federal Acquisition Regulations, and must be substantiated by certified copies of paid invoices. Rates for equipment rented from an organization under common control, lease-purchase or sale-leaseback arrangements will be determined using the schedule except that rental costs leased from an organization under common control that has an established practice of leasing the same or similar equipment to unaffiliated lessees are allowable. Costs for major repairs and overhaul are unallowable.

1.16.3 Equipment Costs

When actual equipment costs are proposed and the total amount of the pricing action is over $25,000, cost or pricing data must be submitted on the Standard Form 1411, "Contract Pricing Proposal Cover Sheet". By submitting cost or pricing data, the Contractor grants to the Contracting Officer or an authorizing representative the right to examine those books, records, documents and other supporting data that will permit evaluation of the proposed equipment costs. After price agreement the Contractor must certify that the equipment costs or pricing data submitted are accurate, complete and current.

1.16.4 Marine Equipment

In determining the ownership expense for marine equipment as described in the Schedule, the average use per year must be 8 months.

1.17 SUBCONTRACTS AND WORK COORDINATION

Contract Clauses "SUBCONTRACTS", "PERMITS AND RESPONSIBILITIES", and "MATERIAL AND WORKMANSHIP" are supplemented as follows:

a. Divisions or sections of specifications are not intended to control the Contractor in dividing the work among subcontractor, or to limit work performed by any trade.

b. Contractor must be responsible for coordination of the work of the trades, subcontractors, and materials.

c. The Government or its representative will not undertake to settle any difference between the Contractor and Contractor's subcontractors, or between subcontractors.

d. The Government reserves the right to refuse to permit employment on the work or require dismissal from the work of any subcontractor who, by reason of previous unsatisfactory work on Corps of Engineers projects, or for any other reason is considered by the Contracting Officer to be incompetent or otherwise objectionable.

1.18 CONSTRUCTION MANPOWER AND EQUIPMENT REPORT

The Contractor must submit into RMS their Construction Manpower and Equipment Report daily per Section 01 45 00.15 10 RESIDENT MANAGEMENT SYSTEM CONTRACTOR MODE (RMS CM). The report must include manpower and equipment for employees of the Prime Contractor and subcontractors.

1.19 PURCHASE ORDERS

To ensure proper expediting of orders the Contractor and his subcontractors must furnish to the Contracting Officer, one copy of each purchase order covering supplies or services required for performance of the work. Each purchase order must clearly indicate the date of placement, the date delivery is required in order to avoid delay in the scheduled progress of the work, and the date delivery is promised by the supplier or producer. Copies of purchase orders must be forwarded on the date issued.

1.20 PROFIT

1.20.1 Weighted Guidelines

Weighted guidelines method of determining profit must be used on any equitable adjustment change order or modification issued under this contract. The profit factors must be as follows:

Factor	Rate	Weight	Value
Degree of Risk	20		
Relative difficulty of work	15		
Size of Job	15		
Period of performance	15		
Contractor's investment	05		
Assistance by Government	05		
Subcontracting	25		
	100		

1.20.2 Value

Based on the circumstances of each procurement action, each of the above factors must be weighted from .03 to .12 as indicated below. The value must be obtained by multiplying the rate by the weight. The value column when totaled indicates the fair and reasonable profit percentage under the circumstances of the particular procurement.

1.20.2.1 Degree of Risk

Where the work involves no risk or the degree of risk is very small, the weighting should be .03; as the degree of risk increases, the weighting should be increased up to a maximum of .12. Lump sum items will have, generally, a higher weighted value than the unit price items for which quantities are provided. Other things to consider: the portion of the work to be done by subcontractors, nature of work, where work is to be performed, reasonableness of negotiated costs, amount of labor included in costs, and whether the negotiation is before or after performance of work.

1.20.2.2 Relative Difficulty of Work

If the work is most difficult and complex, the weighting should be .12 and should be proportionately reduced to .03 on the simplest of jobs. This factor is tied in to some extent with the degree of risk. Some things to consider: the nature of the work, by whom it is to be done, where, and what is the time schedule.

1.20.2.3 Size of Job

All work not in excess of $100,000 must be weighted at .12. Work estimated between $100,000 and $5,000,000 must be proportionately weighted from .12 to .05.

1.20.2.4 Periods of Performance

Jobs in excess of 24 months are to be weighted at .12. Jobs of lesser duration are to be proportionately weighted to a minimum of .03 for jobs not to exceed 30 days. No weight where additional time not required.

1.20.2.5 Contractor's Investment

To be weighted from .03 to .12 on the basis of below average, average, and above average. Things to consider: amount of subcontracting, mobilization payment item, Government furnished property, equipment and facilities, and expediting assistance.

1.20.2.6 Assistance by Government

To be weighted from .12 to .03 on the basis of average to above average. Things to consider: use of Government owned property, equipment and facilities, and expediting assistance.

1.20.2.7 Subcontracting

To be weighted inversely proportional to the amount of subcontracting. Where 80 percent or more of the work is to be subcontracted, the weighting is to be .03 and such weighting proportionately increased to .12 where all the work is performed by the Contractor's own forces.

1.21 BLASTING

Blasting will not be permitted.

1.22 MOBILIZATION

Contractor must mobilize to the jobsite within 60 calendar days after contract award. Mobilize is defined as having equipment AND having a physical presence of at least one person from the contractor's team on the jobsite.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 01 32 01.00 10

PROJECT SCHEDULE
08/23, CHG 1: 08/24

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.

AACE INTERNATIONAL (AACE)

AACE 52R-06	(2006) Time Impact Analysis - As Applied in Construction
AACE 84R-13	(2015) Planning and Accounting for Adverse Weather

U.S. ARMY CORPS OF ENGINEERS (USACE)

ER 1-1-11	(2017) Administration -- Project Schedules

1.2 SUBMITTALS

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Project Scheduler Qualifications; G, RO

Preliminary Project Schedule; G, RO

SD-07 Certificates

Initial Project Schedule; G, RO

Schedule Update; G, RO

1.3 PROJECT SCHEDULER QUALIFICATIONS

Designate an authorized representative to be responsible for the preparation of the schedule and all required updating and production of reports. The Designated Project Scheduler must have prepared and maintained at least three previous construction schedules for projects of similar size and complexity to this contract, using Primavera P6.. Representative must have a comprehensive knowledge of Critcal Path Method (CPM) scheduling principles and application.

Identify in the submittal the relevant projects and applicable training completed by the Designated Project Scheduler.

1.4 DEFINITIONS AND TERMINOLOGY

1.4.1 Change

A change to the project schedule refers to any of the following:

a. Alterations to activity logic (predecessor or successor activities, lag or lead durations)

b. Combining or dividing activities

c. Creation or deletion of activities, including via modifications. Activity ID and description changes are considered new activities.

d. Adjustments in original duration budget, cost-loaded, amount

e. Any other modification to the schedule which alter the planned execution of the works.

f. Addition, deletion, or revision to any activity logic, duration, or budget amount or cost based on a modification to the contract.

g. Adjustments addition or deletion to budgeted costs.

1.4.2 Critical Path

The critical path is defined as the longest path.

1.4.3 Data Date

The data which reflects the "as-of" condition of the progress of work. It represents the status of all activities as of the completion of work on the identified date. Work started or finished on or before this date is recorded as such. Progress reflecting work performed after the data date and actual dates after the data date are prohibited. The data date will be the "Pay Period Thru" date associated with a corresponding payment in RMS. If submitting monthly, the data date shall be the final day of the month.

1.4.4 Revision

A revision to the project schedule is equivalent to a change in the project schedule. See Change.

1.4.5 Update

An update to the project schedule refers to information associated with an activity that reflects actual progress, and is limited to:

a. The entry of actual start and finish dates

b. Updated scheduled start and finish dates of an activity without any changes in logic, resource assignment, or original duration resulting from entering actual start and finish dates of dependent activities.

c. Recording of progress on an activity to represent work completed, including expected/planned finish date based on actual progress.

1.4.6 Cost Loaded Activities

Cost loaded activities are only activities where physical work is being conducted, WORK-IN-PLACE (WIP).

1.4.7 Level of Effort Activities

Level of Effort activities are designed to represent support work on a project. Work that does not contribute directly to the deliverables or outcome of the project that supports their progress.

Customer Meetings
Project Management tasks
Maintenance of equipment
Clerical work

1.5 BASIS OF PAYMENT, WITHHOLDINGS, AND PAYMENT REJECTION

The schedule is the basis for determining contract earnings during each update period and therefore the amount of each progress payment.

If the Contractor fails or refuses to furnish the information and an acceptable schedule updates as set forth herein, then the Contractor will be deemed not to have provided an estimate upon which a progress payment can be made.

In the event that the Contracting Officer directs schedule revisions and those revisions have not been included in subsequent Project Schedule revisions or updates, the Contracting Officer may at their discretion, withhold 10 percent of pay request amount from each payment period, in addition to any other withholdings, in lieu of rejecting the pay request in its entirety until such revisions to the project schedule have been made.

No payment will be made for work items not fully detailed in the Project Schedule. See paragraph 3.5.5.1 Naming and Identification.

PART 2 PRODUCTS

2.1 SOFTWARE

The scheduling software utilized to produce and update the schedules required herein must be capable of meeting all requirements of this specification.

2.1.1 Government Default Software

The Government uses Primavera P6. Ensure exported schedule files are compatible with the version of P6 used by the Government.

2.1.2 Contractor Software

Scheduling software used by the contractor must be commercially available from the software vendor for purchase with vendor software support agreements available.

2.1.2.1 Primavera

If Primavera P6 is selected for use, provide the "xer" export file in a

version of P6 importable by the Government system.

Confirm at the SEKO meeting which version of P6 is in use by the Government. Export the schedule in a version of P6 no newer than that used by the Government.

2.1.2.2 Other Than Primavera

If the Contractor chooses software other than Primavera P6, that is compliant with this specification, provide for the Government's use two licenses, two computers, and training for two Government employees in the use of the software. These computers will be stand-alone and not connected to Government network. Computers and licenses will be returned at project completion.

Exporting of data from one software for import into P6 is not an acceptable alternative due to differences in how various schedule programs function. Only native XER files exported from P6 will be considered acceptable for import into the Governments P6 databases.

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

Prepare for approval a Project Schedule, as specified herein, pursuant to FAR Clause 52.236-15 Schedules for Construction Contracts. Show in the schedule the proposed sequence to perform the work and dates contemplated for starting and completing all schedule activities. The scheduling of the entire project is required. The scheduling of construction is the responsibility of the Contractor.

Contractor management personnel must actively participate in its development. Subcontractors, and suppliers working on the project must also contribute in developing and maintaining an accurate Project Schedule. Provide a schedule that is a forward planning as well as a project monitoring tool. Use the Critical Path Method (CPM) of network calculation to generate all Project Schedules. Prepare each Project Schedule using the Precedence Diagram Method (PDM).

3.2 MEETINGS

3.2.1 Scheduling Expectations Kickoff Meeting(SEKO)

Prior to preparing the schedule, coordinate with the Government a separate and distinct Scheduling Expectations Kickoff Meeting(SEKO). The intent of this meeting is for the government to review with the contractor the requirements of this scheduling specification, communicate the Government’s expectations regarding schedule development and management, and answer any questions the Contractor may have regarding the schedule requirements.

3.2.2 Periodic Schedule Update Meetings

Conduct periodic schedule update meetings for the purpose of reviewing the proposed Schedule Update, Narrative Report, and progress payment. Conduct meetings at least monthly unless agreed to otherwise with the Contracting Officer. Meetings should be held within five days of the proposed schedule data date.

Provide a computer with the scheduling software loaded and a projector

which allows all meeting participants to view the proposed schedule during the meeting. The Contractor's scheduler must organize, group, sort, filter, perform schedule revisions as needed and review functions as requested by the Contractor and/or Government. The meeting is a working interactive exchange which allows the Government and Contractor the opportunity to review the updated schedule on a real time and interactive basis. The meeting will last no longer than 8 hours.

Provide a draft of the proposed narrative report and schedule data file to the Government a minimum of two workdays in advance of the meeting. The Contractor's Project Manager and scheduler must attend the meeting with the authorized representative of the Contracting Officer. Superintendents, foremen and major subcontractors must attend the meeting as required to discuss the project schedule and work.

3.2.3 Recurring Progress Meetings

Conduct recurring meetings with the Government on a weekly or as otherwise mutually agreed to basis for the purpose of jointly reviewing the actual progress of the project as compared to the as planned progress and based on the latest approved schedule update and to review planned activities for the upcoming two weeks. Deviation or variations from the latest schedule will be annotated as different and documented with a note for the changed activity in the agenda and meeting minutes.

Use the current approved schedule for the purposes of this meeting and for the production and review of reports. Report the status - actual starts, finishes, and percent complete for all activities which were not completed as of the previous update. Identify and discuss the status of RFIs, RFPs and Submittals.

3.3 EARLY COMPLETION

An Early Completion Schedule is an Initial Project Schedule (IPS) that indicates all scope of the required contract work will be completed before the contractually required completion date.

a. No IPS indicating an Early Completion will be accepted without being fully resource-loaded (including crew sizes and manhours) and the Government agreeing that the schedule is reasonable and achievable.

b. The Government is under no obligation to accelerate work items it is responsible for to ensure that the early completion is met.

3.4 PROJECT SCHEDULE SUBMISSIONS

Provide a separate submittal for each type of schedule identified below.

3.4.1 Preliminary Project Schedule

If the contract duration is more than 18 months, and the contractor intends to request payment for early work activities prior to the approval of the initial project schedule, they may submit a Preliminary Project Schedule as described in this paragraph.

An approved Preliminary Project Schedule may be used for payment purposes not to exceed 90 calendar days after NTP. If a Preliminary Project Schedule has not been approved within 60 days of NTP, proceed with the submission of the Initial Project Schedule.

a. Use a data date of the NTP.

b. Detail all work to be started within the first 90 days of NTP, whether or not it will be completed. Summary activities for all work started after 90 days from NTP are acceptable, however they will not be paid on.

c. Contain sufficient activities to balance the contract amount and every CLIN. All activities must be assigned a BIDI and RESP codes as described elsewhere in this specification.

d. Include separate activities for the preparation and approval of all required pre-construction/pre-mobilization plans identified in the contract.

3.4.2 Initial Project Schedule (IPS)

Submit an Initial Project Schedule for approval within 40 calendar days after NTP is issued. The schedule must demonstrate a reasonable and realistic sequence of activities which represent all work through the entire contract performance period.

Any demolition or construction work started prior to the submission of the Final Design must be detailed before payment will be allowed on those items.

The IPS must use a data date of the NTP.

3.4.3 Schedule Update

Update the Project Schedule on a regular basis, monthly at a minimum. Provide a draft Periodic Schedule Update for review at the schedule update meetings as prescribed in the paragraph PERIODIC SCHEDULE UPDATE MEETINGS. These updates will enable the Government to assess Contractor's progress and make payment.

Identify each Schedule Update as a separate item in the submittal register.

The item description must read "Schedule Update - Data Date YYYY/MM/DD" where YYYY is the year, MM is the two digit month (e.g. 06 for June), and DD is the day. Resubmission of disapproved Schedule Updates will be treated as resubmission of the existing item.

Schedule Updates are not to be treated as a resbumittal of the most current approved project schedule update.

a. Update information including Actual Start Dates (AS), Actual Finish Dates (AF), Remaining Durations (RD), and Percent Complete, are subject to the approval of the Government. Actualized dates will only be allowed in period being updated for review.

b. AS and AF dates must match the date(s) reported on the Contractor's Quality Control Report for an activity start or finish. Provide support of the action in the narrative of the QCR.

3.4.4 Changed or Revised Schedule

When it becomes necessary to change or revise (not update) the approved

schedule, the contractor must submit the proposed changes for review and approval. Provide the revised schedule and all documents as a new transmittal, not a resubmittal of a previously approved submittal. When dates are actualized outside the period being updated for review, this is a revision. Identify the submittal via the addition of a new item to the submittal register with a description "Revised Schedule - Data Date YYYY/MM/DD" where YYYY is the year, MM is the two digit month (e.g. 06 for June), and DD is the day. Resubmission of disapproved Revised Schedules will be treated as resubmission of the existing item.

Note: An approved Revised Schedule becomes the basis of the Update Schedule and payment for the following month. Important, the Revised Schedule becomes the basis for the next Update schedule.

3.5 PROJECT SCHEDULE MINIMUM REQUIREMENTS

3.5.1 Level of Detail Required

Develop the Project Schedule to the appropriate level of detail to address major milestones and to allow for satisfactory project planning and execution. Failure to develop the Project Schedule to an appropriate level of detail will result in its disapproval. The Contracting Officer will consider, but is not limited to, the characteristics and requirements described herein to determine appropriate level of detail.

3.5.2 Sequencing

Where other contract documents require the contractor to sequence the work or their operations or stage operations around specific operations - for example completing work in one area before starting in another - incorporate these restrictions in the schedule by appropriate use of logic, predeccessor and successor connections, as necessary to properly account for the sequencing.

3.5.3 Grouping and Sorting

Organize activities using the Work Breakdown Structure (WBS) or as otherwise directed to assist in the understanding of the activity sequence. Typically, this flow will group activities by major elements of work, category of work, work area and/or responsibility.

3.5.4 Calendars

Schedule activities on a Calendar to which the activity logically belongs. Develop calendars to accommodate any contract defined work period such as a 7-day calendar for Government Acceptance activities, concrete cure times, etc. Develop the default Calendar to match the physical work plan with non-work periods identified including weekends and holidays. Develop seasonal Calendar(s) and assign to seasonally affected activities as applicable.

Assign all weather sensitive activities to a calendar showing non-work weather days on a monthly basis, with the non-work weather days selected at random across the weeks of the calendar. Assign non-work days over the actual work week. Implementation and execution of the weather calendar is to be in accordance with AACE 84R-13.

If proposing to use a method other than a weather calendar to account for adverse weather, government approval is required prior to development of

the schedule. AACE 84R-13 provides methodologies for techniques in planning for adverse weather. Discuss the proposed approach at the SEKO meeting, to include how the schedule would account shifts of weather sensitive work to different time periods.

3.5.5 Activity Requirements

3.5.5.1 Naming and Identification

Activity IDs must be less than 10 characters due to limitations of RMS.

Activity Names will be truncated at the 31st character when importing into RMS. Ensure no duplicative activity names in the first 30 characters and the most defining and detailed description is contained within the first 30 characters.

3.5.5.2 Durations

Activity Original Durations (OD) must be reasonable to perform the work item. OD changes are prohibited unless justification is provided and approved by the Contracting Officer. Reasonable activity durations are those that allow the progress of ongoing activities to be accurately determined between update periods.

Non-procurement construction activities may not have Original Durations (OD) greater than 20 work days or 30 calendar days. Longer duration activities shall be split into multiple smaller duration activities to provide necessary detail for workflow.

3.5.5.3 Adding Activities

Any activities added to the schedule must be approved through a Schedule Revision submittal in accordance with 3.4.4 Changed or Revised Schedule. This includes subdividing existing activities to break the work into more detail, any change in activity ID, or changes to activity names, with the exception of correction of spelling or grammatical errors.

3.5.5.4 Deleting Activities

Activities may not be deleted once payment has been made on the activity, regardless of the amount. The activity may be reduced in value only to the amounts previously paid. Activities may not be deleted if an actual start or actual finish date has been entered.

3.5.6 Logic and Relationships

3.5.6.1 Open Ended Logic

Only two open ended activities are allowed: the first activity "NTP Acknowledged" may have no predecessor logic, and the last activity -"End Project" may have no successor logic.

Predecessor open ended logic may be allowed on the first activity in a time impact analyses provided it is constrained to the actual date of the applicable event.

3.5.6.2 Lags

Lags must be reasonable as determined by the Government and not used in

place of realistic original durations, must not be in place to artificially absorb float, or to replace proper schedule logic. All lags must be identified and explained in the schedule narrative.

Changes to approved lag occurances will be treated as a Schedule Revision and will be handled in accordance with 3.4.4. Leads (negative lags are prohibited.

3.5.6.3 Start-Start Relationships

Activities may not have only Start to Start (SS) relationships as successors (either with or without lag).

Any activity with a SS relationship to another activity as a successor must have at least one of the following:

a. A Finish-Start (FS) relationship to another activity

b. A Finish-Finish (FF) relationship (with or without lags) with the same activity(-ies) as those with a SS relationship

3.5.6.4 Finish-Finish Relationship

Activities may not have only Finish to Finish (FF) relationships as predecessors (either with or without lag).

Any activity with a FF relationship to another activity as a predecessor must have at least one of the following:

a. A Finish-Start (FS)SF relationship to another activity

b. A Start-Start (SS) relationship (with or without lags) with the same activity(-ies) as those with a FF relationship

3.5.6.5 Start-Finish Relationships

Start to Finish (SF) relationships are prohibited.

3.5.6.6 Retained Logic

Schedule calculations must retain the logic between predecessors and successors ("retained logic" mode) even when the successor activity(s) starts and the predecessor activity(s) has not finished (out-of-sequence progress). Software features that in effect sever the tie between predecessor and successor activities when the successor has started and the predecessor logic is not satisfied ("progress override") are prohibited.

3.6 REQUIRED ACTIVITIES

3.6.1 Design and Design Related Activities

Provide a detailed level of scheduling sufficient to identify all major design tasks that control the flow of work. Also include separate review and correction periods associated with each item.

Include in the schedule activities associated with design, including but not limited to identification of individual design packages, design submission, reviews, and conferences identified in the project documents.

3.6.2 Contract Milestones and Constraints

Milestone activities are to be used for significant project events including, but not limited to, project phasing, project start and end activities, or interim completion dates. The use of artificial float constraints such as "zero free float" or "zero total float" are prohibited.

Constraints that ignore or affect network logic are prohibited. No constrained dates are allowed in the schedule other than those specified herein. Submit additional constraints to the Contracting Officer for approval on a case by case basis.

3.6.2.1 Project Start Date

The first activity in the project schedule must be a start milestone titled "NTP Acknowledged," which must have a "Start On" constraint date equal to the date that the NTP is acknowledged.

3.6.2.2 Construction Completion

The last activity required to be completed prior to acceptance of the project by the Government must be a finish milestone titled "Required Completion."

Constrain the activity with a "Must Finish By" date equal to the required contract completion date.

The Government retains right to direct activities to be linked to the "Required Completion" milestone.

3.6.2.3 End Project

The last activity in the schedule must be a finish milestone titled "End Project."

Link Activities which are not required to be completed prior to acceptance to this milestone, rather than the "Required Completion" milestone. Typical activities may include completion of as-built drawings, demobilization, final O&M manuals, etc. Refer to specific requirements identified in other sections for items required to be completed as part of the "Required Completion" milestone.

The "End Project" milestone represents the completion of all physical work at the project site and acceptance or approval of all contractor required deliverables. It normally coincides with the contractors submission of final payment.

3.6.2.4 Phases and Interim Completion Dates

Constrain contractually specified interim completion dates to show negative float when the calculated late finish date of the last activity in that phase is later than the specified interim completion date.

3.6.2.4.1 Start Phase

Use a start milestone as the first activity for a project phase. Call the start milestone "Start Phase X" where "X" refers to the phase of work.

3.6.2.4.2 End Phase

Use a finish milestone as the last activity for a project phase. Call the finish milestone "End Phase X" where "X" refers to the phase of work.

3.6.3 Mandatory Items for All Projects

The project schedule must include separate activities for the following items:

a. Permits. Activities for (a) preparation and (b) review and approval of required permits from authorities at any level (National, State, Local, etc.). This requirement does not include recurring approval activities which extend throughout the performance period, such as vetting of workers or installation access requirements.

b. Key submittals. Each activity for a submittal must represent a single submittal (the submittal may have multiple items). Where multiple submittals are required, separate activities must be identified in the schedule. The narrative must identify the specific submittal item(s) from the submittal register which are linked to the specific activity. Separate activities for (a) contractor efforts to prepare, review, approve and submit (b) Government review and approval of the following:

    1. SD-01 Preconstruction Submittals required to be approved prior to mobilization to the site.

    2. Design packages or features requiring design completion (extensions of design).

    3. O&M Manuals

    4. As-built drawings

c. Long Lead Items. Long lead items are materials, equipment, fabricated assemblies, and supplies where the time between ordering and delivery to the project site is 30 calendar days or longer. Include separate activities associated with:

    1. Submittal preparation

    2. Submittal review and approval

    3. Procurement

    4. Fabrication

    5. Delivery of materials, equipment, fabricated assemblies, and supplies

d. Government Activities. Show Government and activities that could impact progress. These activities include, but are not limited to: reviews, approvals, acceptance, permits, inspections, utility connection or tie-in, move-in or move-out of facilities, and Government Furnished Equipment (GFE).

e. Commissioning has a perscribed schedule template for Cx. (ECB 2005-10). Submission and approval of Building Commissioning Plan, test data, and reports: Develop the schedule logic to include

preparing test plans and actual testing and commissioning of systems to a level of detail consistent with the contract commissioning requirements. The schedule logic must show all tasks associated with building testing and commissioning completed prior to submission of building commissioning report and contract completion. Included in these activities are:

1. Testing and air balance (TAB)

2. Functional Performance Testing and Verification

3. Controls Testing

f. Completion Activities. Include:

1. Contractor's pre-final inspection

2. Correction of punch list from Contractor's pre-final inspection

3. Government's pre-final inspection

4. Final inspection

3.6.4 Resubmittals

Where the schedule includes activities for submittals, and the submittal is disapproved or requires resubmission, add separate activities for the contractor effort to revise and for the Government to review the resubmittal.

The durations for these activities must match (1) the time required by the contractor to prepare the retransmittal and (2) the contractually allowed review period for the Government.

The initial schedule activity for Government review must show completion as of the date the original transmittal was returned.

a. Add the initial government review of the original submittal as a new activity (RESP code = GOVT) with a predecessor being the preparation of the original submittal by the contractor. Apply actual start and finish dates for the receipt and return of the transmittal by the Government.

b. Add the preparation of the revised submittal as a successor to the above activity. The successor to this activity will be the pre-existing schedule activity for government review.

c. Remove any actual dates from the pre-existing government review activity.

3.7 ACTIVITY COST LOADING

Activity cost loading must be reasonable and without front-end loading. Provide additional documentation to demonstrate reasonableness if requested by the Contracting Officer.

Except as explicitly identified in this section, costs which are not associated with physical work, including overhead, profit, guarantees or bonds, costs to operate site facilities, and all other indirect costs may

not be assigned to separate activities. All such costs must be distributed among the physical work activities.

3.7.1 Balancing with Contract Line Items (CLINs)

The aggregate value of all activities coded to a contract CLIN must equal the value of the CLIN.

3.7.2 Bonds and Performance Guarantees

Initial payment for a performance bond or guarantee may be allowed based upon proof of payment. Confirm acceptability with the COR prior to creating an activity.

The activity must be titled "Performance Guarantee Payment", have the NTP activity as its sole predecessor and the End Project activity as its sole successor.

3.7.3 Cost Loading of Submittals

No costs are to be assigned to activities for the preparation, review, or approval of submittals, except as described under paragraph 3.7.10 Closeout Activities.

3.7.4 Contractor Prepared Designs

Payment for contractually specified design submissions (i.e. 65%, 95%, Corrected Final, etc.) will be allowed only after approval of the design submission by the government. Cost load a separate activity with a duration of one day with a predecessor of the government review and approval activity.

No payment will be made for the preparation or approval of any contractor prepared SD-02 Shop Drawing submittals.

3.7.5 Designer of Record, Government Activities

Any activity with a Responsible Party Coding (RESP) (see paragraph 3.13.1.2) of Designer of Record (DOR), Government (GOVT) or other Government (GOVO) may not have any cost assigned to it.

3.7.6 Fees to Other Parties

Unless specifically identified as a payable item in the contract, activities representing payment of fees to other government agencies or entities at any level may not be separately cost loaded in the schedule.

This includes taxes, customs, duties, and delivery fees, as well as fees payable by or to subcontractors or suppliers at any level.

Where fees are identified as payable, the costs will be paid only upon proof fee payment and approval/acceptance of the associated item by the relevant entity.

3.7.7 Equipment and Material Fabrication and Delivery (Stored Materials)

No costs are to be assigned to material or equipment fabrication, transportation, or delivery.

Generally, costs for materials and equipment are to be included in the activities associated with the physical construction or installation. The government may allow payment for material or equipment costs provided all of the following conditions are met:

a. The contractor provides proof of payment and ownership of the materials or equipment. The government will pay only the value of the material or equipment without any markups.

b. The materials or equipment are securely and safely stored on the project site, to include being protected from damage or degradation due to weather and other construction activities. Off-site stored material is not eligible for payment, unless otherwise authorized by this contract.

c. Bulk materials or multiple quantity items such as "lighting fixtures" will not be separately reimbursed.

Identify any stored material items in the schedule with an activity having a duration of 1 day, with a single predecessor representing the delivery of the item to the site and a single successor representing the installation of the item. Multiple successors are not allowed as the item cannot be tracked to a specific construction activity in the schedule.

The government does not commit to authorizing or allowing costs for any stored materials, even if requested by the contractor.

3.7.8 Negative Costs

Negative values for activity costs are prohibited. If existing requirements are reduced or removed via modification, reduce the value of existing activities.

3.7.9 Closeout Activities

Include cost loaded activities as follows:

3.7.9.1 Punch List

Include a cost loaded activity titled "Correction of punch list from Government pre-final inspection" with a value not less than 1 percent of the initial contract value. Activity(ies) will be completed (Actual Finish) only after verification by the Government of completion and correction of all items identified during Government pre-final. The activity will not be progressed or paid until all the corrections are made and the work is accepted as complete by COR/ACO/KO. inspection(s).

3.7.9.2 As-Built Drawings

Include a cost loaded activity titled "Approval of final as-built drawings" with a value not less than 1 percent of the initial contract value, up to $200,000. The activity will not be considered complete until the final as-built drawings have been approved by the Government.

If multiple facilities are constructed under this contract, this activity may be subdivided into separate activities for each facility or separate portion of work.

3.7.9.3 O & M Manuals

Include a cost loaded activity titled "Approval of O & M manuals" with a value not less than 1 percent of the initial contract value. Activity will not be considered complete until all O & M manuals have been approved by the Government.

3.8 SUBMITTAL CONTENTS

Every schedule submittal must include the following items:

3.8.1 Data Submission

Provide via electronic means the project schedule in the format of the scheduling software (e.g. .XER).

Include PDF copies of the Narrative Report and all required Schedule Reports. Each schedule must have a unique file name and use project specific settings. Submit all files through RMS-CM as attachments to a submittal.

3.8.2 Narrative Report (Other Than Schedule Updates)

The Narrative Report must correlate to the schedule and provide information regarding how the contractor has organized the schedule and intends to perform all work required by the contract from start to finish.

At a minimum, the Narrative must:

a. Contain a header with (1)the contract number (including delivery order), (2) contract title, (3) data date, (4) schedule reference id (the XER name), (5) the transmittal the schedule is being submitted with, and (6) the most recent approved schedule which can be used for comparison, including the data date of that schedule.

b. Describe the work required by the contract, how it is organized and will be performed, with specific references to how the schedule correlates to the chronological work sequence. If the work sequence has changed from a previous submission, explain what changes occurred and why.

c. Identify and describe the activities along the critical path.

d. Identify activities and float paths with minimal (less than 5 days) or large (more than 75 days) of float. Explain causes and reasons.

e. Describe the Work Breakdown Structure (WBS) used in the schedule and how it is organized in relation to the requirements of the contract.

f Describe any activity numbering procedures (for example, all procurement activities begin with "P").

g. Describe the methods used to determine activity durations, including estimates of personnel required to execute tasks.

h. Identify long lead items in the schedule, along with how the estimated delivery dates were determined.

i. Describe significant assumptions, risks, and constraints to

executing the work and mitigation measures (actual or possible) taken.

j. Identify and explain the purpose for all lags.

k. Explicitly identify all activities with SS or FF relationships and explain the reasoning.

l. Identify all project calendars and non-work days (weekends, holidays, weather). Explain how activities were assigned to each calendar.

m. Except for revised baselines or completion schedules, dDescribe allny changes to the schedule which have been made, along with the reasons for the change. Include at a minimum new and deleted activities, logic changes, duration changes, calendar changes, lag changes, resource changes, and changes in activity costs.

n. Identify all out-of-sequence work and explain the reasons for not correcting the schedule logic to eliminate it.

o. Identify all activity code values, including both those identified in paragraph Standard Activity Coding Dictionary and any specific codes used by the contractor. Explain intent and how values are assigned.

3.8.3 Narrative Report (Schedule Updates)

Provide a Narrative Report with each schedule update. The Narrative Report is expected to communicate to the Government the thorough analysis of the schedule output and the plans to compensate for any problems, either current or potential, which are revealed through that analysis.

The Narrative Report must include at a minimum:

a. A header with (1)the contract number (including delivery order), (2) contract title, (3) data date, (4) schedule reference id (the XER name), (5) the transmittal the schedule is being submitted with, and (6) the most recent approved schedule which can be used for comparison, including the data date of that schedule.

b. Identify and discuss the work scheduled to start in the next update period.

c. Identify changes in the scheduled (projected) completion date of all milestones, including the Construction Completion and End Project milestones from the previous schedule. Specifically identify any positive or negative float and reasons for all changes since the previous schedule.

d. If the critical path has changed from a previous submission, explain what caused the change(s).

e. A description of current and anticipated problem areas or delaying factors and their impact and an explanation of corrective actions taken or required to be taken.

f. Identify and explain why activities based on their calculated late dates should have either started or finished during the update period but did not.

g. Identify work completed since the previous submission.

h. Identify and discuss out-of-sequence work. Explain what is required to complete the predecessor activities causing the activity to appear as out-of-sequence.

3.8.4 Network Diagram

Include two Network Diagrams with every schedule submission as described below. Depict and display the order and interdependence of activities and the sequence in which the work is to be accomplished. Show the name and description of all activities with their duration and total float.

a. A Gantt chart including baseline and current planned (or actual) Start and Finish Dates, total float, logic, and duration for all activities, including milestones, in the project schedule. Show the activity ID, description, duration, and amount earned to date. The critical path must be shown in a different color than other activities.

b. A standard Activity on Node CPM chart showing early start, early finish, late start, and late finish, along with all logic for all activities in the project schedule.

3.8.5 Cash Flow / Schedule Variance Control (SVC) Diagram

Provide a SVC diagram showing: Cash Flow S-Curves indicating planned project cost based on projected early and late activity finish dates, and Earned Value to-date.

3.9 SCHEDULE UPDATES

Update the schedule continuously to reflect the actual progression of work, but no less than monthly, unless approved otherwise by the Contracting Officer.

3.9.1 Default Progress Data Disallowed

Actual Start and Finish dates must not automatically update with default mechanisms included in the scheduling software. Updating of the percent complete and the remaining duration of any activity must be independent functions. Disable program features that calculate one of these parameters from the other.

3.9.2 Activity Actual Start and Actual Finish

Activity Actual Start (AS) and Actual Finish (AF) dates assigned during the updating process must match those dates provided in the Contractor Quality Control (QC) Reports.

Discrepancies with the QC Report or failure to document the AS and AF dates in the Daily Quality Control report will result in disapproval of the Contractor's schedule.

3.9.3 Percent Complete

Update the percent complete for each activity started, based on a realistic assessment of earned value.

Activities which are complete but for remaining minor punch list work and which do not restrain the initiation of successor activities may either:

a. Be declared 100 percent complete, provided an activity is added to the schedule representing the punch list work with a predecessor of the applicable activity and a successor of the pre-final inspection or similar activity. This activity must have a value no less than 5% of the original activity, which must be decreased in value accordingly. Activities added in this manner may be included in a Schedule Update and must be identified in the Narrative Report.

b. Remain uncompleted, with no more than 95% progress reported and activity value earned, until the deficiency(-ies) are corrected. The successor work will appear as Out-of-Sequence.

3.9.4 Remaining Duration

Update the remaining duration for each activity based on the number of estimated work days it will take to complete the activity. Remaining duration may not mathematically correlate with percentage found under paragraph entitled Percent Complete. The remaining duration for unstarted activities are not to be less than its original duration.

3.9.5 Out-of-Sequence Progress

When schedule updates result in activities that have progressed before all preceding logic has been satisfied (out-of-sequence progress), identify and explain the reasons for the out-of-sequence progress.
Propose logic corrections to eliminate out of sequence progress or justify not changing the sequencing. Changes to schedule logic should be discussed as part of the Periodic Schedule Update Meeting, but are to be submitted and approved as a revised schedule.

3.9.6 Update Submission Following Progress Meeting

Following the periodic schedule update meeting, make corrections to the draft submission. Include only those changes approved by the Government in the submission and invoice for payment.

Submit the complete Schedule Update of the Project Schedule containing all approved progress, revisions, and adjustments, not later than 4 work days after the periodic schedule update meeting.

3.10 REQUESTS FOR TIME EXTENSIONS

When requesting an adjustment in the performance period or in any interim milestone, whether in response to a Request for Proposal (RFP) for a change to the contract or for any other delay, provide a justification of the proposed change based on the delay. Every request for a time extension must include both a written narrative and schedule (XER file).

3.10.1 Justification of Delay

Provide a description of the event(s) that caused the delay and/or impact to the work. As part of the description, identify all schedule activities impacted. Show that the event that caused the delay/impact was the responsibility of the Government. Provide a time impact analysis that demonstrates the effects of the delay or impact on the project completion date or interim completion date(s). Evaluate multiple impacts chronologically; each with its own justification of delay. With multiple impacts consider any concurrent delay.

3.10.2 Time Impact Analysis (Prospective Analysis)

Submit requests for time extensions based on a prospective analysis if the work involved or the impact identified has not already occurred. Where the impact is ongoing, a prospective analysis may be considered, however the government reserves the right to require a retrospective analysis be prepared after the impact has ended.

Prepare a time impact analysis for approval by the Contracting Officer based on industry standard AACE 52R-06. Utilize a copy of the last approved schedule prior to the first day of the impact or delay for the time impact analysis. This schedule must be identified in the narrative and a separate copy of that schedule (prior to any changes) provided with the request for time extension. If Contracting Officer determines the time frame between the last approved schedule and the first day of impact is too great, prepare an interim updated schedule to perform the time impact analysis. Unless approved by the Contracting Officer, no other changes may be incorporated into the schedule being used to justify the time impact.

3.10.3 Forensic Schedule Analysis (Retrospective Analysis)

Submit requests for time extensions based on a retrospective analysis if the work involved or the impact identified has already occurred. The analysis must account for the actual performance of both the impacted work and all other contract work in the schedule.

Prepare an analysis for approval by the Contracting Officer based on one of the methodologies identified in AACE 52R-06. Include in the analysis the reasoning for the choice of methodology.

3.10.4 Fragmentary Network (Fragnet)

Prepare a proposed fragnet for time impact analysis consisting of a sequence of new activities that are proposed to be added to the project schedule. Identify and include any proposed changes to existing activities.

A fragnet is required to be submitted with all proposals for changes or adjustments in the contract, whether the performance period is impacted or not.

Clearly show how the proposed fragnet is to be tied into the project schedule including all predecessors and successors to the fragnet activities. The proposed fragnet must be approved by the Contracting Officer prior to incorporation into the project schedule.

3.11 FAILURE TO ACHIEVE PROGRESS

Should the progress fall behind the approved project schedule for reasons other than those that are excusable within the terms of the contract, the Contracting Officer may require provision of a written recovery plan for approval. The plan must detail how progress will be made-up to include which activities will be accelerated by adding additional crews, longer work hours, extra work days, etc.

3.11.1 Artificially Improving Progress

Artificially improving progress by means such as, but not limited to,

revising the schedule logic, modifying or adding constraints, shortening activity durations, or changing calendars in the project schedule is prohibited. Indicate assumptions made and the basis for any logic, constraint, duration and calendar changes used in the creation of the recovery plan. Any additional resources, manpower, or daily and weekly work hour changes proposed in the recovery plan must be evident at the work site and documented in the daily report along with the Schedule Narrative Report.

3.11.2 Failure to Perform

Failure to perform work and maintain progress in accordance with the supplemental recovery plan may result in an interim and final unsatisfactory performance rating and/or may result in corrective action directed by the Contracting Officer pursuant to FAR 52.236-15 Schedules for Construction Contracts, FAR 52.249-10 Default (Fixed-Price Construction), and other contract provisions.

3.12 OWNERSHIP OF FLOAT

Float available in the schedule, at any time, belongs to the project and is available for Contractor and Government use.

Activity float is the number of work days that an activity can be delayed without causing a delay to the "Required Completion" milestone.

3.13 TRANSFER OF SCHEDULE DATA INTO RMS-CM

Import approved schedule data into RMS-CM. This data is considered to be additional supporting data in a form and detail required by the Contracting Officer pursuant to FAR 52.232-5 - Payments under Fixed-Price Construction Contracts. The receipt of a proper payment request pursuant to FAR 52.232-27 - Prompt Payment for Construction Contracts is contingent upon the Government receiving acceptable matching RMS data for the application for progress payment.

Data may be imported into RMS-CM only if the scheduling software allows activity coding in the Standard Data Exchange Format (SDEF) as described below. If the scheduling software does not allow importing into RMS-CM using SDEF, the information must be manually loaded in RMS-CM by the contractor.

3.13.1 Standard Activity Coding Dictionary

Use the activity coding structure defined in the Standard Data Exchange Format (SDEF) in ER 1-1-11. This exact structure is mandatory. Develop and assign all Activity Codes to activities as detailed herein.

Activities may not be assigned more than one value for each activity codes.

The SDEF format is as follows:

Field	Activity Code	Length	Description
1	WRKP	3	Workers per day

Field	Activity Code	Length	Description
2	RESP	4	Responsible party
3	AREA	4	Area of work
4	MODF	6	Modification Number
5	BIDI	6	Bid Item (CLIN)
6	PHAS	2	Phase of work
7	CATW	1	Category of work
8	FOW	20	Feature of work*

*Some systems require that FEATURE OF WORK values be placed in several activity code fields. The notation shown is for Primavera P6. Refer to the specific software guidelines with respect to the FEATURE OF WORK field requirements.

3.13.1.1 Workers Per Day (WRKP)

Assign Workers per Day for all field construction or direct work activities. Workers per day is based on the average number of workers expected each day to perform a task for the duration of that activity. It does not include management or other labor associated with the administration of the work.

The value of this field must be the number of workers as whole number (integer) matching the code value. For example, 001 would represent 1 worker/day. Do not alter from this requirement without prior approval from the Contracting Officer.

3.13.1.2 Responsible Party Coding (RESP)

Assign responsibility code for all activities to the Prime Contractor, Subcontractor(s) or Government agency(ies) responsible for performing the activity. Activities cannot have more than one responsibility code: divide activities where required to ensure that all work associated with the activity is performed by a single responsible party. Each RESP code other than "PRIM" will generate a new Subcontractor record in RMS-CM which will then appear on the contractors pay request.

a. Activities coded with a Government Responsibility code include, but are not limited to: Government review and approvals, Government Furnished Property/Equipment (GFP) and Notice to Proceed (NTP) for phasing requirements.

b. Activities which are the responsibility of any Government agency at any level, including, but not limited to: reviews, permit approvals, and clearances must have a Responsibility Code assigned.

c. Utilize the following specific activity codes Examples of acceptable activity code values are: DOR (for the designer of record); ELEC (for the electrical subcontractor); MECH (for the mechanical

subcontractor); GOVT (for USACE); and GOVO (for US Government actions other than USACE, and PRIM (for the prime contractor).

d. Generic coding for subcontract trades, such as "MECH" for Mechanical, and "ELEC" for electrical are acceptable only if there is a single subcontractor for that trade. All subcontractors shown on the contractors pay request must be shown in the schedule. Each subcontractor will be assigned a unique RESP code.

e. The Prime Contractor MUST have a Responsibility Code of "PRIM".

3.13.1.3 Area of Work Coding (AREA)

Assign Work Area code to activities based upon the work area in which the activity occurs. Define work areas based on resource constraints or space constraints that would preclude a resource, such as a particular trade or craft work crew from working in more than one work area at a time due to restraints on resources or space. Examples of Work Area Coding include different areas within a floor of a building, different floors within a building, and different buildings within a complex of buildings.

Not all activities are required to be Work Area coded. A lack of Work Area coding indicates the activity is not resource or space constrained.

3.13.1.4 Modification Number (MODF)

Assign a Modification Number Code to any activity or sequence of activities added to the schedule as a result of a Contract Modification. Key all Code values to the Government's modification numbering system.

When preparing a prospective Time Impact Analysis, insert the Change Request (CR) number identified in the RFP letter to allow for proper filtering.

3.13.1.5 Bid Item Coding (BIDI)

Assign a Bid Item Code to all activities using the Contract Line Item Schedule (CLIN) to which the activity belongs, even when an activity is not cost loaded. The CLIN must match the CLIN as shown in RMS-CM. For milestones or other activities which have no cost and which are not associated with a single CLIN, a BIDI is not required.

3.13.1.6 Phase of Work Coding (PHAS)

If the contract specifies phasing with separately defined performance periods, identify a Phase Code to allow filtering and organizing the schedule accordingly.

3.13.1.7 Category of Work Coding (CATW)

Assign a Category of Work Code to all activities. Category of Work Codes include, but are not limited to design, design submittal, design reviews, review conferences, permits, construction submittals, procurement, fabrication, weather sensitive installation, non-weather sensitive installation, start-up, and testing activities. Each activity can have no more than one Category of Work Code.

3.13.1.8 Feature of Work Coding (FOW)

Assign a Feature of Work Code to appropriate activities based on the Definable Feature of Work to which the activity belongs based on the approved QC plan. Do not assign FOW by specification section number.

Definable Feature of Work is defined in Section 01 45 00 QUALITY CONTROL.

3.13.2 Manual Entry of Schedule Information

If the scheduling software is not able to create a SDEF file, the contractor is required to manually enter the following schedule information in RMS-CM for each activity:

a. ID (Number)

b. Description

c. Duration

d. Amount

e. CLIN

f. All other information identified in Paragraph STANDARD ACTIVITY CODING STRUCTURE

3.14 PRIMAVERA P6 MANDATORY REQUIREMENTS

Ensure Primavera P6 settings provide a schedule capable of fulfilling the requirements of the contract. The following settings are mandatory and required in all schedule submissions to the Government:

a. Activity Codes must be Project Level, not Global or EPS level.

b. Calendars must be Project Level, not Global or Resource level.

c. Activity Duration Types must be set to "Fixed Duration & Units".

d. Percent Complete Types must be set to "Physical".

e. Time Period Admin Preferences must remain the default "8.0 hr/day, 40 hr/week, 172 hr/month, 2000 hr/year". Set Calendar Work Hours/Day to 8.0 Hour days.

f. Set Schedule Option for defining Critical Activities to "Longest Path".

g. Set Schedule Option for defining progressed activities to "Retained Logic".

h. Set up cost loading using a single lump sum non-labor resource. The Price/Unit must be $1/hr, Default Units/Time must be "8h/d", and settings "Auto Compute Actuals" and "Calculate costs from units" un-selected.

i. Do not include a "Must Finish By" date under the Dates tab of the Project.

-- End of Section --

SECTION 01 33 00

SUBMITTAL PROCEDURES
08/18, CHG 4: 02/21

PART 1 GENERAL

1.1 SUMMARY

1.1.1 Submittal Information

The Contracting Officer may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective sections. Each submittal is to be complete and in sufficient detail to allow ready determination of compliance with contract requirements.

Units of weights and measures used on all submittals are to be the same as those used in the contract drawings.

1.1.2 Project Type

1.1.3 Submission of Submittals

Schedule and provide submittals requiring Government approval before acquiring the material or equipment covered thereby. Pick up and dispose of samples not incorporated into the work in accordance with manufacturer's Safety Data Sheets (SDS) and in compliance with existing laws and regulations.

1.2 DEFINITIONS

1.2.1 Submittal Descriptions (SD)

Submittal requirements are specified in the technical sections. Examples and descriptions of submittals identified by the Submittal Description (SD) numbers and titles follow:

SD-01 Preconstruction Submittals

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

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

Certificates Of Insurance

Surety Bonds

List Of Proposed Subcontractors

List Of Proposed Products

Baseline Network Analysis Schedule (NAS)

Submittal Register

Schedule Of Prices Or Earned Value Report

Accident Prevention Plan

Work Plan

Quality Control (QC) plan

Environmental Protection Plan

SD-02 Shop Drawings

Drawings, diagrams and schedules specifically prepared to illustrate some portion of the work.

Diagrams and instructions from a manufacturer or fabricator for use in producing the product and as aids to the Contractor for integrating the product or system into the project.

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

SD-03 Product Data

Catalog cuts, illustrations, schedules, diagrams, performance charts, instructions and brochures illustrating size, physical appearance and other characteristics of materials, systems or equipment for some portion of the work.

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

SD-04 Samples

Fabricated or unfabricated physical examples of materials, equipment or workmanship that illustrate functional and aesthetic characteristics of a material or product and establish standards by which the work can be judged.

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

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

SD-05 Design Data

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

SD-06 Test Reports

Report signed by authorized official of testing laboratory that a material, product or system identical to the material, product or

system to be provided has been tested in accord with specified requirements. Unless specified in another section, testing must have been within three years of date of contract award for the project.

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

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

Investigation reports

Daily logs and checklists

Final acceptance test and operational test procedure

SD-07 Certificates

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

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

Confined space entry permits

Text of posted operating instructions

SD-08 Manufacturer's Instructions

Preprinted material describing installation of a product, system or material, including special notices and Safety Data Sheets(SDS)concerning impedances, hazards and safety precautions.

SD-09 Manufacturer's Field Reports

Documentation of the testing and verification actions taken by manufacturer's representative at the job site, in the vicinity of the job site, or on a sample taken from the job site, on a portion of the work, during or after installation, to confirm compliance with manufacturer's standards or instructions. The documentation must be signed by an authorized official of a testing laboratory or agency and state the test results; and indicate whether the material, product, or system has passed or failed the test.

Factory test reports.

SD-11 Closeout Submittals

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

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

Special requirements necessary to properly close out a construction contract. For example, Record Drawings and as-built drawings. Also, submittal requirements necessary to properly close out a major phase of construction on a multi-phase contract.

1.2.2 Approving Authority

Office or designated person authorized to approve the submittal.

1.2.3 Work

As used in this section, on-site and off-site construction required by contract documents, including labor necessary to produce submittals, construction, materials, products, equipment, and systems incorporated or to be incorporated in such construction. In exception, excludes work to produce SD-01 submittals.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Submittal Register; G

1.4 SUBMITTAL CLASSIFICATION

1.4.1 Government Approved (G)

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

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

1.4.2 For Information Only (FIO)

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

1.5 PREPARATION

1.5.1 Transmittal Form

Use the ENG Form 4025-R transmittal form for submitting both Government-approved and information-only submittals. Submit in accordance with the instructions on the reverse side of the form. These forms are

included in the RMS CM software that the Contractor is required to use for this contract. Properly complete this form by filling out all the heading blank spaces and identifying each item submitted. Exercise special care to ensure proper listing of the specification paragraph and sheet number of the contract drawings pertinent to the data submitted for each item.

1.5.2 Submittal Format

1.5.2.1 Format of SD-01 Preconstruction Submittals

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

Provide data in the unit of measure used in the contract documents.

1.5.2.2 Format for SD-02 Shop Drawings

Provide shop drawings not less than 8 1/2 by 11 inches nor more than 30 by 42 inches, except for full-size patterns or templates. Prepare drawings to accurate size, with scale indicated, unless another form is required. Ensure drawings are suitable for reproduction and of a quality to produce clear, distinct lines and letters, with dark lines on a white background.

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

b. Dimension drawings, except diagrams and schematic drawings. Prepare drawings demonstrating interface with other trades to scale. Use the same unit of measure for shop drawings as indicated on the contract drawings. Identify materials and products for work shown.

Submit an electronic copy of drawings in PDF format and native electronic format.

1.5.2.2.1 Drawing Identification

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

Number drawings in a logical sequence. Each drawing is to bear the number of the submittal in a uniform location next to the title block. Place the Government contract number in the margin, immediately below the title block, for each drawing.

Reserve a blank space, no smaller than 3 by 4 inches on the right-hand side of each sheet for the Government disposition stamp.

1.5.2.3 Format of SD-03 Product Data

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

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

pertains.

1.5.2.3.1 Product Information

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

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

1.5.2.3.2 Standards

Where equipment or materials are specified to conform to industry or technical-society reference standards of such organizations as the American National Standards Institute (ANSI), ASTM International (ASTM), National Electrical Manufacturer's Association (NEMA), Underwriters Laboratories (UL), or Association of Edison Illuminating Companies (AEIC), submit proof of such compliance. The label or listing by the specified organization will be acceptable evidence of compliance. In lieu of the label or listing, submit a certificate from an independent testing organization, competent to perform testing, and approved by the Contracting Officer. State on the certificate that the item has been tested in accordance with the specified organization's test methods and that the item complies with the specified organization's reference standard.

1.5.2.3.3 Data Submission

Collect required data submittals for each specific material, product, unit of work, or system into a single submittal that is marked for choices, options, and portions applicable to the submittal. Mark each copy of the product data identically. Partial submittals will not be accepted for expedition of the construction effort.

Submit the manufacturer's instructions before installation.

1.5.2.4 Format of SD-04 Samples

1.5.2.4.1 Sample Characteristics

Furnish samples in the following sizes, unless otherwise specified or unless the manufacturer has prepackaged samples of approximately the same size as specified:

a. Sample of Equipment or Device: Full size.

b. Sample of Materials Less Than 2 by 3 inches: Built up to 8 1/2 by 11 inches.

c. Sample of Materials Exceeding 8 1/2 by 11 inches: Cut down to 8 1/2 by 11 inches and adequate to indicate color, texture, and material variations.

d. Sample of Linear Devices or Materials: 10 inch length or length to be supplied, if less than 10 inches. Examples of linear devices or materials are conduit and handrails.

e. Sample Volume of Nonsolid Materials: Pint. Examples of nonsolid materials are sand and paint.

f. Color Selection Samples: 2 by 4 inches. Where samples are specified for selection of color, finish, pattern, or texture, submit the full set of available choices for the material or product specified. Sizes and quantities of samples are to represent their respective standard unit.

g. Sample Panel: 4 by 4 feet.

h. Sample Installation: 100 square feet.

1.5.2.4.2 Sample Incorporation

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

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

1.5.2.4.3 Comparison Sample

Samples Showing Range of Variation: Where variations in color, finish, pattern, or texture are unavoidable due to nature of the materials, submit sets of samples of not less than three units showing extremes and middle of range. Mark each unit to describe its relation to the range of the variation.

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

1.5.2.5 Format of SD-05 Design Data

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

1.5.2.6 Format of SD-06 Test Reports

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

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

1.5.2.7 Format of SD-07 Certificates

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

1.5.2.8 Format of SD-08 Manufacturer's Instructions

Present manufacturer's instructions submittals for each section as a complete, bound volume. Include the manufacturer's name, trade name, place of manufacture, and catalog model or number on product data. Also

include applicable federal, military, industry, and technical-society publication references. If supplemental information is needed to clarify the manufacturer's data, submit it as specified for SD-07 Certificates.

Submit the manufacturer's instructions before installation.

1.5.2.8.1 Standards

Where equipment or materials are specified to conform to industry or technical-society reference standards of such organizations as the American National Standards Institute (ANSI), ASTM International (ASTM), National Electrical Manufacturer's Association (NEMA), Underwriters Laboratories (UL), or Association of Edison Illuminating Companies (AEIC), submit proof of such compliance. The label or listing by the specified organization will be acceptable evidence of compliance. In lieu of the label or listing, submit a certificate from an independent testing organization, competent to perform testing, and approved by the Contracting Officer. State on the certificate that the item has been tested in accordance with the specified organization's test methods and that the item complies with the specified organization's reference standard.

1.5.2.9 Format of SD-09 Manufacturer's Field Reports

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

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

1.5.2.10 Format of SD-11 Closeout Submittals

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

Provide data in the unit of measure used in the contract documents.

1.5.3 Source Drawings for Shop Drawings

1.5.3.1 Source Drawings

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

1.5.3.2 Terms and Conditions

Data contained on these electronic files must not be used for any purpose other than as a convenience in the preparation of construction data for the referenced project. Any other use or reuse is at the sole risk of the Contractor and without liability or legal exposure to the Government. The Contractor must make no claim, and waives to the fullest extent permitted by law any claim or cause of action of any nature against the Government, its agents, or its subconsultants that may arise out of or in connection with the use of these electronic files. The Contractor must, to the fullest extent permitted by law, indemnify and hold the Government

harmless against all damages, liabilities, or costs, including reasonable attorney's fees and defense costs, arising out of or resulting from the use of these electronic files.

These electronic source drawing files are not construction documents. Differences may exist between the source drawing files and the corresponding construction documents. The Government makes no representation regarding the accuracy or completeness of the electronic source drawing files, nor does it make representation to the compatibility of these files with the Contractor hardware or software. The Contractor is responsible for determining if any conflict exists. In the event that a conflict arises between the signed and sealed construction documents prepared by the Government and the furnished source drawing files, the signed and sealed construction documents govern. Use of these source drawing files does not relieve the Contractor of the duty to fully comply with the contract documents, including and without limitation the need to check, confirm and coordinate the work of all contractors for the project. If the Contractor uses, duplicates or modifies these electronic source drawing files for use in producing construction data related to this contract, remove all previous indication of ownership (seals, logos, signatures, initials and dates).

1.5.4 Electronic File Format

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

E-mail electronic submittal documents smaller than 10MB to an e-mail address as directed by the Contracting Officer. Provide electronic documents over 10 MB on an optical disc or through an electronic file sharing system such as the DOD SAFE Web Application located at the following website: https://safe.apps.mil/.

1.6 QUANTITY OF SUBMITTALS

1.6.1 Number of SD-01 Preconstruction Submittal Copies

Unless otherwise specified, submit two sets of administrative submittals.

1.6.2 Number of SD-02 Shop Drawing Copies

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

1.6.3 Number of SD-03 Product Data Copies

Submit in compliance with quantity requirements specified for shop drawings.

1.6.4 Number of SD-04 Samples

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

b. Submit one sample panel or provide one sample installation where directed. Include components listed in the technical section or as directed.

c. Submit one sample installation, where directed.

d. Submit one sample of nonsolid materials.

1.6.5 Number of SD-05 Design Data Copies

Submit in compliance with quantity requirements specified for shop drawings.

1.6.6 Number of SD-06 Test Report Copies

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

1.6.7 Number of SD-07 Certificate Copies

Submit in compliance with quantity requirements specified for shop drawings.

1.6.8 Number of SD-08 Manufacturer's Instructions Copies

Submit in compliance with quantity requirements specified for shop drawings.

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

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

1.6.10 Number of SD-10 Operation and Maintenance Data Copies

Submit five copies of O&M data to the Contracting Officer for review and approval.

1.6.11 Number of SD-11 Closeout Submittals Copies

Unless otherwise specified, submit two sets of administrative submittals.

1.7 FOR INFORMATION ONLY SUBMITTALS

Submittals without a "G" designation must be certified by the QC manager and submitted to the Contracting Officer for information-only. Approval of the Contracting Officer is not required on information only submittals. The Contracting Officer will mark "receipt acknowledged" on submittals for information and will return only the transmittal cover sheet to the Contractor. Normally, submittals for information only will not be returned. However, the Government reserves the right to return unsatisfactory submittals and require the Contractor to resubmit any item found not to comply with the contract. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and specifications; will not prevent the Contracting Officer from requiring removal and replacement of nonconforming material incorporated in the work; and does not relieve the Contractor of the requirement to furnish samples for testing by the Government laboratory or for check testing by the Government in those instances where the technical specifications so prescribe.

1.8 PROJECT SUBMITTAL REGISTER

A sample Project Submittal Register showing items of equipment and materials for when submittals are required by the specifications is provided as "Attachment A - Submittal Register."

1.8.1 Submittal Management

Prepare and maintain a submittal register, as the work progresses. Do not change data that is output in columns (c), (d), (e), and (f) as delivered by Government; retain data that is output in columns (a), (g), (h), and (i) as approved. As an attachment, provide a submittal register showing items of equipment and materials for which submittals are required by the specifications. This list may not be all-inclusive and additional submittals may be required. Maintain a submittal register for the project in accordance with Section 01 45 00.15 10 RESIDENT MANAGEMENT SYSTEM CONTRACTOR MODE(RMS CM).

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

Column (d): Lists each submittal description (SD Number. and type, e.g., SD-02 Shop Drawings) required in each specification section.

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

Thereafter, the Contractor is to track all submittals by maintaining a complete list, including completion of all data columns and all dates on which submittals are received by and returned by the Government.

1.8.2 Preconstruction Use of Submittal Register

Submit the submittal register. Include the QC plan and the project schedule. Verify that all submittals required for the project are listed and add missing submittals. Coordinate and complete the following fields

on the register submitted with the QC plan and the project schedule:

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

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

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

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

1.8.3 Contractor Use of Submittal Register

Update the following fields in the Government-furnished submittal register program or equivalent fields in the program used by the Contractor with each submittal throughout the contract.

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

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

Column (l) Date submittal transmitted.

Column (q) Date approval was received.

1.8.4 Approving Authority Use of Submittal Register

Update the following fields:

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

Column (l) Date submittal was received.

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

Column (q) Date of return to Contractor.

1.8.5 Action Codes

1.8.6 Delivery of Copies

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

1.9 VARIATIONS

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

1.9.1 Considering Variations

Discussion of variations with the Contracting Officer before submission will help ensure that functional and quality requirements are met and minimize rejections and resubmittals. For variations that include design changes or some material or product substitutions, the Government may require an evaluation and analysis by a licensed professional engineer hired by the contractor.

Specifically point out variations from contract requirements in a transmittal letter. Failure to point out variations may cause the Government to require rejection and removal of such work at no additional cost to the Government.

1.9.2 Proposing Variations

Specifically point out variations from contract requirements in a transmittal letter. Failure to point out variations may cause the Government to require rejection and removal of such work at no additional cost to the Government.

Check the column "variation" of ENG Form 4025 for submittals that include variations proposed by the Contractor. Set forth in writing the reason for any variations and note such variations on the submittal. The Government reserves the right to rescind inadvertent approval of submittals containing unnoted variations.

1.9.3 Warranting that Variations are Compatible

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

1.9.4 Review Schedule Extension

In addition to the normal submittal review period, a period of 14 calendar days will be allowed for the Government to consider submittals with variations.

1.10 SCHEDULING

Schedule and submit concurrently product data and shop drawings covering component items forming a system or items that are interrelated. Submit pertinent certifications at the same time. No delay damages or time extensions will be allowed for time lost in late submittals. Schedule and submit concurrently submittals covering component items forming a system or items that are interrelated. Include certifications to be submitted with the pertinent drawings at the same time. No delay damages or time extensions will be allowed for time lost in late submittals. Submittals not marked "G" or "S" are considered For Information Only (FIO) and the government will have 15 days to accept the contractor's statement that they are in accordance with the contract. Submittals marked G or S shall have a 30 day review period. Allow an additional 14 days for review and approval of submittals for review and approval of refrigeration and HVAC control submittals.

a. Coordinate scheduling, sequencing, preparing, and processing of submittals with performance of work so that work will not be delayed by submittal processing. The Contractor is responsible for additional

time required for Government reviews resulting from required resubmittals. The review period for each resubmittal is the same as for the initial submittal.

b. Submittals required by the contract documents are listed on the submittal register. If a submittal is listed in the submittal register but does not pertain to the contract work, the Contractor is to include the submittal in the register and annotate it "N/A" with a brief explanation. Approval by the Contracting Officer does not relieve the Contractor of supplying submittals required by the contract documents but that have been omitted from the register or marked "N/A."

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

Contracting Officer review will be completed within 30 calendar days after the date of submission.

1.11 GOVERNMENT APPROVING AUTHORITY

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

a. Note the date on which the submittal was received.

b. Review submittals for approval within the scheduling period specified and only for conformance with project design concepts and compliance with contract documents.

c. Identify returned submittals with one of the actions defined in paragraph REVIEW NOTATIONS and with comments and markings appropriate for the action indicated.

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

1.11.1 Review Notations

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

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

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

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

d. Submittals marked "not reviewed" indicate that the submittal has been previously reviewed and approved, is not required, does not have evidence of being reviewed and approved by Contractor, or is not complete. A submittal marked "not reviewed" will be returned with an explanation of the reason it is not reviewed. Resubmit submittals returned for lack of review by Contractor or for being incomplete, with appropriate action, coordination, or change.

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

1.12 DISAPPROVED SUBMITTALS

Make corrections required by the Contracting Officer. If the Contractor considers any correction or notation on the returned submittals to constitute a change to the contract drawings or specifications, give notice to the Contracting Officer as required under the FAR clause titled CHANGES. The Contractor is responsible for the dimensions and design of connection details and the construction of work. Failure to point out variations may cause the Government to require rejection and removal of such work at the Contractor's expense.

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

1.13 APPROVED SUBMITTALS

The Contracting Officer's approval of submittals is not to be construed as a complete check, and indicates only that the general method of construction, materials, detailing, and other information are satisfactory.

Approval or acceptance by the Government for a submittal does not relieve the Contractor of the responsibility for meeting the contract requirements or for any error that may exist, because under the Quality Control (QC) requirements of this contract, the Contractor is responsible for ensuring information contained with in each submittal accurately conforms with the requirements of the contract documents.

After submittals have been approved or accepted by the Contracting Officer, no resubmittal for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.

1.14 APPROVED SAMPLES

Approval of a sample is only for the characteristics or use named in such approval and is not be construed to change or modify any contract requirements. Before submitting samples, provide assurance that the materials or equipment will be available in quantities required in the project. No change or substitution will be permitted after a sample has been approved.

Match the approved samples for materials and equipment incorporated in the work. If requested, approved samples, including those that may be damaged in testing, will be returned to the Contractor, at its expense, upon completion of the contract. Unapproved samples will also be returned to

the Contractor at its expense, if so requested.

Failure of any materials to pass the specified tests will be sufficient cause for refusal to consider, under this contract, any further samples of the same brand or make as that material. The Government reserves the right to disapprove any material or equipment that has previously proved unsatisfactory in service.

Samples of various materials or equipment delivered on the site or in place may be taken by the Contracting Officer for testing. Samples failing to meet contract requirements will automatically void previous approvals. Replace such materials or equipment to meet contract requirements.

1.15 WITHHOLDING OF PAYMENT

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

1.16 CERTIFICATION OF SUBMITTAL DATA

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

_____NAME OF CONTRACTOR _____ SIGNATURE OF CONTRACTOR

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
FEDMMA

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAG # RAPH	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY				MAILED TO CONTR/	REMARKS
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION	DATE RCD FRM APPR AUTH	
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		01 11 00	SD-01 Preconstruction Submittals															
			Salvage Plan	1.11	G	RO												
		01 14 00	SD-01 Preconstruction Submittals															
			List of Contact Personnel	1.4.1.1														
		01 30 00	SD-01 Preconstruction Submittals															
			View Location Map	1.3														
			Progress and Completion	1.4														
			Pictures															
		01 32 01.00 10	SD-01 Preconstruction Submittals															
			Project Scheduler Qualifications	1.3	G	RO												
			Preliminary Project Schedule	3.4.1	G	RO												
			SD-07 Certificates															
			Initial Project Schedule	3.4.2	G	RO												
			Schedule Update	3.4.3	G	RO												
			Schedule Update	3.9.6	G	RO												
		01 33 00	SD-01 Preconstruction Submittals															
			Submittal Register	1.8	G													
		01 35 26	SD-01 Preconstruction Submittals															
			Accident Prevention Plan (APP)	1.8	G	RO												
			Accident Prevention Plan (APP)	1.8.1	G	RO												
			SD-06 Test Reports															
			Accident Reports	1.13.2	G	RO												
			LHE Inspection Reports	1.13.3														
			Monthly Exposure Reports	1.5	G	RO												
			SD-07 Certificates															
			Crane Operators/Riggers	1.7.5.2														

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
FEDMMA

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAG # RAPH	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		01 35 26	Activity Hazard Analysis (AHA)	1.9	G	RO												
			Certificate of Compliance	1.13.4														
			Confined Space Entry Permit	1.10.1														
			Hot Work Permit	1.10.1														
			Hot Work Permit	1.14														
			License Certificates	1.15														
			Portable Gauge Operations	1.15.1	G	RO												
			Planning Worksheet															
			Radiography Operation Planning	1.15.1	G	RO												
			Work Sheet															
			Standard Lift Plan	1.8.3.2	G	RO												
			Critical Lift Plan	1.8.3.3	G	RO												
		01 45 00	SD-01 Preconstruction Submittals															
			Contractor Quality Control (CQC)	1.5.2	G	RO												
			Plan															
			SD-06 Test Reports															
			Verification Statement	1.12.3														
		01 50 00	SD-01 Preconstruction Submittals															
			Construction Site Plan	1.3	G	RO												
			Traffic Control Plan	3.3.1	G	RO												
			Haul Road Plan	2.2.1	G	RO												
			Contractor Computer	1.6.1.4	G	RO												
			Cybersecurity Compliance															
			Statements															

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
FEDMMA

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAG # RAPH	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		01 50 00	Contractor Temporary Network	1.6.6	G	RO												
			Cybersecurity Compliance															
			Statements															
			SD-06 Test Reports															
			Backflow Preventer Tests	3.4														
			SD-07 Certificates															
			Backflow Tester	1.4.1														
			Backflow Preventers	1.4														
		01 57 19	SD-01 Preconstruction Submittals															
			Preconstruction Survey	1.5.1														
			Regulatory Notifications	1.5.2	G	RO												
			Environmental Manager	1.5.4	G	RO												
			Qualifications															
			Employee Training Records	1.5.5	G	RO												
			Environmental Protection Plan	1.6	G	RO												
			Dirt and Dust Control Plan	1.6.9.1	G	RO												
			Solid Waste Management Permit	1.10	G	RO												
			Stormwater Pollution Prevention	3.2.1.1	G	RO												
			Plan															
			Stormwater Notice of Intent	3.2.1.2	G	RO												
			Spill Prevention Control And	3.12.2	G	RO												
			Countermeasure (SPCC) Plan															
			SD-06 Test Reports															
			Monthly Solid Waste Disposal	1.10.1	G	RO												
			Report															
			Inspection Reports	3.2.1.3														

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
FEDMMA

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAG # RAPH	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		01 57 19	SD-07 Certificates															
			Employee Training Records	1.5.5	G	RO												
			Erosion and Sediment Control	1.5.5														
			Inspector															
			Certificate of Competency	1.5.5.1														
			SD-11 Closeout Submittals															
			Regulatory Notifications	1.5.2	G	RO												
			Assembled Employee Training	1.5.5	G	RO												
			Records															
			Solid Waste Management Permit	1.10	G	RO												
			Stormwater Pollution Prevention	3.2.1.4	G	RO												
			Plan Compliance Notebook															
			Stormwater Notice of Termination	3.2.1.5	G	RO												
			As-Built Topographic Survey	3.2.1.5														
			Waste Determination	3.7.1	G	RO												
			Documentation															
			Project Solid Waste Disposal	3.7.2.1	G	RO												
			Documentation Report															
			Sales Documentation	3.7.2.1	G	RO												
			Contractor Certification	3.7.2.1														
			Hazardous Waste/Debris	3.7.3.1	G	RO												
			Management															
			Disposal Documentation for	3.7.3.5	G	RO												
			Hazardous and Regulated Waste															
		01 58 00	SD-02 Shop Drawings															
			Preliminary One Line	1.3.1.1	G	RO												

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
FEDMMA

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAG # RAPH	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		01 58 00	Sign Legend Orders	1.4.1	G	RO												
			SD-04 Samples															
			Final Framed Rendering	1.3.1.3	G	RO												
			Final Rendering	1.3.1.2	G	RO												
		01 74 19	SD-01 Preconstruction Submittals															
			Construction Waste Management	1.8	G	RO												
			Plan															
			SD-06 Test Reports															
			Quarterly Reports	1.10.2														
			Annual Report	1.10.3														
			SD-11 Closeout Submittals															
			Final Construction Waste	1.11	S													
			Diversion Report															
		01 78 00	SD-03 Product Data															
			Warranty Management Plan	1.8.1														
			Warranty Tags	1.8.5														
			Spare Parts Data	1.6														
			SD-08 Manufacturer's Instructions															
			Instructions	1.8.1														
			SD-11 Closeout Submittals															
			As-Built Drawings	3.1	G													
			Record Drawings	3.3	G													
			Record Model	2.2	G													
			As-Built Record of Equipment	1.8.1														
			and Materials															

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
FEDMMA

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAG # RAPH	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		01 78 00	As-Built Record of Equipment	3.6														
			and Materials															
			Final Approved Shop Drawings	3.4	G													
			Construction Contract	3.5	G													
			Specifications															
			Certification of EPA Designated	2.3	G													
			Items															
			Interim DD FORM 1354	3.8.1	G													
			Checklist for DD FORM 1354	3.8.2	G													
			High Performance and	3.8.2	G													
			Sustainable Building (HPSB)															
			Checklist															
		03 30 00	SD-01 Preconstruction Submittals															
			Concrete Curing Plan	1.6.2.1														
			Quality Control Program	1.6.4	G													
			Laboratory Accreditation	1.6.6	G													
			Maturity Method Data	3.3.7														
			SD-03 Product Data															
			Formwork Materials	2.1														
			Cementitious Materials	2.3.1	S													
			Concrete Curing Materials	2.4.1														
			Admixtures	2.3.4														
			SD-05 Design Data															
			Concrete Mix Design	1.6.1.1	G													
			SD-06 Test Reports															
			Concrete Mix Design	1.6.1.1	G													

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
FEDMMA

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAG # RAPH	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		03 30 00	Fly Ash	1.6.3.1														
			Pozzolan	1.6.3.1														
			Slag Cement	1.6.3.2														
			Aggregates	1.6.3.3														
			Compressive Strength Tests	3.10.3.3	G													
			Unit Weight of Structural	3.10.3.5														
			Concrete															
			Chloride Ion Concentration	3.10.3.6														
			Air Content	3.10.3.4														
			Slump Tests	3.10.3.1														
			Water	2.3.2														
			SD-07 Certificates															
			Safety Data Sheets	1.6.2.2														
		05 12 00	SD-01 Preconstruction Submittals															
			Erection and Erection Bracing	1.3.1.1	G													
			Drawings															
			SD-02 Shop Drawings															
			Fabrication Drawings	1.3.2	G													
			SD-03 Product Data															
			Welding Electrodes and Rods	2.4.1														
			SD-07 Certificates															
			Steel	2.2														
			Bolts, Nuts, and Washers	2.3														
			Galvanizing	2.5														
			Welding Procedures and	1.3.3.1														
			Qualifications															

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
FEDMMA

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAG # RAPH	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		05 12 00	Welding Electrodes and Rods	2.4.1														
			Certified Welding Inspector	3.6.1.1														
			Welding Procedure Specifications	3.4														
			(WPS)															
		05 51 33	SD-02 Shop Drawings															
			Ladders	2.3														
			SD-03 Product Data															
			Ladders	2.3														
			Ladder Safety Devices	2.3.2														
			SD-07 Certificates															
			Fabricator Certification for Ladder	1.3														
			Assembly															
			Fabricator Certification for Ships	1.3														
			Ladder Assembly															
		06 10 00	SD-03 Product Data															
			Structural-use and OSB Panels	1.4.3														
			Oriented Strand Board	2.3														
			SD-06 Test Reports															
			Preservative-treated	1.4.4														
			SD-07 Certificates															
			Certificates of Grade	1.8.1														
			Preservative Treatment	1.7														
		31 00 00	SD-01 Preconstruction Submittals															
			Borrow Plan	3.2.1	G													
			Dewatering Work Plan	3.1.2	G													
			Preconstruction Meeting	1.6.3	G													

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
FEDMMA

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)		(q)	(r)
		31 00 00	SD-03 Product Data																
			Flowable Fill Mix Design	2.2	G														
			SD-06 Test Reports																
			Pipe Inspection Report	3.6.1.4	G														
			Material Test Report	3.11	G														
		31 00 01	SD-01 Preconstruction Submittals																
			Excavation and Placement Plan	3.3	G														
			Sheeting and Shoring Installation	3.3	G														
			Plan																
			SD-06 Test Reports																
			Special Inspection Of Excavation	3.5.1	G														
		31 05 22	SD-04 Samples																
			Geotextiles	2.2.1	G														
			SD-06 Test Reports																
			Geotextiles	2.2.1	G														
			Site Verification	2.2.2	G														
			SD-07 Certificates																
			Geotextiles	2.2.1	G														
		33 40 00	SD-01 Preconstruction Submittals																
			PE Pipe Placement and Fusion	2.2.1.1	G														
			Plan																
			SD-03 Product Data																
			Placing Pipe	3.2															
			SD-04 Samples																
			Pipe	2.1															
			SD-07 Certificates																

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
FEDMMA

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)		(q)	(r)
		33 40 00	Resin Certification	2.1.2															
			Pipeline Testing	3.3															
			Hdpe Pipe Fusion Operator	2.2.1.1															
			Certificates																
			SD-08 Manufacturer’s Instructions																
			PE Pipe Placement and Fusion	2.2.1.1	G														
			Plan																
		35 42 35	SD-02 Shop Drawings																
			Shop Drawings	2.2.1	G														
			SD-04 Samples																
			Geogrid	1.4.2	G														
			Braid	2.2.3	G														
			Mechanical Connection Elements	2.2.2	G														
			SD-07 Certificates																
			Geogrid	1.4.2	G														
			SD-08 Manufacturer’s Instructions																
			Manufacturer's Instructions	3.4.2	G														
			SD-09 Manufacturer’s Field																
			Reports																
			Roll Values	1.4.3	G														

SECTION 01 35 26

GOVERNMENTAL SAFETY REQUIREMENTS
05/24, CHG 1: 05/25

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN SOCIETY OF SAFETY PROFESSIONALS (ASSP)

ANSI/ASSP A10.44	(2020) Control of Energy Sources (Lockout/Tagout) for Construction and Demolition Operations
ANSI/ASSP Z359.4	(R2022) Safety Requirements for Assisted-Rescue and Self-Rescue Systems, Subsystems and Components
ANSI/ASSP Z359.2	(2023) Minimum Requirements for a Comprehensive Managed Fall Protection Program

ASTM INTERNATIONAL (ASTM)

ASTM F855	(2020) Standard Specifications for Temporary Protective Grounds to Be Used on De-energized Electric Power Lines and Equipment

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE 1048	(2016) Guide for Protective Grounding of Power Lines
IEEE C2	(2023) National Electrical Safety Code

INTERNATIONAL SAFETY EQUIPMENT ASSOCIATION (ISEA)

ANSI/ISEA Z89.1	(2014; R 2019) American National Standard for Industrial Head Protection

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 10	(2026) Standard for Portable Fire Extinguishers
NFPA 51B	(2024) Standard for Fire Prevention During Welding, Cutting, and Other Hot Work
NFPA 70	(2023; ERTA 1 2024; TIA 24-1) National Electrical Code
NFPA 70E	(2024) Standard for Electrical Safety in

	the Workplace
NFPA 241	(2022) Standard for Safeguarding Construction, Alteration, and Demolition Operations
NFPA 306	(2024) Standard for the Control of Gas Hazards on Vessels

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2024) Safety -- Safety and Occupational Health (SOH) Requirements

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

10 CFR 20	Standards for Protection Against Radiation
29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1910.147	The Control of Hazardous Energy (Lock Out/Tag Out)
29 CFR 1915	Confined and Enclosed Spaces and Other Dangerous Atmospheres in Shipyard Employment
29 CFR 1926	Safety and Health Regulations for Construction
49 CFR 173	Shippers - General Requirements for Shipments and Packagings
CPL 2.100	(1995) Application of the Permit-Required Confined Spaces (PRCS) Standards, 29 CFR 1910.146

1.2 DEFINITIONS

The following definitions are for the convenience of the reader. If there is a referenced document in the text of this specification section, that is the document that should define terms for that paragraph. If further clarification is needed, contact the Contracting Officer.

1.2.1 Site Safety and Health Officer (SSHO)

A Contractor Employee that is responsible for overseeing and ensuring implementation of the prime Contractor's Safety and Occupational Health (SOH) program according to the Contract, EM 385-1-1, applicable federal, state, and local requirements.

1.2.1.1 Level One SSHO

A designated employee with full-time SOH responsibility that meets and follows the requirements of EM 385-1-1.

1.2.1.2 Level Two SSHO

A designated employee with Level Two SSHO responsibility that meets and

follows the requirements of EM 385-1-1. Level Two SSHOs cannot be assigned to projects that have a residual Risk Assessment Code (RAC) of high or extremely high.

1.2.1.3 Level Three SSHO

A designated Qualified Person or Competent Person with SOH responsibility that meets and follows the requirements of EM 385-1-1. Level 3 SSHOs cannot be assigned to projects that have a residual RAC of high or extremely high.

1.2.1.4 Alternate SSHO

An employee that meets the definition of the contract-required level SSHO, but is not the primary SSHO.

1.2.2 Competent Person (CP)

The CP is a person designated in writing, who, through training, knowledge and experience, is capable of identifying, evaluating, and addressing existing and predictable hazards in the working environment or working conditions that are unsanitary, hazardous, or dangerous to personnel, and who has authorization to take prompt corrective measures to eliminate them.

1.2.3 Competent Person, Confined Space

The CP, Confined Space, is a person meeting the competent person requirements as defined EM 385-1-1 with thorough knowledge of OSHA’s Confined Space Standard, 29 CFR 1910.146, and designated in writing to be responsible for the immediate supervision, implementation and monitoring of the confined space program, who through training, knowledge and experience in confined space entry is capable of identifying, evaluating and addressing existing and potential confined space hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.4 Competent Person, Cranes and Rigging

The CP, Cranes and Rigging, as defined in EM 385-1-1 is a person meeting the competent person, who has been designated in writing to be responsible for the immediate supervision, implementation and monitoring of the Crane and Rigging Program, who through training, knowledge and experience in crane and rigging is capable of identifying, evaluating and addressing existing and potential hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.5 Competent Person, Excavation/Trenching

A CP, Excavation/Trenching, is a person meeting the competent person requirements as defined in EM 385-1-1 and 29 CFR 1926, who has been designated in writing to be responsible for the immediate supervision, implementation and monitoring of the excavation/trenching program, who through training, knowledge and experience in excavation/trenching is capable of identifying, evaluating and addressing existing and potential hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.6 Competent Person, Fall Protection

The CP, Fall Protection, is a person meeting the competent person requirements as defined in EM 385-1-1 and in accordance with ANSI/ASSP Z359.2, who has been designated in writing by the employer to be responsible for immediate supervising, implementing and monitoring of the fall protection program, who through training, knowledge and experience in fall protection and rescue systems and equipment, is capable of identifying, evaluating and addressing existing and potential fall hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.7 Competent Person, Scaffolding

The CP, Scaffolding is a person meeting the competent person requirements in EM 385-1-1 and designated in writing by the employer to be responsible for immediate supervising, implementing and monitoring of the scaffolding program. The CP for Scaffolding has enough training, knowledge and experience in scaffolding to correctly identify, evaluate and address existing and potential hazards and also has the authority to take prompt corrective measures with regard to these hazards. CP qualifications must be documented and include experience on the specific scaffolding systems/types being used, assessment of the base material that the scaffold will be erected upon, load calculations for materials and personnel, and erection and dismantling. The CP for scaffolding must have a documented, minimum of 8-hours of scaffold training to include training on the specific type of scaffold being used (e.g. mast-climbing, adjustable, tubular frame), in accordance with EM 385-1-1.

1.2.8 Qualified Person (QP)

The QP is a person designated in writing, who, by possession of a recognized degree, certificate, or professional standing, or extensive knowledge, training, and experience, has successfully demonstrated their ability to solve or resolve problems related to the subject matter, the work, or the project.

1.2.9 Qualified Person, Fall Protection (QP for FP)

A QP for FP is a person meeting the requirements of EM 385-1-1, and ANSI/ASSP Z359.2, with a recognized degree or professional certificate and with extensive knowledge, training and experience in the fall protection and rescue field who is capable of designing, analyzing, and evaluating and specifying fall protection and rescue systems.

1.2.10 Qualified Person, Electrical (QP for Electrical)

One who meets the requirements of EM 385-1-1, demonstrates the skills and knowledge related to the construction, operation, and maintenance of electrical equipment and installations, and receives relevant safety training to recognize, avoid and control associated hazards that might be present with respect to that equipment, work method and job or task assignment. A person can be considered qualified with respect to certain equipment and tasks, but still be unqualified for others.

1.3 SUBMITTALS

Government Acceptance or Approval does not remove responsibility from the Contractors for their actions or liability.

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Accident Prevention Plan (APP); G, RO

SD-06 Test Reports

Accident Reports; G, RO

LHE Inspection Reports

Monthly Exposure Reports; G, RO

SD-07 Certificates

Crane Operators/Riggers

Activity Hazard Analysis (AHA); G, RO

Certificate of Compliance

Confined Space Entry Permit

Hot Work Permit

License Certificates

Portable Gauge Operations Planning Worksheet; G, RO

Radiography Operation Planning Work Sheet; G, RO

Standard Lift Plan; G, RO

Critical Lift Plan; G, RO

1.4 PUBLIC HEALTH EMERGENCIES

In the event of a declared public health emergency, follow safety precautions as required by the Occupational Safety and Health Administration (OSHA) www.osha.gov, the Centers for Disease Control and Prevention (CDC) www.cdc.gov, and as required by federal, state and local requirements.

1.5 MONTHLY EXPOSURE REPORTS

Provide a Monthly Exposure Report by the fifth of each month for the previous month. This report is a compilation of employee-hours worked each month for all site workers, both Prime and subcontractor. Failure to submit the report may result in retention of up to 10 percent of the progress payment. Submit the hours via the agency construction management system of record.

1.6 REGULATORY REQUIREMENTS

In addition to the detailed requirements included in the provisions of this Contract, comply with the most recent edition of USACE EM 385-1-1, and the following federal, state, and local laws, ordinances, criteria, rules and regulations at the date of the Solicitation for this Contract. Submit matters of interpretation of standards to the appropriate administrative agency for resolution before starting work. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements govern.

1.7 SITE QUALIFICATIONS, DUTIES, AND MEETINGS

1.7.1 Site Safety and Health Officer (SSHO)

1.7.1.1 Qualifications of SSHO

All SSHOs will have met the training, experience requirements identified in the EM 385-1-1 and this Contract.

1.7.1.2 Duties of SSHO

All SSHOs will carry out the roles and responsibilities as identified in this Contract and the EM 385-1-1. All SSHOs will be designated on an ENG Form 6282, provided by the Contracting Officer. Superintendent, QC Manager, and SSHO are subject to dismissal if their required duties are not being effectively carried out. If either the Superintendent, QC Manager, or SSHO are dismissed, project work will be stopped and will not be allowed to resume until a suitable replacement is approved and the above duties are again being effectively carried out.

1.7.1.3 Safety Meetings

Conduct safety meetings to review past activities, plan for new or changed operations, review pertinent aspects of appropriate AHA (by trade), establish safe working procedures for anticipated hazards, and provide pertinent Safety and Occupational Health (SOH) training and motivation. Conduct meetings at least once a month for all supervisors at the project location. The SSHO, supervisors, or foremen must conduct meetings at least once a week for the trade workers. Document meeting minutes to include the date, persons in attendance, subjects discussed, and names of individual(s) who conducted the meeting. Maintain documentation on-site and furnish copies to the Contracting Officer on request. Notify the Contracting Officer of all scheduled meetings 7 calendar days in advance.

1.7.2 Roles and Responsibilities of Prime Contractor and SSHO

The Prime Contractor and SSHO must ensure that the requirements of all applicable OSHA and EM 385-1-1 are met for the project. The Prime Contractor must ensure an SSHO or an equally qualified Alternate SSHO(s) is at the worksite at all times to implement and administer the Contractor's safety program and Government accepted Accident Prevention Plan. If the required SSHO has to temporarily (that is, up to 24 hours / 1 day) leave the site of work due to unforeseen or emergency situations, a Level One, Two, or Three SSHO may be used in the interim and must be on the site of work at all times when work is being performed.

If the SSHO must be off-site for a period longer than 24 hours / 1 day, a qualified alternate that meets the contract requirements must be onsite.

a. Prime contractor must ensure all SSHOs will:

(1) Are designated on an ENG Form 6282.

(2) Meet minimum training and experience requirements identified in EM 385-1-1.

(3) Execute roles and responsibilities identified in EM 385-1-1.

1.7.3 Additional Requirements

The Level One SSHO must not serve as the Quality Control Manager. The One SSHO must not serve as the Superintendent.

1.7.4 Contract Site Safety And Health Officer Minimum Requirements

Provide a minimum of one Level One SSHO that meets the requirements of EM 385-1-1 for this project.

1.7.5 Competent Person Qualifications

Provide Competent Persons in accordance with EM 385-1-1, and herein. Competent Persons for high risk activities include confined space, cranes and rigging, excavation/trenching, fall protection, and electrical work. The CP for these activities must be designated in writing, and meet the requirements for the specific activity (i.e. competent person, fall protection).

The Competent Person identified in the Contractor's Safety and Health Program and accepted Accident Prevention Plan, must be on-site at all times when the work that presents the hazards associated with their professional expertise is being performed. Provide the credentials of the Competent Persons(s) to the Contracting Officer for information in consultation with the Safety Office.

1.7.5.1 Competent Person for Confined Space Entry

Provide a Confined Space (CP) Competent Person who meets the requirements of EM 385-1-1, and herein. The CP for Confined Space Entry must supervise the entry into each confined space in accordance with EM 385-1-1, Section 34.

Since this work involves operations that handle combustible or hazardous materials, this person must have the ability to understand and follow through on the air sampling, Personal Protective Equipment (PPE), and instructions of a Marine Chemist, Coast Guard authorized persons, or Certified Industrial Hygienist. Confined space and enclosed space work must comply with NFPA 306, OSHA 29 CFR 1915, Subpart B, "Confined and Enclosed Spaces and Other Dangerous Atmospheres in Shipyard Employment," or as applicable, 29 CFR 1910.147 for general industry.

1.7.5.2 Competent Person for Crane Operators/Riggers

Provide Operators, Signal Persons, and Riggers meeting the requirements in EM 385-1-1 for Riggers, Crane Operators and Signal Persons. Provide proof of current qualification.

1.7.5.3 Competent Person for Scaffolding

Provide a Competent Person for Scaffolding who meets the requirements of EM 385-1-1 and herein.

1.7.5.4 Competent Person for Fall Protection

Provide a Competent Person for Fall Protection who meets the requirements of EM 385-1-1 and herein.

1.7.6 Preconstruction Conference

a. Contractor representatives who have a responsibility or significant role in accident prevention on the project must attend the preconstruction conference. This includes the project superintendent, Site Safety and Occupational Health Officer, quality control manager, or any other assigned safety and health professionals who participated in the development of the APP (including the Activity Hazard Analyses (AHAs) and special plans, program and procedures associated with it).

b. Discuss the details of the submitted APP to include incorporated plans, programs, procedures and a listing of anticipated AHAs that will be developed and implemented during the performance of the Contract. This list of proposed AHAs will be reviewed and an agreement will be reached between the Contractor and the Contracting Officer as to which phases will require an analysis. In addition, establish a schedule for the preparation, submittal, and Government review of AHAs to preclude project delays. The creation of the APP and Schedule will be created after being given Notice to Proceed.

c. Deficiencies in the submitted APP, identified during the Contracting Officer's review, must be corrected, and the APP re-submitted for review prior to the start of construction. Work is not permitted to begin until an APP is established that is acceptable to the Contracting Officer.

1.8 ACCIDENT PREVENTION PLAN (APP)

1.8.1 Accident Prevention Plan (APP)

Submit the Accident Prevention Plan (APP) for review and acceptance by the Government at least 15 calendar days prior to the start, after being given Notice to Proceed. A competent person must prepare the written site-specific APP. Prepare the APP in accordance with the format and requirements of EM 385-1-1, ENG Form 6293, and herein. The APP must be job-specific and address any unusual or unique aspects of the project or activity for which it is written. The APP must interface with the Contractor's overall safety and occupational health program referenced in the APP in the applicable APP element, and made site-specific. Describe the methods to evaluate past safety performance of potential subcontractors in the selection process. Also, describe innovative methods used to ensure and monitor safe work practices of subcontractors. The Government considers the Prime Contractor to be the "controlling employer" for all worksite safety and health of the subcontractors. Contractors are responsible for informing their subcontractors of the safety provisions under the terms of the Contract and the penalties for noncompliance, coordinating the work to prevent one craft from interfering with or creating hazardous working conditions for other crafts, and

inspecting subcontractor operations to ensure that accident prevention responsibilities are being carried out. The APP must be signed in accordance with the APP and ENG Form 6293 Accident Prevention Plan Worksheet. The SSHO must provide and maintain the APP and a log of signatures by each subcontractor foreman, attesting that they have read and understand the APP, and make the APP and log available on-site to the Contracting Officer. If English is not the foreman's primary language, the Prime Contractor must provide an interpreter.

Submit the APP to the Contracting Officer 15 calendar days prior to the date of the preconstruction conference for acceptance.

1.8.2 Names and Qualifications

Provide plans in accordance with the requirements outlined in EM 385-1-1, including the following:

a. Names and qualifications (resumes including education, training, experience and certifications) of site safety and health personnel designated to perform work on this project to include the designated Site Safety and Health Officer and other competent and qualified personnel to be used. Specify the duties of each position.

b. As a minimum, designate and submit qualifications of Competent Persons (CP) for each of the following major areas: excavation; scaffolding; fall protection; hazardous energy; confined space; health hazard recognition, evaluation and control of chemical, physical and biological agents; and personal protective equipment and clothing to include selection, use and maintenance. Designate and submit qualifications for additional CPs as applicable to the work performed under this Contract.

1.8.3 Plans

Provide plans in the APP in accordance with the requirements outlined in EM 385-1-1, including the following:

1.8.3.1 Confined Space Entry Plan

Develop a confined or enclosed space entry plan in accordance with EM 385-1-1, applicable OSHA standards 29 CFR 1910, 29 CFR 1915, and 29 CFR 1926, OSHA Directive CPL 2.100, and any other federal, state and local regulatory requirements identified in this Contract. Identify the qualified person's name and qualifications, training, and experience. Delineate the qualified person's authority to direct work stoppage in the event of hazardous conditions. Include procedure for rescue by Contractor personnel and the coordination with emergency responders. (If there is no confined space work, include a statement that no confined space work exists and none will be created.)

1.8.3.2 Standard Lift Plan

Develop a Standard Lift Plan (SLP) in accordance with EM 385-1-1 and using Standard Pre-Lift Crane Plan/Checklist for each lift planned. Submit SLP to the Contracting Officer for approval within 15 calendar days in advance of planned lift.

1.8.3.3 Critical Lift Plan - Crane or Load Handling Equipment

Provide a Critical Lift Plan as required by EM 385-1-1, using ENG Form 6213. In addition to EM 385-1-1, Critical Lift Plans are required for the following:

a. Lifts involving HAZMAT (for example, explosives, highly volatile substances).

b. Hoisting personnel with LHE.

c. Lifts made with more than one LHE.

d. Lifts where the center of gravity (CG) could change.

e. Lifts that exceed 75% of the load chart of the LHE during construction work.

f. Lifts without the use of outriggers using rubber tire load charts.

g. Lifts using more than one hoist on the same LHE.

h. Lifts involving MLR assemblies or other non-routine or technically difficult rigging arrangements.

i. Lifts involving submerged loads.

In addition to EM 385-1-1 requirements, Critical Lift Plans are required for the following:

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

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

c. For lifts with anticipated binding conditions.

d. When erecting cranes.

1.8.3.3.1 Critical Lift Plan Planning and Schedule

Critical lifts require detailed planning and additional or unusual safety precautions. Develop and submit a critical lift plan to the Contracting Officer 30 calendar days prior to critical lift. Comply with load testing requirements in accordance with EM 385-1-1.

1.8.3.3.2 Lifts of Personnel

In addition to the requirements of EM 385-1-1 for lifts of personnel, demonstrate compliance with the requirements of 29 CFR 1926 and EM 385-1-1.

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

Multi-purpose machines, material handling equipment, and construction equipment used to lift loads that are suspended by rigging gear, require proof of authorization from the machine OEM that the machine is capable of making lifts of loads suspended by rigging equipment. Written approval

from a qualified registered professional engineer, after a safety analysis is performed, is allowed in lieu of the OEM's approval. Demonstrate that the operator is properly trained and that the equipment is properly configured to make such lifts and is equipped with a load chart.

1.8.3.5 Fall Protection and Prevention (FP&P) Plan

The plan must comply with the requirements of EM 385-1-1 and ANSI/ASSP Z359.2, be site specific, and address all fall hazards in the work place and during different phases of construction. Address how to protect and prevent workers from falling to lower levels when they are exposed to fall hazards above 6 feet. A competent person or qualified person for fall protection must prepare and sign the plan documentation. Include fall protection and prevention systems, equipment and methods employed for every phase of work, roles and responsibilities, assisted rescue, self-rescue and evacuation procedures, training requirements, and monitoring methods. Review and revise, as necessary, the Fall Protection and Prevention Plan documentation as conditions change, but at a minimum every six months, for lengthy projects, reflecting any changes during the course of construction due to changes in personnel, equipment, systems or work habits. Keep and maintain the accepted Fall Protection and Prevention Plan documentation at the job site for the duration of the project. Include the Fall Protection and Prevention Plan documentation in the Accident Prevention Plan (APP).

1.8.3.6 Rescue and Evacuation Plan

Provide a Rescue and Evacuation Plan in accordance with EM 385-1-1 and ANSI/ASSP Z359.4, and include in the FP&P Plan and as part of the APP. Include a detailed discussion of the following: methods of rescue; methods of self-rescue; equipment used; training requirement; specialized training for the rescuers; procedures for requesting rescue and medical assistance; and transportation routes to a medical facility.

1.8.3.7 Excavation Plan

Identify the safety and health aspects of excavation, and provide and prepare the plan in accordance with EM 385-1-1 and Section 31 00 00 EARTHWORK.

1.9 ACTIVITY HAZARD ANALYSIS (AHA)

Before beginning each activity, task or Definable Feature of Work (DFOW) involving a type of work presenting hazards not experienced in previous project operations, or where a new work crew or subcontractor is to perform the work, the Contractor(s) performing that work activity must prepare an AHA. AHAs must be developed by the Prime Contractor, subcontractor, or supplier performing the work, and provided for Prime Contractor review and approval before submitting to the Contracting Officer. AHAs must be signed by the SSHO, Superintendent, QC Manager and the subcontractor Foreman performing the work. Format the AHA in accordance with EM 385-1-1 or as directed by the Contracting Officer. Submit the AHA for review at least 15 working days prior to the start of each activity task, or DFOW. The Government reserves the right to require the Contractor to revise and resubmit the AHA if it fails to effectively identify the work sequences, specific anticipated hazards, site conditions, equipment, materials, personnel and the control measures to be implemented.

AHAs must identify competent persons required for phases involving high risk activities, including confined entry, crane and rigging, excavations, trenching, electrical work, fall protection, and scaffolding.

1.9.1 AHA Management

Review the AHA list periodically (at least monthly) at the Contractor supervisory safety meeting, and update as necessary when procedures, scheduling, or hazards change. Use the AHA during daily inspections by the SSHO to ensure the implementation and effectiveness of the required safety and health controls for that work activity.

1.9.2 AHA Signature Log

Each employee performing work as part of an activity, task or DFOW must review the AHA for that work and sign a signature log specifically maintained for that AHA prior to starting work on that activity. The SSHO must maintain a signature log on site for every AHA. Provide employees whose primary language is other than English, with an interpreter to ensure a clear understanding of the AHA and its contents.

1.10 DISPLAY OF SAFETY INFORMATION

1.10.1 Safety Bulletin Board

Within seven calendar days after commencement of contract work, the contractor must erect a safety bulletin board at the site of work. Where size, duration, or logistics of project do not facilitate a bulletin board, an alternative KO or COR accepted method (for example, binder, digital) may be deemed as meeting the requirement for a bulleting board. Include and maintain information on safety bulletin board as required by EM 385-1-1. Additional items required to be posted include:

a. Confined space entry permit.

b. Hot work permit.

1.10.2 Safety and Occupational Health (SOH) Deficiency Tracking System

Establish a SOH deficiency tracking system that lists and monitors the status of SOH deficiencies in chronological order. Use the tracking system to evaluate the effectiveness of the APP. A monthly evaluation of the data must be discussed in the QC or SOH meeting with everyone on the project. The list must be posted on the project bulletin board and updated daily, and provide the following information:

a. Date deficiency identified;

b. Description of deficiency;

c. Name of person responsible for correcting deficiency;

d. Projected resolution date;

e. Date actually resolved.

1.11 SITE SAFETY REFERENCE MATERIALS

Maintain safety-related references applicable to the project, including

those listed in paragraph REFERENCES. Maintain applicable equipment manufacturer's manuals.

1.12 EMERGENCY MEDICAL TREATMENT

Contractors must arrange for their own emergency medical treatment in accordance with EM 385-1-1. The Government has no responsibility to provide emergency medical treatment.

1.13 NOTIFICATIONS AND REPORTS

1.13.1 Accident Notification

Notify the Contracting Officer in accordance with the EM 385-1-1 Accident Reporting Timeline.

Table
Accident Reporting Required Timeline

Accident Type	Notify KO or COR	Complete Final Accident Report on ENG 3394 and provide to KO or COR
Fatality, in-patient hospitalization, amputation, eye loss, or property damage over $600,000.	Immediately, no later than (NLT) 8 Hours	Within 7 Days
All other accidents and near misses	Immediately, no later than (NLT) 24 Hours	Within 7 Days

Within notification include Contractor name; Contract title; type of Contract; name of activity, installation or location where accident occurred; date and time of accident; names of personnel injured; extent of property damage, if any; extent of injury, if known, and brief description of accident (for example, type of construction equipment used and PPE used). Preserve the conditions and evidence on the accident site until the Government investigation team arrives on-site and Government investigation is conducted. Assist and cooperate fully with the Government's investigation(s) of any accident or near miss.

1.13.2 Accident Reports

a. Conduct an accident investigation for recordable injuries and illnesses, property damage, and near misses as defined in EM 385-1-1, to establish the root cause(s) of the accident. All accidents are reportable, regardless of whether or not it is recordable. Complete the applicable USACE Accident Report, ENG Form 3394, and provide the report to the Contracting Officer within 7 calendar days of the accident. The Contracting Officer will provide copies of any required or special forms. All accidents are reportable, regardless of whether or not it is recordable.

b. Near Misses: For Army projects, report all "Near Misses" to the Contracting Officer Representative (COR), using local accident reporting procedures, within 24 hours. The Contracting Officer will

provide the Contractor the required forms. Near miss reports are considered positive and proactive Contractor safety management actions.

1.13.3 LHE Inspection Reports

Submit LHE inspection reports required in accordance with EM 385-1-1 and as specified herein with Daily Reports of Inspections.

1.13.4 Certificate of Compliance and Pre-lift Plan/Checklist for LHE and Rigging

Provide a Certificate of Compliance for LHE entering an activity under this Contract and in accordance with EM 385-1-1. Ensure certifications are posted on the crane in a clearly visibile location.

1.14 HOT WORK PERMIT

In accordance with EM 385-1-1, the USACE supervisor/KO or COR must survey all activities and determine which require a hot work permit.

1.14.1 Permit and Personnel Requirements

Submit and obtain a written permit prior to performing "Hot Work" (i.e., welding or cutting) or operating other flame-producing/spark producing devices, from the Fire Division. A permit is required from the Explosives Safety Office for work in and around where explosives are processed, stored, or handled. Contractors are required to meet all criteria before a permit is issued. Provide at least two 20 pound 4A:20 BC rated extinguishers for normal "Hot Work". The extinguishers must be current inspection tagged, and contain an approved safety pin and tamper resistant seal. It is also mandatory to have a designated FIRE WATCH for any "Hot Work" done at this activity. The Fire Watch must be trained in accordance with NFPA 51B and remain on-site for a minimum of 1 hour after completion of the task or as specified on the hot work permit.

When starting work in the facility, require personnel to familiarize themselves with the location of the nearest fire alarm boxes and place in memory the emergency Fire Division phone number. Report any fire, no matter how small, to the responsible Fire Division immediately.

1.14.2 Work Around Flammable Materials

Obtain permit approval from a NFPA Certified Marine Chemist, or Certified Industrial Hygienist for "Hot Work" within or around flammable materials (such as fuel systems or welding/cutting on fuel pipes) or confined spaces (such as sewer wet wells, manholes, or vaults) that have the potential for flammable or explosive atmospheres.

Whenever these materials, except beryllium and chromium (VI), are encountered in indoor operations, local mechanical exhaust ventilation systems that are sufficient to reduce and maintain personal exposures to within acceptable limits must be used and maintained in accordance with manufacturer's instruction and supplemented by exceptions noted in EM 385-1-1.

1.15 RADIATION SAFETY REQUIREMENTS

Submit License Certificates, employee training records, and Leak Test Reports for radiation materials and equipment to the Contracting Officer

and Radiation Safety Office (RSO) for all specialized and licensed material and equipment proposed for use on the construction project (excludes portable machine sources of ionizing radiation including moisture density and X-Ray Fluorescence (XRF)). Maintain on-site records whenever licensed radiological materials or ionizing equipment are on Government property.

Protect workers from radiation exposure in accordance with 10 CFR 20, ensuring any personnel exposures are maintained As Low As Reasonably Achievable.

1.15.1 Radiography Operation Planning Work Sheet

Submit a Gamma and X-Ray Radiography Operation Planning Work Sheet to Contracting Officer 14 days prior to commencement of operations involving radioactive materials or radiation generating devices. For portable machine sources of ionizing radiation, including moisture density and XRF, use and submit the Portable Gauge Operations Planning Worksheet instead. The Contracting Officer will review the submitted worksheet and provide questions and comments.

Contractors must use primary dosimeters process by a National Voluntary Laboratory Accreditation Program (NVLAP) accredited laboratory.

1.15.2 Site Access and Security

Coordinate site access and security requirements with the Contracting Officer for all radiological materials and equipment containing ionizing radiation that are proposed for use on a government facility. For gamma radiography materials and equipment, a Government escort is required for any travels on the Installation. The Government authorized representative will meet the Contractor at a designated location outside the Installation, ensure safety of the materials being transported, and will escort the Contractor for gamma sources onto the Installation, to the job site, and off the Installation. For portable machine sources of ionizing radiation, including moisture density and XRF, the Government authorized representative will meet the Contractor at the job site.

Provide a copy of all calibration records, and utilization records for radiological operations performed on the site.

1.15.3 Loss or Release and Unplanned Personnel Exposure

Loss or release of radioactive materials, and unplanned personnel exposures must be reported immediately to the Contracting Officer, RSO, and Base Security Department Emergency Number.

1.15.4 Site Demarcation and Barricade

Properly demark and barricade an area surrounding radiological operations to preclude personnel entrance, in accordance with EM 385-1-1, Nuclear Regulatory Commission, and Applicable State regulations and license requirements, and in accordance with requirements established in the accepted Radiography Operation Planning Work Sheet.

Do not close or obstruct streets, walks, and other facilities occupied and used by the Government without written permission from the Contracting Officer.

1.15.5 Security of Material and Equipment

Properly secure the radiological material and ionizing radiation equipment at all times, including keeping the devices in a properly marked and locked container, and secondarily locking the container to a secure point in the Contractor's vehicle or other approved storage location during transportation and while not in use. While in use, maintain a continuous visual observation on the radiological material and ionizing radiation equipment. In instances where radiography is scheduled near or adjacent to buildings or areas having limited access or one-way doors, make no assumptions as to building occupancy. Where necessary, the Contracting Officer will direct the Contractor to conduct an actual building entry, search, and alert. Where removal of personnel from such a building cannot be accomplished and it is otherwise safe to proceed with the radiography, position a fully instructed employee inside the building or area to prevent exiting while external radiographic operations are in process.

1.15.6 Transportation of Material

Comply with 49 CFR 173 for Transportation of Regulated Amounts of Radioactive Material. Notify Local Fire authorities and the site Radiation Safety Officer (RSO) of any Radioactive Material use.

1.15.7 Schedule for Exposure or Unshielding

Actual exposure of the radiographic film or unshielding the source must not be initiated until after 5 p.m. on weekdays.

1.15.8 Transmitter Requirements

Adhere to the base policy concerning the use of transmitters, such as radios and cell phones. Obey Emissions control (EMCON) restrictions.

1.16 CONFINED SPACE ENTRY REQUIREMENTS

Confined space entry must comply with EM 385-1-1, 29 CFR 1926, 29 CFR 1910, and Directive CPL 2.100. Any potential for a hazard in the confined space requires a permit system to be used.

1.16.1 Entry Procedures

Prohibit entry into a confined space by personnel for any purpose, including hot work, until the qualified person has conducted appropriate tests to ensure the confined or enclosed space is safe for the work intended and that all potential hazards are controlled or eliminated and documented. Comply with EM 385-1-1, for entry procedures.
Hazards pertaining to the space must be reviewed with each employee during review of the AHA.

1.16.2 Forced Air Ventilation

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

1.16.3 Sewer Wet Wells

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

1.16.4 Rescue Procedures and Coordination with Local Emergency Responders

Develop and implement an on-site rescue and recovery plan and procedures. The rescue plan must not rely on local emergency responders for rescue from a confined space.

1.17 SEVERE STORM PLAN

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

a. Secure outside equipment and materials and place materials that could be damaged in protected areas.

b. Check surrounding area, including roof, for loose material, equipment, debris, and other objects that could be blown away or against existing facilities.

c. Ensure that temporary erosion controls are adequate.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 CONSTRUCTION AND OTHER WORK

Comply with EM 385-1-1, NFPA 70, NFPA 70E, NFPA 241, the APP, the AHA, Federal and State OSHA regulations, and other related submittals and activity fire and safety regulations. The most stringent standard prevails.

PPE is governed in all areas by the nature of the work the employee is performing. Use personal hearing protection at all times in designated noise hazardous areas or when performing noise hazardous tasks. Safety glasses must be worn or carried/available on each person. Mandatory PPE includes:

a. Head Protection that meets ANSI/ISEA Z89.1

b. Long Pants

c. Appropriate Safety Footwear

d. Appropriate Class Reflective Vests

3.1.1 Worksite Communication

Employees working alone in a remote location or away from other workers must be provided an effective means of emergency communications (i.e., cellular phone, two-way radios, land-line telephones or other acceptable means). The selected communication must be readily available (easily within the immediate reach) of the employee and must be tested prior to the start of work to verify that it effectively operates in the area/environment. Develop an employee check-in/check-out communication procedure to ensure employee safety.

3.1.2 Hazardous Material Exclusions

Notwithstanding any other hazardous material used in this Contract, radioactive materials or instruments capable of producing ionizing/non-ionizing radiation (with the exception of radioactive material and devices used in accordance with EM 385-1-1 such as nuclear density meters for compaction testing and laboratory equipment with radioactive sources) as well as materials which contain asbestos, mercury or polychlorinated biphenyls, di-isocyanates, lead-based paint, and hexavalent chromium, are prohibited. The Contracting Officer, upon written request by the Contractor, may consider exceptions to the use of any of the above excluded materials. Low mercury lamps used within fluorescent lighting fixtures are allowed as an exception without further Contracting Officer approval. Notify the Radiation Safety Officer (RSO) prior to excepted items of radioactive material and devices being brought on base.

3.1.3 Unforeseen Hazardous Material

Contract documents identify materials such as PCB, lead paint, and friable and non-friable asbestos and other OSHA regulated chemicals (i.e., 29 CFR Part 1910.1000). If material(s) that can be hazardous to human health upon disturbance are encountered during demolition, repair, renovation, or construction operations, stop portions of work that would disturb the material and notify the Contracting Officer immediately. Within 14 calendar days the Government will determine if the material is hazardous. If material is not hazardous or poses no danger, the Government will direct the Contractor to proceed without change. If material is hazardous and handling of the material is necessary to accomplish the work, the Government will issue a modification.

3.2 UTILITY OUTAGE REQUIREMENTS

Apply for utility outages at least 7 days in advance. At a minimum, the written request must include the location of the outage, utilities being affected, duration of outage, any necessary sketches, and a description of the means to fulfill energy isolation requirements in accordance with EM 385-1-1. In accordance with EM 385-1-1, where outages involve Government or Utility personnel, coordinate with the Government on all activities involving the control of hazardous energy.

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

3.3 OUTAGE COORDINATION MEETING

After the utility outage request is approved and prior to beginning work on the utility system requiring shut-down, conduct a pre-outage coordination meeting in accordance with EM 385-1-1. This meeting must include the Prime Contractor, the Prime and subcontractors performing the work, the Contracting Officer, the Installation representative and Public Utilities representative. All parties must fully coordinate HEC activities with one another. During the coordination meeting, all parties

must discuss and coordinate on the scope of work, HEC procedures (specifically, the lock-out/tag-out procedures for worker and utility protection), the AHA, assurance of trade personnel qualifications, identification of competent persons, and compliance with HECP training in accordance with EM 385-1-1. Clarify when personal protective equipment is required during switching operations, inspection, and verification.

3.4 CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT)

Provide and operate a Hazardous Energy Control Program (HECP) in accordance with EM 385-1-1, 29 CFR 1910, 29 CFR 1915, ANSI/ASSP A10.44, NFPA 70E.

3.4.1 Safety Preparatory Inspection Coordination Meeting with the Government or Utility

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

3.4.2 Lockout/Tagout Isolation

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

3.4.3 Lockout/Tagout Removal

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

3.5 FALL PROTECTION PROGRAM

Establish a fall protection program, for the protection of all employees exposed to fall hazards. Within the program include company policy, identify roles and responsibilities, education and training requirements, fall hazard identification, prevention and control measures, inspection, storage, care and maintenance of fall protection equipment and rescue and

evacuation procedures in accordance with EM 385-1-1.

3.5.1 Fall Protection Equipment and Systems

Enforce use of personal fall protection equipment and systems designated (to include fall arrest, restraint, and positioning) for each specific work activity in the Site Specific Fall Protection and Prevention Plan and AHA at all times when an employee is exposed to a fall hazard. Protect employees from fall hazards as specified in EM 385-1-1.

Provide personal fall protection equipment, systems, subsystems, and components that comply with EM 385-1-1 and 29 CFR 1926.

3.5.1.1 Additional Personal Fall Protection Measures

In addition to the required fall protection systems, other protective measures such as safety skiffs, personal floatation devices, and life rings, are required when working above or next to water in accordance with EM 385-1-1. Personal fall protection systems and equipment are required when working from an articulating or extendible boom, swing stages, or suspended platform. In addition, personal fall protection systems are required when operating other equipment such as scissor lifts. The need for tying-off in such equipment is to prevent ejection of the employee from the equipment during raising, lowering, travel, or while performing work.

3.5.1.2 Personal Fall Protection Equipment

Only a full-body harness with a shock-absorbing lanyard or self-retracting lanyard is an acceptable personal fall arrest body support device. The use of body belts is not acceptable. Harnesses must have a fall arrest attachment affixed to the body support (usually a Dorsal D-ring) and specifically designated for attachment to the rest of the system. Snap hooks and carabineers must be self-closing and self-locking, capable of being opened only by at least two consecutive deliberate actions and have a minimum gate strength of 3,600 lbs in all directions. Use webbing, straps, and ropes made of synthetic fiber. The maximum free fall distance when using fall arrest equipment must not exceed 6 feet, unless the proper energy absorbing lanyard is used. Always take into consideration the total fall distance and any swinging of the worker (pendulum-like motion), that can occur during a fall, when attaching a person to a fall arrest system. Equip all full body harnesses with Suspension Trauma Preventers such as stirrups, relief steps, or similar in order to provide short-term relief from the effects of orthostatic intolerance in accordance with EM 385-1-1.

3.5.2 Rescue and Evacuation Plan and Procedures

When personal fall arrest systems are used, ensure that the mishap victim can self-rescue or can be rescued promptly should a fall occur. Prepare a Rescue and Evacuation Plan and include a detailed discussion of the following: methods of rescue; methods of self-rescue or assisted-rescue; equipment used; training requirement; specialized training for the rescuers; procedures for requesting rescue and medical assistance; and transportation routes to a medical facility. Include the Rescue and Evacuation Plan within the Activity Hazard Analysis (AHA) for the phase of work, in the Fall Protection and Prevention (FP&P) Plan, and the Accident Prevention Plan (APP). The plan must be in accordance with the requirements of EM 385-1-1.

3.6 WORK PLATFORMS

3.6.1 Scaffolding

Provide employees with a safe means of access to the work area on the scaffold. Climbing of any scaffold braces or supports not specifically designed for access is prohibited. Comply with the following requirements:

a. Scaffold platforms greater than 20 feet in height must be accessed by use of a scaffold stair system.

b. Ladders commonly provided by scaffold system manufacturers are prohibited for accessing scaffold platforms greater than 20 feet maximum in height.

c. An adequate gate is required.

d. Employees performing scaffold erection and dismantling must be qualified.

e. Scaffold must be capable of supporting at least four times the maximum intended load, and provide appropriate fall protection as delineated in the accepted fall protection and prevention plan.

f. Stationary scaffolds must be attached to structural building components to safeguard against tipping forward or backward.

g. Special care must be given to ensure scaffold systems are not overloaded.

h. Side brackets used to extend scaffold platforms on self-supported scaffold systems for the storage of material are prohibited. The first tie-in must be at the height equal to 4 times the width of the smallest dimension of the scaffold base.

i. Scaffolding other than suspended types must bear on base plates upon wood mudsills (2 in x 10 in x 8 in minimum) or other adequate firm foundation.

j. Scaffold or work platform erectors must have fall protection during the erection and dismantling of scaffolding or work platforms that are more than 6 feet.

k. Delineate fall protection requirements when working above 6 feet or above dangerous operations in the Fall Protection and Prevention (FP&P) Plan and Activity Hazard Analysis (AHA) for the phase of work.

3.6.2 Elevated Aerial Work Platforms (AWPs)

Workers must be anchored to the basket or bucket in accordance with manufacturer's specifications and instructions (anchoring to the boom may only be used when allowed by the manufacturer and permitted by the CP). Lanyards used must be sufficiently short to prohibit worker from climbing out of basket. The climbing of rails is prohibited. Lanyards with built-in shock absorbers are acceptable. Self-retracting devices are not acceptable. Tying off to an adjacent pole or structure is not permitted unless a safe device for 100 percent tie-off is used for the transfer.

Use of AWPs must be operated, inspected, and maintained as specified in the operating manual for the equipment and delineated in the AHA. Operators of AWPs must be designated as qualified operators by the Prime Contractor. Maintain proof of qualifications on site for review and include in the AHA.

3.7 EQUIPMENT

3.7.1 Material Handling Equipment (MHE)

a. Material handling equipment such as forklifts must not be modified with work platform attachments for supporting employees unless specifically delineated in the manufacturer's printed operating instructions. Material handling equipment fitted with personnel work platform attachments are prohibited from traveling or positioning while personnel are working on the platform.

b. The use of hooks on equipment for lifting of material must be in accordance with manufacturer's printed instructions. Material Handling Equipment Operators must be trained in accordance with OSHA 29 CFR 1910, Subpart N.

c. Operators of forklifts or power industrial trucks must be licensed in accordance with OSHA.

3.7.2 Load Handling Equipment (LHE)

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

a. Equip cranes and derricks as specified in EM 385-1-1

b. Notify the Contracting Officer 15 working days in advance of any LHE entering the activity, in accordance with EM 385-1-1, so that necessary quality assurance spot checks can be coordinated. Contractor's operator must remain with the crane during the spot check. Rigging gear must be in accordance with OSHA, Standards safety standards.

c. Comply with the LHE manufacturer's specifications and limitations for erection and operation of cranes and hoists used in support of the work. Perform erection under the supervision of a designated person. Perform all testing in accordance with the manufacturer's recommended procedures.

d. When operating in the vicinity of overhead transmission lines, operators and riggers must be alert to this special hazard and follow the requirements of EM 385-1-1 as applicable.

e. Do not use crane suspended personnel work platforms (baskets) unless

the Contractor proves that using any other access to the work location would provide a greater hazard to the workers or is impossible. Do not lift personnel with a line hoist or friction crane. Additionally, submit a specific AHA for this work to the Contracting Officer. Ensure the activity and AHA are thoroughly reviewed by all involved personnel.

f. Inspect, maintain, and recharge portable fire extinguishers as specified in NFPA 10, Standard for Portable Fire Extinguishers.

g. All employees must keep clear of loads about to be lifted and of suspended loads, except for employees required to handle the load.

h. Use cribbing when performing lifts on outriggers.

i. The crane hook/block must be positioned directly over the load. Side loading of the crane is prohibited.

j. A physical barricade must be positioned to prevent personnel access where accessible areas of the LHE's rotating superstructure poses a risk of striking, pinching or crushing personnel.

k. Maintain inspection records in accordance by EM 385-1-1, including shift, monthly, and annual inspections, the signature of the person performing the inspection, and the serial number or other identifier of the LHE that was inspected. Records must be available for review by the Contracting Officer.

l. Maintain written reports of operational and load testing in accordance with EM 385-1-1, listing the load test procedures used along with any repairs or alterations performed on the LHE. Reports must be available for review by the Contracting Officer.

m. Certify that all LHE operators have been trained in proper use of all safety devices (e.g. anti-two block devices).

n. Take steps to ensure that wind speed does not contribute to loss of control of the load during lifting operations. At wind speeds greater than 20 mph, the operator, rigger and lift supervisor must cease all crane operations, evaluate conditions and determine if the lift may proceed. Base the determination to proceed or not on wind calculations per the manufacturer and a reduction in LHE rated capacity if applicable. Include this maximum wind speed determination as part of the activity hazard analysis plan for that operation.

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

3.7.3 Machinery and Mechanized Equipment

a. Proof of qualifications for operator must be kept on the project site for review.

b. Manufacture specifications or owner's manual for the equipment must be on-site and reviewed for additional safety precautions or requirements that are sometimes not identified by OSHA or USACE EM 385-1-1. Incorporate such additional safety precautions or requirements into the AHAs.

c. Submit a Machinery & Mechanized Equipment Certification Form to the Contracting Officer prior to being placed into use.

3.7.4 Base Mounted Drum Hoists

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

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

c. When used on telecommunication towers, base mounted drum hoists must be in accordance with 29 CFR 1926.

d. When used to hoist personnel, the AHA must include a written standard operating procedure. Operators must have a physical examination in accordance with EM 385-1-1 and trained, at a minimum, in accordance with EM 385-1-1. The base mounted drum hoist must also comply with OSHA Instructions.

e. Material and personnel must not be hoisted simultaneously.

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

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

3.8 USE OF EXPLOSIVES

Explosives must not be used or brought to the project site without prior written approval from the Contracting Officer. Such approval does not relieve the Contractor of responsibility for injury to persons or for damage to property due to blasting operations.

Storage of explosives, when permitted on Government property, must be only where directed and in approved storage facilities. These facilities must be kept locked at all times except for inspection, delivery, and withdrawal of explosives.

3.9 EXCAVATIONS

Soil classification must be performed by a competent person in accordance with 29 CFR 1926 and EM 385-1-1.

3.9.1 Utility Locations

Provide a third party, independent, private utility locating company to positively identify underground utilities in the work area in addition to any station locating service and coordinated with the station utility department.

3.9.2 Utility Location Verification

Physically verify underground utility locations, including utility depth, by hand digging using wood or fiberglass handled tools when any adjacent construction work is expected to come within 3 feet of the underground system.

3.9.3 Utilities Within and Under Concrete, Bituminous Asphalt, and Other Impervious Surfaces

Utilities located within and under concrete slabs or pier structures, bridges, parking areas, and the like, are extremely difficult to identify. Whenever Contract work involves chipping, saw cutting, or core drilling through concrete, bituminous asphalt or other impervious surfaces, the existing utility location must be coordinated with station utility departments in addition to location and depth verification by a third party, independent, private locating company. The third party, independent, private locating company must locate utility depth by use of Ground Penetrating Radar (GPR), X-ray, bore scope, or ultrasound prior to the start of demolition and construction. Outages to isolate utility systems must be used in circumstances where utilities are unable to be positively identified. The use of historical drawings does not alleviate the Contractor from meeting this requirement.

3.10 ELECTRICAL

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

3.10.1 Electrical Work

As described in EM 385-1-1, electrical work is to be conducted in a de-energized state unless there is no alternative method for accomplishing the work. In those cases obtain an energized work permit from the Contracting Officer. The energized work permit application must be accompanied by the AHA and a summary of why the equipment/circuit needs to be worked energized. Underground electrical spaces must be certified safe for entry before entering to conduct work. Cables that will be cut must be positively identified and de-energized prior to performing each cut. Attach temporary grounds in accordance with ASTM F855 and IEEE 1048. Perform all high voltage cable cutting remotely using hydraulic cutting tool. When racking in or live switching of circuit breakers, no additional person other than the switch operator is allowed in the space during the actual operation. Plan so that work near energized parts is minimized to the fullest extent possible. Use of electrical outages clear of any energized electrical sources is the preferred method.

When working in energized substations, only qualified electrical workers are permitted to enter. When work requires work near energized circuits as defined by NFPA 70, high voltage personnel must use personal protective equipment that includes, as a minimum, electrical hard hat, safety footwear, insulating gloves and electrical arc flash protection for personnel as required by NFPA 70E. Insulating blankets, hearing protection, and switching suits may also be required, depending on the specific job and as delineated in the Contractor's AHA. Ensure that each employee is familiar with and complies with these procedures and 29 CFR 1910.

3.10.2 Qualifications

Electrical work must be performed by QP with verifiable credentials who are familiar with applicable code requirements. Verifiable credentials consist of State, National and Local Certifications or Licenses that a Master or Journeyman Electrician may hold, depending on work being performed, and must be identified in the appropriate AHA. Journeyman/Apprentice ratio must be in accordance with State, Local

requirements applicable to where work is being performed.

3.10.3 Arc Flash

Conduct a hazard analysis/arc flash hazard analysis whenever work on or near energized parts greater than 50 volts is necessary, in accordance with NFPA 70E.

All personnel entering the identified arc flash protection boundary must be QPs and properly trained in NFPA 70E requirements and procedures. Unless permitted by NFPA 70E, no Unqualified Person is permitted to approach nearer than the Limited Approach Boundary of energized conductors and circuit parts. Training must be administered by an electrically qualified source and documented.

3.10.4 Grounding

Ground electrical circuits, equipment and enclosures in accordance with NFPA 70 and IEEE C2 to provide a permanent, continuous and effective path to ground unless otherwise noted by EM 385-1-1.

3.10.5 Testing

Temporary electrical distribution systems and devices must be inspected, tested and found acceptable for Ground-Fault Circuit Interrupter (GFCI) protection, polarity, ground continuity, and ground resistance before initial use, before use after modification and at least monthly. Monthly inspections and tests must be maintained for each temporary electrical distribution system, and signed by the electrical CP or QP.

-- End of Section --

SECTION 01 42 00

SOURCES FOR REFERENCE PUBLICATIONS
05/24

PART 1 GENERAL

1.1 REFERENCES

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

1.2 ORDERING INFORMATION

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

AACE INTERNATIONAL (AACE)
726 East Park Avenue #180
Fairmont, WV 26554 USA
Ph: 304-296-8444
Fax: 304-291-5728
Internet: https://web.aacei.org/

AMERICAN CONCRETE INSTITUTE (ACI)
38800 Country Club Drive
Farmington Hills, MI 48331-3439
Ph: 248-848-3800
Fax: 248-848-3701
Internet: https://www.concrete.org/

AMERICAN HARDBOARD ASSOCIATION (AHA)
1210 W. Northwest Highway
Palatine, IL 60067Falls Church, VA 22042

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)
130 East Randolph, Suite 2000
Chicago, IL 60601
Ph: 312-670-2400
Fax: 312-670-5403
Steel Solutions Center: 866-275-2472
E-mail: solutions@aisc.org
Internet: https://www.aisc.org/

AMERICAN LADDER INSTITUTE (ALI)
1300 Summer Avenue
Clevelan, OH 44115
Ph: 216-241-7333
Fax: 216-241-0105

E-mail: info@americanladderinstitute.org
Internet: https://www.americanladderinstitute.org

AMERICAN LUMBER STANDARDS COMMITTEE (ALSC)
7470 New Technology Way, Suite F
Frederick, MD 21703
Ph: 301-972-1700
Fax: 301-540-8004
E-mail: alsc@alsc.org
Internet: http://www.alsc.org

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)
Two Park Avenue
New York, NY 10016-5990
Ph: 800-843-2763
Fax: 973-882-1717
E-mail: customercare@asme.org
Internet: https://www.asme.org/

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

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

AMERICAN WELDING SOCIETY (AWS)
8669 NW 36 Street, #130
Miami, FL 33166-6672
Ph: 800-443-9353
Email: customercare@aws.org
Internet: https://www.aws.org/

AMERICAN WOOD COUNCIL (AWC)
50 Catoctin Circle SE, Suite 201
Leesburg, VA 20176
Ph: 800-890-7732 or 202-463-2766
Fax: 412-741-0609
E-mail: info@awc.org
Internet: https://www.awc.org/

AMERICAN WOOD PROTECTION ASSOCIATION (AWPA)
P.O. Box 361784
Birmingham, AL 35236-1784
Ph: 205-733-4077
Fax: 205-733-4075
Internet: http://www.awpa.com

APA - THE ENGINEERED WOOD ASSOCIATION (APA)
7011 South 19th St.
Tacoma, WA 98466-5333
Ph: 253-565-6600

Fax: 253-565-7265
Internet: https://www.apawood.org/

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

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

FOUNDATION FOR CROSS-CONNECTION CONTROL AND HYDRAULIC RESEARCH (FCCCHR)
USC Foundation Office
Universityh of Southern California
1150 South Olive Street, Suite 1700
Los Angeles, CA 90015
Ph: 866-545-6340
Fax: 213-740-8399
E-mail: fccchr@usc.edu
Internet: https://fccchr.usc.edu/

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

INTERNATIONAL CODE COUNCIL (ICC)
200 Massachusetts Ave, NW Suite 250
Washington, DC 20001
Ph: 800-786-4452 or 888-422-7233
Fax: 202-783-2348
E-mail: order@iccsafe.org
Internet: https://www.iccsafe.org/

INTERNATIONAL SAFETY EQUIPMENT ASSOCIATION (ISEA)
1101 Wilson Blvd, Suite 1425
Arlington, VA 22209-1762
Ph: 703-525-1695
Fax: 703-528-2148
Internet: https://safetyequipment.org/

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

Internet: https://www.nfpa.org

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

SOCIETY FOR PROTECTIVE COATINGS (SSPC)
800 Trumbull Drive
Pittsburgh, PA 15205
Ph: 877-281-7772 or 412-281-2331
Fax: 412-444-3591
E-mail: customerservice@sspc.org
Internet: http://www.sspc.org

U.S. ARMY CORPS OF ENGINEERS (USACE)
CRD-C DOCUMENTS available on Internet: https://www.wbdg.org/army
THE CAD/BIM TECHNOLOGY CENTER FOR FACILITIES, INFRASTRUCTURE, AND ENVIRONMENT (USACE)on Internet:
https://cadbimcenter.erdc.dren.mil/
Order Other Documents from:
Official Publications of the Headquarters, USACE
E-mail: hqpublications@usace.army.mil
Internet: http://www.publications.usace.army.mil/
or
https://www.hnc.usace.army.mil/Missions/Engineering-Directorate/TECHINFO/

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

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

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

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

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

-- End of Section --

SECTION 01 45 00

QUALITY CONTROL
08/23, CHG 3: 08/25

PART 1 GENERAL

1.1 REFERENCES

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

ASTM INTERNATIONAL (ASTM)

ASTM D3740	(2019) Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
ASTM E329	(2023) Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2024) Safety -- Safety and Occupational Health (SOH) Requirements

1.2 PAYMENT

Separate payment will not be made for providing and maintaining an effective Quality Control program. Include all associated costs in the applicable Bid Schedule item.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Contractor Quality Control (CQC) Plan; G, RO

SD-06 Test Reports

Verification Statement

1.4 GENERAL REQUIREMENTS

Establish and maintain an effective quality control (QC) system that complies with FAR 52.246-12 Inspection of Construction. QC is comprised of plans, procedures, and organization necessary to produce an end product that complies with the Contract requirements. The QC system covers all

construction operations, both onsite and offsite, and must be keyed to the proposed construction sequence. The Quality Control Manager, Superintendent, Site Safety and Health Officer (SSHO), and all on-site supervisors are responsible for the quality of work and are subject to removal by the Contracting Officer for non-compliance with the quality requirements specified in the Contract. The Quality Control Manager must maintain a physical presence at the work site at all times and is the primary individual responsible for all quality control.

1.5 QUALITY CONTROL (QC) PROGRAM REQUIREMENTS

Establish and maintain a QC program as described in this section. The QC program consists of a QC Organization, QC Plan, QC Plan Meeting(s), a Coordination and Mutual Understanding Meeting, QC meetings, three phases of control, submittal review and approval, testing, completion inspections, QC certifications, and documentation necessary to provide materials, equipment, workmanship, fabrication, construction and operations that comply with the requirements of this Contract. The QC program must cover on-site and off-site work and be keyed to the work sequence. No construction work or testing may be performed unless the QC Manager is on the work site. The QC Manager must report to an officer of the firm and not be subordinate to the Project Superintendent or the Project Manager. The QC Manager, Project Superintendent and Project Manager must work together effectively. Although the QC Manager is the primary individual responsible for quality control, all individuals will be held responsible for the quality of work on the job.

1.5.1 Meetings

1.5.1.1 Quality Control Plan Meeting

Prior to submission of the QC Plan, the Contractor may request a meeting with the Contracting Officer to discuss the QC Plan requirements of this Contract.

The purpose of this meeting is to develop a mutual understanding of the QC Plan requirements prior to plan development and submission and to agree on the Contractor's list of Definable Feature of Work (DFOW).

1.5.1.2 Coordination and Mutual Understanding Meeting

After the Preconstruction Conference, before start of construction, and prior to acceptance by the Government of the CQC Plan, meet with the Contracting Officer and discuss the Contractor's quality control system. During the meeting, a mutual understanding of the system details must be developed, including the forms for recording the CQC operations, control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship of Contractor's Management and control with the Government's Quality Assurance. Minutes of the meeting will be prepared by the QC Manager and signed by the Contractor and the Government. Provide a copy of the signed minutes to all attendees and incorporate into the relevant QC Plan. At a minimum the Coordination and Mutual Understanding Meeting must be repeated when a new QC Manager is appointed. There can be other occasions when subsequent conferences will be called by either party to reconfirm mutual understandings or address deficiencies in the CQC system or procedures which can require corrective action by the Contractor.

1.5.1.2.1 Purpose

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

a. Waste Management Plan.

b. Procedures for noise and acoustics management.

c. Environmental Protection Plan.

d. Environmental regulatory requirements.

1.5.1.2.2 Coordination of Activities

Coordinate activities included in various sections to assure efficient and orderly installation of each component. Coordinate operations included under different sections that are dependent on each other for proper installation and operation.

1.5.1.2.3 Attendees

As a minimum, the Contractor's personnel required to attend include an officer of the firm, the Project Manager, Project Superintendent, QC Manager, Alternate QC Manager, and subcontractor representatives.

1.5.1.3 Quality Control (QC) Meetings

After the start of construction, conduct weekly QC meetings led by the QC Manager at the work site with the Project Superintendent, and the other personnel as necessary. The QC Manager is to prepare the minutes of the meeting and provide a copy to the Contracting Officer within 2 working days after the meeting. The Contracting Officer may attend these meetings. As a minimum, accomplish the following at each meeting:

a. Review the minutes of the previous meeting.

b. Review the schedule and the status of work and deficiencies/rework. Review the most current approved schedule (in accordance with schedule specification) and the status of work and deficiencies/rework.

c. Review the status of submittals and Request For Information (RFIs).

d. Review the work to be accomplished in the next 3 weeks as defined by the schedule section paragraph WEEKLY PROGRESS MEETINGS in Section 01 32 01.00 10 PROJECT SCHEDULE and all quality control documentation required for that work.

e. Review Testing Plan and Log including status of tests performed since last QC Meeting.

f. Resolve QC and production problems. Discuss status of pending change orders.

g. Address items that may require revising the QC Plan.

h. Review Accident Prevention Plan (APP) and effectiveness of the safety program.

i. Review environmental requirements and procedures.

j. Review Environmental Management Plan.

k. Review Waste Management Plan.

l. Review the status of training completion.

1.5.2 Contractor Quality Control (CQC) Plan

Submit no later than 15 days after receipt of notice to proceed, the CQC Plan proposed to implement the requirements FAR 52.246-12 Inspection of Construction. The Government will consider an interim plan for the first 60 days of operation. Construction will be permitted to begin only after acceptance of the CQC Plan and other Contract requirements or acceptance of an interim plan applicable to the particular feature of work to be started. Work outside of the accepted interim plan will not be permitted to begin until acceptance of a CQC Plan or another interim plan containing the additional work.

1.5.2.1 Content of Contractor Quality Control (CQC) Plan

Provide a CQC Plan, prior to start of construction that includes a table of contents, with major sections identified, pages numbered sequentially, and that documents the proposed methods and responsibilities for accomplishing quality control during the construction of the project. The CQC Plan must at a minimum include the following sections:

a. A description of the quality control organization and acknowledgment that the CQC staff will implement the three phase control system for all aspects of the work specified.

b. An organizational chart showing the quality control organization with individual names and job titles and lines of authority up to an executive of the company at the home office.

c. NAMES AND QUALIFICATIONS: Names and qualifications, in resume format, (including position titles and durations for qualifying experiences) for each person in the QC organization. Include the Construction Quality Management (CQM) for Contractors course certifications for the QC personnel as required by the paragraph CONSTRUCTION QUALITY MANAGEMENT TRAINING.

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

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

f. APPOINTMENT LETTERS: Letters signed by an officer of the firm

appointing the QC Manager and Alternate QC Manager, and stating that they are responsible for implementing and managing the QC program as described in this Contract. Include in this letter the responsibility of the QC Manager and Alternate QC Manager to implement and manage the three phases of control, and their authority to stop work that is not in compliance with the Contract. Letters of direction are to be issued by the QC Manager to all other QC Specialists or quality control representatives outlining their duties, authorities, and responsibilities. Include copies of the letters in the QC Plan.

g. SUBMITTAL PROCEDURES AND INITIAL SUBMITTAL REGISTER: Procedures for reviewing, approving, scheduling, and managing submittals, including those of subcontractors, offsite fabricators, suppliers, and purchasing agents. Provide the name(s) of the person(s) in the QC organization authorized to review and certify submittals prior to approval. Provide the initial submittal of the Submittal Register as specified in Section 01 33 00 SUBMITTAL PROCEDURES.

h. TESTING LABORATORY INFORMATION: Testing laboratory information required by the paragraph ACCREDITATION REQUIREMENTS, as applicable.

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

j. Procedures to complete construction deficiencies from identification through acceptable corrective action. Establish verification procedures that identified deficiencies have been corrected. This phase is performed prior to beginning work on each definable feature of work, after all required plans, documents, materials are approved, and after copies are at the work site.

k. Reporting procedures, including proposed reporting formats.

l. Procedures for submitting and reviewing design changes/variations prior to submission to the Contracting Officer.

m. LIST OF DEFINABLE FEATURES: A Definable Feature of Work (DFOW) is a task that is separate and distinct from other tasks and has control requirements and work crews unique to that task. A DFOW is identified by different trades or disciplines, or it is work by the same trade in a different environment. A DFOW is by definition any item or activity on the construction schedule, and the schedule specification provides direction regarding how the DFOWs are to be structured. Include in the list of DFOWs for all activities on the Construction Schedule. Although each section of the specifications can generally be considered as a definable feature of work, there are frequently more than one definable features under a particular section. Identify the specification section number and schedule activity ID for each DFOW listed. The DFOW list will be reviewed in coordination with the construction schedule and agreed upon during the Coordination and Mutual Understanding Meeting.

n. PROCEDURES FOR PERFORMING AND TRACKING THE THREE PHASES OF CONTROL: Identify procedures used to ensure the three phases of control to manage the quality on this project. For each Definable Feature of Work (DFOW), a Preparatory and Initial phase checklist will be filled out during the Preparatory and Initial phase meetings. Conduct the

Preparatory and Initial Phases and meetings with a view towards obtaining quality construction by planning ahead and identifying potential problems for each DFOW.

1.5.3 Acceptance of the Quality Control (QC) Plan

The Contracting Officer's acceptance of the Contractor QC Plan, or interim plan applicable to the particular feature of work to be started, is required prior to the start of construction. Work outside of the accepted interim plan will not be permitted to begin until acceptance of a CQC Plan or another interim plan containing the additional work. The Contracting Officer reserves the right to require changes in the QC Plan and operations as necessary, including removal or addition of personnel, to ensure the specified quality of work. The Contracting Officer reserves the right to interview any member of the QC organization at any time to verify the submitted qualifications. All QC organization personnel are subject to acceptance by the Contracting Officer. The Contracting Officer may require the removal of any individual for non-compliance with quality requirements specified in the Contract.

1.5.4 Notification of Changes

Notify the Contracting Officer, in writing, of any proposed changes in the QC Plan or changes to the QC organization personnel. Proposed changes are subject to acceptance by the Contracting Officer.

1.6 QUALITY CONTROL (QC) ORGANIZATION

1.6.1 Personnel Requirements

The requirements for the CQC organization are a Site Safety and Health Officer (SSHO), QC Manager, and enough qualified personnel to ensure safety and Contract compliance. The SSHO reports directly to a senior project (or corporate) official independent from the QC Manager. The SSHO will also serve as a member of the CQC Staff Personnel identified in the technical provisions as requiring specialized skills to assure the required work is being performed properly. The CQC staff always maintains a presence at the site during progress of the work and have complete authority and responsibility to take any action necessary to ensure Contract compliance. The CQC staff will be subject to acceptance by the Contracting Officer. Provide adequate office space, filing systems and other resources as necessary to maintain an effective and fully functional CQC organization. Promptly complete and furnish all letters, material submittals, shop drawing submittals, schedules, and all other project documentation to the CQC organization. The CQC organization is responsible for always maintaining these documents and records at the site, except as otherwise acceptable to the Contracting Officer.

1.6.2 Quality Control (QC) Manager

1.6.2.1 Duties

Provide a QC Manager at the work site to implement and manage the QC program. The QC Manager must be employed by the Prime Contractor. In addition to implementing and managing the QC program, the QC Manager may perform the duties of Project Superintendent. The QC Manager must attend the Coordination and Mutual Understanding Meeting, perform the three phases of control, perform submittal review and approval, ensure testing is performed and provide QC certifications and documentation required in

this Contract. The QC Manager is responsible for managing and coordinating the three phases of control and documentation performed by the QC Specialists, testing laboratory personnel and any other inspection and testing personnel required by this Contract. The QC Manager is the manager of all QC activities.

1.6.2.2 Qualifications

The QC Manager must be an individual with a minimum of 10 years combined experience in the following positions: Project Superintendent, QC Manager, Project Manager, Project Engineer or Construction Manager on similar size and type construction Contracts which included the major trades that are part of this Contract. The individual must have at least 2 years experience as a QC Manager. The individual must be familiar with the requirements of EM 385-1-1 and have experience in the areas of hazard identification, safety compliance, and sustainability.

The QC Manager and all members of the QC organization must be capable of reading, writing, and conversing fluently in the English language.

1.6.2.3 Construction Quality Management Training

In addition to the above experience and education requirements, the QC Manager Alternate QC Manager, Superintendent, QC Specialist, and DQCM must have completed the CQM for Contractors course. If the QC Manager does not have a current certification, obtain the CQM for Contractors course certification within 90 days of award. This course is periodically offered by the Naval Facilities Engineering Systems Command and the Army Corps of Engineers. Contact the Contracting Officer for information on the next scheduled class.

The Construction Quality Management Training certificate expires after 5 years. If the QC Manager's certificate has expired, retake the course to remain current.

1.6.3 Organizational Changes

Maintain the QC staff with personnel as required by the specification section at all times. When it is necessary to make changes to the QC staff, revise the CQC Plan to reflect the changes and submit the changes to the Contracting Officer for acceptance.

1.6.4 Alternate Quality Control (QC) Manager Duties and Qualifications

Designate an alternate for the QC Manager at the work site to serve in the event of the designated QC Manager's absence. The qualification requirements for the Alternate QC Manager must be the same as for the QC Manager.

1.6.5 Quality Control (QC) Specialists

Provide a separate QC Specialist at the work site for each of the areas as listed in the Matrix listed below, who must assist and report to the QC Manager and who may perform production related duties but must be allowed sufficient time to perform their assigned quality control duties. These individuals or specialized technical companies are employees of the Prime Contractor. A single person can cover more than one area provided that the single person is qualified to perform quality control activities in each designated and that workload allows. QC Specialists must be

physically present at the work site with frequency as indicated in the Experience Matrix below, to participate in the QC Meetings, perform the three phases of control, including participation in Preparatory and Initial Phase meetings, and to perform and document Follow-up inspections as an extension of the QC Manager for each definable feature of work in their area of responsibility. QC Specialist must assist and be present for training events, and Critical System Acceptance inspections by the Government. Qualification, experience, Area of Responsibility, and frequency of QC surveillance are provided in Matrix listed herein.

Experience Matrix		
1. Area	**2-1. Qualification** **2-2. Experience**	**3-1. Area of Responsibility** **3-2. Frequency**
Civil	2-1. Graduate Civil Engineer or Construction Manager and 2-2. 2 years experience in the type of work being performed on this project or technician with 5 years related experience	3-2. Frequency of QC surveillance and inspection will be daily during installation and including final inspection.
Structural	-1. Graduate Civil Engineer (with Structural Track or Focus) or Construction Manager, and 2-2. 2 years experience or person 5 years of experience supervising structural features of work in the field with a construction company	3-2. Frequency of QC surveillance and inspection will be daily during installation and including final inspection.
Concrete, Pavements and Soils	2-1. Materials Technician 2-2. 2 years experience for the appropriate area	3-2. Frequency of QC surveillance and inspection will be daily during installation and including final inspection.

1.7 SUBMITTAL AND DELIVERABLES REVIEW AND APPROVAL

Procedures for submission, review and approval of submittals are described in Section 01 33 00 SUBMITTAL PROCEDURES. Procedures must include field verification of relevant dimensions and component characteristics by the QC organization prior to submittal being sent to the Contracting Officer. The CQC organization is responsible for certifying that all submittals and deliverables are in compliance with the Contract.

1.8 THREE PHASES OF CONTROL

CQC enables the Contractor to ensure that the construction, including that of subcontractors and suppliers, complies with the requirements of the Contract. At least three phases of control must be conducted by the QC Manager to adequately cover both on-site and off-site work for each definable feature of the construction work as follows:

1.8.1 Preparatory Phase

Document the results of the preparatory phase actions by separate minutes prepared by the QC Manager and attach to the daily CQC report. Instruct applicable workers as to the acceptable level of workmanship required to meet Contract specifications.

Notify the Contracting Officer at least 2 business days in advance of each preparatory phase meeting. The meeting will be conducted by the QC Manager and attended by the Project Superintendent, and the foreman responsible for the DFOW. When the DFOW will be accomplished by a subcontractor, that subcontractor's foreman must attend the preparatory phase meeting. This phase is performed prior to beginning work on each definable feature of work, after all required plans/documents/materials are approved/accepted, and after copies are at the work site. Perform the following prior to beginning work on each DFOW:

a. Review each paragraph of the applicable specification sections, reference codes, and standards. Make available during the prepatory inspection a copy of those sections of referenced codes and standards applicable to that portion of the work to be accomplished in the field. Maintain and make available in the field for use by Government personnel until final acceptance of the work.

b. Review the Contract drawings.

c. Verify that field measurements are as indicated on construction or shop drawings or both before confirming product orders, to minimize waste due to excessive materials.

d. Verify that appropriate shop drawings and submittals for materials and equipment have been submitted and approved. Verify receipt of approved factory test results, when required.

e. Review the testing plan and ensure that provisions have been made to provide the required QC testing.

f. Examine the work area to ensure that the required preliminary work has been completed and complies with the Contract and ensure any deficiencies/rework items in the preliminary work have been corrected and confirmed by the Contracting Officer.

g. Review coordination of product/material delivery to designated prepared areas to execute the work.

h. Examine the required materials, equipment and sample work to ensure that they are on hand and conform to the approved shop drawings and submitted data and are properly stored.

i. Check to assure that all materials and equipment have been tested, submitted, and approved.

j. Discuss specific controls to be used, construction methods, construction tolerances, workmanship standards, and the approach that will be used to provide quality construction by planning ahead and identifying potential problems for each DFOW. Ensure any portion of the plan requiring separate Contracting Officer acceptance has been approved.

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

l. Discussion of procedures for controlling quality of the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that feature of work.

m. Discuss schedule and execution of the initial control phase and confirmation or construction quality compliance.

1.8.2 Initial Phase

Notify the Contracting Officer at least 2 business days in advance of each initial phase. When construction crews are ready to start work on a DFOW, conduct the initial phase with the Project Superintendent, and the foreman responsible for that DFOW. Observe the initial segment of the DFOW to ensure that the work complies with Contract requirements. Document the results of the initial phase in the daily CQC Report and in the Initial Phase Checklist. Repeat the initial phase for each new crew to work on-site when acceptable levels of specified quality are not being met. Indicate the exact location of initial phase for definable feature of work for future reference and comparison with follow-up phases. Perform the following for each DFOW:

a. Check work to ensure that it is in full compliance with Contract requirements. Review minutes of the preparatory meeting.

b. Verify adequacy of controls to ensure full Contract compliance. Verify required control inspection and testing comply with the Contract.

c. Establish level of workmanship and verify that it meets the minimum acceptable workmanship standards. Compare with required sample panels as appropriate.

d. Resolve any workmanship issues.

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

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

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

1.8.3 Follow-Up Phase

Perform the following for on-going DFOW daily, or more frequently as necessary, until the completion of each DFOW. The Final Follow-Up for any

DFOW will clearly note in the daily report the DFOW is completed, and all deficiencies/rework items have been completed in accordance with the paragraph DEFICIENCY/REWORK ITEMS LIST. Each DFOW that has completed the Initial Phase and has not completed the Final Follow-up must be included on each daily report. If no work was performed on that DFOW for the period of that daily report, it must be so noted. Document all Follow-Up activities for DFOWs in the daily CQC Report:

a. Ensure the work including control testing complies with Contract requirements until completion of that particular work feature. Record checks in the CQC documentation.

b. Maintain the quality of workmanship required.

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

d. Ensure that deficiencies/rework items are being corrected. Conduct final follow-up checks and correct all deficiencies prior to the start of additional features of work which may be affected by the deficient work.

e. Do not build upon nor conceal non-conforming work.

f. Assure manufacturers' representatives have performed necessary inspections if required and perform safety inspections.

1.8.4 Additional Preparatory and Initial Phases

Conduct additional preparatory and initial phases on the same DFOW if the quality of on-going work is unacceptable, if there are changes in the applicable QC organization, if there are changes in the on-site production supervision or work crew, if work on a DFOW has not started within 45 days of the initial preparatory meeting or has resumed after 45 days of inactivity, or if other problems develop.

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

Notify the Contracting Officer at least 2 weeks prior to the start of the preparatory and initial phases.

1.8.6 Deficiency/Rework Items List

The QC Manager must maintain a list of work that does not comply with the Contract, identifying what items need to be corrected, the activity ID number associated with the item, the date the item was originally discovered, the date the item will be corrected by, and the date the item was corrected.

The QC Manager reviews the list at each weekly QC Meeting:

a. There is no requirement to report a deficiency/rework item that is corrected the same day it is discovered.

b. No successor task may be advanced beyond the preparatory phase meeting until all deficiencies/rework items have been cleared by the QC Manager and concurred with by the Contracting Officer. This must be confirmed as part of the Preparatory Phase activities.

c. Attach a copy of the "Deficiency/Rework Items List" to the last daily

CQC Report of each month.

d. The Contractor is responsible for including those items identified by the Contracting Officer.

e. All deficiencies/rework items must be confirmed as corrected by the QC Manager, and concurred by the Contracting Officer, prior to commencement of any completion inspections per paragraph COMPLETION INSPECTIONS unless specifically exempted by the Contracting Officer.

f. Non-Compliance with these requirements is grounds for removal in accordance with paragraph ACCEPTANCE OF THE QUALITY CONTROL (QC) PLAN.

g. All delays, concurrent or related to failure to manage, monitor, control, and correct deficiencies/rework items are entirely the responsibility of the Contractor and can not be made the subject, or any component of any request for additional time or compensation.

1.9 TESTING

Perform specified or required tests to verify that control measures are adequate to provide a product which conforms to Contract requirements. Upon request, furnish to the Government duplicate samples of test specimens for possible testing by the Government. Testing includes operation and acceptance tests when specified. Procure the services of an U.S. Army Corps of Engineers approved testing laboratory. Perform the following activities and record and provide the following data:

a. Verify that testing procedures comply with Contract requirements.

b. Verify that facilities and testing equipment are available and comply with testing standards.

c. Check test instrument calibration data against certified standards.

d. Verify that recording forms and test identification control number system, including all test documentation requirements, have been prepared.

e. Record results of all tests taken, both passing and failing on the CQC report for the date taken. Specification paragraph reference, location where tests were taken, and the sequential control number identifying the test. If approved by the Contracting Officer, actual test reports are submitted later with a reference to the test number and date taken. Provide an information copy of tests performed by an offsite or commercial test facility directly to the Contracting Officer. Failure to submit timely test reports as stated results in nonpayment for related work performed and disapproval of the test facility for this Contract.

1.9.1 Laboratory Accreditation Authorities

All testing laboratories must be validated by the USACE Material Testing Center (MTC) for the tests to be performed. Information on the USACE MTC with web-links to both a list of validated testing laboratories and for the laboratory inspection request for can be found at: https://mtc.erdc.dren.mil

1.9.2 Capability Check

The Contracting Officer retains the right to check laboratory equipment in the proposed laboratory and the laboratory technician's testing procedures, techniques, and other items pertinent to testing, for compliance with the standards set forth in this Contract. Laboratories utilized for testing soils, concrete, asphalt, and steel must meet criteria detailed in ASTM D3740 and ASTM E329.

1.9.2.1 Capability Recheck

If the selected laboratory fails the capability check, the Contractor will be assessed a charge of $1,375 to reimburse the Government for each succeeding recheck of the laboratory or the checking of a subsequently selected laboratory. Such costs will be deducted from the Contract amount due the Contractor.

1.9.3 Test Results

Cite applicable Contract requirements, tests or analytical procedures used. Provide actual results and include a statement that the item tested or analyzed conforms or fails to conform to specified requirements. If the item fails to conform, notify the Contracting Officer immediately. Conspicuously stamp the cover sheet for each report in large red letters "CONFORMS" or "DOES NOT CONFORM" to the specification requirements, whichever is applicable. Test results must be signed by a testing laboratory representative authorized to sign certified test reports. Furnish the signed reports, certifications, and other documentation to the Contracting Officer via the QC Manager.

1.10 COMPLETION INSPECTIONS

1.10.1 Punch-Out Inspection

Near the completion of all work or any increment thereof, established by a completion time stated in the Contract Clause entitled "Commencement, Prosecution, and Completion of Work," or stated elsewhere in the specifications, the QC Manager must conduct an inspection of the work and develop a "punch list" of items which do not conform to the approved drawings, specifications, and Contract. Include in the punch list any remaining items on the "Deficiency/Rework Items List", that were not corrected prior to the Punch-Out Inspection as approved by the Contracting Officer in accordance with the paragraph DEFICIENCY/REWORK ITEMS LIST. Include within the punch list the estimated date by which the deficiencies will be corrected. Provide a copy of the punch list to the Contracting Officer.

The QC Manager, or staff, must make follow-on inspections to ascertain that all deficiencies have been corrected. All punch list items must be confirmed as corrected by the QC Manager and concurred by the Contracting Officer. Once this is accomplished, notify the Government that the facility is ready for the Government "Pre-Final Inspection".

1.10.2 Pre-Final Inspection

The Government and QC Manager will perform this inspection to verify that the facility is complete and ready to be occupied. A Government "Pre-Final Punch List" will be documented by the QC Manager as a result of this inspection. The QC Manager will ensure that all items on this list

are corrected and concurred by the Contracting Officer prior to notifying the Government that a "Final" inspection with the Client can be scheduled. All items noted on the "Pre-Final" inspection must be corrected and concurred by the Contracting Officer in a timely manner and be accomplished before the Contract completion date for the work, or any increment thereof, if the project is divided into increments by separate completion dates unless exceptions are directed by the Contracting Officer.

1.10.3 Final Acceptance Inspection

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

1.11 QUALITY CONTROL (QC) CERTIFICATIONS

1.11.1 Contractor Quality Control (CQC) Report Certification

Contain the following statement within the CQC Report: "On behalf of the Contractor, I certify that this report is complete and correct and equipment and material used, and work performed during this reporting period is in compliance with the Contract drawings and specifications to the best of my knowledge, except as noted in this report."

1.11.2 Completion Certification

Upon completion of work under this Contract, the QC Manager must furnish a certificate to the Contracting Officer attesting that "the work has been completed, inspected, tested and is in compliance with the Contract." Provide a copy of this final QC Certification for completion to the preparer of the Operation & Maintenance (O&M) documentation.

1.12 DOCUMENTATION AND INFORMATION FOR THE CONTRACTING OFFICER

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

Contact the Contracting Officer for sample forms or print from RMS-QCS as needed. Prior to commencing work on construction, the Contractor must obtain a copy set of the current report forms. The report forms will consist of the Contractor Quality Control (CQC) Report, CQC Report (Continuation Sheet), Contractor Production Report, Contractor Production Report (Continuation Sheet), Preparatory Phase Checklist, Initial Phase Checklist, Testing Plan and Log, and Rework Items List. Unless otherwise provided by the Contracting Officer, Contractor may use the forms provided as related material located at https://www.wbdg.org/dod/ufgs/ufgs-forms-graphics-tables.

1.12.1 Construction Documentation

Reports are required for each day that work is performed and must be attached to the Contractor Quality Control Report prepared for the same day. Maintain current and complete records of on-site and off-site QC program operations and activities. Reports are required for each day work is performed. Account for each calendar day throughout the life of the Contract.

The Project Superintendent and the QC Manager must prepare and sign the Contractor Production and CQC Reports, respectively. Every space on the forms must be filled in. Use N/A if nothing can be reported in one of the spaces. The reporting of work must be identified by terminology consistent with the construction schedule. In the "Remarks" sections of the reports, enter pertinent information including directions received, problems encountered during construction, work progress and delays, conflicts or errors in the drawings or specifications, field changes, safety hazards encountered, instructions given and corrective actions taken, delays encountered, a record of visitors to the work site, quality control problem areas, deviations from the QC Plan, construction deficiencies encountered, and meetings held. For each entry in the report(s), identify the Schedule Activity No. that is associated with the entered remark.

1.12.2 Quality Control Activities

CQC and Contractor Production reports will be prepared daily to maintain current records providing factual evidence that required quality control activities and tests have been performed. Include in these records the work of subcontractors and suppliers on an acceptable form that includes, as a minimum, the following information:

a. The name and area of responsibility of the Contractors and any subcontractors.

b. Operating plant/equipment with hours worked, idle, or down for repair.

c. Work performed each day, giving location, description, and by whom. When a Network Analysis Schedule (NAS) is used, identify each item of work performed each day by NAS activity number.

d. Control phase activities performed. Preparatory, and Initial phase Checklists associated with the DFOW referenced to the construction schedule. Follow-up phase activities identified to the DFOW. If testing or specific QC Specialist activities are associated with the Follow-up phase activities for a specific DFOW note this and include those reports.

e. Test and control activities performed with results and references to specifications and drawings requirements. Identify the control phase (Preparatory, Initial, Follow-up). List of deficiencies noted, along with corrective action in accordance with the paragraph DEFICIENCY/REWORK ITEMS LIST.

f. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications and drawings requirements.

g. Submittals and deliverables reviewed, with Contract reference, by

whom, and action taken.

h. Offsite surveillance activities, including actions taken.

i. Job safety evaluations stating what was checked, results, and instructions or corrective actions.

j. Instructions given/received and conflicts in plans and specifications.

1.12.3 Verification Statement

Indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. Cover both conforming and deficient features and include a statement that equipment and materials incorporated in the work and workmanship comply with the Contract.

Furnish the original and one copy of these records in report form to the Government by 10:00 AM the next working day after the date covered by the report. As a minimum, prepare and submit one report for every 7 days of no work and on the last day of a no work period. All calendar days need to be accounted for throughout the life of the Contract. The first report following a day of no work will be for that day only. Reports need to be signed and dated by the QC Manager. Include copies of test reports and copies of reports prepared by all subordinate quality control personnel within the QC Manager Report.

1.12.4 Quality Control Validation

Establish and maintain the following in an electronic folder. Divide folder into a series of tabbed sections as shown below. Ensure folder is updated at each required progress meeting.

a. CQC Meeting minutes in accordance with paragraph QUALITY CONTROL (QC) MEETINGS.

b. All completed Preparatory and Initial Phase Checklists, arranged by specification section, further sorted by DFOW referenced to the construction schedule. Submit each individual Phase Checklist the day the phase event occurs as part of the CQC daily report.

c. All milestone inspections, arranged by Activity Number referenced to the construction schedule.

d. An up-to-date copy of the Testing Plan and Log with supporting field test reports, arranged by specification section referenced to the DFOW to which individual reports results are associated. Individual field test reports will be submitted within 2 working days after the test is performed in accordance with the paragraph QUALITY CONTROL ACTIVITIES.

e. Copies of all Contract modifications, arranged in numerical order. Also include documentation that modified work was accomplished.

f. An up-to-date copy of the paragraph DEFICIENCY/REWORK ITEMS LIST.

g. Upon commencement of Completion Inspections of the entire project or any defined portion, maintain up-to-date copies of all punch lists issued by the QC staff to the Contractor and subcontractors and all punch lists issued by the Government in accordance with the paragraph

COMPLETION INSPECTIONS.

1.12.5 Testing Plan and Log

As tests are performed, the QC Manager will record on the "Testing Plan and Log" the date the test was performed and the date the test results were forwarded to the Contracting Officer. Attach a copy of the updated "Testing Plan and Log" to the last daily CQC Report of each month. Provide a copy of the final "Testing Plan and Log" to the preparer of the Operation & Maintenance (O&M) documentation.

1.12.6 As-Built Drawings

The QC Manager must ensure the as-built drawings, required by Section 01 78 00 CLOSEOUT SUBMITTALS are kept current on a daily basis and marked to show deviations which have been made from the Contract drawings. The as-built drawings document commences with the QC Manager ensuring all amendments, or changes to the Contract prior to Contract award are accurately noted in the initial document set creating the accurate baseline of the Contract prior to any work starting. Ensure each deviation has been identified with the appropriate modifying documentation (e.g., PC No., Modification No., Request for Information No.). The QC Manager must initial each revision. Upon completion of work, the QC Manager will furnish a certificate attesting to the accuracy of the as-built drawings prior to submission to the Contracting Officer.

1.13 NOTIFICATION ON NON-COMPLIANCE

The Contracting Officer will notify the Contractor of any detected non-compliance with the Contract. Take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, is deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders will be made the subject of a claim for extension of time for excess costs or damages by the Contractor.

1.14 DELIVERY, STORAGE, AND HANDLING

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

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 01 45 00.15 10

RESIDENT MANAGEMENT SYSTEM CONTRACTOR MODE (RMS CM)
11/23

PART 1 GENERAL

1.1 REFERENCES

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

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2024) Safety -- Safety and Occupational Health (SOH) Requirements

1.2 MEASUREMENT AND PAYMENT

The work of this section is not measured for payment. The Contractor is responsible for the work of this section, without any direct compensation other than the payment received for contract items.

1.3 CONTRACT ADMINISTRATION

The Government will use the Resident Management System (RMS) to assist in its monitoring and administration of this contract. The Government accesses the system using the Government Mode of RMS (RMS GM) and the Contractor accesses the system using the Contractor Mode (RMS CM). The term RMS will be used in the remainder of this section for both RMS GM and RMS CM. The joint Government-Contractor use of RMS facilitates electronic exchange of information and overall management of the contract. The Contractor accesses RMS to record, maintain, input, track, and electronically share information with the Government throughout the contract period in the following areas:

Administration
Finances
Quality Control
Submittal Monitoring
Scheduling
Closeout
Import/Export of Data

The Contractor must be prepared to transition from the Resident Management System (RMS) to the new Construction Management Platform (CMP) at any time during the period of performance of this contract, once the USACE enterprise implements this change. The Contractor's obligation to transition from RMS to the CMP system is a requirement of this contract. Therefore, additional time or cost increase to complete this transition will not be considered. In the event of the transition, RMS project information will be migrated to CMP by the government and available in the CMP system. After the transition, the Contractor must utilize the CMP system to perform all contract administration functions previously required in RMS, including all areas listed above. After the transition, “RMS” and “CMP” will be synonymous for all “Resident Management System” and “RMS” references in this contract’s specification. To facilitate the

transition from RMS to CMP, online training for the CMP system will be made available to the Contractor with enough time to train staff, prior to the transition occurring.

1.3.1 Correspondence and Electronic Communications

For ease and speed of communications, exchange correspondence and other documents in electronic format to the maximum extent feasible. Use of RMS CM is required for correspondence, with courtesy copies provided via e-mail. Correspondence, pay requests and other documents comprising the official contract record must be provided in electronic format, suitable for uploading to PCF, DoD's Paperless Contract Files system, with signatures and dates where necessary. Paper copies will be provided as required elsewhere in this contract.

1.3.2 Other Factors

Other portions of this document have a direct relationship to the reporting accomplished through RMS. Particular attention is directed to FAR 52.236-15 Schedules for Construction Contracts; FAR 52.232-27 Prompt Payment for Construction Contracts; FAR 52.232-5 Payments Under Fixed-Priced Construction Contracts; Section 01 32 01.00 10 PROJECT SCHEDULE; Section 01 33 00 SUBMITTAL PROCEDURES; Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS; and Section 01 45 00 QUALITY CONTROL.

1.4 RMS SOFTWARE

RMS is a web based application. Download, install and be able to utilize the latest version of RMS within 7 calendar days of receipt of the Notice to Proceed. RMS software, user manuals, access and installation instructions, program updates and training information are available from the RMS website (https://rms.usace.army.mil). The Government and the Contractor will have different access authorities to the same contract database through RMS. The common database will be updated automatically each time a user finalizes an entry or change.

1.5 CONTRACT DATABASE - GOVERNMENT

The Government will enter the basic contract award data in RMS prior to granting the Contractor access. The Government entries into RMS will generally be related to submittal reviews, correspondence status, and Quality Assurance(QA)comments, as well as other miscellaneous administrative information.

1.6 CONTRACT DATABASE - CONTRACTOR

Contractor entries into RMS establish, maintain, and update data throughout the duration of the contract. Contractor entries generally include prime and subcontractor information, daily reports, submittals, RFI's, schedule updates and payment requests. RMS includes the ability to import attachments and export reports in many of the modules, including submittals. The Contractor responsibilities for entries in RMS typically include the following items:

1.6.1 Administration

1.6.1.1 Contractor Information

Enter all current Contractor administrative data and information into RMS

within 7 calendar days of receiving access to the contract in RMS. This includes, but is not limited to, Contractor's name, address, telephone numbers, management staff, and other required items.

1.6.1.2 Subcontractor Information

Enter all missing subcontractor administrative data and information into RMS CM within seven calendar days of receiving access to the Contract in RMS or within seven calendar days of the signing of the subcontractor agreement for agreements signed at a later date. This includes name, trade, address, phone numbers, and other required information for all subcontractors. A subcontractor is listed separately for each trade to be performed.

1.6.1.3 Correspondence

Identify all Contractor correspondence to the Government with a serial number. Prefix correspondence initiated by the Contractor's site office with "S". Prefix letters initiated by the Contractor's home (main) office with "H". Letters are numbered starting from 0001. (e.g., H-0001 or S-0001). The Government's letters to the Contractor will be prefixed with "C" or "RFP".

1.6.1.4 Equipment

Enter and maintain a current list of equipment planned for use or being used on the jobsite, including the most recent and planned equipment inspection dates in accordance with Section 01 45 00 QUALITY CONTROL.

1.6.1.5 Reports

Track the status of the project using the reports available in RMS. The value of these reports reflects the quality of the data input. These reports include but are not limited to the Progress Payment Request worksheet, Quality Control (QC) comments, Deficiency Tracking Log, Submittal Register Status, and Three-Phase Control worksheets in accordance with Sections 01 20 00 PRICE AND PAYMENT PROCEDURES, Section 01 32 01.00 10 PROJECT SCHEDULE, 01 33 00 SUBMITTAL PROCEDURES, and 01 45 00 QUALITY CONTROL.

1.6.1.6 Request For Information (RFI)

Create and track all Requests For Information (RFI) in the RMS Administration Module for Government review and response. Provide status at weekly progress meeting in accordance with Section 01 32 01.00 10 PROJECT SCHEDULE.

1.6.2 Finances

1.6.2.1 Pay Activity Data

Develop and enter a list of pay activities in conjunction with the project schedule in accordance with Section 01 32 01.00 10 PROJECT SCHEDULE. The sum of pay activities equals the total Contract amount, including modifications. Each pay activity must be assigned to a Contract Line Item Number (CLIN). The sum of the activities assigned to a CLIN equals the amount of each CLIN.

1.6.2.2 Payment Requests

Prepare all progress payment requests using RMS. Update the work completed under the Contract at least monthly, measured as percent or as specific quantities. After the update, generate a payment request and prompt payment certification using RMS. Submit the signed prompt payment certification and payment request as well as supporting data, either electronically or by hard copy.

1.6.3 Quality Control (QC)

Enter and track implementation of the 3-phase QC Control System, QC testing, transferred and installed property and warranties in RMS. Link each deficiency and QC test to a pay activity. Prepare daily reports, identify and track deficiencies, document progress of work, and support other Contractor QC requirements in RMS. Maintain all data on a daily basis. Ensure that RMS reflects all quality control methods, tests and actions contained within the Contractor Quality Control (CQC) Plan and Government review comments. Provide within seven calendar days of Government acceptance of the CQC Plan.

1.6.3.1 Quality Control (QC) Reports

The Contractor's Quality Control (QC) Daily Report in RMS is the official report. The Contractor can use other supplemental formats to record QC data, but information from any supplemental formats are to be consolidated and entered into the RMS QC Daily Report. Any supplemental information may be entered into RMS as an attachment to the report. QC Daily Reports must be finalized and signed in RMS within 24 hours after the date covered by the report. Provide the Government a printed signed copy of the QC Daily Report, unless waived by the Contracting Officer.

1.6.3.2 Deficiency Tracking

Use the QC Daily Report Module to enter and track deficiencies. Deficiencies identified and entered into RMS by the Contractor or the Government will be sequentially numbered with a QC or QA prefix for tracking purposes. Enter each deficiency into RMS the same day that the deficiency is identified. Monitor, track and resolve all QC and QA entered deficiencies. A deficiency is not considered to be corrected until the Government indicates concurrence in RMS.

1.6.3.3 Three-Phase Control Meetings

Maintain scheduled and actual dates and times of preparatory and initial control meetings in RMS, and upload meeting minutes of the meetings. Worksheets for the three-phase control meetings are generated within RMS.

1.6.3.4 Labor and Equipment Hours

Enter labor and equipment exposure hours on a daily basis. Roll up the labor and equipment exposure data into a monthly exposure report.

1.6.3.5 Accident/Safety Reporting

Both the Contractor and the Government enter safety related comments in RMS as a deficiency. The Contractor must monitor, track and show resolution for safety issues in the QC Daily Report area of the RMS QC Module. In addition, follow all reporting requirements for accidents and

incidents as required in EM 385-1-1, Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS and as required by any other applicable Federal, State or local agencies.

1.6.3.6 Definable Features of Work

Enter each feature of work, as defined in the approved CQC Plan, into the RMS QC Module. A feature of work may be associated with a single or multiple pay activities, however a pay activity is only to be linked to a single feature of work.

1.6.3.7 Activity Hazard Analysis

Import activity hazard analysis electronic document files into the RMS QC Module utilizing the document package manager. Prepare activity hazard analysis in accordance with Section 01 35 26 GOVERNMENT SAFETY REQUIREMENTS.

1.6.4 Submittal Management

Enter all current submittal register data and information into RMS within seven calendar days of receiving access to the Contract in RMS. The Contractor will import the information shown in the submittal register following the specification Section 01 33 00 SUBMITTAL PROCEDURES unless otherwise directed by the Contracting Officer. Group electronic submittal documents into transmittal packages to send to the Government, except very large electronic files, samples, spare parts, mock ups, color boards, or where hard copies are specifically required. Track transmittals and update the submittal register in RMS on a daily basis throughout the duration of the Contract. Submit hard copies of all submittals unless waived by the Contracting Officer.

Contractor may request submittals to be added to RMS throughout the lifecycle of the project. Approval/disapproval of Contractor requests is at the discretion of the Contracting Officer. Submittals entry into RMS must be updated daily or as practical for performance of the Contract, as approved by the Contracting Officer.

1.6.5 Schedule

Enter and update the contract project schedule in RMS by either manually entering all schedule data or by importing the Standard Data Exchange Format (SDEF) file, based on the requirements in Section 01 32 01.00 10 PROJECT SCHEDULE.

1.6.6 Closeout

Closeout documents, processes and forms are managed and tracked in RMS by both the Contractor and the Government. Ensure that all closeout documents are entered, completed and documented within RMS.

1.7 IMPLEMENTATION

Use of RMS as described in the preceding paragraphs is mandatory. Ensure that sufficient resources are available to maintain contract data within the RMS system. RMS is an integral part of the Contractor's required management of quality control.

1.8 NOTIFICATION OF NONCOMPLIANCE

Take corrective action within seven calendar days after receipt of notice of RMS non-compliance by the Contracting Officer.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 01 50 00

TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS
11/20, CHG 3: 08/24

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN WATER WORKS ASSOCIATION (AWWA)

AWWA C511	(2017; R 2021) Reduced-Pressure Principle Backflow Prevention Assembly

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

FCCCHR List	(continuously updated) List of Approved Backflow Prevention Assemblies

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(2023; ERTA 1 2024; TIA 24-1) National Electrical Code
NFPA 241	(2022) Standard for Safeguarding Construction, Alteration, and Demolition Operations

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2024) Safety -- Safety and Occupational Health (SOH) Requirements

U.S. FEDERAL HIGHWAY ADMINISTRATION (FHWA)

MUTCD	(2009; Rev 2012) Manual on Uniform Traffic Control Devices

1.2 SUBMITTALS

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Construction Site Plan; G, RO

Traffic Control Plan; G, RO

Haul Road Plan; G, RO

Contractor Computer Cybersecurity Compliance Statements; G, RO

Contractor Temporary Network Cybersecurity Compliance Statements; G,RO

SD-06 Test Reports

Backflow Preventer Tests

SD-07 Certificates

Backflow Tester Certification

Backflow Preventers Certificate of Full Approval

1.3 CONSTRUCTION SITE PLAN

Prior to the start of work, submit for Government approval a site plan showing the locations and dimensions of temporary facilities (including layouts and details, equipment and material storage area (onsite and offsite), and access and haul routes, avenues of ingress/egress to the fenced area and details of the fence installation. Identify any areas which may have to be graveled to prevent the tracking of mud. Indicate if the use of a supplemental or other staging area is desired. Show locations of safety and construction fences, site trailers, construction entrances, trash dumpsters, temporary sanitary facilities, and worker parking areas.

1.4 BACKFLOW PREVENTERS CERTIFICATE

1.4.1 Backflow Tester Certificate

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

1.4.2 Backflow Prevention Training Certificate

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

1.5 DOD CONDITION OF READINESS (COR)

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

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

Unless otherwise directed by the Contracting Officer, comply with:

a. Condition FOUR (Sustained winds of 58 mph or greater expected within 72 hours): Normal daily jobsite cleanup and good housekeeping practices. Collect and store in piles or containers scrap lumber,

waste material, and rubbish for removal and disposal at the close of each work day. Maintain the construction site including storage areas, free of accumulation of debris. Stack form lumber in neat piles less than 3.3 feet high. Remove all debris, trash, or objects that could become missile hazards. Review requirements pertaining to "Condition THREE" and continue action as necessary to attain "Condition FOUR" readiness. Contact Contracting Officer for weather and COR updates and completion of required actions.

b. Condition THREE (Sustained winds of 58 mph or greater expected within 48 hours): Maintain "Condition FOUR" requirements and commence securing operations necessary for "Condition ONE" which cannot be completed within 18 hours. Cease all routine activities which might interfere with securing operations. Commence securing and stow all gear and portable equipment. Make preparations for securing buildings. Reinforce or remove formwork and scaffolding. Secure machinery, tools, equipment, materials, or remove from the jobsite. Expend every effort to clear all missile hazards and loose equipment from general base areas. Contact Contracting Officer for weather and COR updates and completion of required actions. Review requirements pertaining to "Condition TWO" and continue action as necessary to attain "Condition THREE" readiness.

c. Condition TWO (Sustained winds of 58 mph or greater expected within 24 hours): Secure the jobsite, and leave Government premises.

d. Condition ONE. (Sustained winds of 58 mph or greater expected within 12 hours): Contractor access to the jobsite and Government premises is prohibited.

1.6 CYBERSECURITY DURING CONSTRUCTION

{For Reference Only: This subpart (and its subparts) relates to AC-18, SA-3, CCI-00258.} Meet the following requirements throughout the construction process.

1.6.1 Contractor Computer Equipment

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

1.6.1.1 Operating System

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

1.6.1.2 Anti-Malware Software

The computer must run anti-malware software from a reputable software manufacturer. Anti-malware software must be a version currently supported by the software manufacturer, must be current on all patches and updates, and must use the latest definitions file. All computers used on this project must be scanned using the installed software at least once per day.

1.6.1.3 Passwords and Passphrases

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

1.6.1.4 Contractor Computer Cybersecurity Compliance Statements

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

1.6.2 Temporary IP Networks

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

1.6.2.1 Network Boundaries and Connections

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

1.6.3 Government Access to Network

Government personnel, as defined, prescribed, and identified by the Contracting Officer, must be allowed to have complete and immediate access to the network at any time in order to verify compliance with this specification. Or if there is a Government agency that's responsible, identify that agency.

1.6.4 Temporary Wireless IP Networks

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

1.6.4.1 Contractor Provided Wi-Fi Network

Provide standalone Wi-Fi network for authorized Government personnel. Network access must be available throughout the jobsite and for the entire Contract period. The Government will use the Wi-Fi service for coordination in the field and related activities. Do not attach or connect the temporary Wi-Fi network to Government networks or systems unrelated to construction activities.

Password information must adhere to requirements outlined in Paragraph PASSWORDS AND PASSPHRASES. Provide password and Wi-Fi network name (SSID) to the Contracting Officer for Government personnel access. Wi-Fi performance must be capable of handling bandwidth to support Government and Contractor activities, including drawing and model access onsite. Provide a point of contact for reporting Wi-Fi outages.

1.6.4.2 Temporary Wireless IP Networks Security

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

1.6.5 Passwords and Passphrases

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

1.6.6 Contractor Temporary Network Cybersecurity Compliance Statements

Provide a single submittal containing completed Contractor Temporary Network Cybersecurity Compliance Statements for each company implementing a temporary IP network. Contractor Temporary Network Cybersecurity Compliance Statements must use the template published at https://www.wbdg.org/dod/ufgs/ufgs-forms-graphics-tables. Each Statement must be signed by a cybersecurity representative for the relevant company. If no temporary IP networks will be used, provide a single copy of the Statement indicating this.

PART 2 PRODUCTS

2.1 TEMPORARY SIGNAGE

2.1.1 Bulletin Board

Within one calendar day of mobilization on site and prior to the commencement of work activities, provide a clear weatherproof covered bulletin board not less than 36 by 48 inches in size for displaying the Equal Employment Opportunity poster, a copy of the wage decision contained in the Contract, Wage Rate Information poster, Safety and Health Information as required by EM 385-1-1 and other information approved by the Contracting Officer. Coordinate requirements herein with 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS. Locate the bulletin board at the project site in a conspicuous place easily accessible to all employees, and in location as approved by the Contracting Officer.

2.1.2 Project Identification Signs

The requirements for the signs, their content, and location are as indicated and as specified in Section 01 58 00 PROJECT IDENTIFICATION. Erect signs within 15 days after receipt of the notice to proceed. Correct the data required by the safety sign daily, with light colored metallic or non-metallic numerals.

2.1.3 Warning Signs

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

designating the construction site as a hard hat area.

2.2 TEMPORARY TRAFFIC CONTROL

2.2.1 Haul Roads

Construct access and haul roads necessary for proper prosecution of the work under this Contract in accordance with EM 385-1-1. Construct with suitable grades and widths; avoid sharp curves, blind corners, and dangerous cross traffic. Submit haul road plan for approval. Provide necessary lighting, signs, barricades, and distinctive markings for the safe movement of traffic. The method of dust control, although optional, must be adequate to ensure safe operation at all times. Location, grade, width, and alignment of construction and haul roads are subject to approval by the Contracting Officer. Lighting must be adequate to assure full and clear visibility for full width of haul road and work areas during any night work operations.

2.2.2 Barricades

Erect and maintain temporary barricades to limit public access to hazardous areas. Barricades are required whenever safe public access to paved areas such as roads, parking areas or sidewalks is prevented by construction activities or as otherwise necessary to ensure the safety of both pedestrian and vehicular traffic. Securely place barricades clearly visible with adequate illumination to provide sufficient visual warning of the hazard during both day and night.

2.3 FENCING

Provide fencing along the construction site and at all open excavations and tunnels to control access by unauthorized personnel. Safety fencing must be highly visible to be seen by pedestrians and vehicular traffic. All fencing must meet the requirements of EM 385-1-1. Remove the fence upon completion and acceptance of the work.

2.3.1 Polyethylene Mesh Safety Fencing

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

2.3.2 Post-Driven Chain Link Fencing

Temporary post-driven fencing must be galvanized chain link fencing 8 feet high supported by an tightly secured to galvanized steel posts driven below grade. Fence posts must be located on minimum 10 foot centers. Posts may be set in various surfaces such as sand, soil, asphalt or concrete as necessary. Chain link fencing must remain rigid and taut with a minimum of 200 pounds of force exerted on it from any direction with less than 4 inches of deflection. Completely remove fencing and posts at the completion of construction and restore surfaces disturbed or damaged to its original condition. Locate and identify underground utilities prior to setting fence posts. Equip fence with a lockable gate. Gate must remain locked when construction personnel are not present.

2.4 TEMPORARY WIRING

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

2.5 BACKFLOW PREVENTERS

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

Reduced pressure principle type conforming to the applicable requirements AWWA C511. Provide backflow preventers complete with 150 pound flanged cast iron, mounted gate valve and strainer, 304 stainless steel or bronze, internal parts.

PART 3 EXECUTION

3.1 EMPLOYEE PARKING

Construction Contract employees must park privately owned vehicles in an area designated by the Contracting Officer. This area will be within reasonable walking distance of the construction site. Employee parking must not interfere with existing and established parking requirements of the Government installation.

3.2 AVAILABILITY AND USE OF UTILITY SERVICES

3.2.1 Temporary Utilities

Provide temporary utilities required for construction. Materials may be new or used, must be adequate for the required usage, not create unsafe conditions, and not violate applicable codes and standards.

3.2.2 Sanitation

Provide and maintain within the construction area minimum field-type sanitary facilities in accordance with EM 385-1-1. Locate the facilities behind the construction fence or out of the public view. Clean units and empty wastes at least once a week or more frequently into a municipal, district, or station sanitary sewage system, or remove waste to a commercial facility. Obtain approval from the system owner prior to discharge into a municipal, district, or commercial sanitary sewer system. Penalties or fines associated with improper discharge will be the responsibility of the Contractor. Coordinate with the Contracting Officer and follow station regulations and procedures when discharging into the station sanitary sewer system. Maintain these conveniences at all times. Include provisions for pest control and elimination of odors. Government toilet facilities will not be available to Contractor's personnel.

3.2.3 Telephone

Make arrangements and pay all costs for telephone facilities desired.

3.2.4 Fire Protection

Provide temporary fire protection equipment for the protection of personnel and property during construction. Remove debris and flammable materials weekly to minimize potential hazards.

3.3 TRAFFIC PROVISIONS

3.3.1 Maintenance of Traffic

a. Conduct operations in a manner that will not close a thoroughfare or interfere with traffic on railways or highways except with written permission of the Contracting Officer at least 15 calendar days prior to the proposed modification date, and provide a Traffic Control Plan for Government approval detailing the proposed controls to traffic movement for approval. The plan must be in accordance with State and local regulations and the MUTCD, Part VI. Make all notifications and obtain all permits required for modification to traffic movements outside Station's jurisdiction. Contractor may move oversized and slow-moving vehicles to the worksite provided requirements of the highway authority have been met.

b. Conduct work so as to minimize obstruction of traffic, and maintain traffic on at least half of the roadway width at all times. Obtain approval from the Contracting Officer prior to starting any activity that will obstruct traffic.

c. Provide, erect, and maintain, at Contractor's expense, lights, barriers, signals, passageways, detours, and other items, that may be required by the Life Safety Signage, overhead protection authority having jurisdiction.

d. Provide cones, signs, barricades, lights, or other traffic control devices and personnel required to control traffic. Do not use foil-backed material for temporary pavement marking because of its potential to conduct electricity during accidents involving downed power lines.

3.3.2 Protection of Traffic

Maintain and protect traffic on all affected roads during the construction period except as otherwise specifically directed by the Contracting Officer. Measures for the protection and diversion of traffic, including the provision of watchmen and flagmen, erection of barricades, placing of lights around and in front of equipment the work, and the erection and maintenance of adequate warning, danger, and direction signs, will be as required by the State and local authorities having jurisdiction. Provide self-illuminated (lighted) barricades during hours of darkness. Brightly-colored (orange) vests are required for all personnel working in roadways. Protect the traveling public from damage to person and property. Minimize the interference with public traffic on roads selected for hauling material to and from the site. Investigate the adequacy of existing roads and their allowable load limit. Contractor is responsible for the repair of damage to roads caused by construction operations.

3.3.3 Rush Hour Restrictions

Do not interfere with the peak traffic flows preceding and during normal operations without notification to and approval by the Contracting

Officer. The peak traffic flows at the main gate are Monday-Friday from 0600-0830 hours.

3.3.4 Dust Control

Dust control methods and procedures must be approved by the Contracting Officer. Coordinate dust control methods with 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS.

3.4 REDUCED PRESSURE BACKFLOW PREVENTERS

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

Perform backflow preventer tests using test equipment, procedures, and certification forms conforming to those outlined in the latest edition of the Manual of Cross-Connection Control published by the FCCCHR Manual. Test and tag each reduced pressure backflow preventer upon initial installation (prior to continued water use) and quarterly monthly thereafter. Tag must contain the following information: make, model, serial number, dates of tests, results, maintenance performed, and signature of tester. Record test results on certification forms conforming to requirements cited earlier in this paragraph.

3.5 CONTRACTOR'S TEMPORARY FACILITIES

Contractor-owned or -leased trailers must be identified by Government assigned numbers. Size and location of the number will comply with installation requirements. Apply the number to the trailer within 14 calendar days of notification, or sooner, if directed by the Government. Temporary facilities must meet requirements as identified in EM 385-1-1.

Contractor is responsible for security of their property. Contractor is responsible to provide adequate outside security lighting at the temporary facilities and effectively maintains a secure environment for facilities and property. Implement security measures including perimeter fencing, well-lit exteriors, window bars where appropriate, and door locks. This multi-layered approach, ensures continuous oversight and a secure work environment for both contractor and government personnel during operational hours while effectively restricting access after hours. This allows for free movement within the facilities during the workday while maintaining a high level of security. Trailers must be anchored to resist high winds and meet applicable state or local standards for anchoring mobile trailers. Coordinate anchoring with EM 385-1-1. The Contract Clause entitled "FAR 52.236-10, Operations and Storage Areas" and the following apply:

3.5.1 Administrative Field Offices

Provide and maintain administrative field office facilities within the construction area at the designated site. Government office and warehouse facilities will not be available to the Contractor's personnel.

3.5.2 Storage Area

Construct a temporary 6 foot high chain link fence around trailers and materials. Include plastic strip inserts, colored green, so that visibility through the fence is obstructed. Fence posts may be driven, in

lieu of concrete bases, where soil conditions permit. Do not place or store trailers, materials, or equipment outside the fenced area unless such trailers, materials, or equipment are assigned a separate and distinct storage area by the Contracting Officer away from the vicinity of the construction site but within the installation boundaries. Trailers, equipment, or materials must not be open to public view with the exception of those items which are in support of ongoing work on the current day. Do not stockpile materials outside the fence in preparation for the next day's work. Park mobile equipment, such as tractors, wheeled lifting equipment, cranes, trucks, and like equipment within the fenced area at the end of each work day.

Keep fencing in a state of good repair and proper alignment. If the Contractor elects to traverse grassed or unpaved areas which are not established roadways with construction equipment or other vehicles, cover the grassed or unpaved areas with a layer of gravel as necessary to prevent rutting and the tracking of mud onto paved or established roadways; gravel gradation must be at the Contractor's discretion.. Mow and maintain grass located within the boundaries of the construction site for the duration of the project. Grass and vegetation along fences, structures, under trailers, and in areas not accessible to mowers must be edged or trimmed neatly.

3.5.3 Supplemental Storage Area

Upon request, and pending availability, the Contracting Officer will designate another or supplemental area for the use and storage of trailers, equipment, and materials. This area may not be in close proximity of the construction site but will be within the installation boundaries. Maintain the area in a clean and orderly fashion and secured if needed to protect supplies and equipment. Utilities will not be provided to this area by the Government.

3.5.4 Appearance of Trailers

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

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

3.5.5 Safety Systems

Protect the integrity of all installed safety systems or personnel safety devices. Obtain prior approval from the Contracting Officer if entrance into systems serving safety devices is required. If it is temporarily necessary to remove or disable personnel safety devices in order to accomplish Contract requirements, provide alternative means of protection prior to removing or disabling any permanently installed safety devices or equipment and obtain approval from the Contracting Officer.

3.5.6 Weather Protection of Temporary Facilities and Stored Materials

Take necessary precautions to ensure that roof openings and other critical openings in the building are monitored carefully. Take immediate actions required to seal off such openings when rain or other detrimental weather

is imminent, and at the end of each workday. Ensure that the openings are completely sealed off to protect materials and equipment in the building from damage.

3.5.6.1 Building and Site Storm Protection

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

3.6 PLANT COMMUNICATIONS

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

3.7 TEMPORARY PROJECT SAFETY FENCING

As soon as practicable, but not later than 15 days after the date established for commencement of work, furnish and erect temporary project safety fencing at the work site. Maintain the safety fencing during the life of the Contract and, upon completion and acceptance of the work, remove from the work site.

3.8 CLEANUP

Remove construction debris, waste materials, packaging material and the like from the work site daily. Any dirt or mud which is tracked onto paved or surfaced roadways must be cleaned away. Store all salvageable materials resulting from demolition activities within the fenced area described above or at the supplemental storage area. Neatly stack stored materials not in trailers, whether new or salvaged.

3.9 RESTORATION OF STORAGE AREA

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

-- End of Section --

SECTION 01 57 19

TEMPORARY ENVIRONMENTAL CONTROLS
08/22, CHG 1: 05/25

PART 1 GENERAL

1.1 REFERENCES

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

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

29 CFR 1910.1053	Respirable Crystalline Silica
29 CFR 1910.1200	Hazard Communication
29 CFR 1926.1153	Respirable Crystalline Silica
40 CFR 50	National Primary and Secondary Ambient Air Quality Standards
40 CFR 60	Standards of Performance for New Stationary Sources
40 CFR 63	National Emission Standards for Hazardous Air Pollutants for Source Categories
40 CFR 64	Compliance Assurance Monitoring
40 CFR 82	Protection of Stratospheric Ozone
40 CFR 112	Oil Pollution Prevention
40 CFR 122.26	Storm Water Discharges (Applicable to State NPDES Programs, see section 123.25)
40 CFR 152	Pesticide Registration and Classification Procedures
40 CFR 241	Guidelines for Disposal of Solid Waste
40 CFR 243	Guidelines for the Storage and Collection of Residential, Commercial, and Institutional Solid Waste
40 CFR 258	Subtitle D Landfill Requirements
40 CFR 260	Hazardous Waste Management System: General
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 261.7	Residues of Hazardous Waste in Empty Containers

40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 262.11	Hazardous Waste Determination and Recordkeeping
40 CFR 263	Standards Applicable to Transporters of Hazardous Waste
40 CFR 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 265	Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 266	Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities
40 CFR 268	Land Disposal Restrictions
40 CFR 273	Standards for Universal Waste Management
40 CFR 273.2	Standards for Universal Waste Management - Batteries
40 CFR 273.3	Standards for Universal Waste Management - Pesticides
40 CFR 273.4	Standards for Universal Waste Management - Mercury Containing Equipment
40 CFR 273.5	Standards for Universal Waste Management - Lamps
40 CFR 273.6	Applicability - Aerosol Cans
40 CFR 279	Standards for the Management of Used Oil
40 CFR 300	National Oil and Hazardous Substances Pollution Contingency Plan
40 CFR 300.125	National Oil and Hazardous Substances Pollution Contingency Plan - Notification and Communications
40 CFR 355	Emergency Planning and Notification
40 CFR 372	Toxic Chemical Release Reporting
40 CFR 403	General Pretreatment Regulations for Existing and New Sources of Pollution
40 CFR 745	Lead-Based Paint Poisoning Prevention in Certain Residential Structures
49 CFR 171	General Information, Regulations, and

	Definitions
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
49 CFR 173	Shippers - General Requirements for Shipments and Packagings
49 CFR 178	Specifications for Packagings

1.2 DEFINITIONS

1.2.1 Class I and II Ozone Depleting Substance (ODS)

Class I ODS is defined in Section 602(a) of The Clean Air Act. A list of Class I ODS can be found on the EPA website at the following weblink. https://www.epa.gov/ozone-layer-protection/ozone-depleting-substances.

Class II ODS is defined in Section 602(s) of The Clean Air Act. A list of Class II ODS can be found on the EPA website at the following weblink. https://www.epa.gov/ozone-layer-protection/ozone-depleting-substances.

1.2.2 Contractor Generated Hazardous Waste

Contractor generated hazardous waste is materials that, if abandoned or disposed of, may meet the definition of a hazardous waste. These waste streams would typically consist of material brought on site by the Contractor to execute work, but are not fully consumed during the course of construction. Examples include, but are not limited to, excess paint thinners (i.e., methyl ethyl ketone, toluene), waste thinners, excess paints, excess solvents, waste solvents, excess pesticides, and contaminated pesticide equipment rinse water.

1.2.3 Electronics Waste

Electronics waste is discarded electronic devices intended for salvage, recycling, or disposal.

1.2.4 Environmental Pollution and Damage

Environmental pollution and damage is the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade the environment aesthetically, culturally or historically.

1.2.5 Environmental Protection

Environmental protection is the prevention/control of pollution and habitat disruption that may occur to the environment during construction. The control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.2.6 Hazardous Debris

As defined in paragraph SOLID WASTE, debris that contains listed hazardous waste (either on the debris surface, or in its interstices, such as pore structure) in accordance with 40 CFR 261. Hazardous debris also includes debris that exhibits a characteristic of hazardous waste in accordance with 40 CFR 261.

1.2.7 Hazardous Materials

Hazardous material is any material that: Is defined in 49 CFR 171, listed in 49 CFR 172, regulated as a hazardous material in accordance with 49 CFR 173; or requires a Safety Data Sheet (SDS) in accordance with 29 CFR 1910.1200; or during end use, treatment, handling, packaging, storage, transportation, or disposal meets or has components that meet or have potential to meet the definition of a hazardous waste as defined by 40 CFR 261 Subparts A, B, C, or D. Designation of a material by this definition, when separately regulated or controlled by other sections or directives, does not eliminate the need for adherence to that hazard-specific guidance which takes precedence over this section for "control" purposes. Such material includes ammunition, weapons, explosive actuated devices, propellants, pyrotechnics, chemical and biological warfare materials, medical and pharmaceutical supplies, medical waste and infectious materials, bulk fuels, radioactive materials, and other materials such as asbestos, mercury, and polychlorinated biphenyls (PCBs).

1.2.8 Hazardous Waste

Hazardous Waste is any material that meets the definition of a solid waste and exhibits a hazardous characteristic (ignitability, corrosivity, reactivity, or toxicity) as specified in 40 CFR 261, Subpart C, or contains a listed hazardous waste as identified in 40 CFR 261, Subpart D, or meets a state, local, or host nation definition of a hazardous waste.

1.2.9 Installation Pest Management Coordinator

Installation Pest Management Coordinator (IPMC) is the individual officially designated by the Installation Commander to oversee the Installation Pest Management Program and the Installation Pest Management Plan.

1.2.10 Land Application

Land Application means spreading or spraying discharge water at a rate that allows the water to percolate into the soil. No sheeting action, soil erosion, discharge into storm sewers, discharge into defined drainage areas, or discharge into the "waters of the United States" must occur. Comply with federal, state, and local laws and regulations.

1.2.11 Municipal Separate Storm Sewer System (MS4) Permit

MS4 permits are those held by municipalities or installations to obtain NPDES permit coverage for their stormwater discharges.

1.2.12 National Pollutant Discharge Elimination System (NPDES)

The NPDES permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States.

1.2.13 Oily Waste

Oily waste are those materials that are, or were, mixed with Petroleum, Oils, and Lubricants (POLs) and have become separated from that POLs. Oily wastes also means materials, including wastewaters, centrifuge solids, filter residues or sludges, bottom sediments, tank bottoms, and sorbents which have come into contact with and have been contaminated by, POLs and may be appropriately tested and discarded in a manner which is in compliance with other state and local requirements.

This definition includes materials such as oily rags, "kitty litter" sorbent clay and organic sorbent material. These materials may be land filled provided that: It is not prohibited in other state regulations or local ordinances; the amount generated is "de minimus" (a small amount); it is the result of minor leaks or spills resulting from normal process operations; and free-flowing oil has been removed to the practicable extent possible. Large quantities of this material, generated as a result of a major spill or in lieu of proper maintenance of the processing equipment, are a solid waste. As a solid waste, perform a hazardous waste determination prior to disposal. As this can be an expensive process, it is recommended that this type of waste be minimized through good housekeeping practices and employee education.

1.2.14 Pesticide

Comply with EMP 4.4.6.16 Contracting Environmental Special Conditions (Attachment B)for guidance

Pesticide is any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest, or intended for use as a plant regulator, defoliant or desiccant.

1.2.15 Pesticide Treatment Plan

A plan for the prevention, monitoring, and control to eliminate pest infestation.

1.2.16 Pests

Pests are arthropods, birds, rodents, nematodes, fungi, bacteria, viruses, algae, snails, marine borers, snakes, weeds and other organisms (except for human or animal disease-causing organisms) that adversely affect readiness, military operations, or the well-being of personnel and animals; attack or damage real property, supplies, equipment, or vegetation; or are otherwise undesirable.

1.2.17 Project Pesticide Coordinator

The Project Pesticide Coordinator (PPC) is an individual who resides at a Civil Works Project office and who is responsible overseeing of pesticide application on project grounds.

1.2.18 Regulated Waste

Regulated waste are solid wastes that have specific additional federal, state, or local controls for handling, storage, or disposal.

1.2.19 Sediment

Sediment is soil and other debris that have eroded and have been transported by runoff water or wind.

1.2.20 Solid Waste

Solid waste is a solid, liquid, semi-solid or contained gaseous waste. A solid waste can be a hazardous waste, non-hazardous waste, or non-Resource Conservation and Recovery Act (RCRA) regulated waste. Types of solid waste typically generated at construction sites may include:

1.2.20.1 Debris

Debris is non-hazardous solid material generated during the construction, demolition, or renovation of a structure that exceeds 2.5-inch particle size that is: a manufactured object; plant or animal matter; or natural geologic material (for example, cobbles and boulders), broken or removed concrete, masonry, and rock asphalt paving; ceramics; roofing paper and shingles. Inert materials may not be reinforced with or contain ferrous wire, rods, accessories and weldments. A mixture of debris and other material such as soil or sludge is also subject to regulation as debris if the mixture is comprised primarily of debris by volume, based on visual inspection.

1.2.20.2 Green Waste

Green waste is the vegetative matter from landscaping, land clearing and grubbing, including, but not limited to, grass, bushes, scrubs, small trees and saplings, tree stumps and plant roots. Marketable trees, grasses and plants that are indicated to remain, be re-located, or be re-used are not included.

1.2.20.3 Material Not Regulated As Solid Waste

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

1.2.20.4 Non-Hazardous Waste

Non-hazardous waste is waste that is excluded from, or does not meet, hazardous waste criteria in accordance with 40 CFR 261.

1.2.20.5 Recyclables

Recyclables are materials, equipment and assemblies such as doors, windows, door and window frames, plumbing fixtures, glazing and mirrors that are recovered and sold as recyclable, wiring, insulated/non-insulated copper wire cable, wire rope, and structural components. It also includes commercial-grade refrigeration equipment with Freon removed, household appliances where the basic material content is metal, clean polyethylene terephthalate bottles, cooking oil, used fuel oil, textiles, high-grade paper products and corrugated cardboard, stackable pallets in good condition, clean crating material, and clean rubber/vehicle tires. Metal meeting the definition of "lead contaminated" or "lead based paint

contaminated" may be included as recyclable only if the metal is handled and transported in accordance with regulations, and the facility receiving the material is permitted and authorized to accept and process lead contaminated materials. Paint cans that meet the definition of empty containers in accordance with 40 CFR 261.7 may be included as recyclable if sold to a scrap metal company.

1.2.20.6 Surplus Soil

Surplus soil is existing soil that is in excess of what is required for this work, including aggregates intended, but not used, for on-site mixing of concrete, mortars, and paving. Contaminated soil meeting the definition of hazardous material or hazardous waste is not included and must be managed in accordance with paragraph HAZARDOUS MATERIAL MANAGEMENT.

1.2.20.7 Scrap Metal

This includes scrap and excess ferrous and non-ferrous metals such as reinforcing steel, structural shapes, pipe, and wire that are recovered or collected and disposed of as scrap. Scrap metal meeting the definition of hazardous material or hazardous waste is not included.

1.2.20.8 Wood

Wood is dimension and non-dimension lumber, plywood, chipboard, hardboard. Treated or painted wood that meets the definition of lead contaminated or lead based contaminated paint is not included. Treated wood includes, but is not limited to, lumber, utility poles, crossties, and other wood products with chemical treatment.

1.2.21 Surface Discharge

Surface discharge means discharge of water into drainage ditches, storm sewers, or creeks meeting the definition of "waters of the United States". Surface discharges from construction sites are discrete, identifiable sources and require a permit from the governing agency. Comply with federal, state, and local laws and regulations.

1.2.22 Wastewater

Wastewater is the used water and solids that flow through a sanitary sewer to a treatment plant.

1.2.22.1 Stormwater

Stormwater is any precipitation in an urban or suburban area that does not evaporate or soak into the ground, but instead collects and flows into storm drains, rivers, and streams.

1.2.23 Waters of the United States

Waters of the United States means Federally jurisdictional waters, including wetlands, that are subject to regulation under Section 404 of the Clean Water Act or navigable waters, as defined under the Rivers and Harbors Act.

1.2.24 Wetlands

Wetlands are those areas that are inundated or saturated by surface or

groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

1.2.25 Universal Waste

The universal waste regulations streamline collection requirements for certain hazardous wastes in the following categories: batteries, pesticides, mercury-containing equipment (for example, thermostats), and lamps (for example, fluorescent bulbs). The rule is designed to reduce hazardous waste in the municipal solid waste (MSW) stream by making it easier for universal waste handlers to collect these items and send them for recycling or proper disposal. These regulations can be found at 40 CFR 273.

1.2.26 Critical Root Zone (CRZ)

The critical root zone is the area around and under a tree where the majority of its roots are located. The CRZ is usually measured as a circle with a radius of 1.5 foot for every inch of the tree's diameter at breast height (DBH), and a depth of 24 inches.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Preconstruction Survey

Regulatory Notifications; G, RO

Environmental Manager Qualifications; G, RO

Employee Training Records; G, RO

Environmental Protection Plan; G, RO

Dirt and Dust Control Plan; G, RO

Solid Waste Management Permit; G, RO

Stormwater Pollution Prevention Plan (SWPPP); G, RO

Stormwater Notice of Intent (for NPDES coverage under the general permit for construction activities); G, RO

Spill Prevention Control And Countermeasure (SPCC) Plan; G, RO

SD-06 Test Reports

Monthly Solid Waste Disposal Report; G, RO

Inspection Reports

SD-07 Certificates

Employee Training Records; G, RO

Erosion and Sediment Control Inspector Qualifications

Certificate of Competency

SD-11 Closeout Submittals
Regulatory Notifications; G, RO

Assembled Employee Training Records; G, RO

Solid Waste Management Permit; G, RO

Stormwater Pollution Prevention Plan Compliance Notebook; G, RO

Stormwater Notice of Termination (for NPDES coverage under the general permit for construction activities); G, RO

As-Built Topographic Survey

Waste Determination Documentation; G, RO

Project Solid Waste Disposal Documentation Report; G, RO

Sales Documentation; G, RO

Contractor Certification

Hazardous Waste/Debris Management; G, RO

Disposal Documentation for Hazardous and Regulated Waste; G, RO

1.4 ENVIRONMENTAL PROTECTION REQUIREMENTS

Comply with EMP 4.4.6.16 Contracting Environmental Special Conditions (Attachment B)for guidance

Provide and maintain, during the life of the contract, environmental protection as defined. Plan for and provide environmental protective measures to control pollution that develops during construction practice. Plan for and provide environmental protective measures required to correct conditions that develop during the construction of permanent or temporary environmental features associated with the project. Protect the environmental resources within the project boundaries and those affected outside the limits of permanent work during the entire duration of this Contract. Comply with federal, state, and local regulations pertaining to the environment, including water, air, solid waste, hazardous waste and substances, oily substances, and noise pollution.

Tests and procedures assessing whether construction operations comply with Applicable Environmental Laws may be required. Analytical work must be performed by qualified laboratories; and where required by law, the laboratories must be certified.

1.4.1 Conformance with the Environmental Management Procedure (EMP)

Comply with EMP 4.4.6.16 Contracting Environmental Special Conditions (Attachment B)for guidance

Perform work under this contract consistent with the policy and objectives identified in the installation's Environmental Management Procedure (EMP). Perform work in a manner that conforms to objectives and targets of the environmental programs and operational controls identified by the EMP. Support Government personnel when environmental compliance and EMP audits are conducted by escorting auditors at the Project site, answering questions, and providing proof of records being maintained. Provide monitoring and measurement information as necessary to address environmental performance relative to environmental, energy, and transportation management goals. In the event an EMP nonconformance or environmental noncompliance associated with the contracted services, tasks, or actions occurs, take corrective and preventative actions. In addition, employees must be aware of their roles and responsibilities under the installation EMP and of how these EMP roles and responsibilities affect work performed under the contract.

Coordinate with the installation's EMP coordinator to identify training needs associated with environmental aspects and the EMP, and arrange training or take other action to meet these needs. Provide training documentation to the Contracting Officer. The Installation Environmental Office will retain associated environmental compliance records. Make EMP Awareness training completion certificates available to Government auditors during EMP audits and include the certificates in the Employee Training Records. See paragraph EMPLOYEE TRAINING RECORDS.

1.4.2 Special Base Wide Requirements

Refer to Section 01 14 00, Appendix A for specific base wide waste management requirements. Appendix A should be considered basic requirements for the project. Other requirements in the Specification documents are in addition to the requirements in Appendix A.

1.4.3 Special Environmental Requirements

Comply with the special environmental requirements as outlined in Attachment B of the 4.4.6.16 JBLE-Eustis Environmental Management Procedure. (EMP)
https://www.jble.af.mil/About-Us/Units/Ft-Eustis/Eustis-Environmental/EMPs/

1.5 QUALITY ASSURANCE

1.5.1 Preconstruction Survey and Protection of Features

This paragraph supplements the Contract Clause PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS. Prior to start of any onsite construction activities, perform a Preconstruction Survey of the project site with the Contracting Officer, and take photographs showing existing environmental conditions in and adjacent to the site. Submit a report for the record. Include in the report a plan describing the features requiring protection under the provisions of the Contract Clauses, which are not specifically identified on the drawings as environmental features requiring protection along with the condition of trees, shrubs and grassed areas immediately adjacent to the site of work and adjacent to the Contractor's assigned storage area and access

route(s), as applicable. The Contractor and the Contracting Officer or the COR will sign this survey report upon mutual agreement regarding its accuracy and completeness. Protect those environmental features included in the survey report and any indicated on the drawings, regardless of interference that their preservation may cause to the work under the Contract.

1.5.2 Regulatory Notifications

Provide regulatory notification requirements in accordance with federal, state and local regulations. In cases where the Government will also provide public notification (such as stormwater permitting), coordinate with the Contracting Officer. Submit copies of regulatory notifications to the Contracting Officer at least 14 days prior to commencement of work activities. Typically, regulatory notifications must be provided for the following (this listing is not all-inclusive): demolition, renovation, NPDES defined site work, construction, removal or use of a permitted air emissions source, and remediation of controlled substances (asbestos, hazardous waste, lead paint).

1.5.3 Environmental Brief

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

Prior to initiating any work on site, meet with the Contracting Officer and installation Environmental Office to discuss the proposed Environmental Protection Plan (EPP) or equipment local requirement. Develop a mutual understanding relative to the details of environmental protection, including measures for protecting natural and cultural resources, required reports, required permits, permit requirements (such as mitigation measures), and other measures to be taken.

1.5.4 Environmental Manager

Appoint in writing an Environmental Manager for the project site. The Environmental Manager is directly responsible for coordinating contractor compliance with federal, state, local, and installation requirements. The Environmental Manager must ensure compliance with Hazardous Waste Program requirements (including hazardous waste handling, storage, manifesting, and disposal); implement the EPP; ensure environmental permits are obtained, maintained, and closed out; ensure compliance with Stormwater Program requirements; ensure compliance with Hazardous Materials (storage, handling, and reporting) requirements; and coordinate any remediation of regulated substances (lead, asbestos, PCB transformers). This can be a collateral position; however, the person in this position must be trained to adequately accomplish the following duties: ensure waste segregation and storage compatibility requirements are met; inspect and manage Satellite Accumulation areas; ensure only authorized personnel add wastes to containers; ensure Contractor personnel are trained in 40 CFR requirements in accordance with their position requirements; coordinate removal of waste containers; and maintain the Environmental Records binder and required documentation, including environmental permits compliance and close-out. Submit Environmental Manager Qualifications to the Contracting Officer.

1.5.5 Employee Training Records

Prepare and maintain Employee Training Records throughout the term of the contract meeting applicable 40 CFR requirements. Provide Employee Training Records in the Environmental Records Binder. Submit these Assembled Employee Training Records to the Contracting Officer at the conclusion of the project, unless otherwise directed.

Train personnel to meet EPA and state requirements. Conduct environmental protection/pollution control meetings for personnel prior to commencing construction activities. Conduct additional meetings for new personnel and when site conditions change. Include in the training and meeting agenda: methods of detecting and avoiding pollution; familiarization with statutory and contractual pollution standards; installation and care of devices, vegetative covers, and instruments required for monitoring purposes to ensure adequate and continuous environmental protection/pollution control; anticipated hazardous or toxic chemicals or wastes, and other regulated contaminants; recognition and protection of archaeological sites, artifacts, waters of the United States, and endangered species and their habitat that are known to be in the area. Provide copy of the Erosion and Sediment Control Inspector Certification as required by the Commonwealth of Virginia.

1.5.5.1 Pest Control Training

Trained personnel in pest control. Conduct a pest control meeting for personnel prior to commencing construction activities. Conduct additional meetings for new personnel and when site conditions change. Include in the training and meeting agenda: methods of detecting and pest infestation; familiarization with statutory and contractual pest control standards; installation and care of devices, and instruments, if required, for monitoring purposes to ensure adequate and continuous pest control; anticipated hazardous or toxic chemicals or wastes, and other regulated contaminants; recognition and protection of waters of the United States, and endangered species and their habitat that are known to be in the area. Provide a Certificate of Competency for the personnel who will be conducting the pesticide application and management of pest control.

1.5.6 Non-Compliance Notifications

The Contracting Officer will notify the Contractor in writing of any observed noncompliance with federal, state or local environmental laws or regulations, permits, and other elements of the Contractor's EPP. After receipt of such notice, inform the Contracting Officer of the proposed corrective action and take such action when approved by the Contracting Officer. The Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. FAR 52.242-14 Suspension of Work provides that a suspension, delay, or interruption of work due to the fault or negligence of the Contractor allows for no adjustments to the contract for time extensions or equitable adjustments. In addition to a suspension of work, the Contracting Officer may use additional authorities under the contract or law.

1.6 ENVIRONMENTAL PROTECTION PLAN

Comply with EMP 4.4.6.16 Contracting Environmental Special Conditions (Attachment B)for guidance.

The purpose of the EPP is to present an overview of known or potential

environmental issues that must be considered and addressed during construction. Incorporate construction related objectives and targets from the installation's EMS into the EPP. Include in the EPP measures for protecting natural and cultural resources, required reports, and other measures to be taken. Meet with the Contracting Officer or Contracting Officer Representative to discuss the EPP and develop a mutual understanding relative to the details for environmental protection including measures for protecting natural resources, required reports, and other measures to be taken. Submit the EPP within 7 days after notice to proceed and not less than 7 days before the preconstruction meeting. Revise the EPP throughout the project to include any reporting requirements, changes in site conditions, or contract modifications that change the project scope of work in a way that could have an environmental impact. No requirement in this section will relieve the Contractor of any applicable federal, state, and local environmental protection laws and regulations. During Construction, identify, implement, and submit for approval any additional requirements to be included in the EPP. Maintain the current version onsite.

The EPP includes, but is not limited to, the following elements:

1.6.1 General Overview and Purpose

1.6.1.1 Descriptions

A brief description of each specific plan required by environmental permit or elsewhere in this Contract such as stormwater pollution prevention plan, spill control plan, solid waste management plan, wastewater management plan, air pollution control plan, contaminant prevention plan, pesticide treatment plan, Non-Hazardous Solid Waste Disposal Plan.

1.6.1.2 Duties

The duties and level of authority assigned to the person(s) on the job site who oversee environmental compliance, such as who is responsible for adherence to the EPP, who is responsible for spill cleanup and training personnel on spill response procedures, who is responsible for manifesting hazardous waste to be removed from the site (if applicable), and who is responsible for training the Contractor's environmental protection personnel.

1.6.1.3 Procedures

A copy of any standard or project-specific operating procedures that will be used to effectively manage and protect the environment on the project site.

1.6.1.4 Communications

Communication and training procedures that will be used to convey environmental management requirements to Contractor employees and subcontractors.

1.6.1.5 Contact Information

Emergency contact information contact information (office phone number, cell phone number, and e-mail address).

1.6.2 General Site Information

1.6.2.1 Drawings

Drawings showing locations of proposed temporary excavations or embankments for haul roads, stream crossings, jurisdictional wetlands, material storage areas, structures, sanitary facilities, storm drains and conveyances, and stockpiles of excess soil.

1.6.2.2 Work Area

Work area plan showing the proposed activity in each portion of the area and identify the areas of limited use or nonuse. Include measures for marking the limits of use areas, including methods for protection of features to be preserved within authorized work areas and methods to control runoff and to contain materials on site, and a traffic control plan.

Show where any fuels, hazardous substances, solvents, or lubricants will be stored. Provide a spill plan to address any releases of those materials.

1.6.2.3 Documentation

A letter signed by an officer of the firm appointing the Environmental Manager and stating that person is responsible for managing and implementing the Environmental Program as described in this contract. Include in this letter the Environmental Manager's authority to direct the removal and replacement of non-conforming work.

1.6.3 Management of Natural Resources

a. Land resources

b. Tree protection

c. Replacement of damaged landscape features

d. Temporary construction

e. Stream crossings

f. Fish and wildlife resources

g. Wetland areas

1.6.4 Protection of Historical and Archaeological Resources

a. Objectives

b. Methods

1.6.5 Stormwater Management and Control

a. Ground cover

b. Erodible soils

c. Temporary measures

(1) Structural Practices

(2) Temporary and permanent stabilization

d. Effective selection, implementation and maintenance of Best Management Practices (BMPs).

e. Stormwater Pollution Prevention Plan (SWPPP).

1.6.6 Protection of the Environment from Waste Derived from Contractor Operations

This item consist of the management procedures for hazardous waste to be generated. The elements of those procedures will coincide with the Installation Hazardous Waste Management Plan when within an installation. The Contracting Officer will provide a copy of the Installation Hazardous Waste Management Plan as applicable.

As a minimum, include the following:

a. List of the types of hazardous wastes expected to be generated

b. Procedures to ensure a written waste determination is made for appropriate wastes that are to be generated

c. Sampling/analysis plan, including laboratory method(s) that will be used for waste determinations and copies of relevant laboratory certifications

d. Methods and proposed locations for hazardous waste accumulation/storage (that is, in tanks or containers)

e. Management procedures for storage, labeling, transportation, and disposal of waste (treatment of waste is not allowed unless specifically noted)

f. Management procedures and regulatory documentation ensuring disposal of hazardous waste complies with Land Disposal Restrictions (40 CFR 268)

g. Management procedures for recyclable hazardous materials such as lead-acid batteries, used oil, and similar

h. Used oil management procedures in accordance with 40 CFR 279; Hazardous waste minimization procedures

i. Plans for the disposal of hazardous waste by permitted facilities; and Procedures to be employed to ensure required employee training records are maintained.

1.6.7 Prevention of Releases to the Environment

Procedures to prevent releases to the environment

Notifications in the event of a release to the environment

1.6.8 Regulatory Notification and Permits

List what notifications and permit applications must be made. Some permits require up to 180 days to obtain. Demonstrate that those permits have been obtained or applied for by including copies of applicable environmental permits. The EPP will not be approved until the permits have been obtained.

1.6.9 Clean Air Act Compliance

1.6.9.1 Haul Route

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

1.6.9.2 Pollution Generating Equipment

Identify air pollution generating equipment or processes that may require federal, state, or local permits under the Clean Air Act. Determine requirements based on any current installation permits and the impacts of the project. Provide a list of all fixed or mobile equipment, machinery or operations that could generate air emissions during the project to the Installation Environmental Office (Air Program Manager). Ensure required permits are obtained prior to installing and operating applicable equipment/processes.

1.6.9.3 Stationary Internal Combustion Engines

Identify portable and stationary internal combustion engines that will be supplied, used or serviced. Comply with 40 CFR 60 Subpart IIII, 40 CFR 60 Subpart JJJJ, 40 CFR 63 Subpart ZZZZ, and local regulations as applicable. At minimum, include the make, model, serial number, manufacture date, size (engine brake horsepower), and EPA emission certification status of each engine. Maintain applicable records and log hours of operation and fuel use. Logs must include reasons for operation and delineate between maintenance/testing, emergency, and non-emergency operation.

1.6.9.4 Refrigerants

Identify management practices to ensure that heating, ventilation, and air conditioning (HVAC) work involving refrigerants complies with 40 CFR 82 requirements. Technicians must be certified, maintain copies of certification on site, use certified equipment and log work that requires the addition or removal of refrigerant. Any refrigerant reclaimed is the property of the Government, coordinate with the Installation Environmental Office to determine the appropriate turn in location.

1.6.9.5 Air Pollution-engineering Processes

Identify planned air pollution-generating processes and management control measures (including, but not limited to, spray painting, abrasive blasting, demolition, material handling, fugitive dust, and fugitive emissions). Log hours of operations and track quantities of materials used.

1.6.9.6 Monitoring

For the protection of public health, monitor and control contaminant emissions to the air from Hazardous, Toxic, and Radioactive Waste remedial action area sources to minimize short-term risks that might be posed to the community during implementation of the remedial alternative in accordance with the following.

a. Perimeter Air Contaminant of Concern.

b. Time Averaged Perimeter Action Levels.

c. Perimeter Sampling/Monitoring Locations.

d. Monitoring Instruments/Sampling and Analysis Methods.

e. Staffing.

1.6.9.7 Compliant Materials

Provide the Government a list of SDSs for all hazardous materials proposed for use on site. Materials must be compliant with all Clean Air Act regulations for emissions including solvent and volatile organic compound contents, and applicable National Emission Standards for Hazardous Air Pollutants requirements. The Government may alter or limit use of specific materials as needed to meet installation permit requirements for emissions.

1.7 LICENSES AND PERMITS

Obtain licenses and permits required for the construction of the project and in accordance with FAR 52.236-7 Permits and Responsibilities. Notify the Government of all equipment that may require permits or special approvals that the Contractor plans to use on site. This paragraph supplements the Contractor's responsibility under FAR 52.236-7 Permits and Responsibilities.

1.8 ENVIRONMENTAL RECORDS BINDER

Maintain on-site a separate three-ring Environmental Records Binder and submit at the completion of the project. Make separate parts within the binder that correspond to each submittal listed under paragraph CLOSEOUT SUBMITTALS in this section.

1.9 PESTICIDE DELIVERY, STORAGE, AND HANDLING

1.9.1 Delivery and Storage

Deliver pesticides to the site in the original, unopened containers bearing legible labels indicating the EPA registration number and the manufacturer's registered uses. Store pesticides according to manufacturer's instructions and under lock and key when unattended.

1.9.2 Handling Requirements

Formulate, treat with, and dispose of pesticides and associated containers in accordance with label directions and use the clothing and personal protective equipment specified on the labeling for use during each phases

of the application. Furnish SDSs for pesticide products.

1.10 SOLID WASTE MANAGEMENT PERMIT

Provide the Contracting Officer with written notification of the quantity of anticipated solid waste or debris that is anticipated or estimated to be generated by construction. Include in the report the locations where various types of waste will be disposed or recycled. Include letters of acceptance from the receiving location or as applicable; submit one copy of the receiving location state and local Solid Waste Management Permit or license showing such agency's approval of the disposal plan before transporting wastes off Government property.

1.10.1 Monthly Solid Waste Disposal Report

Monthly, submit a solid waste disposal report to the Contracting Officer. For each waste, the report will state the classification (using the definitions provided in this section), amount, location, and name of the business receiving the solid waste.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 PROTECTION OF NATURAL RESOURCES

Comply with EMP 4.4.6.16 Contracting Environmental Special Conditions (Attachment B)for guidance.

Minimize interference with, disturbance to, and damage to fish, wildlife, and plants, including their habitats. Prior to the commencement of activities, consult with the Installation Environmental Office as applicable, regarding rare species or sensitive habitats that need to be protected. The protection of rare, threatened, and endangered animal and plant species identified, including their habitats, is the Contractor's responsibility. The following species are known and could be affected within the construction area:

a. The federally listed threatened northern long-eared bat (Myotix septentrionalis), the state-and-federally endangered Indiana bat (Myotis sodalis); the state-endangered little brown bat (Myotis lucifigus); the state-endangered tri-colored bat (Perimyotis subflavus.

b. Major trees of concern that need to be cleared for the project, to be cleared by the Contractor will be done during acceptable seasons to avoid conflict with these species.

c. To protect nesting habitat for these species, any additional tree clearing activity on-site needs prior written approval from the Contracting Officer.

Preserve the natural resources within the project boundaries and outside the limits of permanent work. Restore to an equivalent or improved condition upon completion of work that is consistent with the requirements of the Installation Environmental Office or as otherwise specified. Confine construction activities to within the limits of the work indicated

or specified.

3.1.1 Flow Ways

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

3.1.2 Vegetation

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

Protect existing trees and critical root zones (CRZ) that are to remain to ensure they are not injured, bruised, defaced, or otherwise damaged by construction operations. Remove displaced rocks from uncleared areas. Coordinate with the Contracting Officer and Installation Environmental Office to determine appropriate action for trees and other landscape features scarred or damaged by equipment operations.

A time of year restrictions on tree clearing is in place between 15 April and 15 September as a U.S. Fish and Wildlife Service (USFWS) conservation measure to protect the federally listed threatened northern long-eared bat, the state-and-federally endangered Indiana bat; and the state-endangered little brown bat and tri-colored bat species listed above.

3.1.3 Streams

Stream crossings must allow movement of materials or equipment without violating water pollution control standards of the federal, state, and local governments. Construction of stream crossing structures must be in compliance with all required permits including, but not limited to, Clean Water Act Section 404, and Section 401 Water Quality.

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

3.2 STORMWATER

Do not discharge stormwater from construction sites to the sanitary sewer. If the water is noted or suspected of being contaminated, it may only be released to the storm drain system if the discharge is specifically permitted. Obtain authorization in advance from the Installation Environmental Office for any release of contaminated water.

3.2.1 Construction General Permit

Provide a Construction General Permit as required by 40 CFR 122.26 or the

Commonwealth of Virginia General Permit. Complete the attached "Virginia Department of Environmental Quality General BPDES Permit for Discharges of Stormwater from Construction Activities (VAR01) Registration Statement" (2019) to obtain payment. Under the terms and conditions of the permit, install, inspect, maintain BMPs, prepare stormwater erosion and sediment control inspection reports, and submit SWPPP inspection reports. Maintain construction operations and management in compliance with the terms and conditions of the general permit for stormwater discharges from construction activities.

3.2.1.1 Stormwater Pollution Prevention Plan

Submit a project-specific Stormwater Pollution Prevention Plan (SWPPP) to the Contracting Officer for approval, within 30 days of Contract Award and prior to the commencement of work. The SWPPP must meet the requirements of 40 CFR 122.26 and compliance with the Virginia Stormwater Management Program (VSMP) Regulations for stormwater discharges from construction sites.

Include the following:

a. Include a completed copy of the Notice of Intent, BMP Inspection Report Template, and Stormwater Notice of Termination, except for the effective date.

3.2.1.2 Stormwater Notice of Intent for Construction Activities

Prepare and submit the Notice of Intent for NPDES coverage under the general permit for construction activities to the Contracting Officer for review.

Completion of the attached "Virginia Department of Environmental Quality General VPDES Permit for Dischargers of Stormwater from Construction Activities (VAR10) Registration Statement" (2019) qualifies as the notice of intent.

3.2.1.3 Inspection Reports

Submit "Inspection Reports" to the Contracting Officer in accordance with Commonwealth of Virginia Construction General Permit.

3.2.1.4 Stormwater Pollution Prevention Plan Compliance Notebook

Create and maintain a three ring binder of documents that demonstrate compliance with the Construction General Permit. Include a copy of the permit Notice of Intent, proof of permit fee payment, SWPPP and SWPPP update amendments, inspection reports and related corrective action records, copies of correspondence with the Virginia Department of Environmental Quality (VDEQ), and a copy of the permit Notice of Termination in the binder. At project completion, the notebook becomes property of the Government. Provide the compliance notebook to the Contracting Officer.

3.2.1.5 Stormwater Notice of Termination for Construction Activities

Complete the attached Notice of Termination to the Contracting Officer for approval once construction is complete and final stabilization has been achieved on all portions of the site for which the permittee is responsible. Once approved, submit the Notice of Termination to the

appropriate state or federal agency. Prepare as-built topographic survey information required by the permitting agency for certification of the stormwater management system, and provide to the Contracting Officer.

3.2.2 Erosion and Sediment Control Measures

Provide erosion and sediment control measures in accordance with the approved plans and with state and local laws and regulations. Preserve vegetation to the maximum extent practicable.

Erosion control inspection reports may be compiled as part of a stormwater pollution prevention plan inspection reports.

3.2.3 Work Area Limits

Mark the areas that need not be disturbed under this Contract prior to commencing construction activities. Mark or fence isolated areas within the general work area that are not to be disturbed. Protect monuments and markers before construction operations commence. Where construction operations are to be conducted during darkness, all markers must be visible in the dark. Personnel must be knowledgeable of the purpose for marking and protecting particular objects.

3.2.4 Contractor Facilities and Work Areas

Place field offices, staging areas, stockpile storage, and temporary buildings in areas designated on the drawings or as directed by the Contracting Officer. Move or relocate the Contractor facilities only when approved by the Government. Provide erosion and sediment controls for onsite borrow and spoil areas to prevent sediment from entering nearby waters. Control temporary excavation and embankments for plant or work areas to protect adjacent areas.

3.2.5 Municipal Separate Storm Sewer System (MS4) Management

Comply with the Installation's MS4 permit requirements.

3.3 SURFACE AND GROUNDWATER

3.3.1 Cofferdams, Diversions, and Dewatering

Construction operations for dewatering, removal of cofferdams, tailrace excavation, and tunnel closure must be constantly controlled to maintain compliance with existing state water quality standards and designated uses of the surface water body. Comply with the Commonwealth of Virginia water quality standards and anti-degradation provisions and the Clean Water Act Section 404. Do not discharge excavation ground water to the sanitary sewer, storm drains, or to surface waters without prior specific authorization in writing from the Installation Environmental Office or Contracting Officer. Discharge of hazardous substances will not be permitted under any circumstances. Use sediment control BMPs to prevent construction site runoff from directly entering any storm drain or surface waters.

If the construction dewatering is noted or suspected of being contaminated, it may only be released to the storm drain system if the discharge is specifically permitted. Obtain authorization for any contaminated groundwater release in advance from the Installation Environmental Officer and the federal or state authority, as applicable.

Discharge of hazardous substances will not be permitted under any circumstances.

3.3.2 Waters of the United States

Do not enter, disturb, destroy, or allow discharge of contaminants into waters of the United States except as authorized herein. The protection of waters of the United States shown on the drawings in accordance with paragraph LICENSES AND PERMITS is the Contractor's responsibility. Authorization to enter specific waters of the United States identified does not relieve the Contractor from any obligation to protect other waters of the United States within, adjacent to, or in the vicinity of the construction site and associated boundaries.

3.4 PROTECTION OF CULTURAL RESOURCES

3.4.1 Archaeological Resources

Comply with EMP 4.4.6.16 Contracting Environmental Special Conditions (Attachment B)for guidance

If, during excavation or other construction activities, any previously unidentified or unanticipated historical, archaeological, and cultural resources are discovered or found, activities that may damage or alter such resources will be suspended. Resources covered by this paragraph include, but are not limited to: any human skeletal remains or burials; artifacts; shell, midden, bone, charcoal, or other deposits; rock or coral alignments, pavings, wall, or other constructed features; and any indication of agricultural or other human activities. Upon such discovery or find, immediately notify the Contracting Officer so that the appropriate authorities may be notified and a determination made as to their significance and what, if any, special disposition of the finds should be made. Cease all activities that may result in impact to or the destruction of these resources. Secure the area and prevent employees or other persons from trespassing on, removing, or otherwise disturbing such resources. The Government retains ownership and control over archaeological resources.

3.5 AIR RESOURCES

Equipment operation, activities, or processes will be in accordance with 40 CFR 64 and state air emission and performance laws and standards.

3.5.1 Preconstruction Air Permits

Notify the Air Program Manager, through the Contracting Officer, at least 6 months prior to bringing equipment, assembled or unassembled, onto the Installation, so that air permits can be secured. Necessary permitting time must be considered in regard to construction activities. Clean Air Act (CAA) permits must be obtained prior to bringing equipment, assembled or unassembled, onto the Installation.

Confirm that these permits have been obtained.

3.5.2 Oil or Dual-fuel Boilers and Furnaces

Provide product data and details for new, replacement, or relocated fuel fired boilers, heaters, or furnaces to the Installation Environmental Office (Air Program Manager) through the Contracting Officer. Data to be

reported include: equipment purpose (water heater, building heat, process), manufacturer, model number, serial number, fuel type (oil type, gas type) size (MMBTU heat input). Provide in accordance with paragraph PRECONSTRUCTION AIR PERMITS.

3.5.3 Burning

Burning is prohibited on the Government premises.

3.5.4 Class I and II ODS Prohibition

Class I and II ODS are Government property and must be returned to the Government for appropriate management. Coordinate with the Installation Environmental Office to determine the appropriate location for turn in of all reclaimed refrigerant.

3.5.5 Venting of Refrigerant

Accidental venting of a refrigerant is a release and must be reported immediately to the Contracting Officer. Intentional venting of refrigerants (including most Non-ODS substitute refrigerants) is prohibited per 40 CFR 82.

3.5.6 EPA Certification Requirements

Heating and air conditioning technicians must be certified through an EPA-approved program. Maintain copies of certifications at the employees' places of business; technicians must carry certification wallet cards, as provided by environmental law.

3.5.7 Dust Control

Keep dust down at all times, including during nonworking periods. Dry power brooming will not be permitted. Instead, use vacuuming, wet mopping, wet sweeping, or wet power brooming. Air blowing will be permitted only for cleaning nonparticulate debris such as steel reinforcing bars. Only wet cutting will be permitted for cutting concrete blocks, concrete, and bituminous concrete. Do not unnecessarily shake bags of cement, concrete mortar, or plaster. Since these products contain Crystalline Silica, comply with the applicable OSHA standard, 29 CFR 1910.1053 or 29 CFR 1926.1153 for controlling exposure to Crystalline Silica Dust.

3.5.7.1 Particulates

Dust particles, aerosols and gaseous by-products from construction activities, and processing and preparation of materials (such as from asphaltic batch plants) must be controlled at all times, including weekends, holidays, and hours when work is not in progress. Maintain excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and other work areas within or outside the project boundaries free from particulates that would exceed 40 CFR 50, state, and local air pollution standards or that would cause a hazard or a nuisance. Sprinkling, chemical treatment of an approved type, baghouse, scrubbers, electrostatic precipitators, or other methods will be permitted to control particulates in the work area. Sprinkling, to be efficient, must be repeated to keep the disturbed area damp. Provide sufficient, competent equipment available to accomplish these tasks. Perform particulate control as the work proceeds and whenever a

particulate nuisance or hazard occurs. Comply with state and local visibility regulations.

3.5.7.2 Abrasive Blasting

Blasting operations cannot be performed without prior approval of the Installation Air Program Manager. The use of silica sand is prohibited in sandblasting.

Provide tarpaulin drop cloths and windscreens to enclose abrasive blasting operations to confine and collect dust, abrasive agent, paint chips, and other debris.

3.5.8 Odors

Control odors from construction activities. The odors must be in compliance with state regulations and local ordinances and may not constitute a health hazard.

3.6 WASTE MINIMIZATION

Minimize the use of hazardous materials and the generation of waste. Include procedures for pollution prevention/ hazardous waste minimization in the Hazardous Waste Management Section of the EPP. Obtain a copy of the installation's Pollution Prevention/Hazardous Waste Minimization Plan for reference material when preparing this part of the EPP. If no written plan exists, obtain information by contacting the Contracting Officer. Describe the anticipated types of the hazardous materials to be used in the construction when requesting information.

3.6.1 Salvage, Reuse and Recycle

Identify anticipated materials and waste for salvage, reuse, and recycling. Describe actions to promote material reuse, resale or recycling. To the extent practicable, all scrap metal must be sent for reuse or recycling and will not be disposed of in a landfill.

Include the name, physical address, and telephone number of the hauler, if transported by a franchised solid waste hauler. Include the destination and, unless exempted, provide a copy of the state or local permit (cover) or license for recycling.

3.6.2 Nonhazardous Solid Waste Diversion Report

Comply with EMP 4.4.6.16 Contracting Environmental Special Conditions (Attachment B)for guidance

Maintain an inventory of nonhazardous solid waste diversion and disposal of construction and demolition debris. Submit a report to Installation through the Contracting Officer on the first working day after each fiscal year quarter, starting the first quarter that nonhazardous solid waste has been generated. Include the following in the report:

Construction and Demolition (C&D) Debris Disposed	cubic yards or tons as appropriate
C&D Debris Recycled	cubic yards or tons as appropriate
C&D Debris Composted	cubic yards or tons as appropriate
Total C&D Debris Generated	cubic yards or tons as appropriate
Waste Sent to Waste-To-Energy Incineration Plant (This amount should not be included in the recycled amount)	cubic yards or tons as appropriate

3.7 WASTE MANAGEMENT AND DISPOSAL

3.7.1 Waste Determination Documentation

Complete a Waste Determination form (provided at the pre-construction conference) for Contractor-derived wastes to be generated. All potentially hazardous solid waste streams that are not subject to a specific exclusion or exemption from the hazardous waste regulations (e.g., scrap metal, domestic sewage) or subject to special rules, (lead-acid batteries and precious metals) must be characterized in accordance with the requirements of 40 CFR 262.11 or corresponding applicable state or local regulations. Base waste determination on user knowledge of the processes and materials used, and analytical data when necessary. Consult with the Installation environmental staff for guidance on specific requirements. Attach support documentation to the Waste Determination form. As a minimum, provide a Waste Determination form for the following waste (this listing is not exhaustive): oil- and latex -based painting and caulking products, solvents, adhesives, aerosols, petroleum products, and containers of the original materials.

3.7.2 Solid Waste Management

3.7.2.1 Project Solid Waste Disposal Documentation Report

Provide copies of the waste handling facilities' weight tickets, receipts, bills of sale, and other sales documentation. In lieu of sales documentation, a statement indicating the disposal location for the solid waste that is signed by an employee authorized to legally obligate or bind the firm may be submitted. The sales documentation Contractor certification must include the receiver's tax identification number and business, EPA or state registration number, along with the receiver's delivery and business addresses and telephone numbers. For each solid waste retained for the Contractor's own use, submit the information previously described in this paragraph on the solid waste disposal report. Prices paid or received do not have to be reported to the Contracting Officer unless required by other provisions or specifications of this Contract or public law.

3.7.2.2 Control and Management of Solid Wastes

Pick up solid wastes, and place in covered containers that are regularly emptied. Do not prepare or cook food on the project site. Prevent

contamination of the site or other areas when handling and disposing of wastes. At project completion, leave the areas clean. Employ segregation measures so that no hazardous or toxic waste will become co-mingled with non-hazardous solid waste. Transport solid waste off Government property and dispose of it in compliance with 40 CFR 260, state, and local requirements for solid waste disposal. A Subtitle D RCRA permitted landfill is the minimum acceptable offsite solid waste disposal option. Verify that the selected transporters and disposal facilities have the necessary permits and licenses to operate. Solid waste disposal offsite must comply with most stringent local, state, and federal requirements, including 40 CFR 241, 40 CFR 243, and 40 CFR 258.

Manage hazardous material used in construction, including but not limited to, aerosol cans, waste paint, cleaning solvents, contaminated brushes, and used rags, in accordance with 49 CFR 173.

3.7.3 Control and Management of Hazardous Waste

Comply with EMP 4.4.6.16 Contracting Environmental Special Conditions (Attachment B)for guidance

Do not dispose of hazardous waste on Government property. Do not discharge any waste to a sanitary sewer, storm drain, or to surface waters or conduct waste treatment or disposal on Government property without written approval of the Contracting Officer and Installation Hazardous Waste Manager.

3.7.3.1 Hazardous Waste/Debris Management

Identify construction activities that will generate hazardous waste or debris. Provide a documented waste determination for resultant waste streams. Identify, label, handle, store, and dispose of hazardous waste or debris in accordance with federal, state, and local regulations, including 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, 40 CFR 265, 40 CFR 266, and 40 CFR 268.

Manage hazardous waste in accordance with the approved Hazardous Waste Management Section of the EPP. Store hazardous wastes in approved containers in accordance with 49 CFR 173 and 49 CFR 178. Hazardous waste generated within the confines of Government facilities is identified as being generated by the Government. Prior to removal of any hazardous waste from Government property, hazardous waste manifests must be signed by personnel from the Installation Environmental Office. Do not bring hazardous waste onto Government property. Provide the Contracting Officer with a copy of waste determination documentation for any solid waste streams that have any potential to be hazardous waste or contain any chemical constituents listed in 40 CFR 372-SUBPART D.

3.7.3.2 Waste Storage/Satellite Accumulation/90 Day Storage Areas

Accumulate hazardous waste at satellite accumulation points and in compliance with 40 CFR 262 and applicable state or local regulations. Individual waste streams will be limited to 55 gallons of accumulation (or one quart for acutely hazardous wastes). If the Contractor expects to generate hazardous waste at a rate and quantity that makes satellite accumulation impractical, the Contractor may request a temporary 90-day or 180-day, as appropriate, accumulation point be established. Submit a request in writing to the Contracting Officer and provide the following information (Attach Site Plan to the Request):

Contract Number	
Contractor	
Haz/Waste or Regulated Waste POC	
Phone Number	
Type of Waste	
Source of Waste	
Emergency POC	
Phone Number	
Location of the Site	

Attach a Waste Determination form for the expected waste streams. Allow 10 working days for processing this request. Additional compliance requirements (e.g., training and contingency planning) that may be required are the responsibility of the Contractor. Barricade the designated area where waste is being stored and post a sign identifying as follows:

"DANGER - UNAUTHORIZED PERSONNEL KEEP OUT"

3.7.3.3 Universal Waste Management

Manage the following categories of universal waste in accordance with federal, state, and local requirements and installation instructions:

a. Batteries as described in 40 CFR 273.2

b. Lamps as described in 40 CFR 273.5

c. Mercury-containing equipment as described in 40 CFR 273.4

d. Aerosol cans as described in 40 CFR 273.6

e. Pesticides as described in 40 CFR 273.3

Mercury is prohibited in the construction of this facility, unless specified otherwise, and with the exception of mercury vapor lamps and fluorescent lamps. Dumping of mercury-containing materials and devices such as mercury vapor lamps, fluorescent lamps, and mercury switches, in rubbish containers is prohibited. Remove without breaking, pack to prevent breakage, and transport out of the activity in an unbroken condition for disposal as directed.

3.7.3.4 Electronics End-of-Life Management

Recycle or dispose of electronics waste, including, but not limited to, used electronic devices such computers, monitors, hard-copy devices, televisions, mobile devices, in accordance with 40 CFR 260-262, state, and local requirements, and installation instructions.

3.7.3.5 Disposal Documentation for Hazardous and Regulated Waste

Contact the Contracting Officer for the facility RCRA identification number that is to be used on each manifest.

Submit a copy of the applicable EPA and or state permit(s), manifest(s), or license(s) for transportation, treatment, storage, and disposal of hazardous and regulated waste by permitted facilities. Hazardous or toxic waste manifests must be reviewed, signed, and approved by the Contracting Officer before the Contractor may ship waste. To obtain specific disposal instructions, coordinate with the Installation Environmental Office. Refer to location special requirements for the Installation Point of Contact information.

3.7.4 Releases/Spills of Oil and Hazardous Substances

3.7.4.1 Response and Notifications

Comply with EMP 4.4.6.16 Contracting Environmental Special Conditions (Attachment B)for guidance

Exercise due diligence to prevent, contain, and respond to spills of hazardous material, hazardous substances, hazardous waste, sewage, regulated gas, petroleum, lubrication oil, and other substances regulated in accordance with 40 CFR 300. Maintain spill cleanup equipment and materials at the work site. In the event of a spill, take prompt, effective action to stop, contain, curtail, or otherwise limit the amount, duration, and severity of the spill/release. In the event of any releases of oil and hazardous substances, chemicals, or gases; immediately (within 15 minutes) notify the Installation Fire Department, the Installation Command Duty Officer, the Installation Environmental Office, the Contracting Officer and the state or local authority.

Submit verbal and written notifications as required by the federal (40 CFR 300.125 and 40 CFR 355), state, local regulations and instructions. Provide copies of the written notification and documentation that a verbal notification was made within 20 days. Spill response must be in accordance with 40 CFR 300 and applicable state and local regulations. Contain and clean up these spills without cost to the Government.

3.7.4.2 Clean Up

Clean up hazardous and non-hazardous waste spills. Reimburse the Government for costs incurred including sample analysis materials, clothing, equipment, and labor if the Government will initiate its own spill cleanup procedures, for Contractor- responsible spills, when: Spill cleanup procedures have not begun within one hour of spill discovery/occurrence; or, in the Government's judgment, spill cleanup is inadequate and the spill remains a threat to human health or the environment.

3.7.5 Mercury Materials

Immediately report to the Environmental Office and the Contracting Officer instances of breakage or mercury spillage. Clean mercury spill area to the satisfaction of the Contracting Officer.

Do not recycle a mercury spill cleanup; manage it as a hazardous waste for disposal.

3.7.6 Wastewater

3.7.6.1 Disposal of Wastewater

Disposal of wastewater must be as specified below.

3.7.6.1.1 Treatment

Do not allow wastewater from construction activities, such as onsite material processing, concrete curing, foundation and concrete clean-up, water used in concrete trucks, and forms to enter water ways or to be discharged prior to being treated to remove pollutants. Dispose of the construction- related waste water off-Government property in accordance with 40 CFR 403, state, regional, and local laws and regulations.

3.7.6.1.2 Surface Discharge

For discharge of ground water, obtain a state or federal permit specific for pumping and discharging ground water prior to surface discharging.

3.7.6.1.3 Land Application

Water generated from the flushing of lines after disinfection or disinfection in conjunction with hydrostatic testing discharged into the sanitary sewer with prior approval and notification to the Contracting Officer's Representative.

3.8 HAZARDOUS MATERIAL MANAGEMENT

Comply with EMP 4.4.6.16 Contracting Environmental Special Conditions (Attachment B)for guidance

Include hazardous material control procedures in the Accident Prevention Plan (APP), in accordance with Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS. Address procedures and proper handling of hazardous materials, including the appropriate transportation requirements. Do not bring hazardous material onto Government property that does not directly relate to requirements for the performance of this contract. Submit an SDS and estimated quantities to be used for each hazardous material to the Contracting Officer prior to bringing the material on the installation. Typical materials requiring SDS and quantity reporting include, but are not limited to, oil and latex based painting and caulking products, solvents, adhesives, aerosol, and petroleum products. Use hazardous materials in a manner that minimizes the amount of hazardous waste generated. Containers of hazardous materials must have National Fire Protection Association labels or their equivalent. Certify that hazardous materials removed from the site are hazardous materials and do not meet the definition of hazardous waste, in accordance with 40 CFR 261 and state and installation requirements.

3.9 PREVIOUSLY USED EQUIPMENT

Clean previously used construction equipment prior to bringing it onto the project site. Equipment must be free from soil residuals, egg deposits from plant pests, noxious weeds, and plant seeds. Consult with the U.S. Department of Agriculture jurisdictional office for additional cleaning requirements.

3.10 CONTROL AND MANAGEMENT OF LEAD-BASED PAINT (LBP)

Comply with EMP 4.4.6.16 Contracting Environmental Special Conditions (Attachment B)for guidance

Manage and dispose of lead-contaminated waste in accordance with 40 CFR 745. Manifest any lead-contaminated waste and provide the manifest to the Contracting Officer.

3.11 MILITARY MUNITIONS

In the event military munitions, as defined in 40 CFR 260, are discovered or uncovered, immediately stop work in that area and immediately inform the Contracting Officer.

3.12 PETROLEUM, OIL, LUBRICANT (POL) STORAGE AND FUELING

POL products include flammable or combustible liquids, such as gasoline, diesel, lubricating oil, used engine oil, hydraulic oil, mineral oil, and cooking oil. Store POL products and fuel equipment and motor vehicles in a manner that affords the maximum protection against spills into the environment. Manage and store POL products in accordance with EPA 40 CFR 112, and other federal, state, regional, and local laws and regulations. Use secondary containments, dikes, curbs, and other barriers, to prevent POL products from spilling and entering the ground, storm or sewer drains, stormwater ditches or canals, or navigable waters of the United States. Describe in the EPP (see paragraph ENVIRONMENTAL PROTECTION PLAN) how POL tanks and containers must be stored, managed, and inspected and what protections must be provided. Storage of fuel on the project site must be in accordance with EPA, state, and local laws and regulations and paragraph OIL STORAGE INCLUDING FUEL TANKS.

3.12.1 Used Oil Management

Manage used oil generated on site in accordance with 40 CFR 279. Determine if any used oil generated while onsite exhibits a characteristic of hazardous waste. Used oil containing 1,000 parts per million of solvents is considered a hazardous waste and disposed of at the Contractor's expense. Used oil mixed with a hazardous waste is also considered a hazardous waste. Dispose in accordance with paragraph HAZARDOUS WASTE DISPOSAL.

3.12.2 Oil Storage Including Fuel Tanks

Comply with JBLE-Eustis EMP 4.4.6.16 Contracting Environmental Special Conditions (Attachment B)for guidance

Provide secondary containment and overfill protection for oil storage tanks. A berm used to provide secondary containment must be of sufficient size and strength to contain the contents of the tanks plus 5 inches freeboard for precipitation. Construct the berm to be impervious to oil for 72 hours that no discharge will permeate, drain, infiltrate, or otherwise escape before cleanup occurs. Use drip pans during oil transfer operations; adequate absorbent material must be onsite to clean up any spills and prevent releases to the environment. Cover tanks and drip pans during inclement weather. Provide procedures and equipment to prevent overfilling of tanks. If tanks and containers with an aggregate aboveground capacity greater than 1320 gallons will be used onsite (only containers with a capacity of 55 gallons or greater are counted), provide

and implement a Spill Prevention Control and Countermeasure (SPCC) plan meeting the requirements of 40 CFR 112. Do not bring underground storage tanks to the installation for Contractor use during a project. Submit the SPCC plan to the Contracting Officer for approval.

Monitor and remove any rainwater that accumulates in open containment dikes or berms. Inspect the accumulated rainwater prior to draining from a containment dike to the environment, to determine there is no oil sheen present.

3.13 INADVERTENT DISCOVERY OF PETROLEUM-CONTAMINATED SOIL OR HAZARDOUS WASTES

If petroleum-contaminated soil, or suspected hazardous waste is found during construction that was not identified in the Contract documents, immediately notify the Contracting Officer. Do not disturb this material until authorized by the Contracting Officer.

3.14 PEST MANAGEMENT

In order to minimize impacts to existing fauna and flora, coordinate with the Installation Pest Management Coordinator (IPMC) or Project Pesticide Coordinator (PPC), through the Contracting Officer, at the earliest possible time prior to pesticide application. Discuss integrated pest management strategies with the IPMC and receive concurrence from the IPMC through the Contracting Officer prior to the application of any pesticide associated with these specifications. Provide Installation Project Office Pest Management personnel the opportunity to be present at meetings concerning treatment measures for pest or disease control and during application of the pesticide.

3.14.1 Application

Apply pesticides using a state-certified pesticide applicator in accordance with EPA label restrictions and recommendation. The certified applicator must wear clothing and personal protective equipment as specified on the pesticide label. The Contracting Officer will designate locations for water used in formulating. Do not allow the equipment to overflow. Inspect equipment for leaks, clogging, wear, or damage and repair prior to application of pesticide.

3.14.2 Pesticide Treatment Plan

Include and update a pesticide treatment plan, as information becomes available. Include in the plan the sequence of treatment, dates, times, locations, pesticide trade name, EPA registration numbers, authorized uses, chemical composition, formulation, original and applied concentration, application rates of active ingredient (that is, pounds of active ingredient applied), equipment used for application and calibration of equipment. Comply with 40 CFR 152-189, state, regional, and local pest management record-keeping and reporting requirements as well as in conformance with DA AR 200-1 Chapter 5, Pest Management, Section 5-4 "Program requirements" for data required to be reported to the Installation.

3.14.3 Pest Control and Pesticide Management (Termites)

1. All pest control work and pesticide applications will be performed in accordance with respective federal and state regulations, Department

of Defense Instruction (DODI) 4150.07, Air Force Instruction (AFI) 32-7064 and the Joint Base Langley-Eustis (JBLE)-Fort Eustis Integrated Pest Management Plan.

2. The Contractor must submit termite control plans to the Fort Eustis Installation Pest Management Coordinator (IPMC) for review and approval before any application of pesticides.

3. Termite control plans will include the following documents at a minimum:

   a. Current, valid Virginia Department of Agriculture and Consumer Services (VDACS) Pesticide Applicator Certificates for category 7b (Wood-destroying pest control). Copies of the certificates must be clearly legible. Registered technicians are NOT considered certified under DoD Pest Management Regulations and cannot apply pesticides on Fort Eustis.

   b. Current, valid Virginia Pesticide Business License and proof of liability insurance. Copies of the certificates must be clearly legible.

   c. Proposed pesticides to be used and associated documents. All pesticides must be approved for use on the installation. The contractor will request approval by submitting a New Pesticide Approval Request form for each proposed pesticide to the IPMC. Copies of the pesticide labels and safety data sheets will be included with the New Pesticide Approval Request form(s). All proposed pesticides must be authorized for use in Virginia.

   d. Termite control/application plan that includes frequency of applications, pesticide information, method of application, area/volumes of treated soil and amount expected to be applied.

   e. Proposed dates of pesticide applications. Finalized (actual) dates will be conveyed to the IPMC at least 2 days in advance.

4. The contractor must provide pest control and pesticide application information for EACH pesticide application in the following manner:

   a. Register with the Air Force's web-based Integrated Pest Management Information System (IPMIS) and use this system to record each pesticide application at Fort Eustis.

   b. In addition to using IPMIS, the contractor must also report each pesticide application to the IPMC using the JBLE-Fort Eustis Pesticide Application Record Report (see below) within 5 working days of applications.

3.14.4 JBLE-Fort Eustis Pesticide Application Record Report

Form will be provided by the COR to the Contractor and finally types of information:

1. Description/Location of Area Treated:

2. Day/Month/Year of Application:.

3. Applicator Name, Certified Applicator #, Certified Categories, License

Expiration Date:

4. Business/Business License #:

5. Name/Address/Phone # of Customer.

6. Brand of Pesticide Used (include active ingredients and EPA REG #):

7. Type of Plants, Crops, Animals or Sites treated and TARGET Pests to be controlled:

8. Amount of pesticide concentrate and amount of diluent used (by weight or volume), in mixture applied:

9. Total Pounds of active ingredient (AI) applied this application:

10. Hours spent applying pesticide for this application:

11. Type of application equipment used:

Submit information within 5 working days of pesticide application to COR.

3.15 SOUND INTRUSION

Make the maximum use of low-noise emission products, as certified by the EPA. Blasting or use of explosives are not permitted without written permission from the Contracting Officer, and then only during the designated times. Confine pile-driving operations to the period between 8 a.m. and 4 p.m. Monday through Friday, exclusive of holidays, unless otherwise specified.

Keep construction activities under surveillance and control to minimize environment damage by noise. Comply with the provisions of the Commonwealth of Virginia rules.

3.16 POST CONSTRUCTION CLEANUP

Clean up areas used for construction in accordance with Contract Clause: "Cleaning Up". Unless otherwise instructed in writing by the Contracting Officer, remove traces of temporary construction facilities such as haul roads, work area, structures, foundations of temporary structures, stockpiles of excess or waste materials, and other vestiges of construction prior to final acceptance of the work. Grade parking area and similar temporarily used areas to conform with surrounding contours.

-- End of Section --

CONTRACTING
JBLE-EUSTIS ENVIRONMENTAL SPECIAL CONDITIONS AND AFFIRMATIVE PROCUREMENT

ENVIRONMENTAL MANAGEMENT PROCEDURE (EMP) 4.4.6.16

JBLE-EUSTIS

25 June 2020

(Revised 18 January 2024)

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
JOINT BASE LANGLEY-EUSTIS VA

25-Oct-24

MEMORANDUM FOR ALL 733 MSG UNITS AND FEVA ORGS

FROM: 633 ABW/CD

SUBJECT: JBLE-Eustis Environmental Management Procedures (EMPs)

1. EMPs apply to all JBLE-Eustis activities (including tenants, associated units, and contractors) that impact any environmental resource area on the installation, to include, but not limited to Air Quality, Water Quality, Hazardous Waste, Hazardous Materials, Natural Resources, Cultural Resources, Solid Waste and Recycling, Inspections, Training, Tanks, Spill Prevention, Pollution Prevention, and Pest Management.

a. EMPs enable our compliance with Federal, State, Department of Defense, and Air Force regulations, directives, instructions, and manuals, and are specific to JBLE-Eustis.

b. EMPs assign responsibilities, provide instruction and guidance for appropriate management of environmental programs to ensure the installations regulatory compliance.

2. JBLE-Eustis personnel may access these EMPs electronically via the JBLE-Eustis Environmental website at: https://www.jble.af.mil/Units/Army/Eustis-Enviromental/.

3. The Office of Primary Responsibility for this document is 733d Civil Engineer Squadron Environmental Element (733 CES/CEIE), and will review all EMPs annually, and update as appropriate. Major revisions require concurrence from the JBLE-Eustis Environmental Management System (EMS) Cross-Functional Team (CFT) and approval by the Environmental Safety and Occupational Health Council (ESOHC).

4. All EMPs are unclassified and will be posted in "Read Only" .pdf format, reviewed, revised and rescinded IAW current directives.

DILLENBURGER.STEVEN.P.1239615100
Digitally signed by DILLENBURGER.STEVEN.P.1239615100
Date: 2024.10.25 13:15:19 -04'00'

STEVEN P. DILLENBURGER, Colonel, USAF
Deputy Installation Commander

INTENTIONALLY LEFT BLANK

Table of Contents

FOREWORD....7
OBJECTIVE....7
1. ENVIRONMENTAL POLICY / MANAGEMENT:....9
2. ENVIRONMENTAL REQUIREMENTS:....9
3. CONTRACTOR ENVIRONMENTAL DELIVERABLES:....9
1.1. SOLID WASTE DISPOSAL:....11
1.1.1. COMPLIANCE WITH REGULATIONS:....11
1.2.2. REFUSE CONTAINERS:....11
1.2.3. CONSTRUCTION/DEMOLITION DEBRIS DIVERSION:....12
1.2.4. RECYCLING AND DISPOSAL REPORTING:....12
1.2.5. CONTAIN LOOSE DEBRIS:....13
1.2.6. TRIP TICKETS:....13
2.1. SOIL AND PETROLEUM CONTAMINATED WASTE:....13
2.1.1. CONTAMINATED ABSORBENTS:....13
2.1.2. SOIL:....13
2.1.3. SOIL BROUGHT ONTO BASE FROM OFF-BASE SOURCES:....14
3.1. UNIVERSAL WASTE:....14
3.1.1. FLUORESCENT LAMPS:....14
4.1. HAZARDOUS WASTE (HW):....14
4.1.2. The Hazardous Waste Accumulation Facility (HWAF):....14
4.1.3. CONTRACTOR RESPONSIBILITY:....14
4.1.4. SITE MANAGEMENT:....15
4.1.6. MANIFESTS:....15
4.1.7. FUEL, SEWAGE AND OTHER SPILLS:....15
5.1. ASBESTOS OR LEAD BASED PAINT....15
5.1.1. ASBESTOS PRESENCE:....16
5.1.2. ABATEMENT PLAN:....16
5.1.3. ASBESTOS ABATEMENT OR REMOVAL NOTIFICATION:....16
5.1.4. ASBESTOS MANIFESTS:....16
5.2. LEAD BASED PAINT PRESENCE:....16
5.2.1. ABATEMENT PLAN:....16
5.2.2. LEAD BASED PAINT DISPOSAL:....16
6.1. AIR QUALITY....17
6.1.1. VOLATILE ORGANIC COMPOUNDS (VOCs):....17

6.1.2. DUST: 17
6.1.3. FOSSIL FUEL-FIRED BOILERS / WATER HEATERS / HVACS: 17
6.1.4. GENERATORS: 17
6.1.5. OZONE DEPLETING SUBSTANCES (ODS): 18
7.1. STORAGE TANKS: 18
7.1.1. STORAGE TANK REGISTRATION NOTIFICATION: 18
7.1.2. ABOVEGROUND STORAGE TANKS (ASTs): 18
7.1.3. NOTIFICATION: 18
7.1.4. UNDERGROUND STORAGE TANKS (USTs): 18
7.1.5. DISPOSAL OF PETROLEUM CONTAMINATED SOIL: 18
8.1. WATER QUALITY: 19
8.1.1. EROSION AND SEDIMENT CONTROL (ESC): 19
8.1.2. STORMWATER MANAGEMENT PLAN (SWM Plan): 20
8.1.3. STORMWATER POLLUTION PREVENTION PLAN (SWPPP): Error! Bookmark not defined.
8.1.4. CONSTRUCTION GENERAL PERMIT (CGP) COVERAGE: 22
8.1.5. PROHIBITED ILLICIT DISCHARGES: 24
8.1.6. WASTEWATER: 24
9.1. HAZARDOUS MATERIALS MANAGEMENT 24
9.1.1. Hazardous Materials Usage and Reporting: 24
9.1.2. Hazardous Materials Management Process (HMMP): 25
9.1.3. Hazardous Material Storage: 26
10.1.2. Site Safety: 27
10.1.3. Monitoring Wells: 28
10.1.4. Additional Excavation: 28
11.1. SOIL SUPPORT PROGRAM (SSP) ACCEPTABILITY: 28
11.1.1. Contaminated Soil and Free Product: 28
11.1.2. Clean Soil: 28
11.1.3. Sample Plan: 29
11.1.4. Chemical Testing Standards: 29
11.1.4. Clean Soil Determination: 31
11.1.5. Excavation and Delivery Screening: 31
11.1.6. Material Physical Characteristics: 31
12.1. TREE PROTECTION, PRESERVATION, AND PLANTING 32
12.1.1. Tree Protection: 32
12.1.2. Trees contribute: 32

12.1.3. Existing Trees: 32
12.1.4. Small Trees: ..... Error! Bookmark not defined.
Above Ground Physical injury to the trunk and crown ..... Error! Bookmark not defined.
Below Ground Physical injury to the trunk and crown ..... Error! Bookmark not defined.
Soil compaction ..... Error! Bookmark not defined.
12.1.5. Tree Protection Zone Structures: ..... Error! Bookmark not defined.
Cutting of roots ..... Error! Bookmark not defined.
13.1. COMPLYING WITH WETLAND REGULATIONS 37
13.1.1. Project Compliance: 37
13.1.1. A Joint Permit Application (JPA): 38
13.1.2. Occupying Wetlands: 38
13.1.3. Other Natural Resources: 39
Step 1: Log-in for the first time: 40
Step 2: Enter Account details: 40
Step 3: Take a Course & Print Certificate 40
15.1. CULTURAL RESOURCE PROTECTION: 41
15.1.1. EXCAVATION: 41
15.1.2. REHABILITATION: 41
15.1.3. DEMOLITION PROJECTS: 41
16.1. ROOF DESIGN TO MINIMIZE BIRD COLONIZATION: 41
16.1.1. BIRD COLONIES: 42
17.1. INTEGRATED PEST MANAGEMENT 42
17.1.1. PESTICIDES: ..... Error! Bookmark not defined.
17.1.2. PEST MANAGEMENT PROJECTS: 42
17.1.3. PESTICIDE DATA MANAGEMENT SYSTEMS: ..... Error! Bookmark not defined.
17.1.4. PERFORMING PEST MANAGEMENT: ..... Error! Bookmark not defined.
18.1. DISCREPANCIES. 43
References: 43
ATTACHMENT 1 CONSTRUCTION/DEMOLITION DEBRIS RECYCLING AND REPORTING 44
ATTACHMENT 2 46
ATTACHMENT 3 48
ATTACHMENT 4 50
ATTACHMENT 5 56
EXEMPTION CERTIFICATION 57

INTENTIONALLY LEFT BLANK

FOREWORD

As stated in all Joint Base Langley-Eustis, Fort Eustis, Virginia (JBLE-Eustis) scopes of work/performance work statements and contracts, Contractors shall comply with the most current version of this Environmental Special Conditions Environmental Management Procedure (EMP) in the bidding and execution of contracts for work at JBLE-Eustis. This document was established by the 733d Civil Engineer Squadron – Environmental Element (CES/CEIE) to guide those engaging in construction projects and maintenance work within the boundaries of the installation. Federal lands are protected by many statutes, some of which are more restrictive and have protection requirement above and beyond those of the Commonwealth of Virginia. The Environmental Special Conditions is also available on the JBLE-Eustis Environmental website at: https://www.jble.af.mil/Units/Army/Eustis-Enviromental/.

The Environmental Special Conditions EMP identifies requirements, particularly those unique to JBLE-Eustis, that must be met in the performance of work, and ensures compliance with pertinent provisions of Federal, State (Virginia), and local regulations and procedures. The Environmental Special Conditions EMP is not intended to be fully inclusive of all regulations. It is the Contractor's responsibility to comply with all Federal, State, and local laws, regulations, or guidance.

The Contractor shall also execute Environmental Best Management Practices (BMPs) where applicable. Any fines and penalties that result from actions by the Contractor, its subcontractors, employees, other representatives or agents of the Contractor are the responsibility of the Contractor to pay. These fines/penalties will not be passed on to JBLE-Eustis.

Additionally, the Contractor, or its designated representative, shall act as an Environmental Officer on all work performed under an awarded contract. The Government's Contracting Officer (KO), or designated representative, shall notify the contractor of any non-compliance with environmental requirements and any corrective action to be taken. Such notice, when delivered to the Contractor, or its representative on the work site or place of performance, shall be deemed sufficient for this purpose.

Anyone performing work at JBLE-Eustis is required to coordinate with the Government's point of contact (POC) for a given project, usually the Project Manager (PM) or Contracting Officer's Representative (COR), to ensure timely submittal of a complete and accurate AF 332 (Work Request) or other project documentation to the CES Operations Flight so that it may be properly tracked and routed through CES's project review management system.

OBJECTIVE

It is the duty of JBLE-Eustis CES/CEIE environmental specialists to ensure that all projects that take place on JBLE-Eustis property meet Federal, State, Local, and Air Force requirements. This document contains fundamental provisions that pertain to common construction, renovation, repair and demolition activities which regularly occur at JBLE-Eustis. Special projects may have additional requirements not mentioned in this EMP and as such, will require a more detailed review by CES/CEIE in order to ensure that all aspects of the environment are protected.

It is the Contractor's responsibility to ensure that all of the requirements of this EMP are adequately addressed and that all requested submittals are received and approved by CES/CEIE. There are a number of submittals that are required to be delivered through the Contracting Office to CES/CEIE.

Failure to adhere to these requirements will delay final payment to the Contractor, and possibly require the contractor to uninstall out of spec equipment or redesign and correct any components of the project that do not pass final inspections.

A reference to this EMP must be included in all Performance Work Statements, Scope of Work documents, and Contract Proposals for work at JBLE-Eustis. A project submittal will not be approved by CES without including such reference.

This document is reviewed and updated annually to reflect changes in regulations and policies. Achieving compliance with laws and regulations is a team effort at JBLE-Eustis and close integrated collaboration between Contractors and environmental staff is key to protecting the environment in which our families work, live, and play. In accordance with the National Environmental Policy Act (NEPA), this program area is imperative to "encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere, and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation."

NEPA is the underlying national charter for protecting the environment. It was enacted on January 1, 1970 and is referred to as the "Environmental Magna Carta." Each Federal agency has its own implementing procedures which adapt the regulations to address agency specific missions and decision-making authority. The NEPA process begins when an agency proposes to take an action (this can include proposals to adopt rules and regulations, formal plans that direct future actions, programs, and specific projects). Once a proposal is conceptualized and any reasonable alternatives have been developed, the agency must determine if the action has the potential to affect the quality of the human environment. This process results in one of three levels of NEPA analysis. Agencies may develop a:

- Record of Environmental Consideration (REC) = application of a Categorical Exclusion (CX);
- Finding of No Significant Impact (FONSI) = preparation of an Environmental Assessment (EA); or
- Record of Decision (ROD) = preparation of an Environmental Impact Statement (EIS).

The majority of JBLE-Eustis actions do not require an EA or EIS and can be documented with a Categorical Exclusion (CX), which are listed in 32 Code of Federal Regulations (CFR) Appendix B to Part 989 (Air Force Environmental Impact Analysis Process) as well as any other federal agency's CX as allowed by 40 CFR 1506.3(d). However, it is important to note that CX's are sometimes not applicable because NEPA does not replace or supersede the requirements of certain other laws or regulations, such as the National Historic Preservation Act. In addition, some CX's require completion of an AF813, Request for Environmental Impact Analysis.

Ultimately, the level of NEPA analysis and documentation for each project is determined by the CES/CEIE Chief or designated representative, who utilizes processes outlined in NEPA to ensure that all requirements are being addressed. Part of this process includes using information from subject matter experts to determine the environmental effects of every project proposed to occur on JBLE-Eustis property.

Any modifications to JBLE-Eustis property or its environment must be executed in a manner that prevents pollution, protects the environment, conserves natural resources, and avoids historic

properties. All procedures must follow the requirements specified in this this EMP and be in joint effort with the CES.

1. ENVIRONMENTAL POLICY / MANAGEMENT:

Joint Base Langley-Eustis, Fort Eustis (JBLE-Eustis) is dedicated to the conservation, protection, and enhancement of the environment. This is accomplished by planning and implementing JBLE-Eustis environmental programs to: attain and maintain environmental compliance; to prevent pollution; to continually improve environmental stewardship; and to achieve a sustainable facility by providing coordination between JBLE-Eustis, the regulatory agencies, and activities (facility or process owners, contractors, and tenants). All services and work provided by contractors will be performed in such a manner to adhere to this policy. The JBLE-Eustis Environmental Policy Statement is available on the JBLE-Eustis Environmental website at: https://www.jble.af.mil/Units/Army/Eustis-Enviromental/.

2. ENVIRONMENTAL REQUIREMENTS:

As stated in all JBLE-Eustis scopes of work/performance work statements and contracts, Contractors shall comply with the most current version of this Environmental Special Conditions, Environmental Management Procedures (EMP) 4.4.6.16. The contractor shall comply with all local, state, and federal laws, ordinances and regulations and JBLE-Eustis policies and procedures, to include but not limited to Air Force Instruction (AFI) 32-7001, Environmental Management, Air Force Manual (AFMAN) 32-7002, Environmental Compliance and Pollution Prevention, and AFMAN 32-7003, Environmental Conservation and JBLE-Eustis EMPs. The Contractor shall comply with the most stringent environmental requirements between differing regulations. The contractor shall immediately submit in writing to the Contracting Officer (CO) for determination of any conflict between requirements and the regulations. The contractor may be required to indemnify the AF for any enforcement actions which result from violations caused by the contractor.

Contractors may access this and other EMPs electronically via the JBLE-Eustis Environmental website at: https://www.jble.af.mil/Units/Army/Eustis-Enviromental/.

3. CONTRACTOR ENVIRONMENTAL DELIVERABLES:

The following contract deliverables are due to the JBLE-Eustis PM and COR who will in turn provide them to the 733 CES/CEIE.

Before Contract Start (60 - 90 days) (if applicable):
Draft Joint Permit Application (JPA), including JBLE-Eustis Frac-Out plan, location map, and construction diagrams. Document must be signed by contractor, agent, and 733 CES Director and then sent to VMRC.

Completed USFWS Section 7 Endangered Species Act and NOAA Threatened and Endangered Marine Species and Essential Fish Habitat Consultation records of determination, determination letters, Biological Assessments or Opinions (as necessary) and MFR documenting effect determinations.

Submit required technical data sheet(s) for each emergency generator and/or fire pump installed to 733 CES/CEIE sixty days prior to installation. Contractor shall provide to the 733 CES/CEIE a copy of the manufacturer's certification of compliance with applicable New Source Performance Standards for stationary diesel engines.

As applicable for construction projects involving historic facilities, contractor shall submit

package with building elevations showing that the proposed building modifications are consistent with Secretary of the Interior's Standards for the Treatment of Historic Properties, as well as photographs of the existing condition to support base consultation with the State Historic Preservation Office that the project will have "no adverse effect" on any historic property.

Before Contract Start (30-60 days) (if applicable):

- Soil Management Plan (SMP)
- Before Contract Start (30 days) if applicable to the project Asbestos Abatement Plan
- Lead-Based Paint Abatement Plan Hazardous Material Usage Request Forms Green Procurement Planning Use Forms
- Environmental Management System (EMS) training certifications DEQ Construction General Permit Registration Statement
- Approved JPA and applicable wetland permits from all regulatory agencies.
- DEQ Construction General Permit Coverage Letter - Virginia
- General Permit for Discharge of Stormwater from Construction Activities
- Stormwater Pollution Prevention Plan (SWPPP) (SWPPP includes three plans below) Erosion and Sediment Control Plan (ESC Plan)
- Pollution Prevention Plan (P2 Plan)
- Stormwater Management Plan (SWM Plan) include Runoff Reduction Calculation
- Soil Sampling Plan
- Clean Soil Certifications
- Landscaping Plan including map, species, and planting methods
- Storage Tank Registration Notification
- Access to STAR Tank Database
- Notify 733 CES/CEIE 30 days prior to a storage tank being put into service to meet regulatory documentation requirements.
- Oil Spill Contingency Plan or similar.
- VDEQ New Source Review Form 7 Application
- EPA Certificate(s) of Conformity for generator(s) to be installed (including portable units to be used during construction activities)
- Pesticide Management training and certifications
    - Current Virginia Department of Agriculture and Consumer Services (VDACS) Pesticide Applicator Certificate, Virginia Pesticide Business License and proof of liability insurance.
    - Labels and safety data sheets and Pesticide Approval Request forms.

During Contract:

- Monthly Hazardous Materials Usage Report Quarterly Refuse/Recycling Reports Generator permit information
- Hazardous Waste/Lead/Asbestos Manifests (to be signed by 733 CES/CEIE Staff)
- Pesticide application information required in Section 1.18 of this document
- Submit Monthly POL Inspections into STAR Database or to CEIE via contracting officer every month.

End of Contract before contract close:

- DEQ Construction General Permit Notice of Termination Letter Green Procurement Exemption Form (if applicable)

- Green Procurement Final Usage Report
- All return Asbestos Manifests (signed by receiving landfill)
- BMP as-builts

1.1. SOLID WASTE DISPOSAL:

1.1.1. COMPLIANCE WITH REGULATIONS:

All waste materials generated by any work under this contract performed on a Federal Government installation shall be handled, transported, stored, recycled, and disposed of by the Contractor and by their subcontractors at any time in accordance with these specifications, all applicable federal, State, or local laws, ordinances, regulations,court orders, or other types of rules or rulings having the same effect of law. These include but are not limited to the Resource Conservation and Recovery Act (RCRA) (40 CFR 260-270); The Toxic Substances Control Act, as amended (15 USC Sec 2601, ET SEQ); the Solid Waste Disposal Act, as amended (42 USC 6901 ET SEQ); and the Virginia Solid Waste Management Regulations (9VAC20-81).

The Contractor shall collect all solid wastes generated during the performance of the contract in a container provided by the Contractor and located in an area designated by the Contracting Officer and approved by CES. The Contractor shall provide appropriate containers for the collection and segregation of solid wastes, recyclables and construction and demolition (C&D) debris generated directly and indirectly by work under this Contract. The Contractor is prohibited from using base dumpsters or other Federal Government owned/leased waste receptacles for the disposal of any solid wastes. All solid wastes shall be reclaimed, recycled or disposed of prior to completion of work on JBLE-Eustis.

As proof of proper disposition of solid wastes, the Contractor shall provide legible weight receipts for solid waste disposed and materials recycled bearing the name, address, and phone number of the receiving facilities for every load of materials delivered. The weight ticket shall detail the type of material, weight of the material in pounds or tons, the date of the transaction, and a signature from a representative of the receiving facility. Receipts shall be submitted to the Contracting Officer and Project Manager within ten (10) calendar days after the transaction.

Under no circumstances will any solid waste or hazardous materials be left at JBLE-Eustis at the end of the project. Before the project is turned over to the Federal Government, the Contractor will remove all solid wastes and hazardous materials from the installation. Those items include but are not limited to dirt piles, concrete piles, asphalt piles and rubbish piles. No materials will be left for the future use of the Federal Government UNLESS instructed to do so in writing by the Federal Government. This is to include the before mentioned items and also regular or touch- up paint, plaster, solvents, etc. If it is determined that the Contractor left materials behind, services may be terminated and/or a penalty payment to include the cost of disposal of the material by the Federal Government may be withheld from the project payment.

NOTE: Hazardous materials are different from hazardous wastes so be careful not to confuse the two. Hazardous Wastes will not be removed from the installation without the 733 CES/CEIE Hazardous Waste Managers signing the Hazardous Waste Manifest. The JBLE-Eustis Hazardous Waste Managers can be contacted at 757-878-3915, 757-878-5662, or 757-878-7368 if needed.

1.2.2. REFUSE CONTAINERS:

All refuse containers shall be free from graffiti, and be equipped with a securable waterproof tarpaulin or cover (NOTE: THE WATERPROOF COVER SHALL BE IN PLACE AT ALL TIMES, EXCEPT WHEN WASTE IS BEING DEPOSITED OR REMOVED). Location of all refuse containers shall be annotated on the Worksite Layout Plan.

1.2.3. CONSTRUCTION/DEMOLITION DEBRIS DIVERSION:

As good stewards of the environment, the Federal Government is committed to diverting its waste away from landfills to the greatest extent possible. This can be done through recycling, reusing (when directed by the Federal Government), and donating construction and demolition debris materials. The Contractor shall recycle all construction/demolition debris to the maximum extent possible. The Contractor shall make every effort to recycle materials such as but not limited to concrete (including concrete with rebar), brick, asphalt, all metals, wood, roofing materials, wallboard, ceiling tiles, etc. The Contractor will collect and take the follow plastics to the Solid Waste and Recycle Center: pallet wrap/film; shrink or bubble wrap, and any form of plastic bags. With prior coordination through the Contracting Officer, 733 CES/CEIE, and 733 CES/Operations Flight (CEO), the Contractor may take scrap metals to the JBLE-Eustis scrap metal yard, located at the Solid Waste and Recycling Center, 1207 Taylor Road, for recycling. The following are some suggested local sites for recycling construction and demolition debris:

Local Sources of Recycling				
Company	**Address**	**City**	**Phone**	**Acceptable Items**
Tidewater Fiber	5602 Chestnut Ave	Newport News	247-5766	paper, cardboard, plastics (1 & 2), aluminum, glass, tin cans
Old Dominion Re-cycling	1618 W. Pem-broke Ave.	Hampton	723-2942	Aluminum, copper, steel, iron, metals, pa-per, tires
S.B. Cox, Inc.	217 Cox Drive	Yorktown	969-1409	All C & D, i.e. concrete, concrete w/rebar, wood, brick, block, steel, all metals, sheet- rock, asphalt, cardboard, paper, plastics (1 & 2)
Butler Paper	324 Newport St	Suffolk	539-2351	Industrial & Commercial Paper Recycling
Gutterman Iron & Metal	706 May Ave.	Norfolk	627-1095	Scrap Brass, Copper & Aluminum
Sims Metal	2116 George Washington Memorial Hwy	Tabb	599-4940	Steel, aluminum, brass, copper, stainless steel, radiators
Waterway Materials Corp	1401 Precon Drive	Chesapeake	545-0004	Concrete, concrete w/rebar, brick, block, asphalt
CrushCon Aggregates	100 North Park Lane	Hampton	723-1131	Concrete, concrete w/rebar

1.2.4. RECYCLING AND DISPOSAL REPORTING:

The Contractor shall report monthly the tonnage of the items recycled and the amounts disposed of by landfill and amounts disposed of by regular or waste-to-energy incineration to the Project Manager, the CO, and 733 CES/CEIE by the 10th day of the following month during the period of performance. The report shall list the title of the project, the project number, the Contractor's

company name and point-of-contact, phone number, the type items (i.e. concrete, concrete with rebar, asphalt, brick, scrap metals, wood, wallboard, etc.) and the tonnage of the items recycled. For all items that could not be recycled, the Contractor shall provide a brief reason within the report as to why the items could not be recycled in addition to the tonnage.

For items disposed of, one total tonnage can be given for items landfilled and one total tonnage for items incinerated (specify waste incinerator or waste-to-energy incinerator) instead of reporting disposal figures for the various items. For items that cannot be accurately measured, estimates will be sufficient. Use the form at Attachment 1 (Construction/Demolition Waste Generation and Recycling Report) to report this information to the Contracting Officer, Project Manager, and to 733 CES/CEIE.

To send it to 733 CES/CEIE, email it to:

733MSG.733CES.CEIEAdmin@us.af.mil

or mail it to:

733 CES/CEIE
Attn: Solid Waste & Recycling Program Mgr.
1407 Washington Boulevard Fort Eustis, VA 23604

1.2.5. CONTAIN LOOSE DEBRIS:

Loose debris on trucks leaving the site shall be loaded in a manner that shall prevent dropping/releasing of materials on streets and conform to local ordinances/laws. Fasten a suitable waterproof cover, such as a tarpaulin, over the load before entering surrounding streets.

1.2.6. TRIP TICKETS:

Contractor shall submit all trip tickets from the landfill facility, incinerators, and recycling companies to show all debris is being landfilled, incinerated or recycled in accordance with all Federal requirements and in an approved location. These trip tickets will be submitted to the Contracting Officer who will in turn give them to the Project Manager.

2.1. SOIL AND PETROLEUM CONTAMINATED WASTE:

2.1.1. CONTAMINATED ABSORBENTS:

All petroleum spills/releases must be cleaned up using absorbent materials. Spills caused by the Contractor will be the Contractor's responsibility to containerize and dispose of the contaminated absorbent material. Spills caused by the Federal Government will be the responsibility of the Federal Government and shall contact the base Hazardous Waste Accumulation Facility (HWAF) 757-878-3915 to arrange for pick-up. CEIE is required to be notified of any spill at 757-644-7411 immediately of a spill.

2.1.2. SOIL:

ALL soil must be tested to determine if it contains any contaminants prior to relocating it on base **or** disposing of it off-base. Testing and disposal of soil shall follow Virginia Solid Waste Management Regulations 9VAC20-81-660 (soil contaminated with petroleum products), https://law.lis.virginia.gov/admincode/title9/agency20/chapter81/section660/. Testing shall include items specified in the solid waste regulations to include but not limited to: RCRA hazardous waste characteristics (i.e., corrosivity, ignitability, reactivity, and toxicity); total metals; volatile organic compounds; semi-volatile compounds; total petroleum hydrocarbons (TPH), pesticides/herbicides; polychlorinated bi-phenyls (PCBs); presence of liquids (paint filter); Benzene, Toluene, Ethyl Benzene, and Xylene (BTEX); Toxicity Characteristic Leaching

Procedure (TCLP); total organic halides (TOX); and perfluorinated alkylated substances (PFAS). If test results determine "other than clean", the material will have to be transported to an appropriate landfill or processing center based on the contaminants identified. Contaminated soils, in sludge or slurry form, shall be containerized and managed as either hazardous waste or non-regulated waste, depending on contaminant identity and concentration spilled. It shall be the responsibility of the Contractor to dispose of such containerized contaminated soil. CEIE must review the sample results and must sign all hazardous/nonhazardous waste manifests prior to disposal. Contact 733 CES/CEIE Hazardous Waste Program Manager, 757-878-5662 for additional information.

One composite sample (combined number of samples collected into a single sample) is required for every 250 cubic yards of soil to be disposed.

NOTE: UNDER NO CIRCUMSTANCES shall soil, clean or contaminated, from JBLE-Eustis be delivered to or donated to off-base sources for use. Clean or contaminated soil shall be taken to an appropriate landfill or processing center based on the contaminants identified by analysis.

2.1.3. SOIL BROUGHT ONTO BASE FROM OFF-BASE SOURCES:

ALL soil brought onto the installation for use will meet the terms of "Environmentally clean" soil. See guidelines established in section 11.1 of this document.

3.1. UNIVERSAL WASTE:

3.1.1. FLUORESCENT LAMPS:

The Contractor shall use environmentally-friendly green tip (i.e., low mercury) fluorescent lamps during lamp replacement. All fluorescent lamps shall be managed as Universal Waste. Contractor shall manage all Universal Waste Lamps in accordance with federal, state, and Air Force laws, regulations, directives, and plans. Contractor can contact the HWAF, 878-3915 to arrange for pick-up, except in cases where lamp replacement is part of the contract. If part of the contract lamps will be properly disposed of by the Contractor, the waste manifest will be signed by 733 CES/CEIE Hazardous Waste Program Managers.

NOTE: UNDER NO CIRCUMSTANCES shall lamps be crushed on JBLE-Eustis.

4.1. HAZARDOUS WASTE (HW):

4.1.1. JBLE-Eustis is a Large Quantity Generator (LQG) of Hazardous Waste (HW), and all HWs must be properly removed from the installation with 90 days of the Accumulation Start Date and 365 days for Universal Wastes (UWs). All HWs, UWs, and Non-Hazardous Waste will be managed IAW JBLE-Eustis Hazardous Waste Management Plan (HWMP). **The JBLE-Eustis waste generation number is EPA ID# VA8213720321**.

4.1.2. The Hazardous Waste Accumulation Facility (HWAF):

HWAF is located at Building 1208, and the office is in Building 1207. The HWAF hours of operations are Monday – Friday, 0800 – 1500 hrs. Hours of operation are subject to change without notice due to mission requirements. Scheduling of appointments must be made through the HWAF, 757-878-3915.

4.1.3. CONTRACTOR RESPONSIBILITY:

Contractor is responsible for all costs associated with waste management including, but not limited to, identification, classification, accumulation, transportation, disposal, cleanup of spills,

etc. The Contractor shall indemnify the Government for all fees, fines or penalties attributable to any regulatory violation committed by the Contractor for failing to properly manage waste IAW all applicable local, state, and Federal regulatory requirements including, but not limited, to those regulations implementing 40 CFR Part(s) 260 through 270. The Contractor is responsible for being aware of those applicable state or local waste management requirements that are more stringent than the noted Federal regulatory requirements. 733 CES/CEIE will approve all laboratories, transporters, and disposal facilities prior to wastes being managed on-site, shipped, and disposed. A project specific sampling plan will be prepared and completed IAW SW846. The contractor shall submit the Sample Plan for the 733 CES/CEIE review and approval.

4.1.4. SITE MANAGEMENT:
All waste containers (HW, non-regulated, used oil, etc.) must be closed when not in use. Waste containers shall be stored undercover as to protect from the elements. All liquid waste shall be in secondary containers. Each waste container is to be properly labeled. Do not store waste containers near storm drains. Upon completion of this project, the Contractor shall remove all waste containers from the installation (for associated manifest requirements see paragraph 4.1.6.)

4.1.5. WASTE CHARACTERIZATION SAMPLES FOR FLOOR RENOVATION:
Waste characterization samples must be collected to determine if its meets the RCRA definition of a hazardous waste. It is the responsibility of the contractor to collect the sample and provide analysis to 733 CES/CEIE. Waste debris from floor stripping or floor blasting performed on JBLE - Eustis must be sampled for TCLP Metals for solid debris and must add corrosivity test for liquid stripping. Additionally, it is the contractor's responsibility to dispose of the waste generated on this project. See manifest requirement in 4.1.6.

4.1.6. MANIFESTS:
733 CES/CEIE shall review all lab analyses and/or Safety Data Sheets (SDSs) of wastes prior to signing manifests. All hazardous waste manifests must be signed by appointed 733 CES/CEIE personnel prior to removal of such waste from the base. The generators initial copy must be provided after the approved person signs the manifest. The destination to generator copy of the manifest must be returned to: Joint Base Langley Eustis, 733 CES/CEIE, 1407 Washington Blvd., Fort Eustis, VA 23604-5306.

4.1.7. FUEL, SEWAGE AND OTHER SPILLS:
CALL 911 – FIRE AND EMERGENCY SERVICES IMMEDIATELY in the event of all spills. In the event of a fuel, sewage, and/or other toxic spillage during the performance of this contract, the Contractor shall be responsible for its containment, clean up, and related disposal costs. The Contractor shall have sufficient spill response supplies readily available on site to contain any spillage. In the event of any Contractor-related release, even if Fire and Emergency Services are not needed, the Contractor shall immediately notify the Contracting Officer and 733 CES/CEIE (757-644-7411) and take appropriate actions to correct its cause to prevent future occurrences. If the federal, State, or local authorities assess any monetary fine, penalty, or assessment related to the release of any substance by the Contractor, his/her employees, or agents during the performance of this contract, the Contractor shall be solely liable for its payment, authorizes the United States Air Force (USAF) to withhold such from payment and otherwise indemnify and hold the USAF harmless.

5.1. ASBESTOS OR LEAD BASED PAINT

5.1.1. ASBESTOS PRESENCE:
Coordinate with 733 CES/CEO and 733 CES/CEIE to determine if any known presence of Asbestos. Tests or records have indicated that asbestos is not present in the areas affected by this work **//or//** Tests or records have indicated the presence of asbestos in the areas affected by this work.] If asbestos not previously known to exist is exposed, the Contractor shall cease work in the affected area and notify the Contracting Officer.

5.1.2. ABATEMENT PLAN:
[Include if project requires asbestos removal] Abatement plans are to include but not limited to the description of how abatement is to be accomplished, required notifications, required licensing, employee safety requirements, and air sampling. The Abatement Plan shall be submitted to 733 CES/CEO to coordinate with 733 CES/CEIE and Industrial Hygiene for concurrence.

5.1.3. ASBESTOS ABATEMENT OR REMOVAL NOTIFICATION:
[Include if project requires asbestos removal] Contractor is responsible for disposal of asbestos debris. Contractor is subject to OSHA, EPA, and Commonwealth of Virginia compliance and inspection for asbestos removal. Contractor must perform asbestos abatement in accordance with these specifications and EPA National Emissions Standards for Hazardous Air Pollutants (NESHAPs) for asbestos and any subsequent updates thereto. This includes State and EPA Region 3 notifications that shall be accomplished at least 20 days prior to starting any asbestos abatement or removal. A copy of the notification shall be submitted to the Contracting Officer and to 733 CES/CEO.

5.1.4. ASBESTOS MANIFESTS:
[Include if project requires asbestos removal] All asbestos waste manifests shall be signed by 733 CES/CEIE prior to removal of asbestos waste from the base. A copy of the completed manifest (signed by the receiving landfill) shall be submitted to 733 CES/CEIE.

5.2. LEAD BASED PAINT PRESENCE:
[Tests have indicated that lead based paint is not present in the areas affected by this work //**or**// Tests have indicated the presence of lead based paint in the areas affected by this work.] If lead based paint not previously known to exist is exposed, the Contractor shall cease work in the affected area and notify the Contracting Officer.

5.2.1. ABATEMENT PLAN:
[Include if project requires lead based paint removal] Abatement plans are to include but not limited to the description of how abatement is to be accomplished, required licensing, employee safety requirements, and air sampling. The Abatement Plan shall be submitted to 733 CES/CEIE and Industrial Hygiene for concurrence.

5.2.2. LEAD BASED PAINT DISPOSAL:

Disposal of lead debris containers is the responsibility of the Contractor. Lead contaminated debris must be sampled to determine the concentration level of lead. The analysis will determine waste management procedures. 733 CES/CEIE will inform the Contractor on management procedures. If wastes are determined to be hazardous by regulatory criteria, the containers cannot leave the installation until a completed manifest is re-viewed and signed by 733 CES/CEIE. The Contractor must contact JBLE-Eustis' Hazardous Waste Accumulation Facility at (757) 878-3915 to make arrangements to store full drums of lead contaminated waste at the <90 day site

located at 1207 Taylor Avenue. The drums must be in good condition, labeled properly and closed. The Contractor has less than 90 days of storage on base before the containers must leave the installation.

6.1. AIR QUALITY

6.1.1. VOLATILE ORGANIC COMPOUNDS (VOCs):
All coatings and solvents used in the performance of this contract shall meet the required performance specifications and shall not exceed the volatile organic compound limits of the Air Pollution Control District(s) where they are used. Coatings and solvents shall be registered with the base HAZMART as described is Section 1.7.

6.1.2. DUST:
[If the project is likely to create dust emissions, the following requirement applies] Mitigation of fugitive dust emissions shall be accomplished in accordance with 9 VAC5-40-90, Standard for Fugitive Dust/Emissions.

6.1.3. FOSSIL FUEL-FIRED BOILERS / WATER HEATERS / HVACS:
[Include if a boiler/ water heater / HVAC is installed as part of this project]: To assist JBLE–Eustis in meeting permit requirements, the Contractor shall submit necessary information for each fossil fuel-fired boiler / water heater / HVAC to 733 CES/CEIE no less than 60 days prior to the anticipated boiler / water heater / HVAC installation date. Necessary information includes but may not be limited to the following (for each boiler, water heater, and/or HVAC) (See 9 VAC-80-1105 and AFMAN 32-7002 4.4.6.):

- Technical specification sheet (e.g., unit manufacturer, model no., maximum heat input, fuel type(s), burner data (mm Btu/hour), etc.)
- Describe the intended purpose of the boiler / water heater / HVAC (i.e., industrial activity, commercial, institutional)
- If installing an oil-fired boiler, contractor shall comply with Subpart JJJJJJ (6J) requirements for initial turn-up and provide the initial notification form to the 733 CES/CEIE Air Program Manager.

6.1.4. GENERATORS:
[Include if an emergency generator is installed as part of this project] To assist JBLE–Eustis in meeting permit requirements, the Contractor shall submit necessary information for each generator to 733 CES/CEIE no less than 60 days prior to the anticipated generator installation date. Necessary information includes but may not be limited to the following (for each generator) (See 9 VAC-80-1105-B2 and AFMAN 32-7002 4.4.6.):

- Technical specification sheet (e.g., manufacturer make, model no., maximum engine power rating, fuel type, fuel consumption rates, specifies conformance with EPA emission standards, etc.)
- Describe the intended purpose of the generator (i.e., stationary emergency, stationary non-emergency, portable/temporary (Note: if designated as portable/temporary; Contractor shall provide estimate for the total duration the generator is to remain on base)
- EPA Certificate of Conformity

If installing a generator set with an incorporated fuel tank (i.e., “belly tank”), the contractor shall

comply with the conditions under paragraph 1.5, Storage Tanks.

6.1.5. OZONE DEPLETING SUBSTANCES (ODS):

Contracts may not include any specification, standard, drawing or other document that requires the use of a Class I or Class II ODS in the design, manufacture, test, operation or maintenance of any system, subsystem, item, component or process. Contracts may not require the delivery of any items of supply that contains a Class I or Class II ODS or any service that includes the use of a Class I or Class II ODS, except for the servicing of existing systems containing a Class II ODS. All refrigerants shall be recovered or recycled during HVAC repairs and demolition projects. See AFMAN 32-7002 2.15., 3.35., 4.2.2., and 4.2.3.

7.1. STORAGE TANKS:

[Include only if work includes or is in area of storage tanks; *contact 733 CES/CEIE to determine any known history or presence of storage tanks]*

7.1.1. STORAGE TANK REGISTRATION NOTIFICATION:

[Include if an AST or UST is going to be installed]: Notify 733 CES Project Manager and CES/CEIE 30 days prior to the tank being put into service to meet regulatory documentation requirements.

7.1.2. ABOVEGROUND STORAGE TANKS (ASTs):

[Include if there is going to be an AST temporarily or permanently installed]: Any ASTs (55 gallons or more) allowed on site shall have secondary containment, venting and spill/overfill protection. Anti- siphon valves are required. The Contractor shall visually inspect such tanks daily for leaks and perform monthly inspections. Inspections are required to be provided to CEIE each month. All ASTs shall be installed or erected in accordance with 9 VAC 25-91, NFPA 30, and 40 CFR 112.7.

7.1.3. NOTIFICATION:

If an AST is removed or re-located, the 733 CES Project Manager is required to notify the 733 CES/CEIE prior to the action so regulatory documentation can be initiated and submitted. The Contractor shall submit a completed VDEQ Form 7540 to the 733 CES Project Manager and CES/CEIE within 21 days of installation of all ASTs with a storage capacity of greater than 660 gallons and for such tanks used on JBLE-Eustis for more than 120 calendar days.

7.1.4. UNDERGROUND STORAGE TANKS (USTs):

[Include if there is going to be construction or excavation where there is an abandoned UST].

USTs located within project area present an underground hazard and the work should be routed around the site or other provisions made. Contractor may encounter unknown USTs and will be required to coordinate the removal with CEIE. Contact 733 CES/CEIE for additional information.

7.1.5. DISPOSAL OF PETROLEUM CONTAMINATED SOIL:

[Include if excavating around any removed, abandoned, or in-service AST or UST]:
Contaminated soil may be encountered in proximity to previous and current tank sites. Disposal of such soil must be funded as part of this project. Contractor is required to immediately notify CEIE Spill Coordinator if a release is suspected such as contaminated material. Waste must be disposed of IAW previous SOIL paragraph 2.1.2, along with applicable State and Federal regulations. If contaminated soil is discovered, notify 733 CES/CEIE Hazardous Waste Program Managers prior to disposal.

8.1. WATER QUALITY:

[Include if there is going to be exterior material laydown, construction, or excavation].

Land Disturbance 10,000 SF to 1 Acre

8.1.1. EROSION AND SEDIMENT CONTROL (ESC):

Regardless of project size amount of land disturbance, the Contractor is responsible for ensuring that adequate erosion and sediment controls are utilized on site to prevent sediment from leaving the activity at all times. ESC practices selected for use shall be designed, installed and maintained in accordance with the Virginia Stormwater Management Handbook. The Contractor shall provide erosion control fencing (silt) to prevent site runoff. Hay bales must not be used for inlet protection from stormwater run-off. The Contractor shall submit alternate methods of protection to the Contracting Officer at the preconstruction conference for review and approval from the Water Program Manager. The Contracting Officer will notify the Contractor of his/her decision prior to issuance of Notice to Proceed (NTP).

All Land Disturbing Activities (LDAs) on JBLE-Eustis require the development of an ESC Plan in accordance with the latest VDEQ Stormwater Management Handbook, found a https://www.deq.virginia.gov/our-programs/water/stormwater/stormwater-construction/handbooks.As part of implementing the plan, the Contractor must conduct stormwater inspections utilizing the latest VDEQ guidance. An erosion and sediment control plan shall be filed for a development and the buildings constructed within, regardless of the phasing of construction. The erosion and sediment control plan shall contain all major conservation decisions to ensure that the entire unit of land will be so treated to achieve the conservation objectives in 9VAC25-875-560. The erosion and sediment control plan may include:

1. Appropriate maps;
2. An appropriate soil and water plan inventory and management information with needed interpretations; and
3. A record of decisions contributing to conservation treatment.

The person responsible for carrying out the plan shall provide the name of an individual holding a Responsible Land Disturber Certificate who will be in charge of and responsible for carrying out the land-disturbing activity to VDEQ and to CES/CEIE through the project manager.

LDAs that are 10,000 square feet or greater require the Contractor to develop a site-specific Erosion and Sediment Control Plan that complies with Virginia Erosion and Sediment Control Law and Regulations (9VAC25-875) and meets the state's 19 minimum standards outlined in 9VAC25-875-560 as applicable. The ESC Plan shall include site plan(s)/detailed maps for the work site that clearly show the siting of the ESC practices and best management practices. The Virginia Uniform Coding System for ESC Practices shall be used on all site plan submittals. The ESC Plan shall include details for all ESC controls being utilized. The Contractor shall submit the ESC Plan to the Contracting Officer for an initial review by the CES/CEIE Water Quality Program Manager. Once reviewed and approved, the Contractor will submit to VDEQ

for final approval.

Contractor shall not remove ESC measures until construction site is 90% covered with the appropriate vegetation that is uniform, mature enough to survive and will inhibit erosion. It is the responsibility of the Contractor to choose the appropriate vegetation for planting based on the season.

Land Disturbance of 1 Acre or Greater

8.1.2. STORMWATER POLLUTION PREVENTION PLAN (SWPPP):

For LDAs over 1 acre, a full SWPPP submittal shall be developed in accordance with 9VAC25-875-500 and submitted to VDEQ for approval. No LDAs may commence without an approved SWPPP. The approved SWPPP must be provided to the CEIE Water Quality Program Manager before any LDA.

All SWPPPs must contain the following:

- Erosion and Sediment Control Plan (See Section 8.1.1)
- Stormwater Management Plan (See Section 8.1.3)
- Pollution Prevention (P2) Plan (See Section 8.1.4)

The stormwater pollution prevention plan (SWPPP) must address the following requirements as specified in 40 CFR 450.21, to the extent otherwise required by state law or regulations and any applicable requirements of a permit:

1. Control stormwater volume and velocity within the site to minimize soil erosion;
2. Control stormwater discharges, including both peak flow rates and total stormwater volume, to minimize erosion at outlets and to minimize downstream channel and stream bank erosion;
3. Minimize the amount of soil exposed during construction activity;
4. Minimize the disturbance of steep slopes;
5. Minimize sediment discharges from the site. The design, installation, and maintenance of erosion and sediment controls must address factors such as the amount, frequency, intensity, and duration of precipitation, the nature of resulting stormwater runoff, and soil characteristics, including the range of soil particle sizes expected to be present on the site;
6. Provide and maintain natural buffers around surface waters, direct stormwater to vegetated areas to increase sediment removal, and maximize stormwater infiltration, unless infeasible;
7. Minimize soil compaction and, unless infeasible, preserve topsoil;
8. Stabilization of disturbed areas must, at a minimum, be initiated immediately whenever any clearing, grading, excavating, or other earth disturbing activities have permanently ceased on any portion of the site, or temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days.
9. Utilize outlet structures that withdraw water from the surface, unless infeasible, when discharging from basins and impoundments.

8.1.3. STORMWATER MANAGEMENT PLAN (SWM PLAN):

A stormwater management plan shall be developed and submitted to the VDEQ for approval. A complete SWM Plan must meet these requirements as described in the latest VDEQ Stormwater Management Handbook which can be found at: https://www.deq.virginia.gov/our-programs/water/stormwater/stormwater-construction/handbooks.

For projects with a VDEQ approved SWM Plan it is the construction Contractor's responsibility to implement the Plan and its design features. At the completion of the project, construction record drawing(s) ("as-built") for permanent stormwater management facilities shall be provided to CES/CEIE, along with any electronic geodata.

A complete stormwater management plan shall include the following elements:

1. Information on the type of and location of stormwater discharges, information on the features to which stormwater is being discharged including surface waters or karst features if present, and predevelopment and post-development drainage areas;
2. Contact information including the name, address, telephone number, and email address;
3. A narrative that includes a description of current site conditions and final site conditions;
4. A general description of the proposed stormwater management facilities and the mechanism through which the facilities will be operated and maintained after construction is complete;
5. Information on the proposed stormwater management facilities, including (i) detailed narrative on the conversion to a long-term stormwater management facility if the facility was used as a temporary ESC measure; (ii) the type of facilities; (iii) location, including geographic coordinates; (iv) acres treated; and (v) the surface waters or karst features into which the facility will discharge;
6. Hydrologic and hydraulic computations, including runoff characteristics;
7. Documentation and calculations verifying compliance with the water quality and quantity requirements of this chapter;
8. A map of the site that depicts the topography of the site and includes:
    a. All contributing drainage areas;
    b. Existing streams, ponds, culverts, ditches, wetlands, other water bodies, and floodplains;
    c. Soil types, geologic formations if karst features are present in the area, forest cover, and other vegetative areas;
    d. Current land use including existing structures, roads, and locations of known utilities and easements;
    e. Sufficient information on adjoining parcels to assess the impacts of stormwater from the site on these parcels;
    f. The limits of clearing and grading, and the proposed drainage patterns on the site;
    g. Proposed buildings, roads, parking areas, utilities, and stormwater management facilities; and
    h. Proposed land use with tabulation of the percentage of surface area to be adapted to various uses, including planned locations of utilities, roads, and easements;

C. All final plan elements, specifications, or calculations of the stormwater management plans whose preparation requires a license under Chapter 4 (§ 54.1-400 et seq.) or 22 (§54.1-2200 et seq.) of Title 54.1 of the Code of Virginia shall be appropriately signed and sealed by a professional who is licensed to engage in practice in the Commonwealth of Virginia.

8.1.4. SITE-SPECIFIC POLLUTION PREVENTION (P2) PLAN

A plan for implementing pollution prevention measures during construction activities shall be developed, implemented, and updated as necessary. The pollution prevention plan shall detail the design, installation, implementation, and maintenance of effective pollution prevention measures as specified in 40 CFR 450.21(d) to minimize the discharge of pollutants. This Plan shall be included in the Contractor's SWPPP submittal. At a minimum, such measures must be designed, installed, implemented, and maintained to:

1. Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters. Wash waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge;
2. Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste, and other materials present on the site to precipitation and to stormwater; and
3. Minimize the discharge of pollutants from spills and leaks and implement chemical spill and leak prevention and response procedures.

The pollution prevention plan shall include effective best management practices to prohibit the following discharges in accordance with 40 CFR 450.21(e):

1. Wastewater from washout of concrete, unless managed by an appropriate control;
2. Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds, and other construction materials;
3. Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance; and
4. Soaps or solvents used in vehicle and equipment washing.

Discharges from dewatering activities, including discharges from dewatering of trenches and excavations, are prohibited unless managed by appropriate controls in accordance with 40 CFR 450.21(c).

8.1.5. CONSTRUCTION GENERAL PERMIT (CGP) COVERAGE:

LDAs greater than or equal to one (1) acre require Construction General Permit coverage under the Virginia Stormwater Management Program (VSMP) General Permit for Discharges of Stormwater from Construction Activities from VDEQ. For CGP coverage, the operator must submit a complete and accurate registration statement in accordance with the General VPDES Permit for Discharges of Stormwater from Construction Activities (9VAC25-880) if such statement is required, on the official department form to VDEQ. The registration statement must be signed by the operator in accordance with 9VAC25-875-940.
No land-disturbing activity can occur until VDEQ has issued its land-disturbance approval.
In addition, the name of the individual who will be assisting the owner in carrying out the

activity and holds a Responsible Land Disturber Certificate pursuant to § 62.1-44.15:30 of the Code of Virginia shall be submitted to VDEQ.

The Virginia Stormwater Management Program Permit Regulations can be found in 9 VAC 25-875 and the General Permit for Discharges of Stormwater from Construction Activities can be found in 9VAC25-875-530. After SWPPP approval, the Contractor shall register for CGP coverage from DEQ in accordance with 9VAC25-880-50. The Contractor is considered the Permit Operator and is responsible for all CGP registration fees. See below for the applicable construction permit fees per 9VAC25-875-1400:

VDEQ CGP Permit Fee Schedule

Fee type	Total fee to be paid by applicant
General / Stormwater Management - Small Construction Activity/Land Clearing (Areas within common plans of development or sale with land-disturbance acreage less than one acre, except for single-family detached residential structures)	$290
General / Stormwater Management - Small Construction Activity/Land Clearing (Sites or areas within common plans of development or sale with land-disturbance acreage equal to or greater than one acre and less than five acres)	$2,700
General / Stormwater Management - Large Construction Activity/Land Clearing (Sites or areas within common plans of development or sale with land-disturbance acreage equal to or greater than five acres and less than 10 acres)	$3,400
General / Stormwater Management - Large Construction Activity/Land Clearing (Sites or areas within common plans of development or sale with land-disturbance acreage equal to or greater than 10 acres and less than 50 acres)	$4,500
General / Stormwater Management - Large Construction Activity/Land Clearing (Sites or areas within common plans of development or sale with land-disturbance acreage equal to or greater than 50 acres and less than 100 acres)	$6,100
General / Stormwater Management - Large Construction Activity/Land Clearing (Sites or areas within common plans of development or sale with land-disturbance acreage equal to or greater than 100 acres)	$9,600

The Contractor shall submit a copy of the VDEQ CGP Registration Statement to the Contracting Officer for review and approval prior to submittal to DEQ. Upon approval, the Contractor shall submit the VDEQ CGP Registration Statement and applicable fee to VDEQ. The Contractor may begin LDAs once a VDEQ Construction General Permit coverage letter has been received. No LDAs shall commence without an approved SWPPP and DEQ-issued CGP coverage. The Contractor shall be responsible for terminating permit coverage once the project site has reached final stabilization and verified by the Inspector and Contracting Officer. Final Stabilization is defined in 9VAC25-875-560 as soil disturbing activities have been completed and a permanent vegetative cover has been established on denuded areas not otherwise permanently stabilized. Permanent vegetation shall not be considered established until a ground cover is achieved that is

uniform, mature enough to survive, and will inhibit erosion.

The SWPPP shall be amended whenever there is a change in design, construction, operation, or maintenance that has a significant effect on the discharge of pollutants to state waters and that has not been previously addressed in the SWPPP. The SWPPP must be maintained at a central location onsite. If an onsite location is unavailable, notice of the SWPPP's location must be posted near the main entrance at the construction site.

8.1.6. PROHIBITED ILLICIT DISCHARGES:

The Contractor shall ensure no illicit discharges occur at the project site. An "illicit discharge" is any non-stormwater discharge to the storm drain system, except as expressly allowed by JBLE-Eustis' VPDES permits, the project-specific VSMP General Permit for Discharges of Stormwater from Construction Activities, and/or a discharge approved in writing by JBLE-Eustis. Water from firefighting, hydrant flushing, and A/C condensate are not considered illicit discharges. Examples of illicit discharges include, but are not limited to, the following:

- Dumping of trash or debris
- Disposing of vehicle/equipment maintenance fluids into a storm drain
- Leaking dumpsters flowing into a storm drain inlet
- Pouring paints, stains, hazardous materials into a storm drain
- Cleaning paint brushes/applicators in or near a storm drain
- Allowing wash waters with soaps, detergents, or paint debris into a storm drain inlet
- Washing silt, sediment, concrete, cement or gravel into a storm drain
- Allowing uncontrolled release of sediment into a storm drain inlet
- A measurable flow during dry weather that contains any other pollutants

8.1.7. WASTEWATER:

The Contractor shall ensure all wastewater generated during construction operations is managed in accordance with local, state, and federal regulations. The 733 CES/CEIE Water Program Manager shall be contacted prior to any discharge of wastewater to the environment.

9.1. HAZARDOUS MATERIALS MANAGEMENT

9.1.1. Hazardous Materials Usage and Reporting:

In compliance with AFMAN 32-7002 *Environmental Compliance and Pollution Prevention* dated 4 Feb 2020, all Contractors are required to report the usage of all hazardous materials to the Federal Government for all projects and contracts including service contracts executed on JBLE-Eustis. In accordance with FAR Clause 52.223-3, each offeror (Contractor) must provide the Contracting Office with a list of proposed HAZMAT that it plans to use on the installation during the performance of the contract. In accordance with AFFARS Clause 5352.223-9303, Contractors must obtain Air Force authorization prior to using HAZMAT on an Air Force installation, and must report usage data to the HAZMART.

Hazardous materials are any substance defined by OSHA as a hazardous substance requiring a Safety Data Sheet (SDS). Hazardous materials that need to be reported include but are not limited to chemicals, paints, thinners, sealing compounds, strippers, glues, solvents, all petroleum products

including oils, hydraulic fluids, and fuels stored on-site (fuels in vehicles are exempt), pesticides, adhesives, acids, flammables, corrosives, oxidizers, compressed gases (such as but not limited to oxygen, acetylene, propane, flammable and non-flammable gases), all aerosols, and all materials containing hazardous substances.

For contracts for six months or longer, the Contractor will assign a hazardous material POC who will be trained and establish an account in the Enterprise Environmental Safety and Occupational Health – Management Information System (EESOH-MIS). The Contractor shall request the proposed usage of all Hazardous Materials by submitting a request in the EESOH MIS software online for each hazardous material and shall submit a copy of the SDS for each item to the EESOH MIS system online prior to bringing the items on the installation. The Contractor shall submit the information for each item within 10 days after award of the contract or project and/or not less than fourteen calendar days prior to bringing the items on the installation. The Contractor shall submit this information as soon as possible for short notice contracts or projects. An electronic version of the Contractor Hazardous Material Worksheet can be obtained through the Project Manager or 733 CES/CEIE.

Contact the Hazardous Material Program Manager for guidance via email at usaf.jble.733-msg.list.ced-ee-p2-procurement@mail.mil .

After the project starts, monthly usage information will be provided to the CO who will in turn provide this information to the Project Manager who will in turn provide it to 733 CES/CEIE. Attachment 3 (Monthly Report for HAZMAT) of this section will be used to report monthly usage. For contracts/projects exceeding six months, this form is required to be filled out on a monthly basis. For contracts less than six months, this form is required at the beginning and upon completion of work.

If there are any questions on how to fill out the Contractor Hazardous Material Worksheet or the monthly report, contact the JBLE-Eustis HAZMART at 757-878-2781 Monday thru Friday between the hours of 0730-1630 or visit them at:

JBLE-Eustis HAZMART
1205 Taylor Road
Fort Eustis, VA

9.1.2. Hazardous Materials Management Process (HMMP):

The JBLE-Eustis HMMP team will meet on an as-needed basis to review the Contractor Hazardous Material Worksheets and SDSs to ensure there are no concerns with the chemicals being used and/or stored on the installation. If there are concerns about any chemicals and if it is determined that the Contractor plansto use an extremely hazardous chemical on JBLE-Eustis, the HMMP team will notify the Project Manager and the Contracting Officer (CO) who will in-turn notify the Contractor of JBLE-Eustis' concern. The Contractor will not bring any extremely hazardous chemicals on JBLE-Eustis or any other chemicals that the HMMP team determines cannot be used on JBLE-Eustis. The HMMP team will also notify the Project Manager if all hazardous materials are authorized for use.

If the Contractor requires additional hazardous materials not previously submitted for approval, they shall submit the request as stated above seven days prior to bringing the item on the base.

NOTE: If it is determined at any time that hazardous materials are on site that were not reported in advance, the CO will be notified and the project can be stopped until the materials are submitted as stated above.

9.1.3. Hazardous Material Storage:

Hazardous materials will be managed properly at all times while on JBLE-Eustis. This means containers will be in good condition and will be properly labeled with the contents and hazard class (flammable, corrosive, oxidizer, etc.) at all times. Containers will be closed at all times when not in use. Hazardous materials shall be kept under cover to protect them from the elements and to prevent stormwater runoff contamination. Tanks and 55- gallon liquid drums shall have secondary containment sufficient to hold 110% of the total capacity of the container. Gas cylinders shall be maintained in the upright position with caps on and secured with chains and locks to prevent tampering and from falling over. Gas storage areas will have signs indicating what type gases are stored in the area (i.e. flammable, oxidizer, non-flammable, etc.). NO SMOKING signs will be posted in all hazardous materials storage areas. In addition, all hazardous materials will be segregated in storage according to compatibility (i.e. flammables will not be stored with corrosives, corrosives will not be stored with oxidizers, flammable gases will not be stored with flammable liquids, etc.). JBLE-Eustis is subject to inspections at any time from outside agencies (EPA, Virginia Department of Environmental Quality and OSHA), any violations by the Contractor will be the responsibility of the Contractor and any fines associated with the violations will be resolved at the Contractor's expense.

9.1.4. USE OF RECYCLED-CONTENT PRODUCTS (GREEN PROCUREMENT):

Whenever the potential for use of non-recycled content products exists during the construction stage of the project, the Contractor shall incorporate in this project, as a substitute, recycled-content products that are listed and identified in EPA's Comprehensive Procurement Guideline (CPG) Program for recycled-content products.[1] The Contractor shall use recycled-content products as required by EPA and other governmental agencies and Federal Acquisition Regulation (FAR) clauses.

The CPG program is authorized by Congress under Section 6002 of the Resource Conservation and Recovery Act (RCRA) (42 U.S. Code 6962) and mandates that the Federal Government use recycled-content products in the construction and/or renovation of facilities. It is the intent of the Federal Government to comply with the EPA requirement 100% of the time and use as many of the applicable listed recycled-content products as feasible and economically practical. The Contractor shall consider this a standard requirement for all aspects of the project construction.

The recycled-content products listed in the CPG can be found on EPA's website. [2] These products are also listed in Attachment 4 (Contract Submittal and Contractor Reporting Form). This list is subject to change at any time, so it is the Contractor's responsibility to be aware of any updates or additions.

Such products shall also comply with the requirements of EPA's Consolidated Recovered Materials Advisory Notice (RMAN). The RMANs recommend recycled-content ranges for CPG products based on current information on commercially available recycled-content products. The recommended recovered materials content percentage can be obtained by clicking on the product on the website.

Before starting the project, the Contractor shall complete Attachment 4 indicating the items he or she plans to use. The Contractor will provide this to the Contracting Officer and the Project Manager. Upon completion of project construction, the Contractor shall complete the form again. At this time, the Contractor shall indicate the use and non-use of products that are contained in the CPG, and shall list the recycled-content percentage for the applicable item. In each instance where a recycled-content construction product is not used, the Contractor shall provide to the Contracting Officer (or his/her designated representative) and the Project Manager a completed

Exemption Form, Attachment 5 (Recovered Materials Determination Form).

The Contractor shall complete this form for all items for which he or she desires an exemption from the Green Procurement Program for Recovered Materials that are being procured. Exemptions can only be taken if all of the following conditions are met:

- The item is not available within a reasonable period of time
- Item fails to meet a performance standard in the specifications, and
- The item was only available at an unreasonable price i.e., the recycled-content product costs more than the non-recycled content product.

The fourth reason on the Recovered Materials Determination Form (i.e., the item is not available from two or more sources), does not apply to construction/renovation Contractors as the Federal Government will not prescribe where you can get your materials from. The Contractor shall provide specific reasons why an item is exempt, and shall furnish supporting documentation.

The Contractor will sign the completed Attachment 4 form as the "Procurement Originator," which will also be signed by the 733 CES/CEN Flight Chief. The form(s) will be kept in the project folder indefinitely.

10.1. ENVIRONMENTAL RESTORATION PROGRAM (ERP) REQUIREMENTS:

[Include only if work is in ERP site area. Ensure drawings define ERP boundaries and monitoring well locations] **Appropriate, additional guidance will be provided if project is on or near an ERP site.**

The Air Force Civil Engineer Center (AFCEC) CERCLA Administrative Record Search website provides a means to search and review public documents regarding environmental testing and sampling conducted at Air Force installations. These documents form the basis for environmental response actions and demonstrate the public's opportunity to participation and comment on the selection of the response action. AFCEC continuously updates the administrative record for each installation until the remedy selection documentation is complete. The documents are available at the link below.

https://ar.afcec-cloud.af.mil/

Select "Continue to site" In the Installation Lit scroll down and select "Fort Eustis, VA"

The website will then display JBLE-Eustis Sites, Operable Units and Records of Decisions

Select the site of interest and then select "Search" The website will then display all the document available that have any reference to the site.

10.1.1. Work on or near a JBLE-Eustis Environmental Restoration Program site:

Work must be coordinated with the JBLE-Eustis Restoration Office. This is normally accomplished through the 733 CES/CEIE Environmental Impact Analysis Process (EIAP), which include review of AF Form 322 (Base Civil Engineer Work Request) and/or AF813 (Request for Environmental Impact Analysis) review process. Work on or near Military Munitions Response Program sites require unexploded ordnance (UXO) training for on-site workers and on-call or onsite UXO support.

10.1.2. Site Safety:

Site summaries/descriptions are furnished with this contract to familiarize personnel with the

potential hazards associated with construction and demolition work at ERP sites. The 733 CES/CEIE EIAP documentation (i.e. AF332, AF813 or other level of analysis), will inform contract workers of potential hazardous exposures from working at ERP sites, and that the appropriate precautions are followed to minimize hazards to human health and the environment. Personnel working at these sites shall have 40-hour HAZWOPER Training. At least one individual on site should have completed the OSHA 8-hour supervisor training course. The plans must identify the boundary of these ERP sites. To perform work at these sites, the Contractor must have a Health and Safety Plan and Hazardous Waste Disposal Plan for proper disposal of all regulated materials generated during execution of this project.

10.1.3. Monitoring Wells:
There may be several monitoring wells installed in and around the proposed construction area. Site maps and construction drawings provide the location of these wells. The Contractor shall take all precautions to prevent any damage to wells. If the wells and associated structures are damaged during the project, the Contractor shall coordinate with the JBLE-Eustis Restoration Office for requirements for repair/replacement. All damages are the contractors responsibility and at no additional expense to the Federal Government. Contractor shall dispose of all regulated materials during repair of the damaged structures and remove any free product as required by VDEQ regulations.

10.1.4. Additional Excavation:
Prior to any excavation beyond the immediate area or boundary of the construction site, the Contractor shall coordinate with 733 CES/CEIE and obtain the Contracting Officer's approval.

11.1. SOIL SUPPORT PROGRAM (SSP) ACCEPTABILITY:
The soils obtained from off-base sources shall meet the criteria outlined below. The soils generated during construction project excavation will be collectively referred to as "soil media." Soil media is not inherently waste-like, but it may contain waste-like materials, including contaminants associated with historical operations at the site. Given the base history of operations, the Contractor must make a determination as to whether the soil media is contaminated. If soil media is determined to be contaminated, then a hazardous waste determination must be made. Standard test methods are described below. Contaminated soil media shall be managed as a solid waste and removed from base in accordance with applicable requirements for disposal of solid waste. If the soil media is determined to be uncontaminated and not waste-like, then it may be disposed on site in an environmentally sound manner or disposed of at an approved landfill.

11.1.1. Contaminated Soil and Free Product:
Any material (soil) that is suspected of containing petroleum products shall be reported to the Contracting Officer or his/her designated representative. If discovered, the Contractor shall mitigate any potential threat to the workers, public and environment. The area that will be disturbed under this contract has the potential to have free product migrate into and under the construction site. Comply with VR-680 and record the quantity of any fuel removed from **[the line]**. Contaminated soil and/or free product shall not be used for backfill or removed from the base without written approval from the Contracting Officer. Once removal is approved, Contractor shall dispose of material under guidance of the Hazardous Waste Manager (733 CES/CEIE). All hazardous waste manifests shall be prepared by the Contractor and shall be coordinated, approved and signed by Hazardous Waste Manager (733 CES/CEIE) prior to removal of such waste from the base.

11.1.2. Clean Soil:

Projects requiring clean soil, including but not limited to topsoil and backfill materials, to be brought onto JBLE-Eustis or relocated within base property must meet minimum standards based on results of physical (geotechnical) and chemical testing. All materials will meet geotechnical specifications appropriate for the type of project being accomplished and are typically identified elsewhere in the project specifications. The intent of this section is to prevent cross contamination (i.e. planned excavation) and define clean soil based on chemical/project specifications. Soil contaminant levels shall be tested, with test procedures and results documented to ensure that only the source(s) of topsoil and/or backfill deemed to have acceptable soil contaminant levels be utilized for current and future use. The Contractor shall implement a plan and confirm the proposed source(s) of clean topsoil and/or backfill (borrow source) meet the clean soil specifications for the project. The plan should incorporate borrow source information, sampling data, and testing results. As a minimum, the Contractor shall meet the following standards:

11.1.2.1. Borrow Source. The Contractor shall provide detailed borrow source information (e.g., location, owner, operator, past and current land use, previous chemical testing results) at the point of planned excavation to 733 CES/CEIE to determine chemical testing requirements. The Con- tractor shall also submit a certification stating the materials contain no asbestos, no gross contamination have been discerned by visual or olfactory observations, and no spills of a listed hazardous waste (40 CFR 261) have occurred at the borrow site. If previous chemical testing results exist and are provided, 733 CES/CEIE will evaluate those results to determine if they are sufficient and the proposed borrow soils meet clean soil requirements. If testing is incomplete, 733 CES/CEIE will review borrow source information to determine chemical sample requirements.

11.1.2.2. On-base Soil Sources. Unless otherwise provided in the contract, the Contractor shall bear all expenses of developing the source. For the site where soil is reclaimed from Federal Government land, the Contractor may be required to perform final grade and seeding according to project requirements.

11.1.2.3. Excess Soil Work. Acceptable excess soil shall be delivered to the designated location(s) following approved haul routes. For the site where excess soil is deposited on Federal Government land, the Contractor may be required to perform final grade and seeding according to project requirements.

11.1.3. Sample Plan:
At least one composite sample (6-8 grabs) for each undisturbed borrow source would be taken from the original point of excavation and required for each 5,000 CY of soil. For soil taken from disturbed borrow sources, samples are required for each 1,000 CY of soil. The nature of the borrow source is to be considered when determining the quantity and depth of the samples. Additional samples may be required to adequately characterize the proposed borrow source (i.e. laterally and vertically). The Contractor shall submit a Sample Plan (to include site map, excavation area, location and depth of samples) for 733 CES/CEIE review and approval.

11.1.4. Chemical Testing Standards:
The analysis must be performed by an accredited or certified laboratory approved by the U.S. Environmental Protection Agency and the State of Virginia (e.g., Environmental Laboratory Accreditation Program [ELAP], Virginia Environmental Laboratory Accreditation Program [VELAP]). Submit a copy of the chain of custody and complete validated report of analysis to

733 CES/CEIE for review and approval 30-days prior to use of any borrow soils. Chemical testing of any borrow source will include sampling for the following suite of contaminants (test requirements may be reduced based on borrow source information):

- Total Petroleum Hydrocarbons (TPH) to include Gasoline Range Organics (GRO) and Diesel Range Organics (DRO);
- Volatile Organic Compounds (VOCs) [EPA method 8260B] to include Benzene, Toluene, Ethylbenzene, and Xylene (BTEX);

The soil support test suite shall also include unless generator knowledge suggests otherwise:

- Semi-volatile Organic Compounds (SVOCs) [EPA method 8270];
- Pesticides [EPA method 8081A];
- Polychlorinated Biphenyls (PCBs) [EPA method 8082];
- Target Analytic List (TAL) metals (including Mercury) [EPA method 6010B/7470A]
- Volatile Organic Compounds (VOCs) [EPA Method 8260] other than BTEX compound reference in the preceding paragraph; and PFAS [EPA method 1633]

11.1.4. Clean Soil Determination:
Soils testing under the EPA screening levels and/or base "background" levels will be considered acceptable "clean" soil. Generally, acceptable clean soil must not exceed EPA Region III "Residential" Risk Based Concentrations (RBC) and the JBLE-Eustis background soil concentrations. For use in current and future industrial areas, EPA Region III "Industrial" RBCs may be considered but shall not exceed UTL background levels.

11.1.5. Excavation and Delivery Screening:
Common to any multiple point sampling, compo- site testing may not accurately characterize the entire site. Should contamination be detected (e.g. free product, stained soils, chemical odors) during excavation or delivery, soil operations shall be immediately discontinued pending 733 CES/CEIE notification and resolution. Additional soil testing and screening may be required to determine if continued use of the borrow site is acceptable.

11.1.6. Material Physical Characteristics:
All soil obtained from sources within or outside the limits of Federal Government-controlled land shall meet the physical characteristics as defined in project specifications.

11.1.7. Red Imported Fire Ants (*Solenopsis invicta*):
Contractors shall comply with the provisions of the Federal Imported Fire Ant Quarantine/Virginia's Imported Fire Ant Quarantine. JBLE-Eustis exists within Virginia's Imported Fire Ant Quarantine area. The following articles regulated by Virginia's Imported Fire Ant Quarantine shall not be brought onto JBLE-Eustis if the source of the article is within the current quarantine area without a VDACS RIFA Inspection Certificate or Compliance Agreement:

- Any life stage of imported fire ant
- Soil, except soil shipped in original containers after commercial preparation
- Plants with roots with soil attached and rhizomes with soil attached
- Grass sod
- Used soil-moving equipment unless free of all non-compacted soil
- Used farm equipment, unless free of all non-compacted soil
- Hay and straw stored in direct contact with the ground
- Honey bee hives stored in direct contact with the ground
- Logs and pulpwood with soil attached

Soil-moving/soil-excavating equipment used on the installation must be free of loose, uncompacted soil prior to accessing the installation. Such equipment used on JBLE-Eustis must be free of all loose, uncompacted soil prior to leaving the installation.

12.1. TREE PROTECTION, PRESERVATION, AND PLANTING

12.1.1. Tree Protection:

Trees take generations to mature, yet they can be irreparably damaged or killed within seconds, or subjected to conditions which may take five to ten years to kill them. Improper planting may result in short-term death, structural failure, or a long-term senescence. Most situations can be prevented. 18 USC 1852-53 makes it illegal to damage, injure, remove, sell, or dispose of trees owned by the Government without consent from the installation forester.

Tree protection structures, such as fencing, silt fence, and flagging should be placed around the dripline of the tree and be at least 48" hight to prevent equipment and supplies from damaging trees or compacting soils. Trees can be damaged and killed from either visible damage the the trunk, compaction of below ground roots, or by introducing disease or insects into damaged branches and limbs.

12.1.2. Trees contribute:

Because trees contribute so much to our quality of life and because they can be a potential liability, they must be actively conserved, wisely selected, well placed, well planted, routinely maintained and constantly protected. One of the most critical steps in planning for trees and cost-effective ways of managing trees is to maintain adequate growing space for each tree's roots, trunk and crown throughout the tree's life. Remember that as a tree gets older it gets larger and the growing space it requires increases accordingly.

12.1.3. Existing Trees:

For existing trees, there is a minimum amount of area, above (for the trunk and crown) and below ground (for soil health and the root system) that is required to protect trees and preserve tree health. This area has been identified as the critical root zone (CRZ) or tree protection zone (TPZ) by various experts and is generally agreed to be equivalent to the soil area below ground and the space above ground defined by the tree's drip line, or the greatest extent of the branches.

12.1.4. Tree Value Replacement:

AFMAN 32-7003 notes both commercial and intrinsic value of trees, even in urban settings, and recognizes standing, live trees as real property. Trees provide more than just commercial harvest revenue. In training environments and urban landscapes, they provide shade, energy use reduction, slow wind and water erosion control, provide wildlife benefits, sequester carbon, and increase mental health and wellbeing of those on the installation. When trees are removed or damaged during construction, the installation must be reimbursed for that value into the AF forestry account.

Tree Compensation Value at Fort Eustis is calculated with two options for replacement.

Option 1: Pay compensation value into the AF Forestry Account with check payable to "US Treasurer" and submitted within 30 days of tree removal to 733 CEIE. Compensation value will be calculated using the *Overall Benefit* annual value from the National Tree Benefit Calculator <https://www.arborday.org/value> for the tree species, DBH, and location; multiplied by 1/3 the tree age.

	Diameter at 4.5' of Tree Removed or Damaged				
	Species	0-8"	8.1-16"	16.1-24"	24"+
Replace Value	Oak/Hickory	$28.0	$68.0	$143.0	$213.0
	Other Hardwood	$28.0	$65.0	$110.0	$200.0
	Pine (softwood)	$28.0	$34.0	$97.0	$190.0

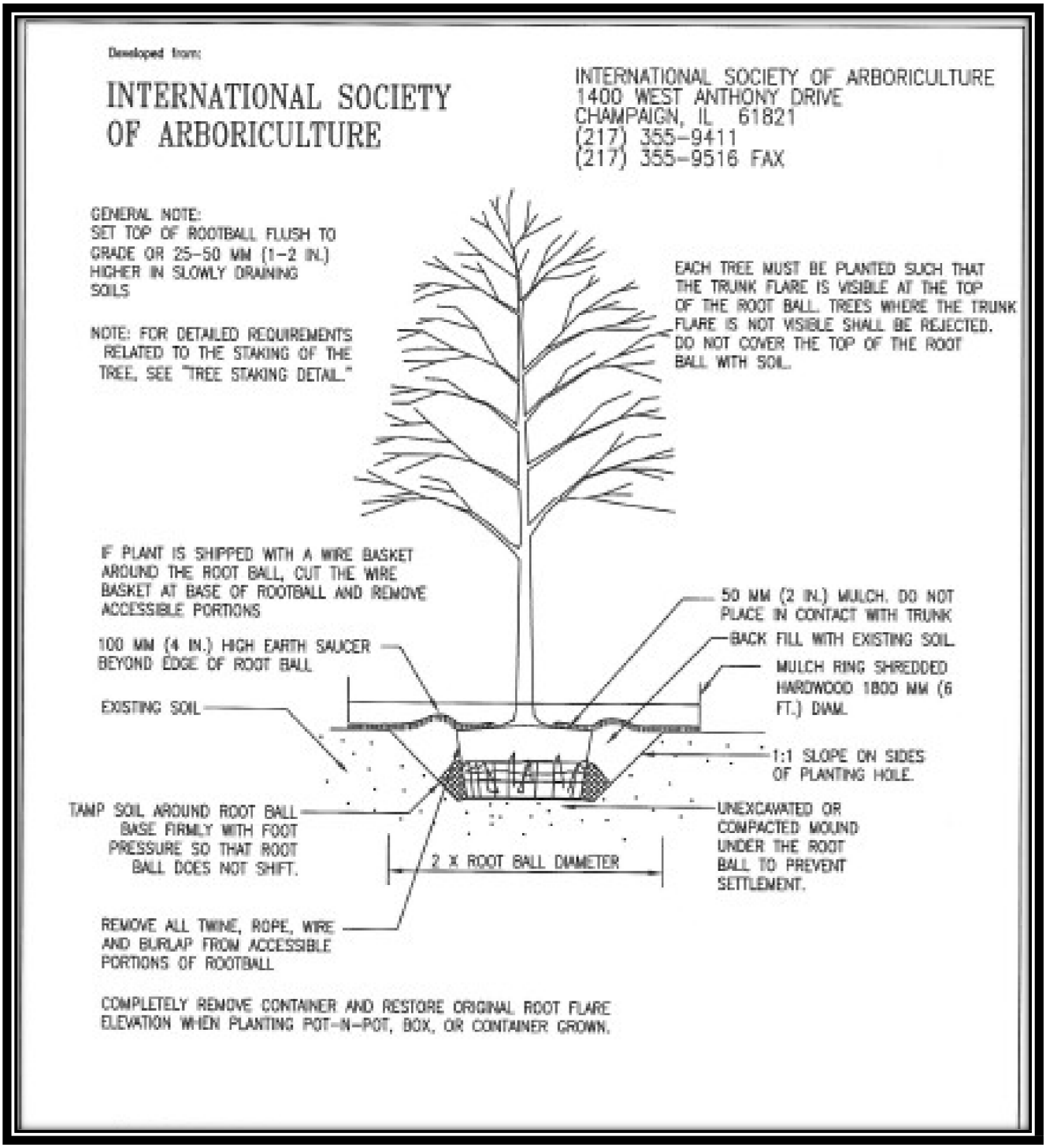
Option 2 is to replace 50% of the tree DBH removed with similar, appropriately selected species to include tree staking or tubing, and a 1 year morbidity warranty. Trees used for replacement will be a similar species, or a species requested by 733 CEIE. Trees less than 3" diameter at planting will be tubed with a 5ft tall tree protection tube and a single wooden tree stake. Trees larger than 3" diameter at planting will be staked using 3 wooden tree stakes and rope, poly, or plastic tree straps (no wire).

	Diameter at 4.5' of Tree Removed or Damaged				
	Species	0-8"	8.1-16"	16.1-24"	24"+
# of 2" Diameter Trees to Replace	Oak/Hickory	1	3	9	12
	Other Hardwood	1	3	8	10
	Pine (softwood)	1	3	8	10

Developed from:

INTERNATIONAL SOCIETY OF ARBORICULTURE

INTERNATIONAL SOCIETY OF ARBORICULTURE
1400 WEST ANTHONY DRIVE
CHAMPAIGN, IL 61821
(217) 355-9411
(217) 355-9516 FAX



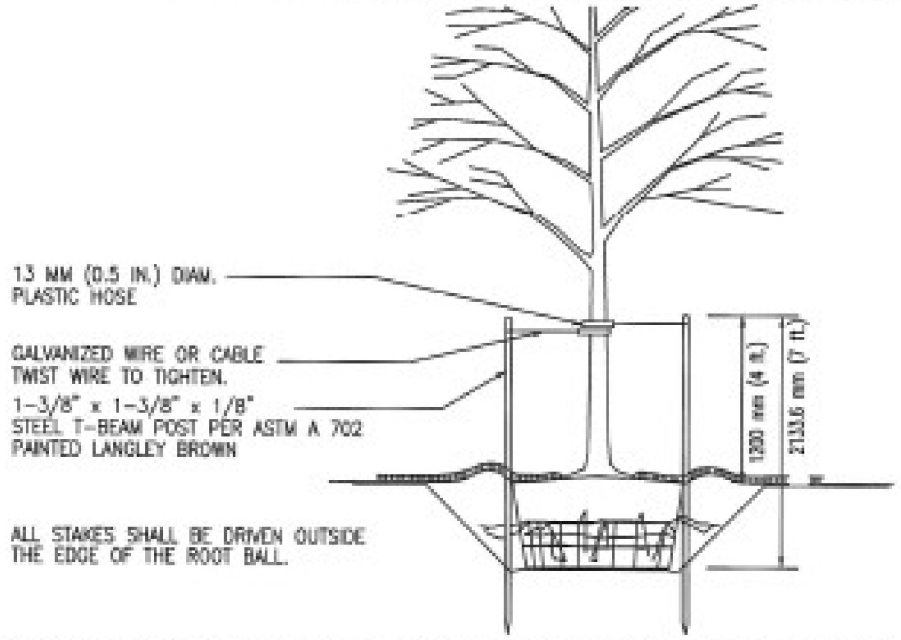
DEVELOPED FROM:
INTERNATIONAL SOCIETY
OF ARBORICULTURE

INTERNATIONAL SOCIETY OF ARBORICULTURE
1400 WEST ANTHONY DRIVE
CHAMPAIGN, IL 61821
(217) 355-9411
(217) 355-9516 FAX

WIRE OR CABLE SIZES SHALL BE AS FOLLOWS:
TREES UP TO 65 MM (2.5 IN.) CALIPER – 14 GAUGE
TREES 65 MM (2.5 IN.) TO 75 MM (3 IN.) CALIPER – 12 GAUGE

TIGHTEN WIRE OR CABLE ONLY ENOUGH TO KEEP FROM SLIPPING. ALLOW FOR SOME TRUNK MOVEMENT. PLASTIC HOSE SHALL BE LONG ENOUGH TO ACCOMMODATE 35MM (1.5 IN.) OF GROWTH AND BUFFER ALL BRANCHES FROM THE WIRE.

TUCK ANY LOOSE ENDS OF THE WIRE OR CABLE INTO THE WIRE WRAP SO THAT NO SHARP WIRE ENDS ARE EXPOSED.



ASSURE THAT THE BEARING SURFACE OF THE PROTECTIVE COVERING OF THE WIRE OR CABLE AGAINST THE TREE TRUNK IS A MINIMUN OF 12 MM (0.5 IN.).

REMOVE ALL STAKING AS SOON AS THE TREE HAS GROWN SUFFICIENT ROOTS TO OVERCOME THE PROBLEM THAT REQUIRED THE TREE TO BE STAKED. STAKES SHALL BE REMOVED NO LATER THE END OF THE FIRST GROWING SEASON AFTER PLANTING.

13.1. COMPLYING WITH WETLAND REGULATIONS

13.1.1. Project Compliance:

733 CES/CEIE is not responsible for project compliance with federal, state and local wetland regulations. It is incumbent upon design and contracting personnel and contractors to determine wetland permitting and mitigation requirements. This process begins with the preparation of the DD 1391 and DD 813 routed for coordination through CEIE. CEIE shall determine whether permits are required based on the AF 813 and supporting documentation.

The contractor/contractor's consultant shall consult with CEIE regarding existing wetland delineation data. The contractor/contractor's consultant may be required to delineate, or have delineated, the affected wetlands in accordance with USACE specifications.

13.1.1. A Joint Permit Application (JPA):
This is used to apply for permits, for work in the waters of the United States (including wetlands) within Virginia. Such work may include (but not limited to) construction, dredging, filling, excavation or crossings in waters or wetlands.

13.1.1.1. There are 2 types of JPAs that can be submitted to the Virginia Marine Resource Commission (VMRC) for construction, dredging, filing, excavation, and crossings of wetlands. The Tidewater JPA may be used for most activities occurring within the tidewater area of Virginia and must include Endangered Species Act and Essential Fish Habitat effect determinations completed by the contractor. The Standard JPA must be used for any activity requiring dredging or excavation of wetlands. All JPAs are submitted to VMRC who distributes them to the other regulatory agencies. Allow at least 90 days for the acquisition of a wetlands permit.

13.1.1.2. The contractor shall submit draft JPA (with all required supporting documentation) to the Natural Resources Program Manager for review and CES Director's signature on the JPA.

13.1.1.3. All wetlands permitting requirements shall be completed prior to the start of construction activities with application and permit fees paid by the contractor. Permit fees include wetland mitigation fees.

13.1.1.4. Wetland mitigation fees must be paid to an approved mitigation bank in accordance with any stipulations set forth as a part of wetland permit conditions. On site wetland mitigation will only be considered as an option for shoreline restoration and stream stabilization projects.

13.1.1.5. Contracts, specifications and bid documents/advertisements will clearly indicate that it is the Contractor's responsibility to determine and verify the presence and location of jurisdictional wetlands, prepare joint permit applications, obtain permits, and perform necessary consultations on behalf of 733 CES.

13.1.1.6. The approved permit must be read by both Contractor and Federal Government representatives. The majority of permits approved will have conditions specific to the permitted project and such conditions must be adhered to.

13.1.2. Occupying Wetlands:

13.1.2.1. Prior to performing any work on the project, the areas of wetland will be identified and marked by the contractor or USACE. All personnel of the contractor shall be alerted to these designated areas.

13.1.2.2. The contractor shall not impact any wetland or waterway, whether it be permanently or temporarily unless otherwise stipulated in a wetland permit. No fill material shall be placed in wetlands without a wetland permit. Fill material includes but is not necessarily limited to trees, tree debris, other vegetation or vegetation debris, soil, sand, refuse, concrete, or any human-generated debris.

13.1.2.3. If a contractor must impact a wetland or waterway not previously described in EIAP, the contractor will cease work on that portion of the project until wetland regulatory agencies have been contacted, JPA has been submitted and applicable permits have been obtained and reviewed by CEIE.

13.1.2.4. If the contractor impacts any wetland or waterway not covered under a wetland permit, they shall be responsible for restoring the wetland areas and possibly mitigating the wetland impacts to the full satisfaction of the regulatory agencies, which could include monetary compensation. The contractor must report accidental or negligent wetland impacts to the CE PM and CEIE immediately upon observation.

13.1.2.5. The cost of restoration and mitigation of the impacted areas shall be at no additional cost to JBLE-Eustis.

13.1.3. OTHER NATURAL RESOURCE CONSIDERATIONS:
While working on JBLE-Eustis, contractors will respect all other natural resources including habitats and wildlife. Issues concerning wildlife will be directed to the respective CEIE. No trees or forest products shall be removed, from the installation without CEIE approval. Contractors involved with timber removal shall consult with CEIE forester for conditions of removal and/or sale, to confirm cutting restrictions, and to anticipate/mitigate any standing timber damage.

14.1. CONFORMANCE WITH ENVIRONMENTAL MANAGEMENT SYSTEMS:
The Contractor shall perform work under this contract consistent with the relevant policy and objectives identified in JBLE-Eustis' Environmental Management System (EMS). The Contractor shall perform work in a manner that conforms to all appropriate Environmental Management Programs and Operational Controls identified by the JBLE-Eustis EMS. In the case of a non-compliance, the Contractor shall respond and take corrective action immediately. In the case of a nonconformance, the Contractor shall respond and take corrective action based on the time schedule established by the EMS Site Coordinator. In addition, the Contractor shall ensure that their employees and subcontractors are aware of the roles and responsibilities identified by the EMS and how these requirements affect their work performed under this contract.

All on-site Contractor personnel shall complete yearly EPA sponsored environmental training specified for the type of work conducted on-site. Upon inclusion in the contract Statement of Work, the Contracting Officer's Representative will verify that all contractor personnel have acquired EMS Awareness Training IAW AFI 32-7001, section 5.7 at their appropriate site or location. The JBLE-Eustis EMS Awareness Training is incorporated into the Environmental Management Awareness and Competency (EMAC) Training is provided through The Environmental Awareness Competency Hub (TEACH) website at https://usaf.learningbuilder.com, open in either Chrome or Edge, Internet Explorer is not supported. Instructions follow:

Step 1: Log-in for the first time:

Select “Register for an Account”

If no error message, THEN: Enter your First and Last Name, Email Address and Password on the “Register for an Account” screen.

If you receive an error message your email is registered in the system, “The email address you provided is already in the system.” THEN:

Select the note that states to “reset your email” or return to the main screen; select “Forgot your password”

Step 2: Enter Account details:

If you created your own account, THEN follow the screen prompt to Enter Account details (notes are below)

If your email address was already in the system, THEN: Select “My Account” on the Top Right Hand side of the website, select “Enter Demographics” (notes are below)

ESOHTN Unclaimed Account (if applicable): Enter email address related to your ESOHTN account. Note only records from 2013 were imported into TEACH.

Employee Type: Civilian, Air National Guard, Reserves, etc. (Drop-down list) Position Series: Select the top level group.

Job Focus Tasks: Select closest to what describes your duty title/additional duties.

Installation: Select the base that closest matches, PSUs shall select the nearby installation other: Enter Wing/Group/Squadron.

Step 3: Take a Course & Print Certificate

On the Home screen, My Transcripts Tab should be available (*account details/demographics must be complete*)

Select “My transcripts” – select “Search for a Course”

Find/Select “+ Select” next to the course required (List can be filtered, if desired) or
(*Note: ESOHTN courses cannot be selected, viewed or re-taken)
(*Note: If a new window does not open – the course will be listed on the “My Transcripts” page – select the button next to the course)

Select “Go To Course”, when finished, select the “X” on the window to close the course.

Complete the Evaluation to received credit for the course – Select “Evaluate Course” – Complete Evaluation by selecting “submit” on the form.
For a Certificate of Completion: In “My Transcripts” find the course name completed, select the

"gear icon" – select "View Certificate"
(*Note: If the gear icon is not available – the course evaluation was not completed)
(*Note: Certificate does not open in a new window – ensure you select the back button in the browser)
(*Note: ESOHTN *attendance records from 2013* were imported into TEACH)

You may choose to end your session after completing the training by logging out. The next time you enter the site, you will login by typing the username and password that you just created.

15.1. CULTURAL RESOURCE PROTECTION:

15.1.1. EXCAVATION:

Prior to any excavation on JBLE-Eustis property Contractors are required to contact MISS Utility and the Network Enterprise Center (NEC) to have utilities marked and request any available utility maps for the project area from the 733 CES. In addition, the Contractor shall coordinate with the 733 CES/CEIE, through the CES project manager, to ensure that excavation is not occurring in known archaeological sites and to ensure the project area has been surveyed for archaeological sites and that Section 106 compliance is completed[1]. In the event of the inadvertent discovery of a potential archaeological material, the contractor shall immediately cease work and contact the CES project manager. The CES project manager shall immediately contact the 733 CES/CEIE Cultural Resources Manager (CRM), and take steps to secure the site. In the event of the discovery of possible human remains, the contractor shall cease work, secure the location of possible human remains, and contact the 733d Security Forces Squadron to investigate the site.

15.1.2. REHABILITATION:

Prior to rehabilitation, repair or maintenance on historic facilities or; new construction, the

[1] The National Historic Preservation Act of 1966 as amended is codified at 54 USC § 300101 et seq. Nevertheless, the Advisory Council on Historic Preservation (Advisory Council) continues to reference original sections of the law, most often "Section 106" (54 USC § 306108) regarding consultation requirements and "Section 110" (54 USC §§ 306101-306107, 306109-306115) preservation responsibilities.

Contractor shall contact the 733 CES project manager, who shall coordinate with the 733 CES/CEIE CRM to assure Section 106 compliance is complete. Historic facilities are facilities that have been determined to be eligible or are potentially eligible for listing on the National Register of Historic Places. All work on historic facilities shall be accomplished in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties. There are four different standards, preservation, rehabilitation, restoration, and reconstruction. Projects conducted on Building 1611 (the Matthew Jones House) will follow the Preservation Standard. Projects on any other historic facility on JBLE-Eustis will follow the rehabilitation standard. The standards can be found at **https://www.nps.gov/tps/standards.htm**.

15.1.3. DEMOLITION PROJECTS:

Prior to commencing demolition projects, the contractor shall coordinate with the 733 CES/CEIE CRM to ensure Section 106 compliance has been completed. If, during the demolition process, unknown features of potential historic interest are uncovered, the contractor shall immediately cease work and contact the733 CES/CEIE CRM.

16.1. ROOF DESIGN TO MINIMIZE BIRD COLONIZATION:

As an Air Force Installation the presence of large colonies of birds poses a hazard to the JBLE-

Eustis mission. Roof design that minimizes bird colonization will reduce the frequency of aircraft impacts with wildlife and protect the life of military personnel in and around the airfield. Colonial shorebirds such as Least Tern, Killdeer, and American Oystercatcher have demonstrated an affinity for rooftop nesting on flat gravel rooftops. In order to prevent Bird Aircraft Strike Hazards, the installation of flat gravel rooftops on new buildings should be avoided. Major roof repair to existing gravel rooftops should include the removal of gravel substrate and replacement with energy efficient materials such as tar shingles, rubber, vinyl, or polyurethane materials.

16.1.1. BIRD COLONIES:
If a shorebird colony is found to be actively nesting on building during repair or replacement of an existing roof, harassment or take of shorebirds is prohibited by the Federal Migratory Bird Act. If shorebirds are present, the Natural Resources Program Manager should be contacted so that the best course of action in compliance with all State and Federal regulations can be identified.

17.1. INTEGRATED PEST MANAGEMENT
All pest management activities will be in accordance with (IAW) the Installation Pest Management Plan (IPMP), DoDI 4150.07, and AFMAN 32-1053. This includes mechanical methods, exclusion, deterrents, and pesticides. Pesticides constitute any substance or mixture of substances, including biological control agents, that may prevent, destroy, repel, or mitigate pests and is specifically labelled for use by the Environmental Protection Agency (EPA). Pesticides include herbicides, insecticides, fungicides, nematocides, acaricides, algaecides and rodenticides. IAW Integrated Pest Management Plan (IPMP), DoDI 4150.07 and AFMAN 32-1053, all pest control activities and pesticide applications occurring on the installation must be approved in advance by Installation Pest Management Coordinator CEIE). Any personnel that apply pesticides shall have current Virginia Department of Agriculture and Consumer Services (VDACS) Pesticide Applicator Certificate. Any person or business applying pesticides shall have a Virginia Pesticide Business License and proof of liability insurance. Registered technicians are not authorized to apply on DoD Installations. The contractor shall maintain complete daily records of pesticide applications and non-chemical pest management and provide digital copies to the IPMC by the last day each month during the contract.

17.1.1. PEST MANAGEMENT DAILY RECORDS:
All pest management projects will be submitted and approved by the JBLE Installation Pest Management Coordinator (IPMC) prior to commencement of work. The following information will be reported to the IPMC for each planned pesticide application, and for each application that occurs:

- Location of applicationand size of the area treated.
- Date of application.
- Applicator name(s), VDACS/DoD Certification #.
- Name/Address/Phone Number of customer.
- Pesticide trade Name and EPA Reg. #applied
- Target pest(s) controlled.
- Amount of pesticide concentrate used.
- Amount of diluent used this application.
- Name(s) and total pounds of each active ingredient (AI) applied this application.
- Hours spent applying pesticide for this application.

- Hours spent using non-chemical control techniques.
- Type of application equipment used.

The above information shall be submitted in electronic formto the Installation Pest Management Coordinator (IPMC) no later than the last day of the month for each month of the contract.

17.1.2. APPROVED PESTICIDES:

All pesticides must be approved for use by the Installation Pest Management Coordinator. Contractors shall provide electronic copies of pesticide labels and safety data sheets for each requested pesticide to the Installation Pest Management Coordinator. Contractors should plan for an estimated 2 weeks for approval determination.

18.1. DISCREPANCIES.

In case of a conflict or discrepancy between Installation Management regulations or laws and the contract specifications, the Contractor shall immediately submit the matter in writing to the Contracting Officer for a determination. Without such determination, any actions taken shall be at the Contractor's own risk and expense.

References:

1. EPA Comprehensive Procurement Guidelines
2. https://www.epa.gov/smm/comprehensive-procurement-guideline-cpg-program
3. EPA Comprehensive Procurement Guidelines for Construction Products https://www.epa.gov/smm/comprehensive-procurement-guidelines-construction-products
4. EPA Consolidated Recovered Materials Advisory Notices (RMANs) for the Comprehensive Procurement Guidelines
5. https://www.epa.gov/smm/consolidated-recovered-materials-advisory-notices-rmans-comprehensive-procurement-guidelines-cpg
6. EPA Region III Risk Based Concentration (RBC) table. As this table is updated every 6 months, analysis is to be determined by the table current at the time of testing. This table can be found at http://www.epa.gov/reg3hwmd/risk/human.
7. Secretary of the Interior's Standards for the Treatment of Historic Properties https://www.nps.gov/tps/standards.htm

ATTACHMENT 1

CONSTRUCTION/DEMOLITION DEBRIS RECYCLING AND REPORTING

As stewards of the environment and because of the Air Force goals of diverting greater than 40% of its waste away from landfills, Contractors shall recycle C&D debris to the maximum extent possible. There are many sources in the local area that can recycle C&D. A list of sources can be found in the "Environmental Special Conditions" portion of JBLE- Eustis construction contracts. If you need further assistance finding sources, contact the 733 CES/CEIE Solid Waste and Recycling Program Manager at 757-878-4123. JBLE-Eustis must report recycling metrics to higher Headquarters quarterly. Therefore, complete the form below for each project on JBLE-Eustis and submit a copy to the 633 CONS Contracting officer, the 733 CES/CEN Project Manager, and 733 CES/CEIE (Solid Waste and Recycling Program Manager), by the 5th day of each quarter (05 Apr, 05 July, 05 Oct and 05 Jan) for the previous three month period for the duration ofthe project.

PROJECT NUMBER AND TITLE: _____

PROJECT LOCATION (BLDG # AND STREET ADDRESS): _____

_____

CONTRACTOR NAME: _____

CONTRACTOR ADDRESS/PHONE NUMBER: _____

_____

TYPE ITEMS RECYCLED:

_____ Concrete without rebar

_____ Concrete with rebar

_____ Scrap Metals

_____ Wood

_____ Roofing Materials

_____ Brick

_____ Asphalt

_____ Other: Specify _____

TONNAGE OF ITEMS RECYCLED:_____TONS TYPE ITEMS NOT RECYCLED:

_____ Concrete without rebar

_____ Concrete with rebar

_____ Scrap Metals

_____ Wood

_____ Roofing Materials

_____ Brick

_____ Asphalt

_____ Other: Specify _____

CONTINUED ON THE BACK

C&D DEBRIS RECYCLING AND REPORTING FORM (CONT'D) REASONS ITEMS WERE NOT RECYCLED:

_____ No market for the items

_____ No local vendors to recycle the materials

_____ Not economically feasible: Specify: _____

_____ Other: Specify: _____

PROVIDE NAME OF COMPANY, POINT-OF-CONTACT AND PHONE NUMBER OF SOURCE BY WHICH RECYCLING AN ITEM(S) WERE ATTEMPTED:

Company Name: _____

Point of Contact: _____

Phone Number: _____

C&D ITEMS DISPOSED OF BY LANDFILL: _____ TONS

C&D ITEMS DISPOSED OF THROUGH REGULAR INCINERATION: _____ TONS

ITEMS DISPOSED OF BY WASTE-TO-ENERGY INCINERATION: _____ TONS

_____ _____
CONTRACTOR SIGNATURE **DATE**

NOTE: ELECTRONIC SIGNATURE ACCEPTABLE

ATTACHMENT 2

Contractor Hazardous Material Worksheet

FOR ASSISTANCE WITH THIS WORKSHEET CONTACT JBLE-EUSTIS HAZMART AT 757-878-2781
CORRESPONDING SAFETY DATA SHEET MUST BE ATTACHED.

CONTRACTOR INFORMATION
Prime Contractor name:
Subcontractor name (if applicable):
Project Manager POC name:
Contracting Office POC:
Contract #:
Project #:
Project title:
Project date range: through (mm-dd-yyyy)

MATERIAL INFORMATION
Part number (from SDS) or National Stock Number:
Noun/Common Name:
Type of Container (ex - can, bucket, box):
Size (ex -1 gal, 5 gal, 1qt, 500 mL, tank):
Unit of Issue (ex - each, box/12, case/24):

DRAW INFORMATION
Estimated amount of this material to be used for duration of contract*:

* *At project completion, submittal summarizing actual usage is required*

TASK INFORMATION
Task Description (describe what it is used for):

LOCATION INFORMATION
Will the process be performed in: (check all applicable locations)
A facility, aircraft, equipment, manhole, other structure? Outdoors?

Is material going to be used in an area occupied by USAF military or civilians? Yes ☐ No ☐

What is the storage location of unused materials? Will respirators be worn? Yes ☐ No ☐

Will a ventilation system be used? Yes ☐ No ☐

REMARKS (provide any additional comments or information)

Contractor Point of Contact

Requestor's Name: Title:
Address:
Phone Number: Date:

To Be Completed by USAF Personnel Only

EESOH-MIS Shop Code:_____

BE:_____Recommend Approval_____Recommend Disapproval: Comments:

SE:_____Recommend Approval_____Recommend Disapproval Comments:

CEIE:_____Approve_____Disapprove Comments:

HAZMART:_____Concur_____No concur Comments:

ATTACHMENT 3

CONTRACTOR'S MONTHLY REPORT FOR HAZMATS

Contractor: Shop Code:
Contract#: Location:

The following information is required for tracking of hazardous materials on JBLE-Eustis. For contracts exceeding six months, this form is required to be filled out on a monthly basis and returned to the Federal Government project Contracting Officer Representative (COR). For contracts that are less than six months, this form is required at the beginning and at the completion of the work. The COR will provide a copy to the HAZMART located in Bldg. 1205. This information is required to comply with State, federal, local, and Air Force laws and regulations.

MATERIAL NAME	MANUFACTURER	NSN/PART #	START BALANCE	AMOUNT USED

Use additional sheets if required.

Contractor Name:_____Date:_____
Signature: _____

Federal Government COR:_____ Date:_____
Signature: _____

INTENTIALLY LEFT BLANK

ATTACHMENT 4

CONTRACT SUBMITTAL AND CONTRACTOR REPORTING FORM

Comprehensive Procurement Guidelines

(This chart is not intended to replace the EPA guidelines found at https://www.epa.gov/smm/comprehensive-procurement-guideline-cpg-program . It is the Contractor's responsibility to stay apprised of any new additions to these guidelines.)

Categories and Designated Items (Note: This table includes proposed CPG items as well as items designated final.)	If marked w/ an "X", item is applicable	Purchased with no recycled content	Purchased with recycled content	Percent of recycled content
VEHICULAR PRODUCTS				
Engine coolants - antifreeze				
Rebuilt vehicular parts				
Re-refined lubricating oils - including motor oil				
Retread tires				
CONSTRUCTION PRODUCTS				
Building insulation products				
Carpet (Polyester)				
Carpet cushion				
Cement and concrete containing coal fly ash, ground granulated blast furnace slag, cenospheres, or silica fume				
Consolidated and reprocessed latex paint				
Floor tiles				
Flowable fill				

Categories and Designated Items (Note: This table includes proposed CPG items as well as items designated final.)	**If marked w/ an "X", item is applicable**	**Purchased with no recycled content**	**Purchased with recycled content**	**Percent of recycled content**
Laminated paperboard				
Modular threshold ramps				
Non-pressure pipe				
Patio blocks				
Railroad grade crossing surfaces				
Roofing materials				
Shower and restroom dividers and partitions				
Structural fiberboard				
LANDSCAPING PRODUCTS				
Compost made from yard trimmings or food waste				
Garden and soaker hoses				
Hydraulic mulch				
Lawn and garden edging				
Plastic lumber landscaping timbers and posts				
NON-PAPER OFFICE PRODUCTS				
Binders				

Categories and Designated Items (Note: This table includes proposed CPG items as well as items designated final.)	**If marked w/ an "X", item is applicable**	**Purchased with no recycled content**	**Purchased with recycled content**	**Percent of recycled content**
NON-PAPER-OFFICE PRODUCTS (cont.)				
Clipboards				
Clip Portfolios				
File folders				
Presentation Folders				
Office Furniture				
Office recycling containers				
Office waste receptacles				
Plastic desktop accessories				
Plastic envelopes				
Plastic trash bags				
Printer ribbons				
Toner cartridges				
PAPER AND PAPER PRODUCTS				
Commercial/industrial sanitary tissue products				
Miscellaneous papers				

Categories and Designated Items (Note: This table includes proposed CPG items as well as items designated final.)	**If marked w/ an "X", item is applicable**	**Purchased with no recycled content**	**Purchased with recycled content**	**Percent of recycled content**
Newsprint				
Paperboard and packaging products				
Printing and writing papers				
PARK and RECREATION PRODUCTS				
Park benches and picnic tables				
Plastic fencing				
Playground equipment				
Playground surfaces				
Running tracks				
TRANSPORTATION PRODUCTS				
Channelizers				
Delineators				
Flexible delineators				
Parking stops				
Traffic barricades				
Traffic cones				

Categories and Designated Items (Note: This table includes proposed CPG items as well as items designated final.)	If marked w/ an "X", item is applicable	Purchased with no recycled content	Purchased with recycled content	Percent of recycled content
MISCELLANEOUS PRODUCTS				
Awards and plaques				
Bike Racks				
Blasting grit				
Industrial drums				
Manual-grade strapping				
Mats				
Pallets				
Signage				
Sorbents				

INTENTIALLY LEFT BLANK

ATTACHMENT 5

RECOVERED MATERIALS DETERMINATION FORM

This form is to be completed by the procurement originator for all purchases requesting an exemption from the Affirmative Procurement Program for Recovered Materials being procured. For questions on whether the product is "EPA designated" or what the required recycled content is, refer to the product descriptions on EPA's website at https://www.epa.gov/smm/comprehensive-procurement-guidelines-construction-products or reference the Consolidated Recovered Materials Advisory Notices (RMANs) for the Comprehensive Procurement Guidelines at https://www.epa.gov/smm/consolidated-recovered-materials-advisory-notices-rmans-comprehensive-procurement-guidelines-cpg. This form is not required for construction item purchases less than $2,000, or for other purchases less than $3,000.

Procurement Request/Project No. _____

EPA Designated Eight Product Category Items

Category 1 *Paper and Paper Products*

_____Commercial/industrial sanitary tissue products
_____Paperboard/packing products
_____Miscellaneous papers
_____Printing and writing papers
_____Newsprint

Category 2 *Non-Paper Office Products*

_____Binders
_____Plastic envelopes
_____Office recycling containers
_____Office furniture
_____Plastic trash bags
_____Office waste receptacles
_____File folders
_____Plastic desktop accessories
_____Clipboards
_____Presentation folders
_____Clip portfolios
_____Printer ribbons
_____Toner Cartridges

Category 3 *Park and Recreation Products*

_____Park benches and picnic tables
_____Running tracks
_____Playground surfaces
_____Playground equipment
_____Plastic fencing

Category 4 *Transportation Products*

_____Traffic barricades
_____Parking Stops
_____Delineators
_____Flexible delineators
_____Traffic Cones
_____Channelizers

Category 5 *Vehicular Products*

_____Engine Coolants
____Retread tires
_____Re-refined lubricating oils
____Rebuilt vehicular parts

Category 6 *Landscaping Products*

_____Garden and soaker hoses
_____Hydraulic mulch
_____Plastic Lumber Landscaping timbers and posts
_____Compost and fertilizer made from recovered organic materials
_____Lawn and garden edging
_____Food waste compost

Category 7 *Construction Products*

_____Consolidated and reprocessed latex paint
_____Cement and concrete containing coal fly ash, ground granulated blast furnace slag, cenospheres, or silica fume
_____ Roofing materials
_____Railroad grade crossing and surfaces
_____Building insulation
_____Shower and restroom dividers
_____Laminated paperboard
_____ Modular threshold ramps
_____ Non-pressure pipe
_____Structural fiberboard
_____Carpet (polyester)
_____Carpet cushion
_____Floor tiles
_____Patio blocks
_____Flowable fill

Category 8 Miscellaneous Products

_____Manual-grade strapping
____Mats
_____ Bike racks
_____ Blasting grit
_____Pallets
_____Awards and plaques
_____Sorbents
_____Industrial drums
_____Signage

EXEMPTION CERTIFICATION

_____ The following EPA designated guideline item is included in the specifications for the project however, compliance with EPA standards is not attainable.

Item:_____

I have determined that the EPA guidelines were considered and determined inapplicable, based on the following:

_____Item is not available within a reasonable period of time. (Need date:_____Date available:_____)

_____Item fails to meet a performance standard in the specifications.
Specifically,_____

_____

_____

_____Item was only available at an unreasonable price (i.e., recycled item cost more than non-recycled item).

Price of recycled item: _____

Price of non-recycled item: _____

_____Item is not available from 2 or more sources.

Market research was performed by calling_____(insert number)
vendors, but only_____(enter name) was able to supply the item.

This determination is made in accordance with FAR 23.405(c).

_____ _____
Procurement Originator/Contractor Date

_____ _____
Signature of GPC Approving Official (if GPC used) Date or Project Manager/Supervisor/Flight Chief or
Deputy for all other type purchases

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY
GENERAL VPDES PERMIT FOR DISCHARGES OF STORMWATER FROM CONSTRUCTION ACTIVITIES (VAR10)
REGISTRATION STATEMENT 2024

PERMIT #: _____
PLAN/ID #: _____

Application type. (CHOOSE ONE)
☐ **NEW PERMIT ISSUANCE**
☐ **MODIFICATION WITH ACREAGE INCREASE: Permit # _____**
☐ **MODIFICATION WITHOUT ACREAGE INCREASE: Permit # _____**
☐ **EXISTING PERMIT REISSUANCE: Permit #_____**

Section I. Operator/Permittee/Billing Information.

A. Construction Activity Operator (Permittee). The person or entity that is applying for permit coverage and will have operational control over construction activities to ensure compliance with the general permit. A person with signatory authority for this operator must sign the certification in Section V (per Part III.K of the VAR10 Permit).	
Operator Name:	
Contact person:	
Address:	
City, State and Zip Code:	
Phone Number:	
Primary and CC Email(s):	
State Corporation Commission Entity Number (if applicable):	
B. Electronic correspondence. To receive an emailed coverage letter or to pay by credit card, you must choose **YES** and include a valid email. May we transmit correspondence electronically? **YES ❑ NO ❑**	

Section II. Construction Activity Information.

A. Include a legible site map showing the location of the existing or proposed land-disturbing activities for which the operator is seeking permit coverage, the limits of land disturbance, construction entrances, construction support activities, and all waterbodies receiving stormwater discharges from the construction site.	
B. Project site location information.	
Construction Activity Name:	
Address:	
City and/or County and Zip Code:	
Construction Activity Entrance Location (description or street address):	
Latitude and Longitude (6-digit, decimal degrees format, e.g. 37.1234, -78.1234):	
C. Acreage totals for all land-disturbing activities to be included under this permit coverage. Report to the nearest one-hundredth of an acre.	
Total area of the construction site (including off-site area):	
Estimated area to be disturbed by the construction activity (on-site only):	
Off-site estimated area to be disturbed (if applicable; please also refer to Section III):	
D. Construction Activity Status:	**FEDERAL ☐ STATE ☐ PUBLIC ☐ PRIVATE ☐**
E. Nature of the Construction Activity Description (i.e. commercial, industrial, residential, agricultural, utility, solar, linear, stream restoration, etc.):	

F. Municipal Separate Storm Sewer System (MS4) name(s) (if the construction activity is discharging to an MS4):	
G. Estimated Construction Activity Dates.	
Start Date:	
Completion Date:	
H. Is this construction activity part of a larger common Plan of development or sale?	**YES ☐ NO ☐**

I. 6th Order Hydrologic Unit Code (HUC) and Receiving Water Name(s). Include additional areas on a separate page.

HUC	NAME(S) OF RECEIVING WATER WATERBODY

Section III. Off-site Support Activity Location Information.

List all off-site support activities and excavated material disposal areas being utilized for this project. Include additional areas on a separate page.

Off-site Activity Name:	
Address:	
City or County:	
Off-site Activity Entrance Location (description or street address):	
Latitude and Longitude (6-digit, decimal degrees format, e.g., 37.1234, -78.1234):	
Is this off-site activity an excavated material disposal area?	**YES ☐ NO ☐**
If this off-site activity is an excavated material disposal area, list the contents of the excavated fill material:	
Will a separate VPDES permit cover this off-site activity?	**YES ☐ Permit #**_____ **NO ☐**

Section IV. Other Information.

A. A Stormwater Pollution Prevention Plan (SWPPP) must be prepared in accordance with the requirements of the General VPDES Permit for Discharges of Stormwater from construction activities prior to submitting the registration statement. By signing the registration statement, the operator certifies the SWPPP has been prepared.	
B. Has an Erosion and Sediment Control Plan been submitted to the VESC Authority for review?	**YES ☐ NO☐**
Erosion and Sediment Control Plan Approval Date: (for the estimated area to be disturbed; MM/DD/YYYY)	
C. Has land-disturbance commenced?	**YES ☐ NO ☐**
D. Standards and Specifications. If this project is utilizing approved Standards and Specifications (S&S), attach the completed S&S Entity Form.	
E. Will nutrient credits be used to comply with the water quality design criteria requirements (9VAC25-875-580)? **YES ☐ NO ☐** (If yes, please include a copy of the letter of availability from an appropriate nutrient bank that nonpoint source nutrient credits are available.)	

Section V. Certification. A person representing the operator as identified in Section I.A and meeting the requirements of Part III.K of 9VAC25-880-70 must physically sign this certification. A typed signature is not acceptable. Please note that operator is defined in 9VAC25-875-20 as follows:

> *"Operator" means the owner or operator of any facility or activity subject to the VESMA and this chapter. In the context of stormwater associated with a large or small construction activity, "operator" means any person associated with a construction project that meets either of the following two criteria: (i) the person has direct operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications or (ii) the person has day-to-day operational control of those activities at a project that are necessary to ensure compliance with a stormwater pollution prevention plan for the site or other permit or VESMP authority permit conditions (i.e., the person is authorized to direct workers at a site to carry out activities required by the stormwater pollution prevention plan or comply with other permit conditions). In the context of stormwater discharges from an MS4, "operator" means the operator of the regulated MS4 system.*

9VAC25-880-70. Part III.K. Signatory requirements. All registration statements shall be signed as follows:

a. "For a corporation: by a responsible corporate officer. For the purpose of this chapter, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy-making or decision-making functions for the corporation; or (ii) the manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions that govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or

c. For a municipality, state, federal, or other public agency: by either a principal executive officer or ranking elected official. For purposes of this chapter, a principal executive officer of a public agency includes (i) the chief executive officer of the agency or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency."

Certification: "I certify under penalty of law that I have read and understand this registration statement and that this document and all attachments were prepared in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations."

Printed Name: _____

Signature (signed in ink): _____

Date Signed: _____

Section VI. Submittal Instructions. Submit this form to the VESMP Authority. If the locality is the VESMP Authority, please send your registration statement submittal directly to the locality; do NOT send this form to DEQ. A list of local VESMP Authorities is available here: VESMP Authorities.

If DEQ is the VESMP Authority, please send to:

Department of Environmental Quality
Office of Stormwater Management Suite 1400
PO Box 1105
Richmond VA 23218
constructiongp@deq.virginia.gov

If the locality is the VESMP Authority, please send to:

The Local VESMP Authority *(insert address below):*

CONSTRUCTION GENERAL PERMIT (VAR10) REGISTRATION STATEMENT 2024 INSTRUCTIONS

PLEASE DO NOT PRINT OR SUBMIT

This registration statement is for coverage under the General Virginia Pollutant Discharge Elimination System (VPDES) Permit for Discharges of Stormwater from Construction Activities (also referred to as the Construction General Permit). This form covers the following permit actions: new permit issuance, existing permit modification with an increase in acreage, existing permit modifications that result in a plan modification but do not result in an increase in disturbed acreage, and reissuance of an active permit coverage.

Application type. Select **NEW PERMIT ISSUANCE** to obtain a new permit coverage. Modifications are for modifying an existing, active permit coverage. Select **MODIFICATION WITH ACREAGE INCREASE** when the previously approved acreage(s) increases (permit modifications are not performed for decreases in acreage unless they result in plan changes – see Modification WITHOUT Acreage Increase). Select **MODIFICATION WITHOUT ACREAGE INCREASE** when there is a change to the site design resulting in a change to the approved plans with no increase in acreage(s). Select **EXISTING PERMIT REISSUANCE** to extend an expiring permit coverage for the next permit cycle and include the existing permit number.

Section I. Operator/Permittee/Billing Information.

A. Construction Activity Operator (Permittee). The person or entity that is applying for permit coverage and will have operational control over construction activities to ensure compliance with the general permit. For companies, use the complete, active, legal entity name as registered with a state corporation commission. Entities that are considered operators commonly consist of the property owner, developer of a project (the party with control of project plans and specifications), or general contractor (the party with day-to-day operational control of the activities at the project site that are necessary to ensure compliance with the general permit). If an individual person is listed as the operator, that person (or a legal representative of) must sign the certification in Section V. An operator may be one of the following:

9VAC25-875-20. Definitions.

"Operator" means the owner or operator of any facility or activity subject to the VESMA and this chapter. In the context of stormwater associated with a large or small construction activity, "operator" means any person associated with a construction project that meets either of the following two criteria: (i) the person has direct operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications or (ii) the person has day-to-day operational control of those activities at a project that are necessary to ensure compliance with a stormwater pollution prevention plan for the site or other permit or VESMP authority permit conditions (i.e., the person is authorized to direct workers at a site to carry out activities required by the stormwater pollution prevention plan or comply with other permit conditions). In the context of stormwater discharges from an MS4, "operator" means the operator of the regulated MS4 system.

"Owner" means the same as that term as defined in § 62.1-44.3 of the Code of Virginia. For a regulated land-disturbing activity that does not require a permit, "owner" also means the owner of the freehold of the premises of lesser estate therein, mortgagee or vendee in possession, assignee of rents, receiver, executor, trustee, lessee, or other person, firm or corporation in control of a property.

"Person" means any individual, partnership, firm, association, joint venture, public or state corporation, trust, estate, commission, board, public or private institution, utility, cooperative, county, city, town, or other political subdivision of the Commonwealth, governmental body, including a federal or state entity as applicable, any interstate body or any other legal entity.

B. May we transmit correspondence electronically? If you choose **YES** to this question and provide an email address in Section I. A., all correspondence, forms, invoices and notifications will be transmitted by email to the operator. This will also give the operator the ability to pay by credit card and to receive permit coverage approval letters immediately upon permit approval.

Section II. Construction Activity Information.

A. A legible site map showing the location of the existing or proposed land-disturbing activities for which the operator is seeking permit coverage, the limits of land disturbance, construction entrances, construction support activities, and all water bodies receiving stormwater discharges from the construction site must be included with the submittal of this form. Aerial imagery maps or topographic maps showing the required items are acceptable. Plan sheet sized site maps are not required. Please consult your VESMP authority if you have additional questions regarding site map requirements.

B. Construction Activity Name and location. Provide a descriptive name of the construction activity to be covered under the general permit (it is helpful to use the same naming convention as listed on the Stormwater Management plans), 911 street address (if available), city/county of the construction activity, and the 6-digit latitude and longitude in decimal degrees format for the centroid, main construction entrance or start and end points for linear projects (i.e., 37.1234, -77.1234).

C. Acreage totals for all construction site activities, on- and off-site, to be included under this permit. Acreages are to be reported to the nearest one-hundredth acre (two decimal places, i.e., 1.15 acres). Provide the total acreage of the construction site as approved on the Stormwater Management Plans and the estimated on-site acreage to be disturbed by the construction activity as approved under the Erosion and Sediment Control Plans. The off-site estimated area to be disturbed is the sum of the disturbed acreages for all off-site support activities to be covered under this general permit. The total area of the construction site includes the construction support activities located on-site and off-site. Permit fees are calculated based on your disturbed acreage total for all on- and off-site areas being disturbed under this permit coverage (the sum of all on-site and off-site disturbed acreages).

D. Construction activity owner status. The status of the construction activity property owner. Any property not owned by a government entity or agency (i.e. federal, state or local governments) is **PRIVATE**.

E. Nature of the construction activity description. Choose the designation that best describes the post-construction use of this project (you may choose more than one). (i.e. commercial, industrial, residential, agricultural, utility, solar, linear, stream restoration, etc.). Describe the post-construction use of the project (i.e. commercial – one new office building and associated parking and utilities; transportation – linear roads, sidewalks and utilities; agricultural – three poultry houses, etc.).

F. Municipal Separate Storm Sewer System (MS4) name(s) if discharging to an MS4. If stormwater is discharged through an MS4 (either partially or completely), provide the name of the MS4(s) that will be receiving water from this construction activity. The MS4 name is typically the town, city, county, institute, or federal facility where the construction activity is located.

G. Estimated construction activity dates. Provide the estimated construction activity start date and completion date in Month/Day/Year or MM/DD/YYYY format (i.e. 07/30/2019).

H. Is this construction activity is part of a larger common plan of development or sale? Per 9VAC25-875-20, "common plan of development or sale" means a contiguous area where separate and distinct construction activities may be taking place at different times on different schedules (i.e. a subdivision, commercial development, business park, etc.).

I. Sixth (6^{th}) Order Hydrologic Unit Code (HUC) and associated Receiving Water Name(s). Provide all 6^{th} order HUCs and receiving waterbody names, for the primary site and any off-site areas included under this permit coverage, that could potentially receive stormwater runoff discharging from this activity. The HUC can be either a 12-digit number (i.e., 0208010101) or 2-letter, 2-number code (i.e., JL52). Include additional HUCs or receiving waters on a separate page. You may utilize DEQ's web-based GIS application to obtain this information.

- DEQ Environmental Data Mapper (EDM) application link: Environmental Data Mapper
- Instructions, help and resources for using DEQ's EDM application link: EDM Help & Resources

Section III. Off-site Support Activity Location Information.

This general permit also authorizes stormwater discharges from support activities (e.g., concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, borrow areas, etc.) located on-site or off-site provided that (i) the support activity specifically supports the construction activity that is required to have general permit coverage; (ii) the support activity is not a commercial operation, nor does it serve multiple unrelated construction activities by different operators; (iii) the support activity does not operate beyond the completion of the construction activity it supports; (iv) the support activity is identified in the registration statement at the time of general permit coverage; (v) appropriate control measures are identified in a SWPPP and implemented to address the discharges from the support activity areas; and (vi) all applicable state, federal, and local approvals are obtained for the support activity.

Off-site activity name and location information. Provide a descriptive off-site project name, 911 street address (if available), construction entrance location (address or description), city/county and the 6-digit latitude and longitude in decimal degrees (i.e., 37.1234, -77.1234) of all off-site support activities. Indicate whether the off-site support activity will be covered under this general permit or a separate VPDES permit.

If excavated material (i.e., fill) will be transported off-site for disposal, the name and physical location address, when available, of all off-site excavated material disposal areas including city or county; 6-digit latitude and longitude in decimal degrees (i.e., 37.1234, -77.1234) and the contents of the excavated material.

List additional off-site areas to be included under this permit coverage on a separate page. Off-site areas not included on this registration will need to obtain coverage under a separate VPDES permit.

Section IV. Other Information.

A. A stormwater pollution prevention plan (SWPPP) must be prepared prior to submitting the registration statement per 9VAC25-880. See 9VAC25-880-70 Part II Of the General Permit for the SWPPP requirements.

B. If the Erosion and Sediment Control Plan for the estimated area to be disturbed listed in Section II. C has been submitted to the Virginia Erosion and Sediment Control Program (VESCP) Authority for review and approval, choose **YES**. If you are submitting this application to reissue an existing permit coverage, please provide the date that the VESCP Authority approved the Erosion and Sediment Control Plan for the estimated area to be disturbed. If land disturbance has commenced, choose **YES**. "Land disturbance" or "land-disturbing activity" means a man-made change to the land surface that may result in soil erosion or has the potential to change its runoff characteristics, including construction activity such as the clearing, grading, excavating, or filling of land.

D. If this project is using approved Standards and Specifications (S&S), attach the completed S&S Entity Form. If the S&S Entity is different from the operator identified in Section I.A., list the S&S Entity Name. The S&S entity is the entity or agency that holds the approved standards & specification. Please indicate if this project is also requesting a plan waiver.

- S&S Entity Form link: Standards and Specifications Entity Information Form

E. If nutrient credits will be used to comply with the water quality design criteria requirements (9VAC25-875-590), choose **YES**. In addition, include a copy of the letter of availability from an appropriate nutrient bank that nonpoint source nutrient credits are available. If nutrient credits will not be used, choose **NO**.

Section V. Certification.

A properly authorized individual associated with the operator identified in Section I.A. of the registration statement is responsible for certifying and signing the registration statement. A person must physically sign the certification, a typed signature is unacceptable. State statutes provide for severe penalties for submitting false information on the registration statement. State regulations require that the registration statement be signed as follows per 9VAC25-880-70 Part III.K.1:

"a. For a corporation: by a responsible corporate officer. For the purpose of this part, a responsible corporate officer means:

(i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy-making or decision-making functions for the corporation; or

(ii) the manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions that govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedure;

b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or

c. For a municipality, state, federal, or other public agency: by either a principal executive officer or ranking elected official. For purposes of this part, a principal executive officer of a public agency includes:

(i) the chief executive officer of the agency, or

(ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency.

Section VI. Submittal Instructions.

Submit this completed signed form to the VESMP/VSMP authority that has jurisdiction for your construction activity. The appropriate authority may be either the local government your locality depending on the location and type of project or DEQ. If your project is under the jurisdiction of a local VESMP authority, please contact the locality for additional submittal instructions. A blank area is provided for the local VESMP authority's mailing address.

Who is the authority for my project? DEQ or the locality?

- **DEQ:** DEQ is the VSMP Authority and administers permit coverage for land-disturbing activities that are:
  - within a locality that is not a VESMP authority;
  - owned by the State or Federal government; or
  - utilizing approved Standards and Specifications.

  Email the completed and signed form to: constructiongp@deq.virginia.gov

- **The Locality:** The local government (locality) is the VESMP authority and administers permit coverage for all other projects not covered by DEQ as listed above. For these projects, please submit permit forms directly to the local VESMP authority. A list of local VESMP authorities is available on DEQ's website here: Local VESMP Authority List.

SECTION 01 58 00

PROJECT IDENTIFICATION
08/19, CHG 5: 08/22

PART 1 GENERAL

1.1 REFERENCES

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

U.S. ARMY CORPS OF ENGINEERS (USACE)

EP 310-1-6a	(2006; 2019 Change 2) Project Operation -- Sign Standards Manual, VOL 1
EP 310-1-6b	(2006) Sign Standards Manual, VOL 2, Appendices

1.2 SUBMITTALS

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Preliminary One Line Drawings Of Project Rendering; G, RO

Sign Legend Orders; G, RO

SD-04 Samples

Final Framed Rendering and Copies; G, RO

Final Rendering; G, RO

1.3 QUALITY CONTROL

1.3.1 Rendering

Provide the project rendering in accordance with the following drawing stages as required in the SUBMITTALS paragraph. The following submittal data is required to properly identify the appropriate view and approve the final rendering of the facility. The final painted rendering will be used to produce the image for the signboard and framed photographic copies provided to the Contracting Officer.

1.3.1.1 Preliminary One Line Drawings

Provide three different views of the facility in a preliminary single line drawing (black and white) format. These three views will represent the best angles at which to view the proposed facility showing the best

design features and the three dimensional character of the facility.

1.3.1.2 Final Rendering Sample

Provide a photographic copy (8 by 10 inches minimum size) of final rendering for approval of color, landscaping, and foreground/background development prior to final submittal.

1.3.1.3 Final Framed Rendering and Copies

Provide final full color rendering of the proposed facility as specified.

1.4 PROJECT IDENTIFICATION SIGN

1.4.1 Construction Project Signs

Furnish the construction project sign package, maintain the signs during construction, and remove the signs from the job site upon completion of the project. The construction project sign package consists of two signs: one for project identification and the other to show the on-the-job safety performance of the contractor. Ensure that the package conforms to the requirements of EP 310-1-6a and EP 310-1-6b, specifically Section 16. Submit the sign legend orders as described in Section 16 of EP 310-1-6a before erecting the signs.

Utilize the Example Graphic of Signage with Dimensions for MILCON Project and follow USACE policy provided in Engineering Pamphlet (EP) 310-1-6a, Sign Standards Manual, VOL 1 for guidelines on fabricating, locating, and mounting construction project signs (https://www.publications.usace.army.mil/Portals/76/Users/182/86/2486/EP_310-1-6a%20change%202.pdf).

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 01 74 19

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
02/19, CHG 3: 11/21

PART 1 GENERAL

1.1 REFERENCES

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

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

40 CFR 273	Standards for Universal Waste Management
49 CFR 173	Shippers - General Requirements for Shipments and Packagings
49 CFR 178	Specifications for Packagings

1.2 DEFINITIONS

1.2.1 Co-mingle

The practice of placing unrelated materials together in a single container, usually for benefits of convenience and speed.

1.2.2 Construction Waste

Waste generated by construction activities, such as scrap materials, damaged or spoiled materials, temporary and expendable construction materials, and other waste generated by the workforce during construction activities.

1.2.3 Demolition Debris/Waste

Waste generated from demolition activities, including minor incidental demolition waste materials generated as a result of Intentional dismantling of all or portions of a building, to include clearing of building contents that have been destroyed or damaged.

1.2.4 Disposal

Depositing waste in a solid waste disposal facility, usually a managed landfill or incinerator, regulated in the US under the Resource Conservation and Recovery Act (RCRA).

1.2.5 Diversion

The practice of diverting waste from disposal in a landfill or incinerator, by means of eliminating or minimizing waste, or reuse of materials.

1.2.6 Final Construction Waste Diversion Report

A written assertion by a material recovery facility operator identifying

constituent materials diverted from disposal, usually including summary tabulations of materials, weight in short-ton.

1.2.7 Recycling

The series of activities, including collection, separation, and processing, by which products or other materials are diverted from the solid waste stream for use in the form of raw materials in the manufacture of new products sold or distributed in commerce, or the reuse of such materials as substitutes for goods made of virgin materials, other than fuel.

1.2.8 Reuse

The use of a product or materials again for the same purpose, in its original form or with little enhancement or change.

1.2.9 Salvage

Usable, salable items derived from buildings undergoing demolition or deconstruction, parts from vehicles, machinery, other equipment, or other components.

1.2.10 Source Separation

The practice of administering and implementing a management strategy to identify and segregate unrelated waste at the first opportunity.

1.3 SPECIAL BASE WIDE REQUIREMENTS

Refer to Section 01 14 00, Appendix A for specific base wide waste management requirements Appendix A should be considered basic requirements for the project. Other requirements in the Specification documents are in addition to the requirements in Appendix A.

1.4 CONSTRUCTION WASTE (INCLUDES DEMOLITION DEBRIS/WASTE)

Divert a minimum of 60 percent by weight of the project construction waste and demolition debris/waste from the landfill or incinerator. Follow applicable industry standards in the management of waste. Apply sound environmental principles in the management of waste. (1) Practice efficient waste management when sizing, cutting, and installing products and materials and (2) use all reasonable means to divert construction waste and demolition debris/waste from landfills and incinerators and to facilitate the recycling or reuse of excess construction materials.

1.5 CONSTRUCTION WASTE MANAGEMENT

Implement a Construction Waste Management Program for the project Take a pro-active, responsible role in the management of construction waste, recycling process, disposal of demolition debris/waste, and require all subcontractors, vendors, and suppliers to participate in the Construction Waste Management Program. Establish a process for clear tracking, and documentation of construction waste and demolition debris/waste.

1.5.1 Implementation of Construction Waste Management Program

Develop and document how the Construction Waste Management Program will be implemented in a Construction Waste Management Plan. Submit a

Construction Waste Management Plan to the Contracting Officer for approval. Construction waste and demolition debris/waste materials include un-used construction materials not incorporated in the final work, as well as demolition debris/waste materials from demolition activities or deconstruction activities. In the management of waste, consider the availability of viable markets, the condition of materials, the ability to provide material in suitable condition and in a quantity acceptable to available markets, and time constraints imposed by internal project completion mandates.

1.5.2 Oversight

The Quality Control Manager, as specified in Section 01 45 00 QUALITY CONTROL, is responsible for overseeing and documenting results from executing the Construction Waste Management Plan for the project.

1.5.3 Special Programs

Implement special programs involving rebates or similar incentives related to recycling of construction waste and demolition debris/waste materials. Retain revenue or savings from salvaged or recycling, unless otherwise directed. Ensure firms and facilities used for recycling, reuse, and disposal are permitted for the intended use to the extent required by federal, state, and local regulations.

1.5.4 Special Instructions

Provide on-site instruction of appropriate separation, handling, recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the projects. Designation of single source separating or commingling will be clearly marked on the containers.

1.5.5 Waste Streams

Delineate waste streams and characterization, including estimated material types and quantities of waste, in the Construction Waste Management Plan. Manage all waste streams associated with the project. Typical waste streams are listed below. Include additional waste steams not listed:

a. Land Clearing Debris

b. Asphalt

c. Masonry and CMU

d. Concrete

e. Metals (Includes, but is not limited to, banding, stud trim, ductwork, piping, rebar, roofing, other trim, steel, iron, galvanized, stainless steel, aluminum, copper, zinc, bronze.)

f. Wood (nails and staples allowed)

g. Glass

h. Paper

i. Plastics (PET, HDPE,PVC,LDPE,PP,PS, Other)

j. Gypsum

k. Non-hazardous paint and paint cans

l. Carpet

m. Ceiling Tiles

n. Insulation

o. Beverage Containers

1.6 SUBMITTALS

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Construction Waste Management Plan; G, RO

SD-06 Test Reports

Quarterly Reports

Annual Report

SD-11 Closeout Submittals

Final Construction Waste Diversion Report; S

1.7 MEETINGS

Conduct Construction Waste Management meetings. After award of the Contract and prior to commencement of work, schedule and conduct a meeting with the Contracting Officer to discuss the proposed Construction Waste Management Plan and to develop a mutual understanding relative to the management of the Construction Waste Management Program and how waste diversion requirements will be met.

The requirements of this meeting may be fulfilled during the coordination and mutual Understanding meeting outlined in Section 01 45 00 QUALITY CONTROL. At a minimum, discuss and document waste management goals at following meetings:

a. Preconstruction meeting.

b. Regular Quality Control meetings.

c. Work safety meeting.

1.8 CONSTRUCTION WASTE MANAGEMENT PLAN

Submit Construction Waste Management Plan within 15 days after notice to proceed. Revise and resubmit Construction Waste Management Plan until it

receives final approval from the Contracting Officer, in order for construction to begin. Manage demolition debris/waste or deconstruction materials in accordance with the approved construction waste management plan.

An approved Construction Waste Management Plan will not relieve the Contractor of responsibility for compliance with applicable environmental regulations or meeting project cumulative waste diversion requirement. Ensure all subcontractors receive a copy of the approved Construction Waste Management Plan. The plan demonstrates how to meet the project waste diversion requirement. Also, include the following in the plan:

a. Identify the names of individuals responsible for waste management and waste management tracking, along with roles and responsibilities on the project.

b. Actions that will be taken to reduce solid waste generation, including coordination with subcontractors to ensure awareness and participation.

c. Description of the regular meetings to be held to address waste management.

d. Description of the specific approaches to be used in recycling/reuse of the various materials generated, including the areas on site and equipment to be used for processing, sorting, and temporary storage of materials.

e. Name of landfill and incinerator to be used.

f. Identification of local and regional re-use programs, including non-profit organizations such as schools, local housing agencies, and organization that accept used materials such as material exchange networks and resale stores. Include the name, location, phone number for each re-use facility identified, and provide a copy of the permit or license for each facility.

g. List of specific materials, by type and quantity, that will be salvaged for resale, salvaged and reused on the current project, salvaged and stored for reuse on a future project, or recycled. Identify the recycling facilities by name, address, and phone number.

h. Identification of materials that cannot be recycled or reused with an explanation or justification, to be approved by the Contracting Officer.

i. Description of the means by which materials identified in item (g) above will be protected from contamination.

j. Description of the means of transportation of the recyclable materials (whether materials will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler and removed from the site).

k. Copy of training plan for subcontractors and other services to prevent contamination by co-mingling materials identified for diversion and waste materials.

l. Identification of at least 5 construction or demolition material streams for diversion.

m. Facilities or subcontractors offering construction waste transport on-site or off-site must ensure that proper shipping orders, bill of lading, manifests, or other shipping documents containing waste diversion information meet requirements of 40 CFR 273 Universal Waste Management, 49 CFR 173 Shippers - General Requirements for Shipments and Packagings, and 49 CFR 178 Specifications for Packaging. Individuals signing manifests or other shipping documents should meet the minimum training requirements.

n. List each supplier who deliver construction materials, in bulk, or package products in returnable containers or returnable packaging, or have take-back programs. List each program and the applicable material to actively monitor and track to assist in meeting waste diversion requirements on the project.

Distribute copies of the waste management plan to each subcontractor, Quality Control Manager , and the Contracting Officer.

1.9 RECORDS (DOCUMENTATION)

1.9.1 General

Maintain records to document the types and quantities of waste generated and diverted though re-use, recycling and sale to third parties; through disposal to a landfill or incinerator facility. Provide explanations for materials not recycled, reused or sold. Collect and retain manifests, weight tickets, sales receipts, and invoices specifically identifying diverted project waste materials or disposed materials.

1.9.2 Accumulated

Maintain a running record of materials generated and diverted from landfill disposal, including accumulated diversion rates for the project. Make records available to the Contracting Officer during construction or incidental demolition activities. Provide a copy of the diversion records to the Contracting Officer upon completion of the construction, incidental demolitions or minor deconstruction activities.

1.10 REPORTS

1.10.1 General

Maintain current construction waste diversion information on site for periodic inspection by the Contracting Officer. Include in the quarterly reports, annual reports and final reports: the project name, contract information, information for waste generated, diverted and disposed of for the current reporting period and show cumulative totals for the project. Reports must identify quantities of waste by type and disposal method. Also include in each report, supporting documentation to include manifests, weigh tickets, receipts, and invoices specifically identifying the project and waste material type and weighted sum.

1.10.2 Quarterly Reporting

Provide cumulative reports at the end of each quarter (December, March, June, and September, corresponding with the federal fiscal year for

reporting purposes). Submit quarterly reports not later than 15 calendar days after the preceding quarter has ended. Submit Quarterly Reports to the appropriate office or identified point of contact.

1.10.3 Annual Reporting

Provide a cumulative construction waste diversion report annually. Submit annual report not later than 30 calendar days after the preceding fourth quarter has ended. Provide copy of annual construction waste diversion report to the installation POC.

1.11 FINAL CONSTRUCTION WASTE DIVERSION REPORT

A Final Construction Waste Diversion Report is required at the end of the project. Provide Final Construction Waste Diversion Report 60 days prior to the Beneficial Occupancy Date (BOD).

1.12 COLLECTION

Collect, store, protect, and handle reusable and recyclable materials at the site in a manner which prevents contamination, and provides protection from the elements to preserve their usefulness and monetary value. Provide receptacles and storage areas designated specifically for recyclable and reusable materials and label them clearly and appropriately to prevent contamination from other waste materials. Keep receptacles or storage areas neat and clean.

Train subcontractors and other service providers to either separate waste streams or use the co-mingling method as described in the Construction Waste Management Plan. Handle hazardous waste and hazardous materials in accordance with applicable regulations and coordinate with Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS. Separate materials by one of the following methods described herein:

1.12.1 Source Separation Method

Separate waste products and materials that are recyclable from trash and sort as described below into appropriately marked separate containers and then transport to the respective recycling facility for further processing. Deliver materials in accordance with recycling or reuse facility requirements (e.g., free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process). Separate materials into the category types as defined in the Construction Waste Management Plan.

1.12.2 Other Methods

Other methods proposed by the Contractor may be used when approved by the Contracting Officer.

1.13 DISPOSAL

Control accumulation of waste materials and trash. Recycle or dispose of collected materials off-site at intervals approved by the Contracting Officer and in compliance with waste management procedures as described in the waste management plan. Except as otherwise specified in other sections of the specifications, dispose of in accordance with the following:

1.13.1 Reuse

Give first consideration to reusing construction and demolition materials as a disposition strategy. Recover for reuse materials, products, and components as described in the approved Construction Waste Management Plan. Coordinate with the Contracting Officer to identify onsite reuse opportunities or material sales or donation available through Government resale or donation programs. Sale of recovered materials is not allowed on the Installation. Consider the use of surplus industrial supply broker services, who match entities with reusable or repurpose industrial materials with entities with need of such materials.

1.13.2 Recycle

Recycle non-hazardous construction and demolition/debris materials that are not suitable for reuse. Track rejection of contaminated recyclable materials by the recycling facility. Rejected recyclables materials will not be counted as a percentage of diversion calculation. Recycle all fluorescent lamps, HID lamps, mercury (Hg) -containing thermostats and ampoules, and PCBs-containing ballasts and electrical components as directed by the Contracting Officer. Do not crush lamps on site as this creates a hazardous waste stream with additional handling requirements.

1.13.3 Waste

Dispose by landfill or incineration only those waste materials with no practical use, economic benefit, or recycling opportunity.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used. -- End of Section --

SECTION 01 78 00

CLOSEOUT SUBMITTALS
05/19, CHG 1: 08/21

PART 1 GENERAL

1.1 REFERENCES

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

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 1110-1-2909	(2012) Engineering and Design -- Geospatial Data and Systems
ERDC/ITL TR-19-6	(2019) A/E/C Graphics Standard, Release 2.1
ERDC/ITL TR-19-7	(2019) A/E/C CAD Standard - Release 6.1

U.S. DEPARTMENT OF DEFENSE (DOD)

UFC 1-300-08	(2009; with Change 2, 2011) Criteria for Transfer and Acceptance of DoD Real Property

1.2 DEFINITIONS

1.2.1 As-Built Drawings

As-built drawings are the marked-up drawings, maintained by the Contractor on-site, that depict actual conditions and deviations from the Contract Documents. These deviations and additions may result from coordination required by, but not limited to: contract modifications; official responses to submitted Requests for Information (RFI's); direction from the Contracting Officer; design that is the responsibility of the Contractor, and differing site conditions. Maintain the as-builts throughout construction as red-lined hard copies on site and red-lined PDF files. These files serve as the basis for the creation of the record drawings.

1.2.2 Record Drawings

The record drawings are the final compilation of actual conditions reflected in the as-built drawings.

1.2.3 Record Model

A model reflecting approved changes during construction including red-lines, requests for information (RFI's), and contract modifications. Include updated construction phase facility/site data for components.

1.2.4 Advanced Modeling

A subset of geospatial technologies as defined in EM 1110-1-2909 to

include Building Information Modeling (BIM), Civil Information Modeling (CIM), Geographic Information Systems (GIS), and Computer-Aided Design (CAD). Advanced modeling is comprised of models and drawings that form a digital representation of the project, or part thereof, that are comprised of model elements with facility data.

1.2.5 USACE CAD/BIM Technology Center

The USACE CAD/BIM Technology Center hosts all standard content for USACE. This content can be accessed through the CAD/BIM Technology Center website, https://cadbimcenter.erdc.dren.mil/.

1.3 SOURCE DRAWING FILES

Request the full set of electronic drawings, in the source format, for Record Drawing preparation, after award and at least 30 days prior to required use.

1.3.1 Terms and Conditions

Data contained on these electronic files must not be used for any purpose other than as a convenience in the preparation of construction drawings and data for the referenced project. Any other use or reuse is at the sole risk of the Contractor and without liability or legal exposure to the Government. The Contractor must make no claim and waives to the fullest extent permitted by law, any claim or cause of action of any nature against the Government, its agents or sub consultants that may arise out of or in connection with the use of these electronic files. The Contractor must, to the fullest extent permitted by law, indemnify and hold the Government harmless against all damages, liabilities or costs, including reasonable attorney's fees and defense costs, arising out of or resulting from the use of these electronic files.

These electronic CAD drawing files are not construction documents. Differences may exist between the CAD files and the corresponding construction documents. The Government makes no representation regarding the accuracy or completeness of the electronic CAD files, nor does it make representation to the compatibility of these files with the Contractor hardware or software. In the event that a conflict arises between the signed and sealed construction documents prepared by the Government and the furnished Source drawing files, the signed and sealed construction documents govern. The Contractor is responsible for determining if any conflict exists. Use of these Source Drawing files does not relieve the Contractor of duty to fully comply with the contract documents, including and without limitation, the need to check, confirm and coordinate the work of all contractors for the project. If the Contractor uses, duplicates or modifies these electronic source drawing files for use in producing construction drawings and data related to this contract, remove all previous indicia of ownership (seals, logos, signatures, initials and dates).

1.4 RECORD DRAWINGS

The Government will provide pdf and or program files at the preconstruction conference that contains one set of "as-designed" electronic CAD files in the specified software and format revised to reflect all amendments and the final contract PDF drawings. The CAD files are provided to enable preparation of as-built or as-constructed drawings. If discrepancies exist between the CAD files and the contract

PDF drawings, correct the CAD files to show the contract PDF drawings.

1.4.1 Variation with Contract Drawings

The electronic files provided are not part of the contract documents. If there is any discrepancy between the electronic files and the contract drawings, the contract drawings govern. The Government has no responsibility to modify any GFM due to changes in the design that occur after award.

Evaluate the content and quality of the GFM upon receipt. If major discrepancies or omissions occur in the GFM, notify the Contracting Officer and indicate the nature of such variations.

1.4.2 Data Loss, Corruption, and Error

Transfer of GFM files may result in corrupted files resulting in data loss and errors. Use of GFM files at own risk. Verify data integrity upon receipt and request a replacement if necessary. Make any adjustment in file structure, format, or software version as needed to make GFM compatible with computer systems and/or software to meet the requirements of the contract.

1.4.3 Modeling Completeness and Quality

The Government makes no guarantee that the GFM provide the level of completeness or quality as required by the contract. Further, the Government makes no guarantee that identified variations will be corrected upon notification.

1.5 SUBMITTALS

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Warranty Management Plan

Warranty Tags

Spare Parts Data

SD-08 Manufacturer's Instructions

Posted Instructions

SD-11 Closeout Submittals

As-Built Drawings; G

Record Drawings; G

Record Model; G

As-Built Record of Equipment and Materials

Final Approved Shop Drawings; G

Construction Contract Specifications; G

Certification of EPA Designated Items; G

Interim DD FORM 1354; G

Checklist for DD FORM 1354; G

High Performance and Sustainable Building (HPSB) Checklist; G

1.6 SPARE PARTS DATA

Submit two copies of the Spare Parts Data list.

a. Indicate manufacturer's name, part number, and stock level required for test and balance, pre-commissioning, maintenance and repair activities. List those items that may be standard to the normal maintenance of the system.

b. At acceptance of commissioning, ensure the required stock level is supplied as indicated in subparagraph a for maintenance and repair activities through the facilities warranty period. Provision of spare parts does not relieve the Contractor of responsibilities listed under the contract guarantee provisions.

1.7 QUALITY CONTROL

Additions and corrections to the contract drawings must be equal in quality and detail to that of the originals. Line colors, line weights, lettering, layering conventions, and symbols must be the same as the original line colors, line weights, lettering, layering conventions, and symbols.

1.8 WARRANTY MANAGEMENT

1.8.1 Warranty Management Plan

Develop a warranty management plan which contains information relevant to FAR 52.246-21 Warranty of Construction. At least 30 days before the planned pre-warranty conference, submit one set of the warranty management plan. Include within the warranty management plan all required actions and documents to assure that the Government receives all warranties to which it is entitled. The plan narrative must contain sufficient detail to render it suitable for use by future maintenance and repair personnel, whether tradesmen, or of engineering background, not necessarily familiar with this contract. The term "status" as indicated below must include due date and whether item has been submitted or was accomplished. Submit warranty information, made available during the construction phase, to the Contracting Officer for approval prior to each monthly pay estimate. Assemble approved information in a binder and turn over to the Government upon acceptance of the work. The construction warranty period must begin on the date of project acceptance and continue for the full product warranty period. Conduct a joint 4 month and 9 month warranty inspection, measured from time of acceptance; with the Contractor, Contracting Officer and the Customer Representative. The warranty management plan must

include, but is not limited to, the following:

a. Roles and responsibilities of personnel associated with the warranty process, including points of contact and telephone numbers within the organizations of the Contractors, subcontractors, manufacturers or suppliers involved.

b. For each warranty, the name, address, telephone number, and e-mail of each of the guarantor's representatives nearest to the project location.

c. A list and status of delivery of Certificates of Warranty for extended warranty items, including roofs, HVAC balancing, pumps, motors, transformers, and for commissioned systems, such as fire protection and alarm systems, sprinkler systems, and lightning protection systems.

d. As-Built Record of Equipment and Materials list for each warranted equipment, item, feature of construction or system indicating:

(1) Name of item.
(2) Model and serial numbers.
(3) Location where installed.
(4) Name and phone numbers of manufacturers or suppliers.
(5) Names, addresses and telephone numbers of sources of spare parts.
(6) Warranties and terms of warranty. Include one-year overall warranty of construction, including the starting date of warranty of construction. Items which have warranties longer than one year must be indicated with separate warranty expiration dates.
(7) Cross-reference to warranty certificates as applicable.
(8) Starting point and duration of warranty period.
(9) Summary of maintenance procedures required to continue the warranty in force.
(10) Cross-reference to specific pertinent Operation and Maintenance manuals.
(11) Organization, names and phone numbers of persons to call for warranty service.
(12) Typical response time and repair time expected for various warranted equipment.

e. The plans for attendance at the 4 and 9 month post-construction warranty inspections conducted by the Government.

f. Procedure and status of tagging of equipment covered by warranties longer than one year.

g. Copies of instructions to be posted near selected pieces of equipment where operation is critical for warranty or safety reasons.

1.8.2 Performance Bond

The Performance Bond must remain effective throughout the construction and warranty period.

a. In the event the Contractor fails to commence and diligently pursue any construction warranty work required, the Contracting Officer will have the work performed by others, and after completion of the work, will charge the remaining construction warranty funds of expenses incurred by the Government while performing the work, including, but not limited to administrative expenses.

b. In the event sufficient funds are not available to cover the construction warranty work performed by the Government at the Contractor's expense, the Contracting Officer will have the right to recoup expenses from the bonding company.

c. Following oral or written notification of required construction warranty repair work, respond in a timely manner. Written verification will follow oral instructions. Failure to respond will be cause for the Contracting Officer to proceed against the Contractor.

1.8.3 Pre-Warranty Conference

Prior to contract completion, and at a time designated by the Contracting Officer, meet with the Contracting Officer to develop a mutual understanding with respect to the requirements of this section. At this meeting, establish and review communication procedures for Contractor notification of construction warranty defects, priorities with respect to the type of defect, reasonable time required for Contractor response, and other details deemed necessary by the Contracting Officer for the execution of the construction warranty In connection with these requirements and at the time of the Contractor's quality control completion inspection, furnish the name, telephone number and address of a licensed and bonded company which is authorized to initiate and pursue construction warranty work action on behalf of the Contractor. This point of contact must be located within the local service area of the warranted construction, be continuously available, and be responsive to Government inquiry on warranty work action and status. This requirement does not relieve the Contractor of any of its responsibilities in connection with other portions of this provision.

1.8.4 Contractor's Response to Construction Warranty Service Requirements

Following oral or written notification by the Contracting Officer, respond to construction warranty service requirements in accordance with the "Construction Warranty Service Priority List" and the three categories of priorities listed below. Submit a report on any warranty item that has been repaired during the warranty period. Include within the report the cause of the problem, date reported, corrective action taken, and when the repair was completed. If the Contractor does not perform the construction warranty within the timeframe specified, the Government will perform the work and back charge the construction warranty payment item established.

a. First Priority Code 1. Perform onsite inspection to evaluate situation, and determine course of action within 4 hours, initiate work within 6 hours and work continuously to completion or relief.

b. Second Priority Code 2. Perform onsite inspection to evaluate situation, and determine course of action within 8 hours, initiate work within 24 hours and work continuously to completion or relief.

c. Third Priority Code 3. All other work to be initiated within 3 work days and work continuously to completion or relief.

d. The "Construction Warranty Service Priority List" is as follows:

Code 1-Life Safety Systems
(1) Fire suppression systems.
(2) Fire alarm system(s) in place in the building.

Code 1-Air Conditioning Systems
(1) Recreational support.
(2) Air conditioning leak in part of building, if causing damage.
(3) Air conditioning system not cooling properly.

Code 1-Doors
(1) Overhead doors not operational, causing a security, fire, or safety problem.
(2) Interior, exterior personnel doors or hardware, not functioning properly, causing a security, fire, or safety problem.

Code 3-Doors
(1) Overhead doors not operational.
(2) Interior/exterior personnel doors or hardware not functioning properly.

Code 1-Electrical
(1) Power failure (entire area or any building operational after 1600 hours).
(2) Security lights
(3) Smoke detectors

Code 2-Electrical
(1) Power failure (no power to a room or part of building).
(2) Receptacle and lights (in a room or part of building).

Code 3-Electrical
Street lights.

Code 1-Gas
(1) Leaks and breaks.
(2) No gas to family housing unit or cantonment area.

Code 1-Heat
(1) Area power failure affecting heat.
(2) Heater in unit not working.

Code 2-Kitchen Equipment
(1) Dishwasher not operating properly.
(2) All other equipment hampering preparation of a meal.

Code 1-Plumbing
(1) Hot water heater failure.
(2) Leaking water supply pipes.

Code 2-Plumbing
(1) Flush valves not operating properly.
(2) Fixture drain, supply line to commode, or any water pipe leaking.
(3) Commode leaking at base.

Code 3 -Plumbing
Leaky faucets.

Code 3-Interior
(1) Floors damaged.
(2) Paint chipping or peeling.
(3) Casework.

Code 1-Roof Leaks
Temporary repairs will be made where major damage to property is occurring.

Code 2-Roof Leaks
Where major damage to property is not occurring, check for location of leak during rain and complete repairs on a Code 2 basis.

Code 2-Water (Exterior)
No water to facility.

Code 2-Water (Hot)
No hot water in portion of building listed.

Code 3-All other work not listed above.

1.8.5 Warranty Tags

At the time of installation, tag each warranted item with a durable, oil and water resistant tag approved by the Contracting Officer. Attach each tag with a copper wire and spray with a silicone waterproof coating. Also, submit two record copies of the warranty tags showing the layout and design. The date of acceptance and the QC signature must remain blank until the project is accepted for beneficial occupancy. Show the following information on the tag.

Type of product/material	
Model number	
Serial number	
Contract number	
Warranty period from/to	
Inspector's signature	
Construction Contractor	
Address	
Telephone number	
Warranty contact	
Address	
Telephone number	
Warranty response time priority code	
WARNING - PROJECT PERSONNEL TO PERFORM ONLY OPERATIONAL MAINTENANCE DURING THE WARRANTY PERIOD.	

PART 2 PRODUCTS

2.1 RECORD DRAWINGS

Prepare the CAD drawing files in AutoCAD Release 2025 format compatible with a Windows operating system.

2.1.1 Additional Drawings

If additional drawings are required, prepare them using the specified electronic file format applying ERDC/ITL TR-19-7 and ERDC/ITL TR-19-6. The title block and drawing border to be used for any new final record drawings must be identical to that used on the contract drawings.

2.1.1.1 Sheet Numbers and File Names

If a sheet needs to be added between two sequential sheets, append a Supplemental Drawing Designator in accordance with ERDC/ITL TR-19-7 Adding a drawing sheet, and ERDC/ITL TR-19-6 Adding or deleting drawing sheets and index sheet procedures.

2.2 ADVANCED MODELING PACKAGE

For each Advanced Modeling Package submittal for both the Interim Record Model Package and the Final Record Model Package, submit in accordance with ERDC/ITL TR-19-7 and also provide the following items:

a. Advanced Modeling PxP: Provide an electronic copy of the most current approved version of the project Advanced Modeling PxP.

b. Electronic Files: Provide an electronic list (.txt file or similar), of all submitted electronic files including a description, directory, and file name for each file submitted. Identify which files have been produced from the Model and Facility Data. For all sheet files, include a list of the sheet titles and sheet numbers.

c. Advanced Modeling Submittal Checklist: Complete the USACE BIM/CIM Advanced Modeling Submittal Checklist and include with each submittal. Download the Checklist from the USACE CAD/BIM Technology Center website.

d. Advanced Modeling Files: Provide all native Advanced Modeling files associated with the production of the contract drawings and associated as-modeled drawings. Update and maintain in compliance with the Advanced Modeling formatting, content requirement, and standards in order to yield a complete and coordinated document package.

e. Quality Control (QC) Reports: Provide electronic PDFs of all QC reports and checklist utilized to ensure full compliance with the contract requirements and standards.

f. CAD Exports of BIM-Generated Sheets and Drawings: Provide supplemental 2D CAD exports from the project BIM model as needed to demonstrate compliance with contract requirements. Export all contract drawings sheets to the CAD format(s) defined.

2.3 CERTIFICATION OF EPA DESIGNATED ITEMS

Submit the Certification of EPA Designated Items as required by FAR 52.223-9 Estimate of Percentage of Recovered Material Content for EPA Designated Items and FAR 52-223-17 Affirmative Procurement of EPA designated items in Service and Construction Contracts. Include on the certification form the following information: project name, project number, Contractor name, license number, Contractor address, and certification. The certification will read as follows and be signed and dated by the Contractor. "I hereby certify the information provided

herein is accurate and that the requisition/procurement of all materials listed on this form comply with current EPA standards for recycled/recovered materials content. The following exemptions may apply to the non-procurement of recycled/recovered content materials:

a. The product does not meet appropriate performance standards;

b. The product is not available within a reasonable time frame;

c. The product is not available competitively (from two or more sources);

d. The product is only available at an unreasonable price (compared with a comparable non-recycled content product).

Record each product used in the project that has a requirement or option of containing recycled content noting total price, total value of post-industrial recycled content, total value of post-consumer recycled content, exemptions (a, b, c, or d, as indicated), and comments. Recycled content values may be determined by weight or volume percent, but must be consistent throughout.

2.4 PDF AS-BUILT FILES

Provide electronic PDF "plots" of all contract drawings sheets associated with the as-built drawing submittal. Compile and organize the PDF set to match the contract drawings. Bookmark and label the pages of the PDF file.

2.5 REDLINES AND MARKUPS

Provide PDFs of the current working redlines and/or markups complying with the as-builts drawing and markup requirements contained in this specification.

2.6 GEO-DATA-BASE FILES

Provide a SDSFIE/FGDC GeoReferenced personal GeoDataBase. For all information outside of the building walls, provide a personal GeoDataBase in .mdb format using the latest version of Spatial Data Standard for Facilities, Infrastructure, and Environment (SDSFIE) as the database structure. Provide a shell database to define the projection and database structure.

For all drawings within and including the exterior walls, utilize the advanced modeling formats described and referenced herein. Provide a short GeoDataBase read-me file explaining the deliverable. The read-me file will include a description of the software used to create the data, projection, and include the attribute tables used.

2.7 AS-BUILT OR ADVANCED MODELING RE-SUBMISSION REQUIREMENTS

If elements of an as-built submittal or advanced modeling package are rejected, provide the following for each re-submission, in addition to any information required in Section 01 33 00 SUBMITTAL PROCEDURES:

a. Re-submit all components required under paragraph As-Builts or Advanced Modeling Package, including a new Advanced Modeling Submittal Checklist and updated content in response to Government comments.

b. Provide a copy of all Government review comments.

c. Provide a disposition/response to each Government review comment for a back-check of the re-submission deliverable.

PART 3 EXECUTION

3.1 AS-BUILT DRAWINGS

Provide and maintain two black line print copies of the PDF contract drawings for As-Built Drawings. Maintain the as-builts throughout construction as red-lined hard copies on site and red-lined PDF files. Submit As-Built Drawings 30 days prior to Beneficial Occupancy Date (BOD).

3.1.1 Markup Guidelines

Make comments and markup the drawings complete without reference to letters, memos, or materials that are not part of the As-Built drawing. Show what was changed, how it was changed, where item(s) were relocated and change related details. These working as-built markup prints must be neat, legible and accurate as follows:

a. Use base colors of red, green, and blue. Color code for changes as follows:

(1) Special (Blue) - Items requiring special information, coordination, or special detailing or detailing notes.

(2) Deletions (Red) - Over-strike deleted graphic items (lines), lettering in notes and leaders.

(3) Additions (Green) - Added items, lettering in notes and leaders.

b. Provide a legend if colors other than the "base" colors of red, green, and blue are used.

c. Add and denote any additional equipment or material facilities, service lines, incorporated under As-Built Revisions if not already shown in legend.

d. Use frequent written explanations on markup drawings to describe changes. Do not totally rely on graphic means to convey the revision.

e. Use legible lettering and precise and clear digital values when marking prints. Clarify ambiguities concerning the nature and application of change involved.

f. Wherever a revision is made, also make changes to related section views, details, legend, profiles, plans and elevation views, schedules, notes and call out designations, and mark accordingly to avoid conflicting data on all other sheets.

g. For deletions, cross out all features, data and captions that relate to that revision.

h. For changes on small-scale drawings and in restricted areas, provide large-scale inserts, with leaders to the applicable location.

i. Indicate one of the following when attaching a print or sketch to a markup print:

1) Add an entire drawing to contract drawings

2) Change the contract drawing to show changes on the drawing.

3) Provided for reference only to further detail the initial design.

j. Incorporate all shop and fabrication drawings into the markup drawings.

3.1.2 As-Built Drawings Content

Revise As-Built Drawings and red-lined PDF files in accordance with ERDC/ITL TR-19-6 and ERDC/ITL TR-19-7. Keep these working as-built markup drawings current on a weekly basis and at least one set available on the jobsite at all times. Changes from the contract drawings which are made during construction or additional information which might be uncovered in the course of construction must be accurately and neatly recorded as they occur by means of details and notes. Submit the working as-built markup drawings for approval prior to submission of each monthly pay estimate. For failure to maintain the working and final record drawings as specified herein, the Contracting Officer will withhold 10 percent of the monthly progress payment until approval of updated drawings. Show on the as-built drawings, but not limited to, the following information:

a. The actual location, kinds and sizes of all sub-surface utility lines. In order that the location of these lines and appurtenances may be determined in the event the surface openings or indicators become covered over or obscured, show by offset dimensions to two permanently fixed surface features the end of each run including each change in direction on the record drawings. Locate valves, splice boxes and similar appurtenances by dimensioning along the utility run from a reference point. Also record the average depth below the surface of each run.

b. The location and dimensions of any changes within the building structure.

c. Layout and schematic drawings of electrical circuits and piping.

d. Correct grade, elevations, cross section, or alignment of roads, earthwork, structures or utilities if any changes were made from contract plans.

e. Changes in details of design or additional information obtained from working drawings specified to be prepared or furnished by the Contractor; including but not limited to shop drawings, fabrication, erection, installation plans and placing details, pipe sizes, insulation material, dimensions of equipment, and foundations.

f. The topography, invert elevations and grades of drainage installed or affected as part of the project construction.

g. Changes or Revisions which result from the final inspection.

h. Where contract drawings or specifications present options, show only the option selected for construction on the working as-built markup drawings.

i. If borrow material for this project is from sources on Government

property, or if Government property is used as a spoil area, furnish a contour map of the final borrow pit/spoil area elevations.

j. Systems designed or enhanced by the Contractor, such as HVAC controls, fire alarm, fire sprinkler, and irrigation systems.

k. Changes in location of equipment and architectural features.

l. Modifications.

m. Actual location of anchors, construction and control joints, etc., in concrete.

n. Unusual or uncharted obstructions that are encountered in the contract work area during construction.

o. Location, extent, thickness, and size of stone protection particularly where it will be normally submerged by water.

3.2 RECORD DRAWING FILES

If additional drawings are required, prepare them using the specified electronic file format applying the same graphic standards specified for original drawings. The title block and drawing border to be used for any new final record drawings must be identical to that used on the contract drawings. Accomplish additions and corrections to the contract drawings using CAD files. Provide all program files and hardware necessary to prepare final PDF record drawings. The Contracting Officer will review final PDF record drawings for accuracy and return them to the Contractor for required corrections, changes, additions, and deletions.

3.2.1 Rename the CAD Drawing files

Rename the CAD Drawing files using the contract number as the Project Code field,(e.g., W91238-15-C-10A-102.DWG) as instructed in the Pre-Construction conference. Use only those renamed files for the Marked-up changes. Make all changes on the layer/level as the original item.

a. For AutoCAD files (DWG), enter all as-built delta changes and notations on the AS-BUILT layer.

b. When final revisions have been completed, show the wording "RECORD DRAWING AS-BUILTS" followed by the name of the Contractor in letters at least 3/16 inch high on the cover sheet drawing. Date RECORD DRAWING AS-BUILTS" drawing revisions in the revision block.

c. Within 20 days after Government approval of all of the working record drawings for a phase of work, prepare the final CAD record drawings for that phase of work and submit PDF drawing files and two sets of prints for review and approval. The Government will promptly return one set of prints annotated with any necessary corrections. Within 10 days revise the CAD files accordingly at no additional cost and submit one set of final prints for the completed phase of work to the Government. Within 20 days of substantial completion of all phases of work, submit the final record drawing package for the entire project. Submit one set of electronic CAD files, and one set of the approved working record PDF and or programfiles with two sets of prints. The CAD files must be complete in all details and identical in form and

function to the CAD drawing files supplied by the Government. Prepare AutoCAD files for transmittal using e-Transmit. Make any transactions or adjustments necessary to accomplish this. The Government reserves the right to reject any drawing files it deems incompatible with the customer's CAD system. Paper prints, drawing files and storage media submitted will become the property of the Government upon final approval. Failure to submit final record PDF drawing files, CAD files and marked prints as specified will be cause for withholding any payment due under this contract. Approval and acceptance of final record drawings must be accomplished before final payment is made.

3.3 RECORD DRAWINGS

Prepare final record drawings after the completion of each definable phase of work as listed in the Contractor Quality Control Plan (such as Foundations, Utilities, or Structural Steel as appropriate for the project). Transfer the changes from the approved working as-built markup drawings to the original electronic CAD drawing files. Modify the as-built CAD drawing files to correctly show the features of the project as-built by bringing the working CAD drawing set into agreement with approved working as-built markup drawings, and adding such additional drawings as may be necessary. Refer to ERDC/ITL TR-19-6. Jointly review the working as-built markup drawings with printouts from working as-built CAD drawing PDF files for accuracy and completeness. Monthly review of working as-built CAD drawing PDF file printouts must cover all sheets revised since the previous review. These PDF drawing files are part of the permanent records of this project. Any drawings damaged or lost must be satisfactorily replaced at no expense to the Government.

Drawing revisions (include within change order price the cost to change working and final record drawings to reflect revisions) and compliance with the following procedures.

a. Follow directions in the revision for posting descriptive changes.

b. The revision delta size must be 5/16 inch unless the area where the delta is to be placed is crowded. Use a smaller size delta for crowded areas.

c. Place a revision delta at the location of each deletion.

d. For new details or sections which are added to a drawing, place a revision delta by the detail or section title.

e. For minor changes, place a revision delta by the area changed on the drawing (each location).

f. For major changes to a drawing, place a revision delta by the title of the affected plan, section, or detail at each location.

g. For changes to schedules or drawings, place a revision delta either by the schedule heading or by the change in the schedule.

3.3.1 Final Record Drawing Package

Submit the final record PDF and CAD drawings package for the entire project within 20 days of substantial completion of all phases of work. Submit one set of ANSI D size PDF and CAD files, two sets of ANSI D size prints and one set of the approved working record drawings. The package

must be complete in all details and identical in form and function to the contract drawing files supplied by the Government.

3.4 FINAL APPROVED SHOP DRAWINGS

Submit final approved project shop drawings 30 days after transfer of the completed facility.

3.5 CONSTRUCTION CONTRACT SPECIFICATIONS

Submit final PDF file record construction contract specifications, including revisions thereto, 30 days after transfer of the completed facility.

3.6 AS-BUILT RECORD OF EQUIPMENT AND MATERIALS

Furnish one copy of preliminary record of equipment and materials used on the project 15 days prior to final inspection. This preliminary submittal will be reviewed and returned 2 days after final inspection with Government comments. Submit Two sets of final record of equipment and materials 10 days after final inspection. Key the designations to the related area depicted on the contract drawings. List the following data:

RECORD OF DESIGNATED EQUIPMENT AND MATERIALS DATA				
Description	Specification Section	Manufacturer and Catalog, Model, and Serial Number	Composition and Size	Where Used

3.7 CLEANUP

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

3.8 REAL PROPERTY RECORD

Refer to UFC 1-300-08 for instruction on completing the DD FORM 1354. Contact the Contracting Officer for any project specific information necessary to complete the DD FORM 1354.

3.8.1 Interim DD FORM 1354

Near the completion of Project, but a minimum of 60 days prior to final acceptance of the work, complete and submit an accounting of all installed property with Interim DD FORM 1354. Include any additional assets,

improvements, and alterations from the Draft DD FORM 1354.

3.8.2 Completed DD FORM 1354

Attach the Real Property receiving Component's completed High Performance and Sustainable Building (HPSB) Checklist for each applicable building to the completed DD 1354. For convenience, a blank fillable PDF DD FORM 1354 may be obtained at the following link: www.esd.whs.mil/Portals/54/Documents/DD/forms/dd/dd1354.pdf

Submit the completed Checklist for DD FORM 1354 of Installed Building Equipment items. Attach this list to the updated DD FORM 1354.

-- End of Section --

SECTION 03 30 00

CAST-IN-PLACE CONCRETE
02/19, CHG 8: 05/24

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN CONCRETE INSTITUTE (ACI)

ACI 117	(2010; R 2015) Specifications for Tolerances for Concrete Construction and Materials and Commentary
ACI 121R	(2008) Guide for Concrete Construction Quality Systems in Conformance with ISO 9001
ACI 301	(2020) Specifications for Structural Concrete
ACI 302.1R	(2015) Guide for Concrete Floor and Slab Construction
ACI 304.2R	(2017) Guide to Placing Concrete by Pumping Methods
ACI 304R	(2000; R 2009) Guide for Measuring, Mixing, Transporting, and Placing Concrete
ACI 305R	(2020) Guide to Hot Weather Concreting
ACI 306R	(2016) Guide to Cold Weather Concreting
ACI 308.1	(2011) Specification for Curing Concrete
ACI MNL-15	(2020) Field Reference Manual: Specifications for Concrete Construction ACI 301-20 with Selected ACI References

AMERICAN HARDBOARD ASSOCIATION (AHA)

AHA A135.4	(1995; R 2004) Basic Hardboard

ASTM INTERNATIONAL (ASTM)

ASTM A934/A934M	(2022) Standard Specification for Epoxy-Coated Prefabricated Steel Reinforcing Bars
ASTM C31/C31M	(2024) Standard Practice for Making and Curing Concrete Test Specimens in the Field

ASTM C33/C33M	(2023) Standard Specification for Concrete Aggregates
ASTM C39/C39M	(2023) Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM C42/C42M	(2020) Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
ASTM C78/C78M	(2022) Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading)
ASTM C94/C94M	(2023) Standard Specification for Ready-Mixed Concrete
ASTM C136/C136M	(2019) Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM C138/C138M	(2023) Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete
ASTM C143/C143M	(2020) Standard Test Method for Slump of Hydraulic-Cement Concrete
ASTM C150/C150M	(2022) Standard Specification for Portland Cement
ASTM C172/C172M	(2017) Standard Practice for Sampling Freshly Mixed Concrete
ASTM C173/C173M	(2024) Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method
ASTM C231/C231M	(2024) Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C260/C260M	(2010a; R 2016) Standard Specification for Air-Entraining Admixtures for Concrete
ASTM C311/C311M	(2024) Standard Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans for Use in Portland-Cement Concrete
ASTM C330/C330M	(2017a) Standard Specification for Lightweight Aggregates for Structural Concrete
ASTM C494/C494M	(2019; E 2022) Standard Specification for Chemical Admixtures for Concrete
ASTM C567/C567M	(2019) Determining Density of Structural Lightweight Concrete

ASTM C595/C595M	(2023) Standard Specification for Blended Hydraulic Cements
ASTM C618	(2023; E 2023) Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
ASTM C803/C803M	(2023) Standard Test Method for Penetration Resistance of Hardened Concrete
ASTM C845/C845M	(2018) Standard Specification for Expansive Hydraulic Cement
ASTM C873/C873M	(2015) Standard Test Method for Compressive Strength of Concrete Cylinders Cast in Place in Cylindrical Molds
ASTM C900	(2015) Standard Test Method for Pullout Strength of Hardened Concrete
ASTM C989/C989M	(2024) Standard Specification for Slag Cement for Use in Concrete and Mortars
ASTM C1012/C1012M	(2018b) Standard Test Method for Length Change of Hydraulic-Cement Mortars Exposed to a Sulfate Solution
ASTM C1074	(2019; E 2021) Standard Practice for Estimating Concrete Strength by the Maturity Method
ASTM C1077	(2024) Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation
ASTM C1157/C1157M	(2023) Standard Performance Specification for Hydraulic Cement
ASTM C1218/C1218M	(2020c) Standard Test Method for Water-Soluble Chloride in Mortar and Concrete
ASTM C1240	(2020) Standard Specification for Silica Fume Used in Cementitious Mixtures
ASTM C1260	(2023) Standard Test Method for Potential Alkali Reactivity of Aggregates (Mortar-Bar Method)
ASTM C1293	(2008; R 2015) Standard Test Method for Determination of Length Change of Concrete Due to Alkali-Silica Reaction
ASTM C1567	(2023) Standard Test Method for Potential Alkali-Silica Reactivity of Combinations of Cementitious Materials and Aggregate (Accelerated Mortar-Bar Method)

ASTM C1602/C1602M	(2022) Standard Specification for Mixing Water Used in Production of Hydraulic Cement Concrete
ASTM C1778	(2023) Standard Guide for Reducing the Risk of Deleterious Alkali-Aggregate Reaction in Concrete
ASTM D3042	(2017) Standard Test Method for Insoluble Residue in Carbonate Aggregates
ASTM D5759	(2012; R 2020) Characterization of Coal Fly Ash and Clean Coal Combustion Fly Ash for Potential Uses

CONCRETE REINFORCING STEEL INSTITUTE (CRSI)

CRSI 10MSP	(2018; Errata 2019) Manual of Standard Practice

NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY (NIST)

NIST PS 1	(2009) DOC Voluntary Product Standard PS 1-07, Structural Plywood

U.S. ARMY CORPS OF ENGINEERS (USACE)

COE CRD-C 104	(1980) Method of Calculation of the Fineness Modulus of Aggregate

1.2 DEFINITIONS

a. "Cementitious material" as used herein must include all portland cement, pozzolan, fly ash, slag cement.

b. "Exposed to public view" means situated so that it can be seen from eye level from a public location after completion of the building. A public location is accessible to persons not responsible for operation or maintenance of the building.

c. "Chemical admixtures" are materials in the form of powder or fluids that are added to the concrete to give it certain characteristics not obtainable with plain concrete mixes.

d. "Supplementary cementing materials" (SCM) include coal fly ash, slag cement, natural or calcined pozzolans, and ultra-fine coal ash when used in such proportions to replace the portland cement that result in improvement to sustainability and durability and reduced cost.

e. "Design strength" (f'c) is the specified compressive strength of concrete at time(s) specified in this section to meet structural design criteria.

f. "Mass Concrete" is any concrete system that approaches a maximum temperature of 158 degrees F within the first 72 hours of placement. In addition, it includes all concrete elements with a section thickness of 3 feet or more regardless of temperature.

g. "Mixture proportioning" is the process of designing concrete mixture

proportions to enable it to meet the strength, service life and constructability requirements of the project while minimizing the initial and life-cycle cost.

h. "Mixture proportions" are the masses or volumes of individual ingredients used to make a unit measure (cubic meter or cubic yard) of concrete.

i. "Pozzolan" is a siliceous or siliceous and aluminous material, which in itself possesses little or no cementitious value but will, in finely divided form and in the presence of moisture, chemically react with calcium hydroxide at ordinary temperatures to form compounds possessing cementitious properties.

j. "Workability (or consistence)" is the ability of a fresh (plastic) concrete mix to fill the form/mould properly with the desired work (vibration) and without reducing the concrete's quality. Workability depends on water content, chemical admixtures, aggregate (shape and size distribution), cementitious content and age (level of hydration).

1.3 SUBMITTALS

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Concrete Curing Plan

Quality Control Program; G

Laboratory Accreditation; GMaturity Method Data

SD-03 Product Data

Formwork Materials

Cementitious Materials; S

Concrete Curing Materials

Admixtures

SD-05 Design Data

Concrete Mix Design; GSD-06 Test Reports

Concrete Mix Design; G

Fly Ash

Pozzolan

Slag Cement

Aggregates

Compressive Strength Tests; G

Unit Weight of Structural Concrete

Chloride Ion Concentration

Air Content

Slump Tests

Water

SD-07 Certificates

Safety Data Sheets

1.4 MODIFICATION OF REFERENCES

Accomplish work in accordance with ACI publications except as modified herein. Consider the advisory or recommended provisions to be mandatory. Interpret reference to the "Building Official," the "Structural Engineer," and the "Architect/Engineer" to mean the Contracting Officer.

1.5 DELIVERY, STORAGE, AND HANDLING

Follow ACI 301, ACI 304R and ASTM A934/A934M requirements and recommendations. Do not deliver concrete until forms and embedded items are in place and ready for concrete placement. Do not store concrete curing compounds or sealers with materials that have a high capacity to adsorb volatile organic compound (VOC) emissions. Do not store concrete curing compounds or sealers in occupied spaces.

1.6 QUALITY ASSURANCE

1.6.1 Design Data

1.6.1.1 Concrete Mix Design

Sixty days minimum prior to concrete placement, submit a mix design for each strength and type of concrete. Submit all documentation required in ACI 301 Section 4 and as specified in this section. Submit a complete list of materials including type, brand, source and amount of cement, supplementary cementitious materials, and admixtures; and applicable reference specifications. Submit mill test and all other test for cement, supplementary cementitious materials, aggregates, and admixtures. Provide documentation of maximum nominal aggregate size, gradation analysis, percentage retained and passing sieve, and a graph of percentage retained verses sieve size. Provide mix proportion data using at least three different water-cementitious material ratios for each type of mixture, which produce a range of strength encompassing those required for each type of concrete required. If source material changes, resubmit mix proportion data using revised source material. Provide only materials that have been proven by trial mix studies to meet the requirements of this specification, unless otherwise approved in writing by the Contracting Officer. Resubmit data on concrete components if the qualities or source of components changes. Required average strength can be

documented by field experience if field strength test data are available and represent a single group of at least 10 consecutive strength tests for one mixture, using materials and conditions similar to those expected for work, and encompassing a period of not less than 45 days. The average of field strength tests shall equal or exceed fcr'. Changes in materials, conditions, and proportions within the test record shall not have been more closely restricted than those for the proposed work. Test records shall not be more than 24 months old. Obtain mix design approval from the contracting officer prior to concrete placement.

1.6.2 Control Submittals

1.6.2.1 Concrete Curing Plan

Submit proposed materials, methods and duration for curing concrete elements in accordance with ACI 308.1.

1.6.2.2 Safety Data Sheets

Submit Safety Data Sheets (SDS) for all materials that are regulated for hazardous health effects. SDS must be readily accessible during each work shift to employees when they are at the construction site.

1.6.3 Test Reports

1.6.3.1 Fly Ash and Pozzolan

Submit test results in accordance with ASTM C618 for fly ash and pozzolan. Submit test results performed within 6 months of submittal date.

1.6.3.2 Slag Cement

Submit test results in accordance with ASTM C989/C989M for slag cement. Submit test results performed within 6 months of submittal date.

1.6.3.3 Aggregates

Submit test results in accordance with ASTM C33/C33M, or ASTM C330/C330M for lightweight aggregate, and ASTM C1293 or ASTM C1567 as required in the paragraph titled ALKALI-AGGREGATE REACTION.

1.6.4 Quality Control Program

Develop and submit for approval a concrete quality control program in accordance with the guidelines of ACI 121R and as specified herein. The plan must include approved laboratories. Provide direct oversight for the concrete qualification program inclusive of associated sampling and testing. All quality control reports must be provided to the Contracting Officer, Quality Manager and Concrete Supplier. Maintain a copy of ACI MNL-15 and CRSI 10MSP at project site.

1.6.5 Laboratory Qualifications for Concrete Qualification Testing

The concrete testing laboratory must have the necessary equipment and experience to accomplish required testing. The laboratory must meet the requirements of ASTM C1077 and be Cement and Concrete Reference Laboratory (CCRL) inspected.

1.6.6 Laboratory Accreditation

Laboratory and testing facilities must be provided by and at the expense of the Contractor. The laboratories performing the tests must be accredited in accordance with ASTM C1077, including ASTM C78/C78M and ASTM C1260. The accreditation must be current and must include the required test methods, as specified. Furthermore, the testing must comply with the following requirements:

a. Aggregate Testing and Mix Proportioning: Aggregate testing and mixture proportioning studies must be performed by an accredited laboratory and under the direction of a registered professional engineer in a U.S. state or territory competent in concrete materials who is competent in concrete materials and must sign all reports and designs.

b. Acceptance Testing: Furnish all materials, labor, and facilities required for molding, curing, testing, and protecting test specimens at the site and in the laboratory. Furnish and maintain boxes or other facilities suitable for storing and curing the specimens at the site while in the mold within the temperature range stipulated by ASTM C31/C31M.

c. Contractor Quality Control: All sampling and testing must be performed by an approved, onsite, independent, accredited laboratory.

PART 2 PRODUCTS

2.1 FORMWORK MATERIALS

a. Form-facing material in contact with concrete must be lumber and plywood. Submit product information on proposed form-facing materials if different from that specified herein.

b. Design formwork, shores, reshores, and backshores to support loads transmitted to them and to comply with applicable building code requirements.

c. Design formwork and shoring for load redistribution resulting from stressing of post-tensioned reinforcement. Ensure that formwork allows movement resulting from application of prestressing force.

d. Design formwork to withstand pressure resulting from placement and vibration of concrete and to maintain specified tolerances.

e. Design formwork to accommodate waterstop materials in joints at locations indicated in Contract Documents.

f. Provide temporary openings in formwork if needed to facilitate cleaning and inspection.

g. Design formwork joints to inhibit leakage of mortar.

h. Limit deflection of facing materials for concrete surfaces exposed to view to 1/240 of center-to-center spacing of facing supports.

i. Do not use earth cuts as forms for vertical or sloping surfaces.

j. Submit product information on proposed form-facing materials if different from that specified herein.

2.1.1 Wood Forms

Use lumber as specified in Section 06 10 00 ROUGH CARPENTRY and as follows. Provide lumber that is square edged or tongue-and-groove boards, free of raised grain, knotholes, or other surface defects. Provide plywood that complies with NIST PS 1, B-B concrete form panels or better or AHA A135.4, hardboard for smooth form lining.

2.1.1.1 Concrete Form Plywood (Standard Rough)

Provide plywood that conforms to NIST PS 1, B-B, concrete form, not less than 5/8-inch thick.

2.1.1.2 Overlaid Concrete Form Plywood (Standard Smooth)

Provide plywood that conforms to NIST PS 1, B-B, high density form overlay, not less than 5/8-inch thick.

2.2 FORMWORK ACCESSORIES

a. Use commercially manufactured formwork accessories, including ties and hangers.

b. Form ties and accessories must not reduce the effective cover of the reinforcement.

2.2.1 Form Ties

a. Use form ties with ends or end fasteners that can be removed without damage to concrete.

b. Where indicated in Contract Documents, use form ties with integral water barrier plates or other acceptable positive water barriers in walls.

2.2.2 Other Embedded items

Use sleeves, inserts, anchors, and other embedded items of material and design indicated in Contract Documents.

2.3 CONCRETE MATERIALS

2.3.1 Cementitious Materials

2.3.1.1 Portland Cement

a. Unless otherwise specified, provide cement that conforms to ASTM C150/C150M Type II.

b. Use one brand and type of cement for formed concrete having exposed-to-view finished surfaces.

c. Supplier must certify that no hazardous waste is used in the fuel mix or raw materials.

d. Submit information along with evidence demonstrating compliance with referenced standards. Submittals must include types of cementitious

materials, manufacturing locations, shipping locations, and certificates showing compliance.

e. Cementitious materials must be stored and kept dry and free from contaminants.

2.3.1.2 Fly Ash

a. ASTM C618, Class F, except that the maximum allowable loss on ignition must not exceed 6 percent.

b. If fly ash is used it shall range from 15 to 20 percent by weight of cementitious material, provided the fly ash does not reduce the amount of cement in the concrete mix below the minimum requirements of local building codes. Where the use of fly ash cannot meet the minimum level,it shall not be used. Report the chemical analysis of the fly ash in accordance with ASTM C311/C311M. Evaluate and classify fly ash in accordance with ASTM D5759.

2.3.1.3 Slag Cement

ASTM C989/C989M, Grade 100.

2.3.1.4 Silica Fume

Silica fume must conform to ASTM C1240, including the optional limits on reactivity with cement alkalis. Silica fume may be furnished as a dry, densified material or as slurry. Proper mixing is essential to accomplish proper distribution of the silica fume and avoid agglomerated silica fume which can react with the alkali in the cement resulting in premature and extensive concrete damage. Supervision at the batch plant, finishing, and curing is essential.

2.3.1.5 Other Supplementary Cementitious Materials

Natural pozzolan must be raw or calcined and conform to ASTM C618, Class N, including the optional requirement for uniformity.

Ultra Fine Fly Ash (UFFA) and Ultra Fine Pozzolan (UFP) must conform to ASTM C618, Class F or N, and the following additional requirements:

a. The strength activity index at 28 days of age must be at least 95 percent of the control specimens.

b. The average particle size must not exceed 6 microns.

c. The sum of SiO_2 plus Al_2O_3 plus Fe_2O_3 must be greater than 77 percent.

2.3.2 Water

a. Water or ice must comply with the requirements of ASTM C1602/C1602M.

b. Minimize the amount of water in the mix. Improve workability by adjusting the grading of the aggregate and using admixture rather than by adding water.

c. Water must be potable; free from injurious amounts of oils, acids, alkalis, salts, organic materials, or other substances deleterious to concrete.

d. Protect mixing water and ice from contamination during storage and delivery.

e. Submit test report showing water complies with ASTM C1602/C1602M.

2.3.3 Aggregate

2.3.3.1 Normal-Weight Aggregate

a. Aggregates must conform to ASTM C33/C33M unless otherwise specified in the Contract Documents or approved by the contracting officer.

b. Aggregates used in concrete must be obtained from the same sources and have the same size range as aggregates used in concrete represented by submitted field test records or used in trial mixtures.

c. Provide sand that is at least 50 percent acid insoluble based on ASTM D3042.

d. Store and handle aggregate in a manner that will avoid segregation and prevents contamination by other materials or other sizes of aggregates. Store aggregates in locations that will permit them to drain freely. Do not use aggregates that contain frozen lumps.

e. Submit types, pit or quarry locations, producers' names, aggregate supplier statement of compliance with ASTM C33/C33M, and ASTM C1293 expansion data not more than 18 months old.

2.3.4 Admixtures

a. Chemical admixtures must conform to ASTM C494/C494M.

b. Air-entraining admixtures must conform to ASTM C260/C260M.

c. Do not use calcium chloride admixtures unless approved by the contracting officer.

d. Use a corrosion-inhibiting admixture for concrete classified under exposure category C2.

e. Admixtures used in concrete must be the same as those used in the concrete represented by submitted field test records or used in trial mixtures.

f. Protect stored admixtures against contamination, evaporation, or damage.

g. To ensure uniform distribution of constituents, provide agitating equipment for admixtures used in the form of suspensions or unstable solutions. Protect liquid admixtures from freezing and from temperature changes that would adversely affect their characteristics.

h. Submit types, brand names, producers' names, manufacturer's technical data sheets, and certificates showing compliance with standards required herein.

2.4 MISCELLANEOUS MATERIALS

2.4.1 Concrete Curing Materials

Provide concrete curing material in accordance with ACI 301 Section 5 and ACI 308.1 Section 2. Submit manufactures instructions for placement of curing compound.

2.5 CONCRETE MIX DESIGN

2.5.1 Properties and Requirements

a. Use materials and material combinations listed in this section and the contract documents.

b. Cementitious material content must be adequate for concrete to satisfy the specified requirements for strength, w/cm, durability, and finishability described in this section and the contract documents.

c. Selected target slump must meet the requirements this section, the contract documents, and must not exceed 9 in. Concrete must not show visible signs of segregation.

d. The target slump must be enforced for the duration of the project. Determine the slump by ASTM C143/C143M. Slump tolerances must meet the requirements of ACI 117.

e. The nominal maximum size of coarse aggregate for a mixture must not exceed three-fourths of the minimum clear spacing between reinforcement, one-fifth of the narrowest dimension between sides of forms, or one-third of the thickness of slabs or toppings.

f. Concrete must be air entrained for members assigned to Exposure Class F1, F2, or F3. The total air content must be in accordance with the requirements of the paragraph titled DURABILITY.

g. Measure air content at the point of delivery in accordance with ASTM C173/C173M or ASTM C231/C231M.

h. Concrete properties and requirements for each portion of the structure are specified in the table below. Refer to the paragraph titled DURABILITY for more details on exposure categories and their requirements.

	Minimum *f'c* psi	**Exposure Categories^**	**Miscellaneous Requirements**
Footings	4000	S0; C2; W1; F2	Max. slump: 9 in. Nominal maximum aggregate size must be 1.5 in.

2.5.2 Durability

2.5.2.1 Alkali-Aggregate Reaction

Do not use any aggregate susceptible to alkali-carbonate reaction (ACR).

Use one of the three options below for qualifying concrete mixtures to reduce the potential of alkali-silica reaction (ASR):

a. For each aggregate used in concrete, the expansion result determined in accordance with ASTM C1293 must not exceed 0.04 percent at one year.

b. For each aggregate used in concrete, the expansion result of the aggregate and cementitious materials combination determined in accordance with ASTM C1567 must not exceed 0.10 percent at an age of 16 days.

c. Alkali content in concrete (LBA) must not exceed 4 pounds per cubic yard for moderately reactive aggregate or 3 pounds per cubic yard for highly reactive aggregate. Reactivity must be determined by testing in accordance with ASTM C1293 and categorized in accordance with ASTM C1778. Alkali content is calculated as follows:
LBA = (cement content, pounds per cubic yard) × (equivalent alkali content of portland cement in percent/100 percent)

2.5.2.2 Freezing and Thawing Resistance

a. Provide concrete meeting the following requirements based on exposure class assigned to members for freezing-and-thawing exposure in Contract Documents:

Exposure class	**Maximum *w/cm****	**Minimum *f'c*, psi**	**Air content**	**Additional Requirements**
F0	N/A	2500	N/A	
F1	0.55	3500	Depends on aggregate size	N/A
F2	0.45	4500	Depends on aggregate size	See limits on maximum cementitious material by mass
F3	0.40	5000	Depends on aggregate size	See limits on maximum cementitious material by mass
F3 plain concrete	0.45	4500	Depends on aggregate size	See limits on maximum cementitious material by mass

*The maximum *w/cm* limits do not apply to lightweight concrete.

b. Concrete must be air entrained for members assigned to Exposure Class F1, F2, or F3. The total air content must meet the requirements of the following table:

Nominal maximum aggregate size, in.	Total air content, percent*^	
	Exposure Class F2 and F3	Exposure Class F1
3/8	7.5	6.0
1/2	7.0	5.5
3/4	6.0	5.0
1	6.0	4.5
1-1/2	5.5	4.5
2	5.0	4.0
3	5.5	3.5

*Tolerance on air content as delivered must be plus/minus 1.5 percent.

^For f'c greater than 5000 psi, reducing air content by 1.0 percentage point is acceptable.

c. Submit documentation verifying compliance with specified requirements.

d. For sections of the structure that are assigned Exposure Class F3, submit certification on cement composition verifying that concrete mixture meets the requirements of the following table:

Cementitious material	Maximum percent of total cementitious material by mass*
Fly ash or other pozzolans conforming to ASTM C618	25
Slag cement conforming to ASTM C989/C989M	50
Silica fume conforming to ASTM C1240	10
Total of fly ash or other pozzolans, slag cement, and silica fume	50^
Total of fly ash or other pozzolans and silica fume	35^

*Total cementitious material also includes ASTM C150/C150M, ASTM C595/C595M, ASTM C845/C845M, and ASTM C1157/C1157M cement. The maximum percentages above must include:

i. Fly ash or other pozzolans present in ASTM C1157/C1157M or ASTM C595/C595M Type IP blended cement.

ii. Slag cement present in ASTM C1157/C1157M or ASTM C595/C595M Type IS blended cement.

iii. Silica fume conforming to ASTM C1240 present in ASTM C1157/C1157M or ASTM C595/C595M Type IP blended cement.

^Fly ash or other pozzolans and silica fume must constitute no more than 25 percent and 10 percent, respectively, of the total mass of the cementitious materials.

2.5.2.3 Corrosion and Chloride Content

a. Provide concrete meeting the requirements of the following table based on the exposure class assigned to members requiring protection against reinforcement corrosion in Contract Documents.

b. Submit documentation verifying compliance with specified requirements.

c. Water-soluble chloride ion content contributed from constituents including water, aggregates, cementitious materials, and admixtures must be determined for the concrete mixture by ASTM C1218/C1218M at age between 28 and 42 days.

d. The maximum water-soluble chloride ion (Cl-) content in concrete, percent by mass of cement is as follows:

Exposure class	**Maximum *w/cm****	**Minimum f'c, psi**	**Maximum water-soluble chloride ion (CL-) content in concrete, percent by mass of cement**
Reinforced concrete			
C0	N/A	2500	1.00
C1	N/A	2500	0.30
C2	0.4	5000	0.15
Prestressed concrete			
C0	N/A	2500	0.06
C1	N/A	2500	0.06
C2	0.4	5000	0.06

*The maximum w/cm limits do not apply to lightweight concrete.

2.5.2.4 Sulfate Resistance

a. Provide concrete meeting the requirements of the following table based on the exposure class assigned to members for sulfate exposure.

Exposure class	**Maximum w/cm**	**Minimum f'c, psi**	**Required cementitious materials-types**			**Calcium chloride admixture**
			ASTM	**ASTM**	**ASTM**	
S0	N/A	2500	N/A	N/A	N/A	No restrictions
S1	0.50	4000	II*^	Types with (MS) designation	MS	No restrictions
S2	0.45	4500	V^	Types with (HS) designation	HS	Not permitted

Exposure class	Maximum w/cm	Minimum f'c, psi	Required cementitious materials-types			Calcium chloride admixture
			ASTM [illegible]	ASTM [illegible]	ASTM [illegible]	
S3	0.45	4500	V + pozzolan or slag cement**	Types with (HS) designation plus pozzolan or slag cement**	HS + pozzolan or slag cement**	Not permitted
S3	0.40	5000	V***	Types with (HS) designation	HS	Not permitted

* For seawater exposure, other types of portland cements with tricalcium aluminate (C3A) contents up to 10 percent are acceptable if the w/cm does not exceed 0.40.

** The amount of the specific source of the pozzolan or slag cement to be used shall be at least the amount determined by test or service record to improve sulfate resistance when used in concrete containing Type V cement. Alternatively, the amount of the specific source of the pozzolan or slag used shall not be less than the amount tested in accordance with ASTM C1012/C1012M and meeting the requirements maximum expansion requirements listed herein.

*** If Type V cement is used as the sole cementitious material, the optional sulfate requirement of 0.040 percent maximum expansion in ASTM C150/C150M shall be required.

^ Other available types of cement, such as Type III or Type I, are acceptable in exposure classes S1 or S2 if the C3A contents are less than 8 or 5 percent, respectively.

b. The maximum w/cm limits for sulfate exposure do not apply to lightweight concrete.

c. Alternative combinations of cementitious materials of those listed in this paragraph are acceptable if they meet the maximum expansion requirements listed in the following table:

Exposure class	Maximum expansion when tested using ASTM C1012/C1012M		
	At 6 months	At 12 months	At 18 months
S1	0.10 percent	N/A	N/A
S2	0.05 percent	0.10 percent^	N/A
S3	N/A	N/A	0.10 percent

^The 12-month expansion limit applies only when the measured expansion exceeds the 6-month maximum expansion limit.

2.5.2.5 Concrete Temperature

The temperature of concrete as delivered must not exceed 95°F.

2.5.2.6 Concrete Permeability

a. Provide concrete meeting the requirements of the following table based on exposure class assigned to members requiring low permeability in the Contract Documents.

Exposure class	**Maximum *w/cm****	**Minimum f'c, psi**	**Additional minimum requirements**
W0	N/A	2500	None
W1	0.5	4000	None
W2	0.50	4000	None

*The maximum w/cm limits do not apply to lightweight concrete.

b. Submit documentation verifying compliance with specified requirements.

2.5.3 Ready-Mix Concrete

Provide concrete that meets the requirements of ASTM C94/C94M.

Ready-mixed concrete manufacturer must provide duplicate delivery tickets with each load of concrete delivered. Provide delivery tickets with the following information in addition to that required by ASTM C94/C94M:

a. Type and brand cement

b. Cement and supplementary cementitious materials content in 94-pound bags per cubic yard of concrete

c. Maximum size of aggregate

d. Amount and brand name of admixtures

e. Total water content expressed by water cementitious material ratio

PART 3 EXECUTION

3.1 EXAMINATION

a. Do not begin installation until substrates have been properly constructed; verify that substrates are level.

b. If substrate preparation is the responsibility of another installer, notify Contracting Officer of unsatisfactory preparation before processing.

c. Check field dimensions before beginning installation. If dimensions vary too much from design dimensions for proper installation, notify Contracting Officer and wait for instructions before beginning

installation.

3.2 PREPARATION

Determine quantity of concrete needed and minimize the production of excess concrete. Designate locations or uses for potential excess concrete before the concrete is poured.

3.2.1 General

a. Surfaces against which concrete is to be placed must be free of debris, loose material, standing water, snow, ice, and other deleterious substances before start of concrete placing.

b. Remove standing water without washing over freshly deposited concrete. Divert flow of water through side drains provided for such purpose.

3.2.2 Subgrade Under Foundations and Footings

a. When subgrade material is semi-porous and dry, sprinkle subgrade surface with water as required to eliminate suction at the time concrete is deposited, or seal subgrade surface by covering surface with specified vapor retarder.

b. When subgrade material is porous, seal subgrade surface by covering surface with specified vapor retarder.

3.2.3 Subgrade Under Slabs on Ground

a. Before construction of slabs on ground, have underground work on pipes and conduits completed and approved.

b. Previously constructed subgrade or fill must be cleaned of foreign materials

c. Finish surface of capillary water barrier under interior slabs on ground must not show deviation in excess of 1/4 inch when tested with a 10-foot straightedge parallel with and at right angles to building lines.

d. Finished surface of subgrade or fill under exterior slabs on ground must not be more than 0.02-foot above or 0.10-foot below elevation indicated.

3.2.4 Edge Forms and Screed Strips for Slabs

a. Set edge forms or bulkheads and intermediate screed strips for slabs to obtain indicated elevations and contours in finished slab surface and must be strong enough to support vibrating bridge screeds or roller pipe screeds if nature of specified slab finish requires use of such equipment.

b. Align concrete surface to elevation of screed strips by use of strike-off templates or approved compacting-type screeds.

3.2.5 Reinforcement and Other Embedded Items

a. Secure reinforcement, joint materials, and other embedded materials in position, inspected, and approved before start of concrete placing.

b. When concrete is placed, reinforcement must be free of materials deleterious to bond. Reinforcement with rust, mill scale, or a combination of both will be considered satisfactory, provided minimum nominal dimensions, nominal weight, and minimum average height of deformations of a hand-wire-brushed test specimen are not less than applicable ASTM specification requirements.

3.3 FORMS

a. Provide forms, shoring, and scaffolding for concrete placement. Set forms mortar-tight and true to line and grade.

b. Chamfer above grade exposed joints, edges, and external corners of concrete 0.75 inch. Place chamfer strips in corners of formwork to produce beveled edges on permanently exposed surfaces.

c. Provide formwork with clean-out openings to permit inspection and removal of debris.

d. Inspect formwork and remove foreign material before concrete is placed.

e. At construction joints, lap form-facing materials over the concrete of previous placement. Ensure formwork is placed against hardened concrete so offsets at construction joints conform to specified tolerances.

f. Provide positive means of adjustment (such as wedges or jacks) of shores and struts. Do not make adjustments in formwork after concrete has reached initial setting. Brace formwork to resist lateral deflection and lateral instability.

g. Fasten form wedges in place after final adjustment of forms and before concrete placement.

h. Provide anchoring and bracing to control upward and lateral movement of formwork system.

i. Construct formwork for openings to facilitate removal and to produce opening dimensions as specified and within tolerances.

j. Provide runways for moving equipment. Support runways directly on formwork or structural members. Do not support runways on reinforcement. Loading applied by runways must not exceed capacity of formwork or structural members.

k. Position and support expansion joint materials, waterstops, and other embedded items to prevent displacement. Fill voids in sleeves, inserts, and anchor slots temporarily with removable material to prevent concrete entry into voids.

l. Clean surfaces of formwork and embedded materials of mortar, grout, and foreign materials before concrete placement.

3.3.1 Coating

a. Cover formwork surfaces with an acceptable material that inhibits bond with concrete.

b. If formwork release agent is used, apply to formwork surfaces in accordance with manufacturer's recommendations before placing reinforcement. Remove excess release agent on formwork prior to concrete placement.

c. Do not allow formwork release agent to contact reinforcement or hardened concrete against which fresh concrete is to be placed.

3.3.2 Reuse

a. Reuse forms providing the structural integrity of concrete and the aesthetics of exposed concrete are not compromised.

b. Wood forms must not be clogged with paste and must be capable of absorbing high water-cementitious material ratio paste.

c. Remove leaked mortar from formwork joints before reuse.

3.3.3 Forms for Standard Rough Form Finish

Provide formwork in accordance with ACI 301 Section 5 with a surface finish, SF-1.0, for formed surfaces that are to be concealed by other construction.

3.3.4 Form Ties

a. For post-tensioned structures, do not remove formwork supports until stressing records have been accepted by the Contracting Officer.

b. After ends or end fasteners of form ties have been removed, repair tie holes in accordance with ACI 301 Section 5 requirements.

3.3.5 Tolerances for Form Construction

a. Construct formwork so concrete surfaces conform to tolerances in ACI 117.

b. Position and secure sleeves, inserts, anchors, and other embedded items such that embedded items are positioned within ACI 117 tolerances.

c. To maintain specified elevation and thickness within tolerances, install formwork to compensate for deflection and anticipated settlement in formwork during concrete placement. Set formwork and intermediate screed strips for slabs to produce designated elevation, camber, and contour of finished surface before formwork removal. If specified finish requires use of vibrating screeds or roller pipe screeds, ensure that edge forms and screed strips are strong enough to support such equipment.

3.3.6 Removal of Forms and Supports

a. If vertical formed surfaces require finishing, remove forms as soon as removal operations will not damage concrete.

b. Remove top forms on sloping surfaces of concrete as soon as removal will not allow concrete to sag. Perform repairs and finishing operations required. If forms are removed before end of specified curing period, provide curing and protection.

c. Do not damage concrete during removal of vertical formwork for columns, walls, and sides of beams. Perform needed repair and finishing operations required on vertical surfaces. If forms are removed before end of specified curing period, provide curing and protection.

3.3.7 Strength of Concrete Required for Removal of Formwork

If removal of formwork, reshoring, or backshoring is based on concrete reaching a specified in-place strength, mold and field-cure cylinders in accordance with ASTM C31/C31M. Test cylinders in accordance with ASTM C39/C39M. Alternatively, use one or more of the methods listed herein to evaluate in-place concrete strength for formwork removal.

a. Tests of cast-in-place cylinders in accordance with ASTM C873/C873M. This option is limited to slabs with concrete depths from 5 to 12 in.

b. Penetration resistance in accordance with ASTM C803/C803M.

c. Pullout strength in accordance with ASTM C900.

d. Maturity method in accordance with ASTM C1074. Submit maturity method data using project materials and concrete mix proportions used on the project to demonstrate the correlation between maturity and compressive strength of laboratory cured test specimens to the Contracting Officer.

3.4 PLACING MISCELLANEOUS MATERIALS

a. Unless otherwise specified, placing miscellaneous materials must be in accordance to ACI 301. Provide bars, welded wire reinforcement, wire ties, supports, and other devices necessary to install and secure miscellaneous materials.

b. Reinforcement must not have rust, scale, oil, grease, clay, or foreign substances that would reduce the bond. Rusting of reinforcement is a basis of rejection if the effective cross-sectional area or the nominal weight per unit length has been reduced. Remove loose rust prior to placing steel. Tack welding is prohibited.

3.4.1 Setting Miscellaneous Material

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

3.5 BATCHING, MEASURING, MIXING, AND TRANSPORTING CONCRETE

In accordance with ASTM C94/C94M, ACI 301, ACI 302.1R and ACI 304R, except as modified herein. Batching equipment must be such that the concrete ingredients are consistently measured within the following tolerances: 1 percent for cement and water, 2 percent for aggregate, and 3 percent for admixtures. Furnish mandatory batch ticket information for each load of ready mix concrete.

3.5.1 Measuring

Make measurements at intervals as specified in paragraphs SAMPLING and TESTING.

3.5.2 Mixing

a. Mix concrete in accordance with ASTM C94/C94M, ACI 301 and ACI 304R.

b. Machine mix concrete. Begin mixing within 30 minutes after the cement has been added to the aggregates. Place concrete within 90 minutes of either addition of mixing water to cement and aggregates or addition of cement to aggregates. A retarder shall be used to facilitate placing and finishing when concrete temperature is 85 degrees F or greater.

c. Dissolve admixtures in the mixing water and mix in the drum to uniformly distribute the admixture throughout the batch. Do not reconstitute concrete that has begun to solidify.

3.5.3 Transporting

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

3.6 PLACING CONCRETE

Place concrete in accordance with ACI 301 Section 5. Concrete shall be placed within 15 minutes of discharge into non-agitating equipment.

3.6.1 Footing Placement

Concrete for footings may be placed in excavations without forms upon inspection and approval by the Contracting Officer. Excavation width must be a minimum of 4 inches greater than indicated.

3.6.2 Pumping

ACI 304R and ACI 304.2R. Pumping must not result in separation or loss of materials nor cause interruptions sufficient to permit loss of plasticity between successive increments. Loss of slump in pumping equipment must not exceed 2 inches at discharge/placement. Do not convey concrete through pipe made of aluminum or aluminum alloy. Avoid rapid changes in pipe sizes. Limit maximum size of course aggregate to 33 percent of the diameter of the pipe. Limit maximum size of well-rounded aggregate to 40 percent of the pipe diameter. Take samples for testing at both the point of delivery to the pump and at the discharge end.

3.6.3 Cold Weather

Cold weather concrete must meet the requirements of ACI 301 unless otherwise specified. Do not allow concrete temperature to decrease below 50 degrees F. Obtain approval prior to placing concrete when the ambient temperature is below 40 degrees F or when concrete is likely to be subjected to freezing temperatures within 24 hours. Cover concrete and provide sufficient heat to maintain 50 degrees F minimum adjacent to both the formwork and the structure while curing. Limit the rate of cooling to

5 degrees F in any one hour and 18 degrees F per 24 hours after heat application.

3.6.4 Hot Weather

Hot weather concrete must meet the requirements of ACI 301 unless otherwise specified. Maintain required concrete temperature using Figure 4.2 in ACI 305R to prevent the evaporation rate from exceeding 0.2 pound of water per square foot of exposed concrete per hour. Cool ingredients before mixing or use other suitable means to control concrete temperature and prevent rapid drying of newly placed concrete. Shade the fresh concrete as soon as possible after placing. Start curing when the surface of the fresh concrete is sufficiently hard to permit curing without damage. Provide water hoses, pipes, spraying equipment, and water hauling equipment, where job site is remote to water source, to maintain a moist concrete surface throughout the curing period. Provide burlap cover or other suitable, permeable material with fog spray or continuous wetting of the concrete when weather conditions prevent the use of either liquid membrane curing compound or impervious sheets. For vertical surfaces, protect forms from direct sunlight and add water to top of structure once concrete is set.

3.6.5 Bonding

Surfaces of set concrete at joints, must be roughened and cleaned of laitance, coatings, loose particles, and foreign matter. Roughen surfaces in a manner that exposes the aggregate uniformly and does not leave laitance, loosened particles of aggregate, nor damaged concrete at the surface.

Obtain bonding of fresh concrete that has set as follows:

a. At joints between footings and walls or columns, between walls or columns and the beams or slabs they support, and elsewhere unless otherwise specified; roughened and cleaned surface of set concrete must be dampened, but not saturated, immediately prior to placing of fresh concrete.

b. At joints in exposed-to-view work; at vertical joints in walls; at joints near midpoint of span in girders, beams, supported slabs, other structural members; in work designed to contain liquids; the roughened and cleaned surface of set concrete must be dampened but not saturated and covered with a cement grout coating.

c. Provide cement grout that consists of equal parts of portland cement and fine aggregate by weight with not more than 6 gallons of water per sack of cement. Apply cement grout with a stiff broom or brush to a minimum thickness of 1/16 inch. Deposit fresh concrete before cement grout has attained its initial set.

3.7 WASTE MANAGEMENT

Provide as specified in the Waste Management Plan and as follows.

3.7.1 Mixing Equipment

Before concrete pours, designate Contractor-owned site meeting environmental standards for cleaning out concrete mixing trucks. Minimize water used to wash equipment.

3.7.2 Other Waste

Identify concrete manufacturer's or supplier's policy for collection or return of construction waste, unused material, deconstruction waste, and/or packaging material.

3.8 SURFACE FINISHES EXCEPT FLOOR, SLAB, AND PAVEMENT FINISHES

3.8.1 Defects

Repair surface defects in accordance with ACI 301 Section 5.

3.8.2 Not Against Forms (Top of Walls)

Surfaces not otherwise specified must be finished with wood floats to even surfaces. Finish must match adjacent finishes.

3.8.3 Formed Surfaces

3.8.3.1 Tolerances

Tolerances in accordance with ACI 117 and as indicated.

3.8.3.2 As-Cast Rough Form

Provide for surfaces not exposed to public view a surface finish SF-1.0. Patch holes and defects in accordance with ACI 301.

3.8.3.3 Standard Smooth Finish

Provide for surfaces exposed to public view a surface finish SF-3.0. Patch holes and defects in accordance with ACI 301.

3.9 CURING AND PROTECTION

Curing and protection in accordance with ACI 301 Section 5, unless otherwise specified. Begin curing immediately following form removal. Avoid damage to concrete from vibration created by blasting, pile driving, movement of equipment in the vicinity, disturbance of formwork or protruding reinforcement, and any other activity resulting in ground vibrations. Protect concrete from injurious action by sun, rain, flowing water, frost, mechanical injury, tire marks, and oil stains. Do not allow concrete to dry out from time of placement until the expiration of the specified curing period. Do not use membrane-forming compound on surfaces where appearance would be objectionable, on any surface to be painted, where coverings are to be bonded to the concrete, or on concrete to which other concrete is to be bonded. If forms are removed prior to the expiration of the curing period, provide another curing procedure specified herein for the remaining portion of the curing period. Provide moist curing for those areas receiving liquid chemical sealer, hardener, or epoxy coating..

3.9.1 Requirements for Type III, High-Early-Strength Portland Cement

The curing periods are required to be not less than one-fourth of those specified for portland cement, but in no case less than 72 hours.

3.9.2 Curing Periods

ACI 301 Section 5, except 10 days for retaining walls, pavement or chimneys. Begin curing immediately after placement. Protect concrete from premature drying, excessively hot temperatures, and mechanical injury; and maintain minimal moisture loss at a relatively constant temperature for the period necessary for hydration of the cement and hardening of the concrete. The materials and methods of curing are subject to approval by the Contracting Officer.

3.9.3 Curing Formed Surfaces

Accomplish curing of formed surfaces, including undersurfaces of girders, beams, supported slabs, and other similar surfaces by moist curing with forms in place for full curing period or until forms are removed. If forms are removed before end of curing period, accomplish final curing of formed surfaces by any of the curing methods specified above, as applicable.

3.9.4 Curing Unformed Surfaces

a. Accomplish initial curing of unformed surfaces, such as monolithic slabs, floor topping, and other flat surfaces, by membrane curing.

b. Accomplish final curing of concrete surfaces to receive liquid floor hardener of finish flooring by moisture-retaining cover curing.

3.9.5 Temperature of Concrete During Curing

When temperature of atmosphere is 41 degrees F and below, maintain temperature of concrete at not less than 55 degrees F throughout concrete curing period or 45 degrees F when the curing period is measured by maturity. When necessary, make arrangements before start of concrete placing for heating, covering, insulation, or housing as required to maintain specified temperature and moisture conditions for concrete during curing period.

When the temperature of atmosphere is 80 degrees F and above or during other climatic conditions which cause too rapid drying of concrete, make arrangements before start of concrete placing for installation of wind breaks, of shading, and for fog spraying, wet sprinkling, or moisture-retaining covering of light color as required to protect concrete during curing period.

Changes in temperature of concrete must be uniform and not exceed 5 degrees F in any one hour nor 49 degrees F in any 24-hour period.

3.9.6 Protection from Mechanical Injury

During curing period, protect concrete from damaging mechanical disturbances, particularly load stresses, heavy shock, and excessive vibration and from damage caused by rain or running water.

3.9.7 Protection After Curing

Protect finished concrete surfaces from damage by construction operations.

3.10 FIELD QUALITY CONTROL

3.10.1 Aggregate Testing

3.10.1.1 Fine Aggregate

At least once during each shift when the concrete plant is operating, there shall be one sieve analysis and fineness modulus determination in accordance with ASTM C136/C136M and COE CRD-C 104 for the fine aggregate or for each fine aggregate if it is batched in more than one size or classification. The location at which samples are taken may be selected by the Contractor as the most advantageous for control. However, the Contractor is responsible for delivering fine aggregate to the mixer within specification limits. When the amount passing on any sieve is outside the specification limits, the fine aggregate shall be immediately resampled and retested. If there is another failure on any sieve, the fact shall be immediately reported to the Contracting Officer, concreting shall be stopped, and immediate steps taken to correct the grading.

3.10.1.2 Coarse Aggregate

At least once during each shift in which the concrete plant is operating, there shall be a sieve analysis in accordance with ASTM C136/C136M for each size of coarse aggregate. The location at which samples are taken may be selected by the Contractor as the most advantageous for production control. However, the Contractor shall be responsible for delivering the aggregate to the mixer within specification limits. A test record of samples of aggregate taken at the same locations shall show the results of the current test as well as the average results of the five most recent tests including the current test. The Contractor may adopt limits for control coarser than the specification limits for samples taken other than as delivered to the mixer to allow for degradation during handling. When the amount passing any sieve is outside the specification limits, the coarse aggregate shall be immediately resampled and retested. If the second sample fails on any sieve, that fact shall be reported to the Contracting Officer. Where two consecutive averages of 5 tests are outside specification limits, the operation shall be considered out of control and reported to the Contracting Officer. Concreting shall be stopped and immediate steps shall be taken to correct the grading.

3.10.2 Concrete Sampling

ASTM C172/C172M. Collect samples of fresh concrete to perform tests specified. ASTM C31/C31M for making test specimens.

3.10.3 Concrete Testing

3.10.3.1 Slump Tests

ASTM C143/C143M. Take concrete samples during concrete placement/discharge. The maximum slump may be increased as specified with the addition of an approved admixture provided that the water-cementitious material ratio is not exceeded. Perform tests at commencement of concrete placement, when test cylinders are made.

3.10.3.2 Temperature Tests

Test the concrete delivered and the concrete in the forms. Perform tests in hot or cold weather conditions (below 50 degrees F and above 80 degrees

F) for each batch (minimum) or every 20 cubic yards (maximum) of concrete, until the specified temperature is obtained, and whenever test cylinders and slump tests are made.

3.10.3.3 Compressive Strength Tests

ASTM C39/C39M. Make eight 6 inch by 12 inch or 12 4 inch by 8 inch test cylinders for each set of tests in accordance with ASTM C31/C31M, ASTM C172/C172M and applicable requirements of ACI 305R and ACI 306R. Take precautions to prevent evaporation and loss of water from the specimen. Test two 6 inch by 12 inch or three 4 inch by 8 inch cylinders at 7 days, two 6 inch by 12 inch or three 4 inch by 8 inch cylinders at 28 days, and hold two 6 inch by 12 inch or three 4 inch by 8 inch cylinders in reserve. Take samples for strength tests for each concrete mixture placed each day not less than once a day, nor less than once for each 150 cubic yards of concrete, nor less than once for each 5000 square feet of surface area for slabs or walls. For the entire project, take no less than five sets of samples and perform strength tests for each mix design of concrete placed. Each strength test result must be the average of two 6 inch by 12 inch or three 4 inch by 8 inch cylinders from the same concrete sample tested at 28 days . Concrete compressive tests must meet the requirements of this section, the Contract Document, and ACI 301.

3.10.3.4 Air Content

ASTM C173/C173M or ASTM C231/C231M for normal weight concrete . Test air-entrained concrete for air content at the same frequency as specified for slump tests.

3.10.3.5 Unit Weight of Structural Concrete

ASTM C567/C567M and ASTM C138/C138M. Determine unit weight of lightweight and normal weight concrete. Perform test for every 20 cubic yards maximum.

3.10.3.6 Chloride Ion Concentration

Chloride ion concentration must meet the requirements of the paragraph titled CORROSION AND CHLORIDE CONTENT. Determine water soluble ion concentration in accordance with ASTM C1218/C1218M. Perform test once for each mix design.

3.10.3.7 Strength of Concrete Structure

The strength of the concrete structure will be considered to be deficient if any of the following conditions are identified:

a. Failure to meet compressive strength tests as evaluated.

b. Reinforcement not conforming to requirements specified.

c. Concrete which differs from required dimensions or location in such a manner as to reduce strength.

d. Concrete curing and protection of concrete against extremes of temperature during curing, not conforming to requirements specified.

e. Concrete subjected to damaging mechanical disturbances, particularly load stresses, heavy shock, and excessive vibration.

f. Poor workmanship likely to result in deficient strength.

Where the strength of the concrete structure is considered deficient submit a mitigation or remediation plan for review and approval by the contracting officer.

3.10.3.8 Non-Conforming Materials

Factors that indicate that there are non-conforming materials include (but not limited to) excessive compressive strength, inadequate compressive strength, excessive slump, excessive voids and honeycombing, concrete delivery records that indicate excessive time between mixing and placement, or excessive water was added to the mixture during delivery and placement. Any of these indicators alone are sufficient reason for the Contracting Officer to request additional sampling and testing.

Investigations into non-conforming materials must be conducted at the Contractor's expense. The Contractor must be responsible for the investigation and must make written recommendations to adequately mitigate or remediate the non-conforming material. The Contracting Officer may accept, accept with reduced payment, require mitigation, or require removal and replacement of non-conforming material at no additional cost to the Government.

3.10.3.9 Testing Concrete Structure for Strength

When there is evidence that strength of concrete structure in place does not meet specification requirements or there are non-conforming materials, make cores drilled from hardened concrete for compressive strength determination in accordance with ASTM C42/C42M, and as follows:

a. Take at least three representative cores from each member or area of concrete-in-place that is considered potentially deficient. Location of cores will be determined by the Contracting Officer.

b. Test cores after moisture conditioning in accordance with ASTM C42/C42M if concrete they represent is more than superficially wet under service.

c. Air dry cores, (60 to 80 degrees F with relative humidity less than 60 percent) for 7 days before test and test dry if concrete they represent is dry under service conditions.

d. Strength of cores from each member or area are considered satisfactory if their average compressive strength is equal to or greater than 85 percent of the design compressive strength, and if no single core strength is less than 75 percent of the design compressive strength. Additional testing of cores extracted from locations represented by erratic core strength results will be permitted only when approved by the Contracting Officer.

Fill core holes solid with patching mortar and finished to match adjacent concrete surfaces.

Correct concrete work that is found inadequate by core tests in a manner approved by the Contracting Officer.

3.11 REPAIR, REHABILITATION AND REMOVAL

Before the Contracting Officer accepts the structure the Contractor must inspect the structure for cracks, damage and substandard concrete placements that may adversely affect the service life of the structure. A report documenting these defects must be prepared which includes recommendations for repair, removal or remediation must be submitted to the Contracting Officer for approval before any corrective work is accomplished.

3.11.1 Crack Repair

Prior to final acceptance, all cracks in excess of 0.02 inches wide must be documented and repaired. The proposed method and materials to repair the cracks must be submitted to the Contracting Officer for approval. The proposal must address the amount of movement expected in the crack due to temperature changes and loading.

3.11.2 Repair of Weak Surfaces

Weak surfaces are defined as mortar-rich, rain-damaged, uncured, or containing exposed voids or deleterious materials. Concrete surfaces with weak surfaces less than 1/4 inch thick must be diamond ground to remove the weak surface. Surfaces containing weak surfaces greater than 1/4 inch thick must be removed and replaced or mitigated in a manner acceptable to the Contracting Officer.

3.11.3 Failure of Quality Assurance Test Results

Proposed mitigation efforts by the Contractor must be approved by the Contracting Officer prior to proceeding.

-- End of Section --

SECTION 05 12 00

STRUCTURAL STEEL
08/18, CHG 2: 05/21

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

AISC 303	(2016) Code of Standard Practice for Steel Buildings and Bridges
AISC 325	(2017) Steel Construction Manual
AISC 326	(2009) Detailing for Steel Construction
AISC 360	(2016) Specification for Structural Steel Buildings

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME B46.1	(2020) Surface Texture, Surface Roughness, Waviness and Lay

AMERICAN WELDING SOCIETY (AWS)

AWS A2.4	(2012) Standard Symbols for Welding, Brazing and Nondestructive Examination
AWS D1.1/D1.1M	(2020; Errata 1 2021) Structural Welding Code - Steel
AWS QC1	(2016) Specification for AWS Certification of Welding Inspectors

ASTM INTERNATIONAL (ASTM)

ASTM A6/A6M	(2024) Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling
ASTM A36/A36M	(2019) Standard Specification for Carbon Structural Steel
ASTM A123/A123M	(2017) Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A307	(2023) Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength

ASTM A563	(2021; E 2022a) Standard Specification for Carbon and Alloy Steel Nuts
ASTM A780/A780M	(2020) Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
ASTM A992/A992M	(2022) Standard Specification for Structural Steel Shapes
ASTM B695	(2021) Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel
ASTM F844	(2019) Standard Specification for Washers, Steel, Plain (Flat), Unhardened for General Use
ASTM F1136/F1136M	(2011) Standard Specification for Zinc/Aluminum Corrosion Protective Coatings for Fasteners
ASTM F1554	(2020) Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength
ASTM F2329/F2329M	(2015; R 2023) Standard Specification for Zinc Coating, Hot-Dip, Requirements for Application to Carbon and Alloy Steel Bolts, Screws, Washers, Nuts, and Special Threaded Fasteners
ASTM F2833	(2011; R 2017) Standard Specification for Corrosion Protective Fastener Coatings with Zinc Rich Base Coat and Aluminum Organic/Inorganic Type

U.S. DEPARTMENT OF DEFENSE (DOD)

UFC 3-301-01	(2023; with Change 1, 2023) Structural Engineering

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

29 CFR Part 1926, Subpart R	Steel Erection

1.2 SUBMITTALS

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Erection and Erection Bracing Drawings; G

SD-02 Shop Drawings

Fabrication Drawings Including Details of Connections; G

SD-03 Product Data

Welding Electrodes and Rods

SD-07 Certificates

Steel

Bolts, Nuts, and Washers

Galvanizing

Welding Procedures and Qualifications

Welding Electrodes and Rods

Certified Welding Inspector

Welding Procedure Specifications (WPS)

1.3 QUALITY ASSURANCE

1.3.1 Preconstruction Submittals

1.3.1.1 Erection and Erection Bracing Drawings

Submit for record purposes. Indicate the sequence of erection, temporary shoring and bracing. The erection drawings must conform to AISC 303. Erection drawings must be reviewed, stamped and sealed by a registered professional engineer.

1.3.2 Fabrication Drawing Requirements

Submit fabrication drawings for approval prior to fabrication. Prepare in accordance with AISC 303, AISC 326 and AISC 325. Fabrication drawings must not be reproductions of contract drawings. Include complete information for the fabrication and erection of the structure's components, including the location, type, and size of bolts, welds, member sizes and lengths, connection details, blocks, copes, and cuts. Use AWS A2.4 standard welding symbols. Clearly highlight any deviations from the details shown on the contract drawings highlighted on the fabrication drawings. Explain the reasons for any deviations from the contract drawings.

1.3.3 Certifications

1.3.3.1 Welding Procedures and Qualifications

Prior to welding, submit certification for each welder stating the type of welding and positions qualified for, the code and procedure qualified under, date qualified, and the firm and individual certifying the qualification tests. If the qualification date of the welder or welding operator is more than 6 months old, the welding operator's qualification certificate must be accompanied by a current certificate by the welder

attesting to the fact that he has been engaged in welding since the date of certification, with no break in welding service greater than 6 months.

Conform to all requirements specified in AWS D1.1/D1.1M.

PART 2 PRODUCTS

2.1 SYSTEM DESCRIPTION

Provide the structural steel system, including galvanizing, complete and ready for use. Provide structural steel systems including design, materials, installation, workmanship, fabrication, assembly, erection, inspection, quality control, and testing in accordance with AISC 303, AISC 360, and UFC 3-301-01 except as modified in this contract.

2.2 STEEL

2.2.1 Structural Steel

Wide flange and WT shapes, ASTM A992/A992M. Angles, Channels and Plates, ASTM A36/A36M.

2.3 BOLTS, NUTS, AND WASHERS

Submit the certified manufacturer's mill reports which clearly show the applicable ASTM mechanical and chemical requirements together with the actual test results for the supplied fasteners.

2.3.1 Common Grade Bolts

2.3.1.1 Bolts

ASTM A307, Grade A, plain finish hot dipped zinc coating. The bolt heads and the nuts of the supplied fasteners must be marked with the manufacturer's identification mark, the strength grade and type specified by ASTM specifications.

2.3.1.2 Nuts

ASTM A563, Grade A, heavy hex style.

2.3.1.3 Washers

ASTM F844.

2.3.2 Foundation Anchorage

2.3.2.1 Anchor Rods

ASTM F1554 Gr 36, Class 1A.

2.3.2.2 Anchor Nuts

ASTM A563, Grade A, hex style.

2.3.2.3 Anchor Washers

ASTM F844.

2.3.2.4 Anchor Plate Washers

ASTM A36/A36M.

2.4 STRUCTURAL STEEL ACCESSORIES

2.4.1 Welding Electrodes and Rods

AWS D1.1/D1.1M. Submit product data for welding electrodes and rods.

2.5 GALVANIZING

ASTM F2329/F2329M, ASTM F1136/F1136M, ASTM F2833 or ASTM B695 for threaded parts or ASTM A123/A123M for structural steel members, as applicable, unless specified otherwise galvanize after fabrication where practicable.

2.6 FABRICATION

Fabrication must be in accordance with the applicable provisions of AISC 325. Fabrication and assembly must be done in the shop to the greatest extent possible. Punch, subpunch and ream, or drill bolt holes perpendicular to the surface of the member.

Compression joints depending on contact bearing must have a surface roughness not in excess of 500 micro inch as determined by ASME B46.1, and ends must be square within the tolerances for milled ends specified in ASTM A6/A6M.

Splices not indicated require the approval of the Contracting Officer.

2.6.1 Markings

Prior to erection, identify members by a painted erection mark. Connecting parts assembled in the shop for reaming holes in field connections must be match marked with scratch and notch marks. Do not locate erection markings on areas to be welded. Do not locate match markings in areas that will decrease member strength or cause stress concentrations.

PART 3 EXECUTION

3.1 ERECTION

a. Erection of structural steel, except as indicated in item b. below, must be in accordance with the applicable provisions of AISC 325, AISC 303 and 29 CFR Part 1926, Subpart R.

After final positioning of steel members, provide full bearing under base plates and bearing plates using nonshrink grout. Place nonshrink grout in accordance with the manufacturer's instructions.

3.1.1 STORAGE

Store the material out of contact with the ground in such manner and location as to minimize deterioration.

3.2 CONNECTIONS

Except as modified in this section, design connections indicated in

accordance with AISC 360. Build connections into existing work. Do not tighten anchor bolts set in concrete with impact torque wrenches. Holes must not be cut or enlarged by burning. Bolts, nuts, and washers must be clean of dirt and rust, and lubricated immediately prior to installation.

3.2.1 Common Grade Bolts

Tighten ASTM A307 bolts to a "snug tight" fit. "Snug tight" is the tightness that exists when plies in a joint are in firm contact. If firm contact of joint plies cannot be obtained with a few impacts of an impact wrench, or the full effort of a man using a spud wrench, contact the Contracting Officer for further instructions.

3.3 GAS CUTTING

Use of gas-cutting torch in the field for correcting fabrication errors is not permitted on any major member in the structural framing. Use of a gas cutting torch will be permitted on minor members not under stress only after approval has been obtained from the Contracting Officer.

3.4 WELDING

Welding must be in accordance with AWS D1.1/D1.1M. Provide AWS D1.1/D1.1M qualified welders, welding operators, and tackers.

Develop and submit the Welding Procedure Specifications (WPS) for all welding, including welding done using prequalified procedures. Submit for approval all WPS, whether prequalified or qualified by testing.

3.5 GALVANIZING REPAIR

Repair damage to galvanized coatings using ASTM A780/A780M zinc rich paint for galvanizing damaged by handling, transporting, cutting, welding, or bolting. Do not heat surfaces to which repair paint has been applied.

3.6 FIELD QUALITY CONTROL

Perform field tests, and provide labor, equipment, and incidentals required for testing. Notify the Contracting Officer in writing of defective welds, bolts, nuts, and washers within 7 working days of the date of the inspection.

3.6.1 Welds

3.6.1.1 Visual Inspection

AWS D1.1/D1.1M. Furnish the services of AWS-certified welding inspectors for fabrication and erection inspection and testing and verification inspections. A Certified Welding Inspector must perform visual inspection on 100 percent of all welds. Document this inspection in the Visual Weld Inspection Log. Submit certificates indicating that certified welding inspectors meet the requirements of AWS QC1.

Inspect proper preparation, size, gaging location, and acceptability of all welds; identification marking; operation and current characteristics of welding sets in use.

-- End of Section --

SECTION 05 51 33

METAL LADDERS
02/16, CHG 2: 02/18

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN LADDER INSTITUTE (ALI)

ALI A14.3	(2008; R 2018) Ladders - Fixed - Safety Requirements

AMERICAN SOCIETY OF SAFETY PROFESSIONALS (ASSP)

ASSP Z359.16	(2016) Safety Requirements for Climbing Ladder Fall Arrest Systems

AMERICAN WELDING SOCIETY (AWS)

AWS D1.1/D1.1M	(2020; Errata 1 2021) Structural Welding Code - Steel

ASTM INTERNATIONAL (ASTM)

ASTM A36/A36M	(2019) Standard Specification for Carbon Structural Steel
ASTM A47/A47M	(1999; R 2022; E 2022) Standard Specification for Ferritic Malleable Iron Castings
ASTM A53/A53M	(2024) Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
ASTM A123/A123M	(2017) Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A153/A153M	(2023) Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A500/A500M	(2023) Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
ASTM A653/A653M	(2023) Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

ASTM A780/A780M	(2020) Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
ASTM A924/A924M	(2022a) Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process

SOCIETY FOR PROTECTIVE COATINGS (SSPC)

SSPC SP 3	(2018) Power Tool Cleaning
SSPC SP 6/NACE No.3	(2007) Commercial Blast Cleaning

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

29 CFR 1910.23	(Nov 2016) Ladders
29 CFR 1910.28	(Nov 2016)Duty to Have Fall Protection and Falling Object Protection
29 CFR 1910.29	(Nov 2016) Fall Protection System and Falling Object Protection - Criteria and Practices

1.2 SUBMITTALS

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are for information only. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Ladders, Installation Drawings

SD-03 Product Data

Ladders

Ladder Safety Devices (Climbing Ladder Fall Arrest Systems)

SD-07 Certificates

Fabricator Certification for Ladder Assembly

Fabricator Certification for Ships Ladder Assembly

1.3 CERTIFICATES

Provide fabricator certification for ladder assembly stating that the ladder and associated components have been fabricated according to the requirements of 29 CFR 1910.23.

Provide fabricator certification for ships ladder assembly stating that the ships ladder and associated components have been fabricated according to the requirements of 29 CFR 1910.23.

1.4 QUALIFICATION OF WELDERS

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

1.5 DELIVERY, STORAGE, AND PROTECTION

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

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Structural Carbon Steel

ASTM A36/A36M.

2.1.2 Structural Tubing

ASTM A500/A500M.

2.1.3 Steel Pipe

ASTM A53/A53M, Type E or S, Grade B.

2.1.4 Fittings for Steel Pipe

Standard malleable iron fittings ASTM A47/A47M.

2.2 FABRICATION FINISHES

2.2.1 Galvanizing

Hot-dip galvanize items specified to be zinc-coated, after fabrication where practicable. Galvanizing: ASTM A123/A123M, ASTM A153/A153M, ASTM A653/A653M or ASTM A924/A924M, G90, as applicable.

2.2.2 Galvanize

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

2.2.3 Repair of Zinc-Coated Surfaces

Repair damaged surfaces with galvanizing repair method and paint conforming to ASTM A780/A780M or by application of stick or thick paste material specifically designed for repair of galvanizing, as approved by Contracting Officer. Clean areas to be repaired and remove slag from welds. Heat surfaces to which stick or paste material is applied, with a torch to a temperature sufficient to melt the metallics in stick or paste; spread molten material uniformly over surfaces to be coated and wipe off excess material.

2.2.4 Shop Cleaning and Painting

2.2.4.1 Surface Preparation

Blast clean surfaces in accordance with SSPC SP 6/NACE No.3. Surfaces that will be exposed in spaces above ceiling or in attic spaces, crawl spaces, furred spaces, and chases may be cleaned in accordance with SSPC SP 3 in lieu of being blast cleaned. Wash cleaned surfaces which become contaminated with rust, dirt, oil, grease, or other contaminants with solvents until thoroughly clean.

2.2.4.2 Pretreatment, Priming and Painting

Apply pretreatment, primer, and paint in accordance with manufacturer's printed instructions.

2.3 LADDERS

Fabricate vertical ladders conforming to 29 CFR 1910.23 and Section 5 of ALI A14.3. Ladders shall be capable of supporting their maximum intended load. Use 2 1/2 by 3/8 inch steel flats for stringers and3/4 inch diameter steel rods for rungs. Ladder rungs, step and cleats must be spaced not less than 10 inches and not more than16 inches wide (measured before installation of ladder safety system), spaced no more than 14 inches apart, plug welded or shouldered and headed into stringers. Install ladders so that the maximum perpendicular distance from the centerline of the steps or rungs, or grab bars, or both, to the nearest permanent object in the back of the ladder or to the finished wall surface will not be less than 7 inches, except for the elevator pit ladders, which have a minimum perpendicular distance of 4.5 inches. Provide heavy clip angles riveted or bolted to the stringer and drilled as indicated. Provide intermediate clip angles not over 48 inches on centers. The top rung of the ladder must be level with the top of the access level, parapet or landing served by the ladder except for hatches or wells. Extend the side rails of through or side step ladders 42 inches above the access level. Provide ladder access protective swing gates at the top of access/egress level. The drawings must indicate ladder locations and details of critical dimensions and materials.

2.3.1 Phasing out of Ladder Cages and Wells (29 CFR 1910.28, Nov 2016)

Conform to 29 CFR 1910.28 (Nov 2016).

Each newly installed ladder over 20 feet in length shall only be equipped with a personal fall arrest system or climbing ladder fall arrest system (ladder safety device), cages and wells are prohibited. When a fixed ladder, cage, or well, or any portion of a section thereof, is replaced, a personal fall arrest system or climbing ladder fall arrest system (ladder safety device) is installed in at least that section of the fixed ladder, cage, or well where the replacement is located. On and after November 18, 2036, all fixed ladders shall only be equipped with a personal fall arrest system or a ladder safety device (climbing ladder Fall Arrest System).

2.3.2 Ladder Safety Devices (Climbing Ladder Fall Arrest Systems)

Conform to 29 CFR 1910.29, Section 7 of ALI A14.3 and ASSP Z359.16. Install ladder safety devices on ladders over 20 feet long or more. The ladder safety systems must meet the design requirement of the ladders which they serve. The ladder safety system must be capable of sustaining a

minimum static load of 1,000 pounds. The applied loads transferred to the climbing ladder mounting locations as a result of a fall shall be specified by the manufacturer of the climbing ladder fall arrest system. Each ladder safety system must allow the worker to climb up and down using both hands and does not require the employee continuously, hold, push, or pull any part of the system while climbing. The connection between the carrier or lifeline and the point of attachment to the body harness does not exceed 9 inches. The ladder safety system consists of a rigid or flexible carrier. Mountings for the rigid carries are attached at each end of the carrier, with intermediate mountings spaced as necessary, along the entire length of the carrier. Mountings for flexible carrier are attached at each end of the carrier and cable guides for flexible carriers are installed at least 25 feet apart but not more than40 feet apart along the entire length of the carrier. The design and installation of mountings and cable guides does not reduce the design strength of the ladder.

PART 3 EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS

Install items at locations indicated, according to manufacturer's instructions. Verify all measurements and take all field measurements necessary before fabrication. Provide Exposed fastenings of compatible materials, generally matching in color and finish, and harmonize with the material to which fastenings are applied. Include materials and parts necessary to complete each item, even though such work is not definitely shown or specified. Poor matching of holes for fasteners will be cause for rejection. Conceal fastenings where practicable. Thickness of metal and details of assembly and supports must provide strength and stiffness. Formed joints exposed to the weather to exclude water. Items listed below require additional procedures.

3.2 WORKMANSHIP

Metalwork must be well formed to shape and size, with sharp lines and angles and true curves. Drilling and punching must produce clean true lines and surfaces. Continuously weld along the entire area of contact. Do not tack weld exposed connections of work in place. Grid smooth exposed welds. Provide smooth finish on exposed surfaces of work in place, unless otherwise approved. Where tight fits are required, mill joints. Cope or miter corner joints, well formed, and in true alignment. Install in accordance with manufacturer's installation instructions and approved drawings, cuts, and details.

3.3 ANCHORAGE, FASTENINGS, AND CONNECTIONS

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

3.4 WELDING

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

3.5 FINISHES

3.5.1 Field Preparation

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

3.5.2 Environmental Conditions

Do not clean or paint surface when damp or exposed to foggy or rainy weather, when metallic surface temperature is less than 5 degrees F above the dew point of the surrounding air, or when surface temperature is below 45 degrees F or over 95 degrees F, unless approved by the Contracting Officer.

3.6 LADDERS

Secure to the adjacent construction with the clip angles attached to the stringer. Install intermediate clip angles not over 48 inches on center. Install brackets as required for securing of ladders welded or bolted to structural steel or built into the masonry or concrete. Ends of ladders must not rest upon floor.

-- End of Section --

SECTION 06 10 00

ROUGH CARPENTRY
08/16, CHG 2: 11/18

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN LUMBER STANDARDS COMMITTEE (ALSC)

ALSC PS 20	(2015) American Softwood Lumber Standard

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME B18.2.1	(2012; Errata 2013) Square and Hex Bolts and Screws (Inch Series)
ASME B18.2.2	(2022) Nuts for General Applications: Machine Screw Nuts, and Hex, Square, Hex Flange, and Coupling Nuts (Inch Series)
ASME B18.5.2.1M	(2006; R 2011) Metric Round Head Short Square Neck Bolts
ASME B18.5.2.2M	(1982; R 2010) Metric Round Head Square Neck Bolts

AMERICAN WOOD COUNCIL (AWC)

AWC NDS	(2015) National Design Specification (NDS) for Wood Construction
AWC WFCM	(2012) Wood Frame Construction Manual for One- and Two-Family Dwellings

AMERICAN WOOD PROTECTION ASSOCIATION (AWPA)

AWPA M2	(2019) Standard for the Inspection of Preservative Treated Wood Products for Industrial Use
AWPA M6	(2013) Brands Used on Preservative Treated Materials

APA - THE ENGINEERED WOOD ASSOCIATION (APA)

APA E445	(2002) Performance Standards and Qualification Policy for Structural-Use Panels (APA PRP-108)
APA F405	(19) Product Guide: Performance Rated Panels

APA L870	(2010) Voluntary Product Standard, PS 1-09, Structural Plywood
APA S350	(2014) PS 2-10, Performance Standard for Wood-Based Structural-Use Panels

ASTM INTERNATIONAL (ASTM)

ASTM A153/A153M	(2023) Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A307	(2023) Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength

INTERNATIONAL CODE COUNCIL (ICC)

ICC IBC	(2024) International Building Code

1.2 SUBMITTALS

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Structural-use and OSB Panels

Oriented Strand Board

SD-06 Test Reports

Preservative-treated Lumber and Plywood

SD-07 Certificates

Certificates of Grade

Preservative Treatment

1.3 DELIVERY AND STORAGE

Deliver materials to the site in an undamaged condition. Store, protect, handle, and install prefabricated structural elements in accordance with manufacturer's instructions and as specified. Store materials off the ground to provide proper ventilation, with drainage to avoid standing water, and protection against ground moisture and dampness. Store materials with a moisture barrier at both the ground level and as a cover forming a well ventilated enclosure. Adhere to requirements for stacking, lifting, bracing, cutting, notching, and special fastening requirements. Do not use materials that have visible moisture or biological growth. Remove defective and damaged materials and provide new materials. Store separated reusable wood waste convenient to cutting station and area of work.

1.4 GRADING AND MARKING

1.4.1 Lumber

Mark each piece of framing and board lumber or each bundle of small pieces of lumber with the grade mark of a recognized association or independent inspection agency. Such association or agency must be certified by the Board of Review, American Lumber Standards Committee, to grade the species used. Surfaces that are to be exposed to view must not bear grademarks, stamps, or any type of identifying mark. Hammer marking will be permitted on timbers when all surfaces will be exposed to view.

1.4.2 Plywood

Mark each sheet with the mark of a recognized association or independent inspection agency that maintains continuing control over the quality of the plywood. The mark must identify the plywood by species group or span rating, exposure durability classification, grade, and compliance with APA L870. Surfaces that are to be exposed to view must not bear grademarks or other types of identifying marks.

1.4.3 Structural-Use and OSB Panels

Mark each panel with the mark of a recognized association or independent inspection agency that maintains continuing control over the quality of the panel. The mark must indicate end use, span rating, and exposure durability classification. Oriented Strand Board (OSB), APA F405.

1.4.4 Preservative-Treated Lumber and Plywood

The Contractor is responsible for the quality of treated wood products. Each treated piece must be inspected in accordance with AWPA M2 and permanently marked or branded, by the producer, in accordance with AWPA M6. The Contractor must provide Contracting Officer's Representative (COR) with the inspection report of an approved independent inspection agency that offered products comply with applicable AWPA Standards. The appropriate Quality Mark on each piece will be accepted, in lieu of inspection reports, as evidence of compliance with applicable AWPA treatment standards.

1.5 SIZES AND SURFACING

ALSC PS 20 for dressed sizes of yard and structural lumber. Lumber must be surfaced four sides. Size references, unless otherwise specified, are nominal sizes, and actual sizes must be within manufacturing tolerances allowed by the standard under which the product is produced. Other measurements are IP or SI standard.

1.6 MOISTURE CONTENT

Air-dry or kiln-dry lumber. Kiln-dry treated lumber after treatment. Maximum moisture content of wood products must be as follows at the time of delivery to the job site:

a. Framing lumber and board, 19 percent maximum

b. Timbers 5 inches and thicker, 25 percent maximum

c. Materials other than lumber; moisture content must be in accordance with standard under which the product is produced

1.7 PRESERVATIVE TREATMENT

a. 0.25 pcf intended for above ground use.

b. 0.40 pcf intended for ground contact and fresh water use. 0.60 pcf intended for Ammoniacal Copper Quaternary Compound (ACQ)-treated foundations. 0.80 to 1.00 pcf intended for ACQ-treated pilings. All wood must be air or kiln dried after treatment. Specific treatments must be verified by the report of an approved independent inspection agency, or the AWPA Quality Mark on each piece. All lumber and woodwork must be preservative treated, except woodwork used temporarily as concrete formwork.

1.8 CERTIFICATIONS

1.8.1 Certified Wood Grades

Provide certificates of grade from the grading agency on graded but unmarked lumber or plywood attesting that materials meet the grade requirements specified herein.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Virgin Lumber

Lumber fabricated from old growth timber is not permitted. Avoid companies who buy, sell, or use old growth timber in their operations, when possible.

2.2 LUMBER

2.2.1 Structural Lumber

Provide No. 2 grade Southern Yellow Pine unless otherwise noted. For concrete formwork, Any of the species and grades listed in AWC NDS that are approved by the contractor's formwork designer may be used. Lumber to be used for spillbox stop logs must be standard or No. 2 grade Southern Yellow Pine, rated for ground contact.

2.3 PLYWOOD, STRUCTURAL-USE, AND ORIENTED STRAND BOARD (OSB) PANELS

APA L870, APA S350, APA E445, and APA F405 respectively.

2.3.1 Other Uses

2.3.1.1 Plywood

Plywood for concrete formwork. Material as required by contractor's formwork designer. Provide minimum C-D Grade, Exposure 1.

2.3.1.2 Structural-Use and OSB Panels

Structural-use and OSB panels for concrete formwork. Material as required by contractor's formwork designer. Sheathing grade with durability

equivalent to Exposure 1.

2.4 ROUGH HARDWARE

Unless otherwise indicated or specified, rough hardware must be of the type and size necessary for the project requirements. Sizes, types, and spacing of fastenings of manufactured building materials must be as recommended by the product manufacturer unless otherwise indicated or specified. Rough hardware permanently exposed to the weather or embedded in or in contact with preservative treated wood, exterior masonry, or concrete walls or slabs must be hot-dip zinc-coated in accordance with ASTM A153/A153M.

2.4.1 Bolts, Nuts, Studs, and Rivets

ASME B18.2.1, ASME B18.5.2.1M, ASME B18.5.2.2M and ASME B18.2.2.

2.4.2 Anchor Bolts

ASTM A307, size as indicated, complete with nuts and washers.

2.4.3 Lag Screws and Lag Bolts

ASME B18.2.1.

2.4.4 Clip Angles

Steel, 3/16 inch thick, size best suited for intended use; or zinc-coated steel or iron commercial clips designed for connecting wood members.

2.4.5 Joist Hangers

Steel or iron, zinc coated, sized to fit the supported member, of sufficient strength to develop the full strength of the supported member in accordance with ICC IBC, and furnished complete with any special nails required.

PART 3 EXECUTION

3.1 INSTALLATION

Do not install building construction materials that show visual evidence of biological growth.

Conform to AWC WFCM unless otherwise indicated or specified.

3.1.1 Beams and Girders

Set beams and girders level and in alignment and anchor to bearing walls, piers, or supports with U-shaped steel strap anchors. Embed anchors in concrete or masonry at each bearing and through-bolt to the beams or girders with not less than two bolts. Provide bolts not less than 1/2 inch in diameter and with plate washers under heads and nuts. Install beams and girders not indicated otherwise with 8 inch minimum end bearing on walls or supports. Provide joints and splices over bearings only and bolt or spike together.

3.1.2 Joists

Provide joists of the sizes and spacing indicated, accurately and in alignment, and of uniform width. Joists must have full bearing on sills, beams; provide laps over bearing only and spike. Where joists are of insufficient length to produce a 12 inch lap, butt joists over bearing and provide wood scabs 2 nominal inches thick by depth of joists by 24 inches long or metal straps 1/4 by 1 1/2 inch by not less than 18 inches long nailed to each joist with not less than four 10-penny nails, or approved sheet metal connectors installed in accordance with the manufacturer's recommendations. Provide metal hangers for joists framing into the side of beams. The minimum joist end bearing must be 4 inches. Provide steel joist hangers of proper size and type to receive the ends of all framed joists.

3.1.2.1 Floor (Ceiling) Framing

Except where otherwise indicated joists must have bearings not less than 4 inches on concrete or masonry and 1-1/2 inches on wood or metal. Joists, trimmers, headers, and beams framing into carrying members at the same relative levels must be carried on joist hangers. Joists must be lapped and spiked together at bearings or butted end-to-end with scab ties at joint and spiked to plates. Openings in floors must be framed with headers and trimmers. Headers carrying more than two tail joists and trimmers supporting headers carrying more than one tail joist must be doubled, unless otherwise indicated.

3.2 WASTE MANAGEMENT OF WOOD PRODUCTS

In accordance with the Waste Management Plan and as specified. Separate and reuse scrap sheet materials larger than2 square feet, framing members larger than16 inches, and multiple offcuts of any size larger than12 inches. Clearly separate damaged wood and other scrap lumber for acceptable alternative uses on site, including bracing, blocking, cripples, ties, and shims.

Separate treated, stained, painted, and contaminated wood and place in designated area for hazardous materials. Dispose of according to local regulations. Do not leave any wood, shavings, sawdust, or other wood waste buried in fill or on the ground, unless for planned future use. Prevent sawdust and wood shavings from entering the storm drainage system. Compost sawdust. Do not burn scrap lumber that has been pressure treated, or lumber that is less than one year old.

-- End of Section --

SECTION 31 00 00

EARTHWORK
08/23

PART 1 GENERAL

1.1 REFERENCES

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

ASTM INTERNATIONAL (ASTM)

ASTM D4832/D4832M	(2023) Standard Test Method for Preparation and Testing of Controlled Low Strength Material (CLSM) Test Cylinders
ASTM D6913/D6913M	(2017) Standard Test Methods for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis
ASTM D6938	(2017a) Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

ASTM INTERNATIONAL (ASTM)

ASTM C33/C33M	(2023) Standard Specification for Concrete Aggregates
ASTM C150/C150M	(2022) Standard Specification for Portland Cement
ASTM C260/C260M	(2010a; R 2016) Standard Specification for Air-Entraining Admixtures for Concrete
ASTM C618	(2023; E 2023) Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
ASTM C989/C989M	(2024) Standard Specification for Slag Cement for Use in Concrete and Mortars
ASTM D698	(2012; E 2014; E 2015) Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/cu. ft. (600 kN-m/cu. m.))
ASTM D1556/D1556M	(2015; E 2016) Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method
ASTM D2216	(2019) Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

ASTM D2321	(2020) Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
ASTM D2487	(2017; E 2020) Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D4318	(2017; E 2018) Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D4832	(2016; E 2018) Standard Test Method for Preparation and Testing of Controlled Low Strength Material (CLSM) Test Cylinders
ASTM D6023	(2016) Standard Test Method for Density (Unit Weight), Yield, Cement Content, and Air Content (Gravimetric) of Controlled Low-Strength Material (CLSM)
ASTM D6103/D6103M	(2017; E 2021) Standard Test Method for Flow Consistency of Controlled Low Strength Material (CLSM)
ASTM D6938	(2017a) Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
ASTM D8167/D8167M	(2023) Standard Test Method for In-Place Bulk Density of Soil and Soil-Aggregate by a Low-Activity Nuclear Method (Shallow Depth)

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2024) Safety -- Safety and Occupational Health (SOH) Requirements

1.2 DEFINITIONS

1.2.1 Structural Fill

Soil material placed to support buildings, walls, pads, and other similar facilities.

1.2.2 Embankment Fill

Soil material placed to construct embankment.

1.2.3 Utility Bedding Material

Fill placed to directly support pipes and appurtenant structures.

1.2.4 Flowable Fill

Fill placed in a plastic or liquid form that flows to near its final placement location with limited assistance and subsequently cures or solidifies to provide a stable or impermeable barrier.

1.2.5 Satisfactory Materials

Satisfactory materials for structural fill, backfill, and/or any in-situ soils to remain in place comprise any materials classified by ASTM D2487 as SM, SC-SM, or SC with 20 to 50 percent fines passing the #200 seive. Maximum particle size to be no greater than 3 inches.

1.2.6 Unsatisfactory Materials

Materials which do not comply with the requirements for satisfactory materials are unsatisfactory. Unsatisfactory materials also include man-made fills (unless excavated, sorted/separated/stockpiled, and tested0; trash; refuse; roots and other organic matter or frozen material. Notify the Contracting Officer when encountering any contaminated materials.

1.2.7 Unstable Material

Unstable materials are too weak to adequately support the utility pipe, conduit, equipment, or appurtenant structure. Satisfactory material may become unstable due to ineffective drainage, dewatering, becoming frozen, excessive loading.

1.2.8 Degree of Compaction (Proctor)

Degree of compaction required, is expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D698 abbreviated as a percent of laboratory maximum density.

1.2.9 Borrow

Satisfactory materials for construction will be obtained from the onsite borrow sources. Materials obtained from required excavation which meet or which can be processed to meet the requirements for satisfactory material may be utilized in the embankment, structural fill, or as backfill.

1.2.10 Subgrade

Earth materials directly below foundations.

1.3 SUBSURFACE DATA

Subsurface soil boring logs are shown in Attachment 1 to these specifications . These data represent available subsurface information; however, variations may exist between boring locations. Subsurface data at the proposed spillway locations was not collected due to the soft nature of the soils at the time of the investigation.

1.4 CRITERIA FOR BIDDING

Base bids on the following criteria:

a. Surface elevations are as indicated.

b. Pipes or other artificial obstructions, except those indicated, will not be encountered.

c. Ground water elevations indicated by the boring log were those existing at the time subsurface investigations were made and do not necessarily represent ground water elevation at the time of construction.

d. Material character is indicated by the boring logs.

e. Hard materials will not be encountered.

1.5 SUBMITTALS

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

SD-01 Preconstruction Submittals

Borrow Plan; G

Dewatering Work Plan; G

Preconstruction Meeting; G

SD-03 Product Data

Flowable Fill Mix Design; G

SD-06 Test Reports

Pipe Inspection Report; G

Material Test Report; G

1.6 QUALITY CONTROL

1.6.1 Qualified Technician

Provide a Qualified Technician to inspect, monitor, sample, and perform field testing. The technician qualifications need to be one of the following: a current National Institute for Certification in Engineering Technologies (NICET) Level II minimum certification in Construction Materials Testing Soils; a Geologist-in-Training with minimum one-year experience; an Engineer-in-Training with minimum one-year experience; a Registered Geologist; or a Professional Engineer.

1.6.2 Lab Validation

Perform testing by a Corps validated commercial testing laboratory or Contractor established testing laboratory meeting the requirements of Section 01 45 00 QUALITY CONTROL and approved by the Contracting Officer. Submit testing laboratory validation for the testing to be performed. Do not permit work requiring testing until testing facilities have been inspected, Corps validated, and approved by the Contracting Officer.

1.6.3 Preconstruction Meeting

Conduct a preconstruction meeting at the jobsite at least five business days prior to the start of earthwork operations on the project. The preconstruction meeting is to be arranged by the Contractor and is to follow the written agenda submitted prior to the meeting. The purpose of this meeting is to review the requirements of this specification and the associated plans. The following individuals must be in attendance at this meeting: Contractor's Project Manager and Project Superintendent, earthwork subcontractor's Project Manager and Site Foreman, Contractor's Geotechnical Engineer and Testing Agency, Government Geotechnical Engineer and Civil Engineer, and Government Construction Manager and Engineering Technician.

The minutes of this meeting are to be recorded by the Contractor and published via email within 48 hours to all attendees. The minutes must be re-published within 48 hours via email pending any subsequent comments from the attendees.

PART 2 PRODUCTS

2.1 SOIL MATERIALS

2.1.1 Embankment Fill

Materials meeting the definition of Satisfactory Material in Section 1.2.5.

2.1.2 Utility Bedding Material

Except as specified otherwise in the individual piping section, provide bedding for buried piping in accordance with ASTM D2321. Install bedding for plastic piping to spring line of pipe. Utility bedding material may include the following:

2.1.2.1 Class I

Angular, 0.25 to 1.5 inch, graded stone, including a number of fill materials that have regional significance such as coral, slag, cinders, crushed stone, and crushed shells.

2.1.2.2 Class II

Coarse sands and gravels with maximum particle size of 1.5 inch, including various graded sands and gravels containing small percentages of fines, generally granular and noncohesive, either wet or dry. Soil Types GW, GP, SW, and SP are included in this class as specified in ASTM D2487.

2.1.2.3 Sand

Clean, coarse-grained sand classified as SW or SP by ASTM D2487 for bedding and backfill as indicated.

2.1.2.4 Gravel and Crushed Stone

Clean, coarsely graded natural gravel, crushed stone or a combination thereof identified as having a classification of GW or GP in accordance with ASTM D2487 for bedding. Do not exceed maximum particle size of 3 inches.

2.2 FLOWABLE FILL

Design and submit flowable fill mix design to consist of Portland cement, fly ash, and/or slag cement and fine aggregate. Include the dry weights of cementitious material(s); quality and gradation of aggregates in the saturated surface-dry weights along with gradation tests; quantities, types, and names of admixtures; and quantity of water per cubic yard. The unconfined compressive strength to be 50 to 100 psi at 28 days in accordance with ASTM D4832. The aggregates in accordance with ASTM C33/C33M Fine Aggregates. Air-entrain fill in accordance with ASTM C260/C260M. The air content to be between 8 and 15 percent in accordance with ASTM D6023. The flow to be between 8 and 12 inches in accordance with ASTM D6103/D6103M. Portland cement to be Type I or II in accordance with ASTM C150/C150M. Fly ash to be Class C in accordance with ASTM C618. Provide slag cement in Grade 100 or 120 in accordance with ASTM C989/C989M.

2.3 BURIED WARNING AND IDENTIFICATION MARKERS

Provide polyethylene plastic and metallic core or metallic-faced, acid- and alkali-resistant, polyethylene plastic warning tape manufactured specifically for warning and identification of buried utility lines. Provide tape on rolls, 3 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, Oil; Dangerous Materials
Orange	Telephone and Other Communications
Blue	Water Systems
Green	Sewer Systems
White	Steam Systems
Gray	Compressed Air

2.3.1 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.

2.3.2 Detection Wire for Non-Metallic Piping

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

2.4 BORROW

Provide borrow materials from sources located within property meeting the requirements of paragraph EMBANKMENT FILL.

2.5 SPOIL AREA

Permanently dispose of grubbed material and unsatisfactory materials from the excavations by placing in abandoned portions of the borrow areas. Shape the material so that its surface is free from abrupt changes in grade and slope to drain.

2.6 GEOTEXTILES

Provide geotextiles in accordance with Specification Section Section 31 05 22 GEOTEXTILES USED AS FILTERS.

PART 3 EXECUTION

3.1 PROTECTION

Perform all work specified in accordance with applicable requirements of the Corps of Engineers publication EM 385-1-1 Safety and Health Requirements Manual.

Use equipment of type and size appropriate for the site conditions (soil character and moisture content). Maintenance of exposed subgrades and fills is the responsibility of the Contractor. The Contractor is required to prevent damage by ineffective drainage, dewatering, and heavy loads and equipment by implementing precautionary measures. Repair or replace any defects or damage.

3.1.1 Underground Utilities

Location of the existing utilities indicated is approximate. Physically verify the location and elevation of the existing utilities indicated prior to starting construction. The Contractor is responsible for protecting utilities from damage during construction.

3.1.2 Drainage and Dewatering

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

3.1.2.1 Drainage

Do 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. Surface water shall be directed away from excavations and construction sites so as to prevent erosion and undermining of the dikes and associated roadways and slopes.
Diversion ditches, dikes, and grading must be provided and maintained as

necessary during construction. Excavated slopes and backfilled surfaces shall be protected to prevent erosion and sloughing. Dewatering may be required in areas of unsuitable excavation to achieve stable slopes. Excavation must be performed so that the site and the area immediately surrounding the site and affecting operations at the site must be continually and effectively drained. These drainage requirements apply to both the borrow site area and the dike areas under construction.

3.1.3 Protection of Graded Surfaces

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

3.2 BORROW

3.2.1 Government Furnished Borrow Area(s)

Submit a borrow plan to include detailed descriptions of proposed excavation and processing of borrow material to generate satisfactory material. Excavate borrow areas to the extent necessary to obtain satisfactory material within the lines as shown on the drawings. The permissible depth(s) in the borrow areas is 20 feet. No excavation within 20 feet of the interior toe of the new dike is permitted. A maximum slope of 1.5H:1V is allowed to the permissible depth. Backfill any excavation below the depths and slopes specified herein or shown on the drawings, at the Contractor's expense, to the specified permissible excavation line, with satisfactory material(s) as specified by the Contracting Officer to a density of at least that of the surrounding material. Drain borrow areas and keep dry during excavation. Temporary excavation slopes must not be steeper than the specified finished slope or the specified construction slope, as applicable, and subject to the approval of the Contracting Officer. This may be accomplished by benching the temporary slope so that the average slope is not steeper than the specified slope.

3.2.1.1 Stockpiling Operations in Borrow Area

Stockpile materials within the borrow area work limits such that the stockpiles do not interfere with borrow operations. Maintain a minimum of 30 feet between all stockpile toes and the top of the borrow cut.

3.2.1.2 Drainage of Borrow Excavations

Provide adequate drainage of borrow area. Ensure that borrow operations result in minimum detrimental effects on natural environmental conditions.

3.3 SURFACE PREPARATION

3.3.1 Clearing and Grubbing

Remove stumps, logs, shrubs, brush and vegetation and other items that would interfere with construction operations. Remove stumps entirely. Grub out matted roots and roots over 3 inches in diameter to at least 18 inches below existing surface. All trees over 6 inches in diameter at breast height are to remain. Dispose of grubbed material per subparagraph 2.5 SPOIL AREA.

3.3.2 Stockpiling Operations

Place and grade stockpiles of satisfactory material within the dredge placement area at least 30 feet from the interior toe of the dike. Stockpiling material over 5 feet in height along the crest of the dike is prohibited. Keep stockpiles in a neat and well drained condition, giving due consideration to drainage at all times. Clear, grub, and seal by rubber-tired equipment, the ground surface at stockpile locations; separately stockpile excavated satisfactory and unsatisfactory materials. Protect stockpiles of satisfactory materials from contamination which may destroy the quality and fitness of the stockpiled material. Do not create stockpiles that could obstruct the flow of any stream, endanger a partly finished structure, impair the efficiency or appearance of any structure, or be detrimental to the completed work in any way. If the Contractor fails to protect the stockpiles, and any material becomes unsatisfactory, remove and replace such material with satisfactory material from approved sources.

3.4 EXCAVATION

Excavate to contours, elevation, and dimensions indicated. Excavate soil disturbed or weakened by Contractor's operations, and soils softened or made unstable for subsequent construction due to exposure to weather. Do not excavate below indicated depths except to remove unstable material as determined by the Government and confirmed by the Contracting Officer. Remove and replace excavations below the grades shown with appropriate materials as directed by the Contracting Officer.

3.4.1 Trench Excavation Requirements

Excavate the trench as recommended by the manufacturer of the pipe to be installed. Slope trench walls below the top of the pipe, or make vertical, and of such width as recommended by the manufacturer. Provide vertical trench walls where no manufacturer installation instructions are available. Do not exceed the trench width of 24 inches below the top pipe plus pipe outside diameter (O.D.) for pipes of less than 24 inches inside diameter. Where recommended trench widths are exceeded, provide redesign, stronger pipe, or special installation procedures. The Contractor is responsible for the cost of redesign, stronger pipe, or special installation procedures without any additional cost to the Government.

3.4.1.1 Bottom Preparation

Grade the bottoms of trenches accurately to provide uniform bearing and support for the bottom quadrant of each section of the pipe. Excavate bell holes to the necessary size at each joint or coupling to eliminate point bearing. Remove stones of 3 inch or greater in any dimension, or as recommended by the pipe manufacturer, whichever is smaller, to avoid point bearing.

3.4.1.2 Removal of Unstable Material

Where unstable material is encountered in the bottom of the trench, remove such material to the depth directed and replace it to the proper grade with satisfactory material as provided in paragraph FILLING AND COMPACTION. When removal of unstable material is required due to the Contractor's fault or neglect in performing the work, the Contractor is responsible for excavating the resulting material and replacing it without additional cost to the Government.

3.4.2 Structural Excavation

See Specification Section 31 00 01 EXCAVATION, FILLING AND BACKFILLING FOR SPILLBOX STRUCTURES

3.5 SUBGRADE PREPARATION

3.5.1 General Requirements

Shape subgrade to line, grade, and cross section as indicated. Remove unsatisfactory and unstable material in surfaces to receive fill or in excavated areas, and replaced with satisfactory materials. Do not place material on surfaces that are muddy, frozen, contain frost, or otherwise containing unstable material. Scarify the surface to a depth of 4 inches prior to placing fill. Step or bench sloped surfaces steeper than 1 vertical to 4 horizontal prior to scarifying. Place 4 inches of loose fill and blend with scarified material. When subgrade is part fill and part excavation or natural ground, scarify to a depth of 8 inches.

3.5.2 Subgrade for Structures, Spread Footings, and Concrete Slabs

Do not excavate below depth shown for structures. If over excavation occurs, notify the Contracting Officer and remove, replace, and compact as directed.

3.6 FILLING AND COMPACTION

Prepare ground surface on which backfill is to be placed and provide compaction requirements for backfill materials in conformance with the applicable portions of paragraphs for SUBGRADE PREPARATION. Do not place material on surfaces that are muddy, frozen, or contain frost. Finish compaction by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, or other approved equipment well suited to the soil being compacted. Moisten material as necessary to plus or minus 2 percent of optimum moisture. Fill and backfill to contours, elevations, and dimensions indicated. Compact and test each lift before placing overlaying lift.

3.6.1 Trench Backfill

Backfill trenches to the grade shown.

3.6.1.1 Replacement of Unstable Material

Replace unstable material removed from the bottom of the trench or excavation with satisfactory material placed in layers not exceeding 6 inches loose thickness.

3.6.1.2 Bedding and Initial Backfill

Place initial backfill material and compact it with approved tampers to a height of at least one foot above the utility pipe or conduit. Bring up the backfill evenly on both sides of the pipe for the full length of the pipe. Take care to ensure thorough compaction of the fill under the haunches of the pipe. Except where shown or when specified otherwise in the individual piping section, provide bedding for buried piping in accordance with PART 2 paragraph UTILITY BEDDING MATERIAL. Compact backfill to top of pipe to 95 percent of ASTM D698 maximum density.

Provide plastic piping with bedding to spring line of pipe.

3.6.1.3 Final Backfill

Do not begin backfill until construction below finish grade has been approved, underground utilities systems have been inspected, tested and approved, forms removed, and the excavation cleaned of trash and debris. Bring backfill to indicated finish grade. Heavy equipment for spreading and compacting backfill are not to be operated closer to foundation or retaining walls than a distance equal to the height of backfill above the top of footing; compact remaining area in layers not more than 4 inches in compacted thickness with power-driven hand tampers suitable for the material being compacted. Place backfill carefully around pipes to avoid damage to coatings or wrappings. Do not place backfill against foundation walls prior to 7 days after completion of the walls. As far as practicable, bring backfill up evenly on each side of the wall and sloped to drain away from the wall.

Fill the remainder of the trench with satisfactory material. Place backfill material and compact as follows:

3.6.1.3.1 Turfed or Seeded Areas and Miscellaneous Areas

Deposit backfill in layers of a maximum of 12 inches loose thickness, and compact it to 85 percent of ASTM D698 maximum density for cohesive soils and 90 percent of ASTM D698 maximum density for cohesionless soils. Apply this requirement to all other areas not specifically designated above.

3.6.1.4 Displacement of Features

After other required tests have been performed and the trench backfill compacted to the finished grade surface, inspect the pipe to determine whether unexpected or damaging displacement has occurred. Inspect pipes smaller than 48 inches using remote methods using closed circuit television, sonar, or hybrid that can provide a 360-degree inspection of the pipe. Prepare and submit a pipe inspection report consisting of digital video or photos. If, in the judgment of the Contracting Officer, the interior of the pipe shows poor alignment or any other defects that would cause improper functioning of the system, replace or repair the defects as directed at no additional cost to the Government.

3.6.1.5 Buried Tape And Detection Wire

3.6.1.5.1 Buried Warning and Identification Tape

Provide buried utility lines with utility identification tape. Bury tape 12 inches below finished grade.

3.6.1.5.2 Buried Detection Wire

Bury detection wire directly above non-metallic piping at a distance not to exceed 12 inches above the top of pipe. Extend the wire continuously and unbroken, from spillbox to spillbox. Terminate the ends of the wire inside the spillbox at each end of the pipe, with a minimum of 3 feet of wire, coiled, remaining accessible in each spillbox. Furnish insulated wire over its entire length.

3.6.2 Structural Fill Placement

Place fill and backfill beneath and adjacent to structures in successive horizontal layers of loose material not more than 8 inches in depth, or in loose layers not more than 4 inches in depth when using hand-operated compaction equipment. Do not place over wet or frozen materials. Compact to at least 95 percent of ASTM D698 laboratory maximum density. Perform compaction in such a manner as to prevent wedging action or eccentric loading upon or other damage to the structure. Moisture condition fill and backfill material to within range of plus 2 or minus 2 percent of optimum moisture content at the time of compaction.

3.6.3 Flowable Fill

Place fill in a manner to completely fill voids in the location indicated. Flowable fill is also authorized to backfill the spillboxes up to the top of the 0.5 inch plates that surround the bottom of the spillboxes. Do not place when atmospheric temperatures are expected to be below 33 degrees F at any time during the 3 day period following placement. Flowable fill is also authorized to backfill the spillboxes up to the top of the 0.5 inch plates that surround the bottom of the spillboxes.

3.6.4 Compaction

3.6.4.1 General Site

Compact underneath areas designated for vegetation to 90 percent of ASTM D698.

3.6.4.2 Adjacent Areas

Compact areas within 5 feet of structures to 95 percent of ASTM D698.

3.7 EMBANKMENTS

3.7.1 Earth Embankments

Construct earth embankments from satisfactory materials free of organic or frozen material and rocks with any dimension greater than 3 inches. Place the material in successive horizontal layers of loose material not more than 8 inches in depth. Spread each layer uniformly on a soil surface that has been moistened or aerated as necessary and scarified or otherwise broken up so that the fill will bond with the surface on which it is placed. After spreading, plow, disk, or otherwise break up each layer; moisten or aerate as necessary; thoroughly mix; and compact to at least 95 percent laboratory maximum density ASTM D698. Backfill and fill material are to be within the range of minus 3 to plus 3 percent of optimum moisture.

Finish compaction by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment.

3.8 FINISHING/FINISH OPERATIONS

During construction, keep embankments and excavations shaped and drained. Maintain ditches and drains along subgrade to drain effectively at all times. Do not disturb the finished subgrade by traffic or other operation. Protect and maintain the finished subgrade in a satisfactory condition until subbase or base is placed. Do not permit the storage or

stockpiling of materials on finished subgrade. Do not lay subbase or base course pavement until the subgrade has been checked and approved, and in no case place subbase or base on a muddy, spongy, frozen or otherwise unstable subgrade.

Finish the surface of excavations, embankments, and subgrades to a smooth and compact surface in accordance with the lines, grades, and cross sections or elevations shown. Provide the degree of finish for graded areas within 0.1 foot of the grades and elevations indicated except as indicated for subgrades specified in paragraph SUBGRADE PREPARATION. Finish the surface of areas to be turfed to a smoothness suitable for the application of turfing materials. Repair graded, topsoiled, or backfilled areas prior to acceptance of the work, and re-establish grades to the required elevations and slopes.

3.8.1 Grading Around Structures

Construct areas within 5 feet outside of structure line true-to-grade, shape to drain, and maintain free of trash and debris until final inspection has been completed and the work has been accepted.

3.8.2 Grading

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

3.9 DISPOSITION OF SURPLUS MATERIAL

Unsatisfactory material should be returned to the borrow areas and graded to match the surrounding material.

3.10 SURVEYING

The Contractor is responsible for the Before Dike (BD) and After Dike (AD) surveys, including associated drawings and quantity calculations.

a. Surveys made for payment purposes shall meet the requirements for third order surveys or better. Surveys and equipment utilizing global position systems (GPS) shall meet GPS guidelines for third order surveys to cover horizontal and vertical control. The dike surface areas to be covered by new dike material plus a 15 foot extension on all sides are required to be surveyed. The four top corners of the concrete footings and the inverts of the new pipes shall also be surveyed.

b. Contractor-furnished surveying will establish alignments for original cross section surveys, final cross section surveys, and quantity calculations for payment purposes. The Contractor must survey cross sections every 100 feet with a minimum of 6 points from the interior toe of the dike to the exterior edge of placed matererial to accurately reflect existing conditions. Surveying must be accomplished by or under the direct supervision of a qualified Virginia State licensed professional land surveyor or a registered professional engineer.

c. The Contractor must provide the surveying necessary to initially

establish the alignment of the dikes, establish appropriate reference points, maintain established control and reference points, and other surveying necessary to accomplish the job. Provide the horizontal and vertical control necessary to ensure the surveyed areas are accurate to 0.2 foot contour interval. Contours shall be determined and shown for each portion of new work areas. Perform a topographic survey to a scale of 1 inch equals 100 feet and a contour interval of 1 foot for the dike portions that must be raised during this Contract. Elevations shall be referenced to NTDE 83-01 mean lower low water (MLLW). Furnish a copy of the original field notes, computations, and records (including survey
meta-data) to the Contracting Officer within 3 working days of their completion. Unless otherwise allowed in writing, surveys for alignment of the dikes and progress payments must be made in the presence of the Contracting Officer or the Contracting Officer's representative thereof.

d. Upon completion of construction, each cross section for dike embankments must be to the specified alignment and specified final lines and grades. In addition, the Contractor must reset cross section stations using the original alignments and cross section locations. Dike cross section stations for original and final surveys shall be set at 100-foot increments.

e. If Government surveys reveal that sections for which final surveys have been made are not to the specified alignment or the specified lines and grades, the cost of corrective actions must be borne by the Contractor. When the area is found to be in satisfactory condition, it will be finally accepted. Subsequent to completion of work under this contract, provide "as-built" drawings of the constructed earthworks, including contours. See Section 01 78 00 CLOSEOUT SUBMITTALS; SURVEY AND RECORD CONSTRUCTION DRAWINGS for additional information.

3.10.1 Layout and Control

Make the necessary surveys for layout and control of the construction work. Benchmarks (locations defined by the Government) must be used by the Contractor to establish vertical control of the work. If the Contractor elects to establish temporary benchmarks (TBM) through the jobsite, they must be established by a closed loop of levels run from the permanent benchmark. TBM's must be located on fixed objects such as weirs, poles, etc., to ensure reliability throughout the duration of the job. TBM's placed on hubs or pipes within the area to receive fill may be used for layout and checking. Provide the original survey notes for TBM's to the Contracting Officer within 3 days of installation.

3.10.2 Dike Alignment

The horizontal dike alignment controls and details for the proposed new work are shown in the Task Order drawings and files. The Contractor must base his surveys on the information supplied by the Government including the location of the center line and stationing. Conflicts (real or perceived) between the Drawings and actual site conditions must be brought immediately to the attention of the Contracting Officer in writing. The Government will examine the information presented and inform the Contractor of its decision regarding clarification and appropriate resolution in writing. Due to the critical nature of the dike alignment with regard to the volume of material ultimately placed, the dike alignment surveys and markers placed must meet or exceed the standards for

a third order survey. The survey standards shall apply for both the initial and final alignments.

3.11 TESTING

Perform testing as indicated in Table 1. Submit material test report within 24 hours of tests being completed.

Material Type	Test Method	Test Frequency
Subgrade for Structures Fill	Density - ASTM D6938. When ASTM D6938 or ASTM D8167/D8167M is used, check the calibration curves and adjust using only the sand cone method as described in ASTM D1556/D1556M.	One test per 1000 square feet, or fraction thereof, of each lift of fill or backfill areas compacted by other than hand-operated machines. Double testing frequency for areas compacted by hand-operated machines. Perform at last one (1) in-place density test on each 1,000 linear feet of embankment length and a minimum of one set of tests for each acceptance area. Each lift shall be tested separately. If ASTM D6938 or ASTM D8167/D8167M is used, check in-place densities by ASTM D1556/D1556M as follows: One check test per lift and one for every 10 tests. Where ASTM D8167/D8167M is used, provide water content verification in accordance with ASTM D2216 as follows: One check test per lift and one for every 10 tests.
Fill	Moisture Content - ASTM D2216	Sample taken immediately prior to compaction after moisture conditioning.
Fill	Moisture Density Relationship - ASTM D698	One representative test per 3000 cubic yards of fill and backfill, or when any change in material occurs which may affect the optimum moisture content or laboratory maximum density. Sample to be taken from stockpile or location of placement.
Fill	Gradation - ASTM D6913/D6913M	One representative test per 3000 cubic yards of fill and backfill, or when any change in material occurs which may affect the optimum moisture content or laboratory maximum density. Sample to be taken from stockpile or location of placement.

Material Type	Test Method	Test Frequency
Fill	Atterberg Limits - ASTM D4318	One representative test per 3000 cubic yards of fill and backfill, or when any change in material occurs which may affect the optimum moisture content or laboratory maximum density. Sample to be taken from stockpile or location of placement.
Flowable Fill	ASTM D4832/D4832M	One representative test per batch.

-- End of Section --

SECTION 31 00 01

EXCAVATION, FILLING AND BACKFILLING FOR SPILLBOX STRUCTURE

PART 1 GENERAL

1.1 SUMMARY

This specification covers the excavation of the dredge material beneath the proposed spillbox structures as shown on the drawings. The dredge material shall be removed a minimum of 10 feet beyond the edges of the marine mattress on all four sides. It also covers the placement of fill material for permanent access roads to the spillboxes as shown on the drawings.

1.2 REFERENCES

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

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2024) Safety -- Safety and Occupational Health (SOH) Requirements

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

29 CFR 1926.652	Safety and Health Regulations for Construction; Subpart P, Excavations; Requirements for Protective Systems

1.3 DEFINITIONS

See Specification Section 31 00 00 EARTHWORK for material definitions.

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-01 Preconstruction Submittals

Excavation and Placement Plan; G

The Contractor shall submit an excavation and placement plan, meeting all requirements of the US Army Corps EM 385-1-1 and Federal Regulations 29 CFR 1926.652 "Subpart P - Construction Standards for Excavations", 30 days prior to the excavation beneath the proposed spillbox structure. The Plan shall include but not be limited to the Contractor's proposed sequence of construction, the excavation of the dredge material and the placement of required fill material and methods and types of

equipment to be utilized for all construction operations, including sloping, benching or shoring the excavation, transporting, placing and compacting materials. Procedures for accomplishing the control of surface water and dewatering work shall be submitted. The Contractor shall be responsible for the design, installation, maintenance, and performance of all temporary dewatering systems. When sheeting, shoring, and/or trench boxes are employed, the dewatering system shall be compatible with the type of shoring to be used. The Plan shall also include the names and addresses of the geotechnical engineer which will perform the inspection and construction monitoring.

Sheeting and Shoring Installation Plan; G

The Contractor shall submit a sheeting and shoring plan. The Plan shall incorporate the provided sheeting and shoring design in the plans and specifications to support the excavations. The plan shall include, but not be limited to, consideration of the depth of excavation, water level in the disposal area, groundwater level, soil conditions (dredge disposal material)and the safety of the workmen. The Contractor shall submit drawings and calculations, certified by a registered professional engineer, describing the methods for sheeting and shoring the excavation. Drawings shall include material sizes and types, arrangement of members, and the sequence and method of installation and removal. Calculations shall include data and references used. The Plan shall include provisions for daily monitoring any 3-dimensional movement of the surrounding ground surface by the contractors geotechnical engineer. Review by the Contracting Officer or his representative shall not relieve the Contractor of responsibility for the adequacy of his excavation, shoring and dewatering systems used to achieve specified results.

SD-06 Test Reports

Special Inspection Of Excavation; G
Contractor's Geotechnical Engineer shall visit, inspect and approve the excavation works at the following stages during construction, to include a memorandum of approval.
- Inspection and approval after installation of all sheet piles
- Inspection and approval after installation of each ring of bracing required by the sheeting and shoring plan
- Continuous presence and monitoring of work at all times when excavation is being performed after placement of the last required excavation bracing.

1.5 SUBSURFACE DATA

Data from a subsurface exploration is available in Appendix A. The information is provided to assist and to obtain a general understanding of subsurface conditions that can be expected at the proposed project. The soil borings and test result data are believed to show the nature of the materials encountered at those specific locations and depths; conditions may vary between and below the exploration locations. This provided data shall be carefully studied by the Contractor, but shall not be implied as fully descriptive and complete. The Contractor shall obtain whatever additional data they deem necessary to properly bid and construct the project in accordance with the drawings and specifications.

The proposed spillboxes are to be constructed within the dredge material disposal area. The dredge material generally consists of submerged, highly plastic, very soft clays containing various amounts of silts and sands. Conventional rubber tired or tracked equipment cannot advance through the dredge materials. To facilitate the construction of the spillboxes and outflow pipes, the access roads shown on the plans will likely need to be constructed first. Side slopes for the access road are to be at a 2 Horizontal: 1 Vertical slope.

The depth of water in the disposal area can vary depending on the time of year and precipitation. The contractor should anticipate a considerable amount ground water present in all excavations due to the nature of the facility. Proper drainage is required for all excavations and earthwork; dewatering will be crucial for successful completion of the project and shall be expected for all excavations and utility trenching. Unstable soil conditions, resulting in delay to construction activity, shall also be expected for earthwork performed during and after rainy periods, and in all excavations and trenches.

1.6 GENERAL WORK DESCRIPTION

The work covered by this section consists of furnishing all equipment, labor, materials, and incidentals; and performing all operations necessary for the excavation and removal of existing soil and dredge material to the bottom of the proposed spillbox structure and to limits specified herein, or indicated on the drawings. The work shall also include the installation of proper sheeting and shoring; all necessary drainage and dewatering; and incidental earthwork needed to construct suitable earth filled platforms to support construction equipment necessary to complete the excavation, sheeting, shoring and backfilling. The work shall also include the placement of embankment fill material to construct a permanent access road as shown on the drawings. Borrow fill material to construct earth platforms, including permanent access road or diversion dikes can be obtained on-site. All work shall comply with the safety requirements of COE EM 385-1-1 and all local, state and federal regulations.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Geotextiles

Geotextiles and geogrids shall be used for stabilization and reinforcement of subgrade soils. Geotextiles and geogrids shall conform to Section 31 05 22 GEOTEXTILED USED AS FILTERS of the contract specifications.

PART 3 EXECUTION

3.1 EXCAVATION

Excavation as discussed herein and shown on the drawings shall be performed. Excavation to the bottom of the proposed spillboxes structure foundation slab and to a distance of at least 10 feet beyond the edges of the structure shall be performed to remove existing loose sands and soft, wet dredge material. All excavations shall be performed in accordance with the requirements of US Army Corps of Engineers EM 385-1-1, 29 CFR 1926.652 and these specifications. The contractor is solely responsible for constructing safe, stable, temporary excavations; and

should shore, slope, or bench all sides of the excavations as required to maintain stability of both the excavation sides and bottom. Unless the contractor can safely slope back the excavation in accordance with regulations, then the excavation shall be properly sheeted and shored as described in paragraph 3.3 SHORING. Slopes may be adversely affected by weather or moisture content. Satisfactory material shall be properly stockpiled for use later. Unused excavated material shall be properly disposed within the existing dredged material disposal area at a location specified by the Contracting Officer. Prior to the excavation, and to insure the excavation and construction is performed at the correct location, the limits of the excavations and an appropriate offset shall be properly surveyed and staked by a surveyor licensed in the Commonwealth of Virginia. The soft dredge material will not support typical construction equipment. The Contractor shall use at their discretion whatever suitable equipment is necessary to perform the excavation in a safe manner and to obtain a level final grade which minimizes disturbance to the underlying subgrade soils. Satisfactory material shall be placed and compacted as specified in paragraph FILLING AND BACKFILLING. Determination of elevations and measurements of approved overdepth excavation of unsatisfactory material below grades indicated shall be done under the direction of the Contracting Officer.

3.1.1 Stockpiles

Stockpiles of satisfactory and wasted materials shall be placed and graded per Specification 31 00 00 EARTHWORK.

3.2 DRAINAGE AND DEWATERING

3.2.1 Drainage

Surface water shall be directed away from excavation and construction sites to prevent erosion and undermining of foundations. Diversion ditches, dikes and grading shall be provided and maintained as necessary during construction. It is the responsibility of the Contractor to assess the soil and ground water conditions presented by the plans and specifications and to employ necessary measures to permit construction to proceed. Excavated slopes and backfill surfaces shall be protected to prevent erosion and sloughing. Excavation shall be performed so that the site, the area immediately surrounding the site, and the area affecting operations at the site shall be continually and effectively drained. Proper drainage will be crucial for successful completion of the project and is required for all excavations and earthwork.

3.2.2 Dewatering

The contractor should anticipate a considerable amount of ground water present in all excavations due to the nature of the facility. Groundwater flowing toward or into excavations shall be controlled to prevent sloughing of excavation slopes and walls, boils, uplift and heave in the excavation and to eliminate interference with orderly progress of construction. Dewatering shall be performed with French drains, sumps, ditches, trenches, wellpoints or wells, or whatever suitable means are needed to lower the water level below the excavated subgrade. Control measures shall be taken by the time the excavation reaches the water level in order to maintain the integrity of the in situ material. While the excavation is open, the water level shall be maintained continuously, at least 1.0 feet below the working level. The Contractor shall be responsible for the design, installation, maintenance, and performance of

all temporary dewatering systems. When sheeting, shoring, and/or trench boxes are employed, the dewatering system shall be compatible with the type of shoring to be used. Proper dewatering will be crucial for successful completion of the project and shall be expected for all excavations and utility trenching.

3.3 SHORING

The Contractor shall submitsheeting and shoring installation plan to the Government for review and approval. The contractor's responsible engineer as defined in 29 CFR 1926.652 "Subpart P - Construction Standards for Excavations", shall evaluate the soil condition exposed in the excavations as part of the contractor's safety procedures. If the soil conditions are unstable, no workers shall enter the excavation until proper shoring has been installed as defined herein. Shoring, which includes sheet piling, as necessary, shall be furnished and installed in accordance with EM 385-1-1 and the approved Excavation and Placement Plan and as necessary to protect workmen, banks, structures, and adjacent dikes. Shoring including sheet piling shall be furnished and installed around the entire excavation perimeter. Excavation work shall be halted and the Contractor's Geotechnical Engineer and Contract officer notified if any movement in excess of 0.005 feet in any dimension, or smaller amount as recommended by the Contractor's Geotechnical Engineer and Contracting Officer, is observed at any monitored feature. Excavation work shall not resume until the Contractor implements corrective measures as approved by the contracting officer to halt further movement. The Contractor shall be responsible for effecting full repairs of any damaged structure or infrastructure. Shoring, bracing, and sheeting shall be removed as excavations are backfilled, in a manner to prevent caving. At the Contractor's option any sheetpiling for the spillbox structure excavation (provided to it is not located directly beneath the structure and 10 feet offset and buried at least 3 feet below the finished grade) may be left in place.

3.4 CLASSIFICATION OF EXCAVATION

Excavation will be unclassified regardless of the nature of material encountered.

3.5 GEOTECHNICAL ENGINEER

The Contractor is required to hire a Professional Geotechnical Engineer to provide inspection of the excavation and soil/groundwater conditions throughout the construction. The Geotechnical Engineer shall be responsible for performing pre-construction and periodic site visits throughout construction to assess site conditions. The Geotechnical Engineer shall update the Exacavation and Placement Plan and Sheeting and Shoring Instllation Plan as construction progresses to reflect changing conditions and shall submit an updated plan if necessary. A written report shall be submitted informing the Contractor and the Contracting Officer of the status of the plan and an accounting of the Contractor's adherence to the plan addressing any present or potential problems. The Geotechnical Engineer shall be available to meet with the Contracting Officer at any time throughout the contract duration.

3.5.1 Special Inspection Of Excavation

Contractor's Geotechnical Engineer shall visit, inspect and approve the excavation works at the following stages during construction, to include a

memorandum of approval submitted in accordance with specification section 31 00 01:

- Inspection and approval after installation of all sheet piles

- Inspection and approval after installation of each ring of bracing required by the sheeting and shoring plan

- Continuous presence and monitoring of work at all times when excavation is being performed after placement of the last required excavation bracing.

3.6 OUTFALL PIPE TRENCHES

Trenches for underground outfall pipe shall be excavated to the required alignments and depths. The bottoms of trenches shall be graded to secure the required slope and provide a uniform support for the entire length of pipe. Appropriate bedding material shall be placed underneath the pipe. Refer to specification Section 31 00 00 EARTHWORK.

3.7 BORROW

Refer to Specification 31 00 00 EARTHWORK for borrow material.

3.8 PREPARATION OF SURFACES FOR FILL

Upon completion of the excavation to the proper depth and elevation, the subgrade shall be inspected by the Contracting Officer and the contractor's Geotechnical Engineer. Groundwater shall be properly controlled. After the inspection, a geotextile shall be placed on the excavated subgrade within 24 hours of approval of the subgrade surface. Above the geotextile, place two 12-inch thickness marine mattresses in accordance with the plans and Section 35 42 35 POLYMERIC MARINE FILTER MATRESSES of the specifications. Groundwater shall be maintained at least 12 inches below the bottom surface level of the marine mattress through pumping and other means necessary.

3.8.1 Removal/Replacement of Unsatisfactory and Unstable Materials

Where unsatisfactory or unstable material (soft clayey dredge spoils) is encountered in the bottom of excavation for the spillbox foundation, such material shall be removed and replaced with structural fill below elevation +8.9' (below the first layer of geotextile) to the depth directed by the contractor's Geotechnical Engineer. The amount of additional structural fill shall be sufficient to stabilize the bottom of excavation and provide an adequate/safe working platform for geotextile placement. Payment therefore will be in conformance with the CHANGES clause of the CONTRACT CLAUSES. When removal of unstable material is due to the fault or neglect of the Contractor while performing sheeting, shoring, benching, sloping, water removal, or other required tasks as indicated in contract documents, such removal shall be performed at no additional cost to the Government.

3.9 FILLING AND BACKFILLING

Satisfactory materials shall be used in bringing fills and backfills to the lines and grades indicated and for replacing unsatisfactory materials. Materials which are unsatisfactory solely due to excess moisture shall be spread, disked, and aerated prior to placing. Satisfactory materials shall be placed in horizontal layers not exceeding 8 inches in loose thickness

or approved by the contracting officer.

3.9.1 Backfill for Appurtenances

After spillbox structure has been constructed and the concrete has been allowed to cure for 7 days, backfill shall be placed in such a manner that the structure will not be damaged by the shock of falling earth. The backfill material shall be deposited and compacted as specified for final backfill, and shall be brought up evenly on all sides of the structure to prevent eccentric loading and excessive stress.

3.9.2 Filling for Permanent Access Road

Permanent Access Road to the new spillboxes shall be constructed using embankment fill material as shown on the drawings. Only traffic compaction is required for material placed for the access road.

3.10 MOISTURE CONTENT

Refer to Specification 31 00 00 EARTHWORK for moisture content requirements.

3.11 COMPACTION

Compact per Specification Section 31 00 00 EARTHWORK.

3.12 TESTING

See Specification Section 31 00 00 EARTHWORK for material testing.

3.13 PROTECTION

Settlement or washing that occurs in graded, topsoiled, or backfilled areas prior to acceptance of the work, shall be repaired and grades reestablished to the required elevations and slopes.

-- End of Section --

SECTION 31 05 22

GEOTEXTILES USED AS FILTERS
08/08

PART 1 GENERAL

1.1 SUMMARY

This SECTION defines the terms and requirements for filter geotextiles used in the construction of outfall pipelines and new spillboxes.

1.2 REFERENCES

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

ASTM INTERNATIONAL (ASTM)

ASTM D123	(2017) Standard Terminology Relating to Textiles
ASTM D4354	(2012) Sampling of Geosynthetics for Testing
ASTM D4355/D4355M	(2014) Deterioration of Geotextiles from Exposure to Light, Moisture and Heat in a Xenon-Arc Type Apparatus
ASTM D4491/D4491M	(2017) Standard Test Methods for Water Permeability of Geotextiles by Permittivity
ASTM D4533/D4533M	(2015) Standard Test Method for Trapezoid Tearing Strength of Geotextiles
ASTM D4632/D4632M	(2015a) Grab Breaking Load and Elongation of Geotextiles
ASTM D4751	(2016) Standard Test Method for Determining Apparent Opening Size of a Geotextile
ASTM D4873/D4873M	(2017) Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples
ASTM D4884/D4884M	(2014a) Strength of Sewn or Thermally Bonded Seams of Geotextiles
ASTM D6241	(2014) Standard Test Method for the Static Puncture Strength of Geotextiles and Geotextile-Related Products Using a 50-mm Probe

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

SD-04 Samples

Geotextiles; G

Submit samples a minimum of 60 days prior to the beginning of installation of the same geotextile. Upon delivery of the geotextile, submit duplicate copies of the written certificate of compliance signed by a legally authorized official of the manufacturer. The certificate shall state that the geotextile shipped to the site meets the chemical requirements and exceeds the minimum average roll value listed in TABLE 1. Upon request, supply quality control and quality assurance tests for the geotextile. All samples provided shall be from the same production lot as will be supplied for the contract, and shall be the full manufactured width of the geotextile by at least 10 feet long, except that samples for seam strength may be a full width sample folded over and the edges stitched for a length of at least 5 feet. Samples submitted for testing shall be identified by manufacturers lot designation. For needle punched geotextile, the manufacturer shall certify that the geotextile has been inspected using permanent on-line metal detectors and does not contain any needles.

SD-06 Test Reports

Geotextiles; G

Site Verification; G

SD-07 Certificates

Geotextiles; G

Submit the manufacturer's certification of the geotextile material. All brands of geotextile and all seams to be used will be accepted on the basis of mill certificates or affidavits. Submit duplicate copies of the mill certificate or affidavit signed by a legally authorized official from the company manufacturing the geotextile. The mill certificate or affidavit shall attest that the geotextile meets the chemical, physical and manufacturing requirements stated in this specification.

1.4 DELIVERY, STORAGE, AND HANDLING

Deliver only approved geotextile rolls to the project site. All geotextile shall be labeled, shipped, stored, and handled in accordance with ASTM D4873/D4873M. No hooks, tongs, or other sharp instruments shall be used for handling geotextile.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 General

Provide geotextile that is a non-woven pervious sheet of plastic yarn as defined by ASTM D123 matching or exceeding the minimum average roll values listed in TABLE 1. Strength values indicated in the table are for the weaker principal direction.

TABLE 1
MINIMUM PHYSICAL REQUIREMENTS FOR GEOTEXTILES

PROPERTY	UNITS	ACCEPTABLE VALUES	TEST METHOD
GRAB STRENGTH*	LBS	205	ASTM D4632/D4632M
CBR PUNCTURE*	LBS	525	ASTM D6241
TRAPEZOID TEAR*	LBS	80	ASTM D4533/D4533M
APPARENT OPENING SIZE	U.S. SIEVE	#70	ASTM D4751
PERMITTIVITY	sec -1	0.5	ASTM D4491/D4491M
ULTRAVIOLET DEGRADATION	Percent	70 at 500 Hrs	ASTM D4355/D4355M

* Note: At 50% elongation.

2.1.2 Geotextile Fiber

Fibers used in the manufacturing of the geotextile shall consist of a long-chain synthetic polymer composed of at least 85 percent by weight of polyolefins, polyesters, or polyamides. Add stabilizers and/or inhibitors to the base polymer, if necessary to make the filaments resistant to deterioration caused by ultraviolet light and heat exposure. Reclaimed or recycled fibers or polymer shall not be added to the formulation. Geotextile shall be formed into a network such that the filaments or yarns retain dimensional stability relative to each other, including the edges. Finish the edges of the geotextile to prevent the outer fiber from pulling away from the geotextile.

2.1.3 Seams

Sew the seams of the geotextile with thread of a material meeting the chemical requirements given above for geotextile yarn or bond the seams by cementing or by heat. Attach the sheets of geotextile at the factory or another approved location, if necessary, to form sections not less than 18 feet wide. Test seams in accordance with method ASTM D4884/D4884M. The strength of the seam shall be not less than 95 percent of the required grab tensile strength of the unaged geotextile in any principal direction (see TABLE 1).

2.1.4 Securing Pins

The geotextile shall be secured to the foundation soil by pins to prevent

movement prior to placement of the marine mattresses. Other appropriate means to prevent movement such as staples, sand bags, and stone could also be used. Securing pins shall be inserted through both strips of overlapped geotextile along the line passing through midpoints of the overlap. The maximum pins spacing shall be equal to or less than 1.5 feet. When windy conditions prevail at the construction site, the number of pins should be increased upon the demand of the Contracting Officer. Terminal ends of the geotextile shall be anchored with key trench or apron at crest, toe of the slope and upstream and downstream limits of installation.

2.2 INSPECTIONS, VERIFICATIONS, AND TESTING

2.2.1 Manufacturing and Sampling

Geotextiles and factory seams shall meet the requirements specified in TABLE 1.

2.2.1.1 Conformance Testing

Perform conformance testing in accordance with the manufacturers approved quality control manual. Submit manufacturer's quality control conformance test results.

2.2.1.2 Factory Sampling

Randomly sample geotextiles in accordance with ASTM D4354 (Procedure Method A). Sample factory seams at the frequency specified in ASTM D4884/D4884M. Provide all samples from the same production lot as will be supplied for the contract, of the full manufactured width of the geotextile by at least 10 feet long, except that samples for seam strength may be a full width sample folded over and the edges stitched for a length of at least 5 feet. Samples submitted for testing shall be identified by manufacturers lot designation.

2.2.1.3 Manufacturer Certification

Upon delivery of the geotextile, submit duplicate copies of the written certificate of compliance signed by a legally authorized official of the manufacturer. The certificate shall state that the geotextile shipped to the site meets the chemical requirements and exceeds the minimum average roll value listed in TABLE 1. All brands of geotextile and all seams to be used will be accepted on the basis of mill certificates or affidavits. Submit duplicate copies of the mill certificate or affidavit signed by a legally authorized official from the company manufacturing the geotextile. The mill certificate or affidavit shall attest that the geotextile meets the chemical, physical and manufacturing requirements stated in this specification.

2.2.2 Site Verification and Testing

Collect samples at approved locations upon delivery to the site in accordance with ASTM D4354 (Procedure Method B). Test samples to verify that the geotextile meets the requirements specified in TABLE 1. Identify samples by manufacturers name, type of geotextile, lot number, roll number, and machine direction. Perform testing at an approved laboratory. Submit test results from the lot under review for approval prior to deployment of that lot of geotextile. Rolls which are sampled shall be immediately rewrapped in their protective covering.

PART 3 EXECUTION

3.1 SURFACE PREPARATION

Prepare surface, on which the geotextile will be placed, to a relatively smooth surface condition in accordance with the applicable portion of this specification and shall be free from obstruction, debris, depressions, erosion feature, or vegetation. Remove any irregularities so as to ensure continuous, intimate contact of the geotextile with all the surface. Any loose material, soft or low density pockets of material, shall be removed; erosion features such as rills, gullies etc. shall be graded out of the surface before geotextile placement.

3.2 INSTALLATION OF THE GEOTEXTILE

3.2.1 General

Place the geotextile in the manner and at the locations shown. At the time of installation, reject the geotextile if it has defects, rips, holes, flaws, deterioration or damage incurred during manufacture, transportation or storage.

3.2.2 Placement

Place the geotextile smooth and free of tension, stress, folds, wrinkles, or creases. Place the strips to provide a minimum width of 24 inches of overlap for each joint. The placement procedure requires that the length of the geotextile be approximately 10 percent greater than the slope length. Adjust the actual length of the geotextile used based on initial installation experience. Perform trimming in such a manner that the geotextile is not damaged in any way.

3.3 PROTECTION

Protect the geotextile at all times during construction from contamination by surface runoff; remove any geotextile so contaminated and replace with uncontaminated geotextile. Replace any geotextile damaged during its installation or during placement of granular filter materials at no cost to the Government. Schedule the work so that the covering of the geotextile with a layer of the specified material is accomplished within 2 calendar days after placement of the geotextile. Failure to comply shall require replacement of geotextile. Protect the geotextile from damage prior to and during the placement of marine mattresses. In no case shall any type of equipment be allowed on the unprotected geotextile.

3.4 OVERLAPPING AND SEAMING

3.4.1 Overlapping

The overlap of geotextile rolls shall be minimum 24 inches.

3.4.2 Sewn Seams

High strength thread should be used so that seam test conforms to ASTM D4884/D4884M. The thread shall meet the chemical, ultraviolet, and physical requirements of the geotextile, and the color shall be different from that of the geotextile. The seam strength shall be equal to the strength required for the geotextile in the direction across the seam.

Overlapping J-type seams are preferable over prayer-type seams as the overlapping geotextile reduces the chance of openings to occur at the seam. Use double sewing, specially for field seams, to provide a safety factor against undetected missed stitches.

-- End of Section --

SECTION 33 40 00

DRAINAGE PIPE
02/10

PART 1 GENERAL

1.1 SUMMARY

This SECTION defines the terms and requirements for smooth wall polyethylene outfall pipe as used in the construction of two new Spillboxes.

This section only covers the procurement, delivery, placement, fusion, and testing of pipe in a previously prepared trench. The earthwork required before and after pipe placement is included in Section 31 00 00 EARTHWORK.

1.2 REFERENCES

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

ASTM INTERNATIONAL (ASTM)

ASTM D3350	(2014) Standard Specification for Polyethylene Plastics Pipe and Fittings Materials
ASTM F1417	(2011a) Standard Test Method for Installation Acceptance of Plastic Gravity Sewer Lines Using Low Pressure Air
ASTM F714	(2013) Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter

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

SD-01 Preconstruction Submittals

PE Pipe Placement and Fusion Plan; G

SD-03 Product Data

Placing Pipe

Submit printed copies of the manufacturer's recommendations for installation procedures of the material being placed, prior to installation.

SD-04 Samples

Pipe

SD-07 Certificates

Resin Certification

Pipeline Testing

Hdpe Pipe Fusion Operator Certificates

SD-08 Manufacturer's Instructions

PE Pipe Placement and Fusion Plan; G

1.4 DELIVERY, STORAGE, AND HANDLING

1.4.1 Delivery and Storage

Materials delivered to site shall be inspected for damage, unloaded, and stored with a minimum of handling. Materials shall not be stored directly on the ground. The inside of pipes and fittings shall be kept free of dirt and debris. Before, during, and after installation, pipe and fittings shall be protected from any environment that would result in damage or deterioration to the material. Keep a copy of the manufacturer's instructions available at the construction site at all times and follow these instructions unless directed otherwise by the Contracting Officer. Solvents, solvent compounds, lubricants, elastomeric gaskets, and any similar materials required to install pipe shall be stored in accordance with the manufacturer's recommendations and shall be discarded if the storage period exceeds the recommended shelf life. Solvents in use shall be discarded when the recommended pot life is exceeded.

1.4.2 Handling

Materials shall be handled in a manner that ensures delivery to the trench in sound, undamaged condition. Pipe shall be carried to the trench, not dragged.

PART 2 PRODUCTS

2.1 PIPE

Pipe shall be of the sizes indicated and shall conform to the requirements specified.

2.1.1 Piping

2.1.2 Polyethylene (PE) Pipe

Submit the pipe manufacturer's resin certification, indicating the cell classification of PE used to manufacture the pipe, prior to installation of the pipe. The minimum cell classification for polyethylene plastic shall apply to each of the seven primary properties of the cell classification limits in accordance with ASTM D3350.

2.1.2.1 Smooth Wall PE Pipe

ASTM F714, maximum DR of 21 for pipes 3 to 24 inches in diameter. Pipe shall be produced from PE certified by the resin producer as meeting the requirements of ASTM D3350, minimum cell class 335434C.

2.2 MISCELLANEOUS MATERIALS

2.2.1 Joints

2.2.1.1 Smooth Wall PE Plastic Pipe

Pipe shall be joined using butt fusion method as recommended by the pipe manufacturer. Submit a PE Pipe Placement and Fusion Plan for approval before beginning pipe placement and jointing. The plan shall include the location of all welded joints, manufacturer instructions for jointing, and fusion equipment setup locations. If the Contractor plans to move any sections of pipe after joining, the Plan shall also include details on how and where joined sections are to be moved.

All butt fusion joints shall be performed by an HDPE pipe fuser with training and certification in fusion joining of HDPE pipe. The certification shall be through a program recommended or accepted by the manufacturer of the HDPE pipe used. Submit HDPE Pipe Fusion Operator Certificates demonstrating the certification of each person performing pipe fusion work.

PART 3 EXECUTION

3.1 EXCAVATION AND BACKFILLING FOR OUTFALL PIPES

Excavation of trenches, and for appurtenances and backfilling for outfall pipes, shall be in accordance with the applicable portions of Section 31 00 00 EARTHWORK.

3.1.1 Movement of Construction Machinery

When compacting by rolling or operating heavy equipment parallel with the pipe, displacement of or injury to the pipe shall be avoided. Movement of construction machinery over pipe at any stage of construction shall be at the Contractor's risk. Any damaged pipe shall be repaired or replaced.

3.2 PLACING PIPE

Each pipe shall be thoroughly examined before being laid; defective or damaged pipe shall not be used. Plastic pipe shall be protected from exposure to direct sunlight prior to laying, if necessary to maintain adequate pipe stiffness and meet installation deflection requirements. Pipelines shall be laid to the grades and alignment indicated. Proper facilities shall be provided for lowering sections of pipe into trenches. Pipe shall not be laid in water, and pipe shall not be laid when trench conditions or weather are unsuitable for such work. Diversion of drainage or dewatering of trenches during construction shall be provided as necessary. The maximum allowable deflection of installed flexible pipe shall not exceed 5%.

Note post installation requirements of paragraph DEFLECTION TESTING of this specification for all pipe products.

3.3 PIPELINE TESTING

3.3.1 Leakage Tests

Lines shall be tested for leakage by low pressure air or water testing or exfiltration tests, as appropriate. Low pressure air testing for plastic pipe shall conform to ASTM F1417. Prior to exfiltration tests, the trench shall be backfilled up to at least the lower half of the pipe. If required, sufficient additional backfill shall be placed to prevent pipe movement during testing, leaving the joints uncovered to permit inspection. Visible leaks encountered shall be corrected regardless of leakage test results. When the water table is 2 feet or more above the top of the pipe at the upper end of the pipeline section to be tested, infiltration shall be measured using a suitable weir or other device acceptable to the Contracting Officer. An exfiltration test shall be made by filling the line to be tested with water so that a head of at least 2 feet is provided above both the water table and the top of the pipe at the upper end of the pipeline to be tested. The filled line shall be allowed to stand until the pipe has reached its maximum absorption, but not less than 4 hours. After absorption, the head shall be reestablished. The amount of water required to maintain this water level during a 2-hour test period shall be measured. Leakage as measured by the exfiltration test shall not exceed 0.2 gallons per inch in diameter per 100 feet of pipeline per hour. When leakage exceeds the maximum amount specified, satisfactory correction shall be made and retesting accomplished.

3.3.2 Deflection Testing

No sooner than 30 days after completion of installation and final backfill, an initial post installation inspection shall be accomplished. Clean or flush all lines prior to inspection. Perform a deflection test on entire length of installed flexible pipeline on completion of work adjacent to and over the pipeline, including leakage tests, backfilling, placement of fill, grading, paving, concreting, and any other superimposed loads. Deflection of pipe in the installed pipeline under external loads shall not exceed limits in paragraph PLACING PIPE above as percent of the average inside diameter of pipe. Determine whether the allowable deflection has been exceeded by use of a laser profiler or mandrel.

a. Laser Profiler Inspection: If deflection readings in excess of the allowable deflection of average inside diameter of pipe are obtained, remove pipe which has excessive deflection, and replace with new pipe. Initial post installation inspections of the pipe interior with laser profiling equipment shall utilize low barrel distortion video equipment for pipe sizes 48 inches or less. Use a camera with lighting suitable to allow a clear picture of the entire periphery of the pipe interior. Center the camera in the pipe both vertically and horizontally and be able to pan and tilt to a 90 degree angle with the axis of the pipe rotating 360 degrees. Use equipment to move the camera through the pipe that will not obstruct the camera's view or interfere with proper documentation of the pipe's condition. The video image shall be clear, focused, and relatively free from roll static or other image distortion qualities that would prevent the reviewer from evaluating the condition of the pipe.

b. Pull-Through Device Inspection: Pass the pull-through device through each run of pipe by pulling it by hand. If deflection readings in excess of the allowable deflection of average inside diameter of pipe are obtained, retest pipe by a run from the opposite direction. If

retest continues to show excess allowable deflections of the average inside diameter of pipe, remove pipe which has excessive deflection, replace with new pipe, and completely retest in same manner and under same conditions. Pull-through device: The mandrel shall be rigid, nonadjustable having a minimum of 9 fins, including pulling rings at each end, engraved with the nominal pipe size and mandrel outside diameter. The mandrel shall be 5 percent less than the certified-actual pipe diameter for Plastic Pipe. When mandrels are utilized to verify deflection of flexible pipe products, the Government will verify the mandrel OD through the use of proving rings that are manufactured with an opening that is certified to be as shown above.

c. Deflection measuring device: Shall be approved by the Contracting Officer prior to use.

3.3.3 Post-Installation Inspection

Check each pipe for rips, tears, joint separations, soil migration through the joint, cracks, localized bucking, bulges, settlement and alignment.

a. Replace pipes having cracks greater than 0.1 inches in width or deflection greater than 5 percent deflection. An engineer shall evaluate all pipes with cracks greater than 0.01 inches but less than 0.10 inches to determine if any remediation or repair is required. Repair or replace any pipe with cracks exhibiting displacement across the crack, exhibiting bulges, creases, tears, spalls, or delamination.

b. Reports: The deflection results and final post installation inspection report shall include: a copy of all video taken, pipe location identification, equipment used for inspection, inspector name, deviation from design, grade, deviation from line, deflection and deformation of flexible pipe systems, inspector notes, condition of joints, condition of pipe wall (e.g. distress, cracking, wall damage dents, bulges, creases, tears, holes, etc.).

-- End of Section --

SECTION 35 42 35

POLYMERIC MARINE FILTER MATTRESS
01/13

PART 1 GENERAL

1.1 SUMMARY

This Section concerns furnishing a Polymeric Marine Filter Mattress (PMFM) system with structural geogrid, braid, mechanical connection elements and stone fill as specified herein and shown on the contract drawings. The geogrid material for the mattress shall include sufficient quantities to form lifting hoops for the units. The work consists of fabricating, filling and placing filter matress units in accordance with this Section and in reasonably close conformity with the lines, grades and dimensions shown on the contract drawings or approved by the Contracting Officer. Some prefabrication of the units may be accomplished prior to delivery to the site.

1.2 REFERENCES

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

ASTM INTERNATIONAL (ASTM)

ASTM D4355/D4355M	(2014) Deterioration of Geotextiles from Exposure to Light, Moisture and Heat in a Xenon-Arc Type Apparatus
ASTM D4759	(2011; R 2018) Standard Practice for Determining the Specification Conformance of Geosynthetics
ASTM D6637	(2015) Standard Test Method for Determining Tensile Properties of Geogrids by the Single or Multi-Rib Tensile Method
ASTM D7737/D7737M	(2015) Standard Test Method for Individual Geogrid Junction Strength
ASTM D7748/D7748M	(2014) Standard Test Method for Flexural Rigidity of Geogrids, Geotextiles and Related Products

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA 9090	Compatibility Test for Wastes and Membrane Liners

1.3 SUBMITTALS

Government approval is required for submittals marked 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

Shop Drawings; G

The Contractor shall submit details of the typical sections and connections. A layout plan showing the positioning of mattress units shall also be submitted.

SD-04 Samples

The Contractor shall submit product samples for the following:

Geogrid; G
Braid; G
Mechanical Connection Elements; G

SD-07 Certificates

Geogrid; G

The Contractor shall submit geogrid product data sheet and certification from the manufacturer that the geogrid product supplied meets the requirements as indicated in paragraph 2.2 MATERIALS of this Section.

SD-08 Manufacturer's Instructions

Manufacturer's Instructions; G

The Contractor shall submit manufacturer's general recommendations and instructions for fabrication, filling, installation and repair.

SD-09 Manufacturer's Field Reports

Roll Values; G

1.4 DEFINITIONS

1.4.1 Polymeric Marine Filter Mattress

A non-metallic compartmental structure filled densely and tightly with stone prior to installation. Filling is achieved while each unit is positioned on edge prior to installation. Units are comprised of structural geogrid, braid, and mechanical connection elements fabricated to allow placement and provide containment of aggregate fill.

1.4.2 Geogrid

An integrally formed grid structure manufactured of a stress resistance polypropylene (PP) material with molecular weight and molecular characteristics which impart high resistance to:

a. Loss of load capacity or structural integrity when the geogrid is subjected to mechanical stress in installation.

b. Deformation when the geogrid is subjected to applied force in use.

c. Loss of load capacity or structural integrity when the geogrid is subjected to long-term environmental stress.

1.4.3 Minimum Average Roll Values

Value based on testing and determined in accordance with ASTM D4759.

1.4.4 True Tensile Modulus in Use

The ratio of tensile strength to corresponding strain (e.g., 1 percent). The tensile strength is measured via ASTM D6637 as modified by AASHTO Standard Specification for Highway Bridges, 1997 Interim, using a single rib having the greater of 3 junctions or 8 inches and tested at a strain rate of 10 percent per minute based on this gauge length without deforming test materials under load before measuring such resistance or employing "secant" or "offset" tangent methods of measurement so as to overstate tensile properties. Values shown in paragraph 2.2.1 are MARV (minimum average roll values).

1.4.5 Junction Strength

Junction Strength - Breaking tensile strength of junctions when tested in accordance with ASTM D7737/D7737M. Values shown in paragraph 2.2.1 are MARV (minimum average roll values).

1.4.6 Flexural Stiffness (Also Known as Flexural Rigidity)

Resistance to bending force measured via ASTM D7748/D7748M using one meter (minimum) long specimens. Values shown in paragraph 2.2.1 are MARV (minimum average roll values).

1.4.7 Resistance to Long Term Degradation

Resistance to loss of load capacity or structural integrity when subjected to chemically aggressive environments measured via EPA 9090 immersion testing. Values shown are typical values.

1.4.8 Ultraviolet Stability

The ratio of tensile strength after exposure to the tensile strength prior to exposure with exposure per ASTM D4355/D4355M and tensile strengths measured via ASTM D6637 as specified in subparagraph "True Tensile Modulus in Use"
of paragraph DEFINITIONS above.

1.5 QUALITY ASSURANCE

Prior to the installation of the units, the Contractor shall arrange a meeting at the site with the system supplier and, where applicable, the system installer. The Contracting Officer shall be notified at least 5 working days in advance of the time of the meeting.

1.6 DELIVERY, STORAGE, AND HANDLING

The Contractor shall prevent excessive mud, wet concrete, epoxy, or other deleterious materials from coming in contact with and affixing to mattress materials. Store at temperatures above -20 degrees F (-29 degrees C).

Rolled materials may be laid flat or stood on end.

PART 2 PRODUCTS

2.1 MANUFACTURERS

An approved source of geogrid is Tensar International Corp., or other approved equivalent.

2.2 MATERIALS

2.2.1 Structural Geogrid

a. Unless otherwise specified on the contract drawings, shop drawings, or directed by the Contracting Officer, the structural geogrid type shall be Type 1 for the Top, Bottom, Sides and Internal Diaphragms of the units.

b. The structural geogrid shall be produced from virgin resin and classified as polypropylene (PP) and shall possess complete continuity of all properties throughout its structure.

c. The structural geogrid shall accept applied force in use by positive mechanical interlock (i.e., direct mechanical keying) with:

(1) Compacted soil or construction fill materials;

(2) Contiguous sections of itself when overlapped and embedded in compacted soil or construction fill materials; and,

(3) Rigid mechanical connection elements such as bodkins, pins or hooks.

d. The structural geogrid shall have the following characteristics:

PROPERTY	UNITS	TYPE 1
Junction Strength (MD/XMD)	kN/m (lb/ft)	24.3/27.9 (1,665/1,911)
Flexural Stiffness	mg-cm	2,000,000
Resistance to Installation Damage	percent GP	85
Resistance to Long Term Degradation	percent	100
Ultraviolet Stability (Retained Strength @ 500 hours)	percent	98
Aperture Dimensions (nominal)	inches (mm)	1.0/1.2 (25.0/30.5)
Rib Thickness (minimum)	inches (mm)	0.07/0.07 (1.78/1.78)

2.2.2 Mechanical Connection Elements

The mechanical connection elements shall be as shown on the

contract drawings and shop drawings and shall be composed of high density HDPE, unless otherwise approved by the Contracting Officer.

2.2.3 UV Stabilized Braid

a. The braid used for tying and lacing in the fabrication of the units shall be 8-strand hollow-core braid composed of high density polyethylene (HDPE). Each strand shall consist of a bundle of monofilament HDPE.

b. The braid shall have a nominal diameter of not less than 3/16 inch and a breaking strength of not less than 400 pounds on a test specimen 36 inches in length.

c. The braid shall be UV stabilized with a minimum carbon black content of 2.0 percent by weight.

2.2.4 Geotextile

Unless otherwise specified on the contract drawings, shop drawings, or directed by the Contracting Officer, the geotextile shall meet minimum physical requirements as indicated in Table 1, Section 31 05 22 GEOTEXTILES USED AS FILTERS.

2.2.5 Extensions

a. Extensions shall be constructed of Structural Geogrid; see paragraph 2.2.1 Structural Geogrid of this Section.

b. Geogrid extensions shall be a two (2) foot structural geogrid extension and attached to the mattress as indicated in the contract drawings, shop drawings or as directed by the Contarcting Officer.

c. Geotextile shall be attached to the underside of the mattress and the geogrid extensions utilizing fasteners spaced a maximum 12 inches apart. The geotextile shall be one continuous piece.

d. The geotextile shall be attached to the underside of the mattress and the mattress's extensions by the manufacturer at the location of the manufacturer of the mattress.

2.2.6 Stone Fill Materials

a. The stone for filling shall be crushed stone. The stone shall be durable and of suitable quality to ensure suitable performance in the mattress and the climate at the work site. Stone shall be free from cracks, seams and other defects that would tend to increase its deterioration in the mattress. The inclusion of objectionable quantities of dirt, sand, clay and rock fines shall not be permitted.

b. Unless otherwise shown on the contract drawings, shop drawings or approved by the Contracting Officer the stone shall possess the following qualities:

Sieve Size (inches)	%, by Weight, Passing
3	100
2.5	90-100
2	35-70
1.5	0-15
0.75	0-5

PART 3 EXECUTION

3.1 EXAMINATION

The Contractor shall check the geogrid, braid and mechanical connection elements upon delivery to verify that the proper material has been received. These materials shall be inspected by the Contractor to be free of flaws or damage occurring during manufacturing, shipping, or handling.

3.2 FINAL FABRICATION AND FILLING

3.2.1 Mechanical Connections

The joints where the ends and baffles of each unit join the top or bottom of the unit shall be made with a mechanical connection between geogrid elements as shown on the contract drawings and shop drawings.

3.2.2 Seaming

Unless otherwise shown on the contract drawings, shop drawings or approved by the Contracting Officer:

a. All cut ends of braid material shall be knotted within 1 inch to 2 inch of the end to prevent raveling of the braid material. The braid material shall be securely knotted to the geogrid at all ends of all stitched seams, and at a spacing not to exceed 6 feet along any stitched seam. Pieces of braid material may be spliced end to end by securely knotting.

b. The stitches along each seam shall be sufficiently tight to close the gap between the adjacent pieces of geogrid. The braid material shall be stitched through each pair of apertures along each seam at least once. The spacing of stitches shall be reasonably uniform at approximately 6 (minimum) stitches per foot along the entire length of each seam.

c. Seaming to connect adjacent units is not required

3.2.3 Filling

Unless otherwise shown on the contract drawings and shop drawings or approved by the Contracting Officer:

a. Each unit shall be filled and the fill shall be packed while the unit is laid flat with the top flaps pointed upwards. Dump stone into each compartment. Spread the stone in each compartment allowing final stage

spreading to be accomplished manually.

b. Packing of the stone fill material and complete filling of each compartment shall be adequate to achieve complete filling as evidenced by tightly confined stone particles, tensioned interior diaphragms, braid connections, slight bulging of each compartment, and no evidence of air space between compartments during lifting. Excessive bulging of the unit or displacement on the interior diaphragms, such as caused by overpacking or inadequate support, shall not be allowed.

c. Lifting hoops shall be formed by splicing together the flap of the main piece of marine grid over the top of the mattress while leaving sufficient length for the lifting hoop on each end of the mattress to form the top layer of marine grid.

d. Filling shall be accomplished in a manner that does not cause excessive damage to the geogrid, mechanical connection elements or the braid.

3.3 PREPARATION

3.3.1 Subgrade

The subgrade soil shall be prepared as indicated on the contract drawings or as directed by the Contracting Officer.

3.4 INSTALLATION

3.4.1 Position

The units shall be placed at the proper elevation, alignment and orientation as shown on the contract drawings or as directed by the Contracting Officer.

3.4.2 Placement Procedures

a. The procedure used in placement of the units shall be in accordance with the Manufacturer's Instructions of the system supplier and as approved by the Contracting Officer.

b. For lifting of each unit, a spreader beam and/or spreader bars shall be used in a manner that the unit is not subjected to severe bending or distortion and that the top and bottom layers of geogrid are tensioned uniformly across their width. Units should generally be lifted from a horizontal position.

c. Personnel shall stay clear of the area beneath units and rigging during lifting.

3.4.3 Construction Tolerances

The finished surface of the marine filter mattress shall not deviate from the lines and grades shown by three (3") inches +/-. Tolerances are measured
perpendicular to the indicated neatline. The intention is that the work shall be built generally to the required elevations, slope and grade. Placed material not meeting these limits shall be removed or reworked as directed by the Contracting Officer.

3.4.4 Splicing and Anchoring

Where applicable, splicing and/or anchoring of the units shall be accomplished as shown on the contract drawings, shop drawings, or as directed by the Contracting Officer.

3.5 REPAIR

Any units damaged during installation shall be repaired in a manner approved by the Contracting Officer or shall be replaced by the Contractor. Any such measures required shall be at no additional cost to the Government.

-- End of Section --

US Army Corps of Engineers ®
Norfolk District

GEOTECHNICAL DATA REPORT (GDR)

FEDMMA DIKE RAISING
FORT EUSTIS, VIRGINIA

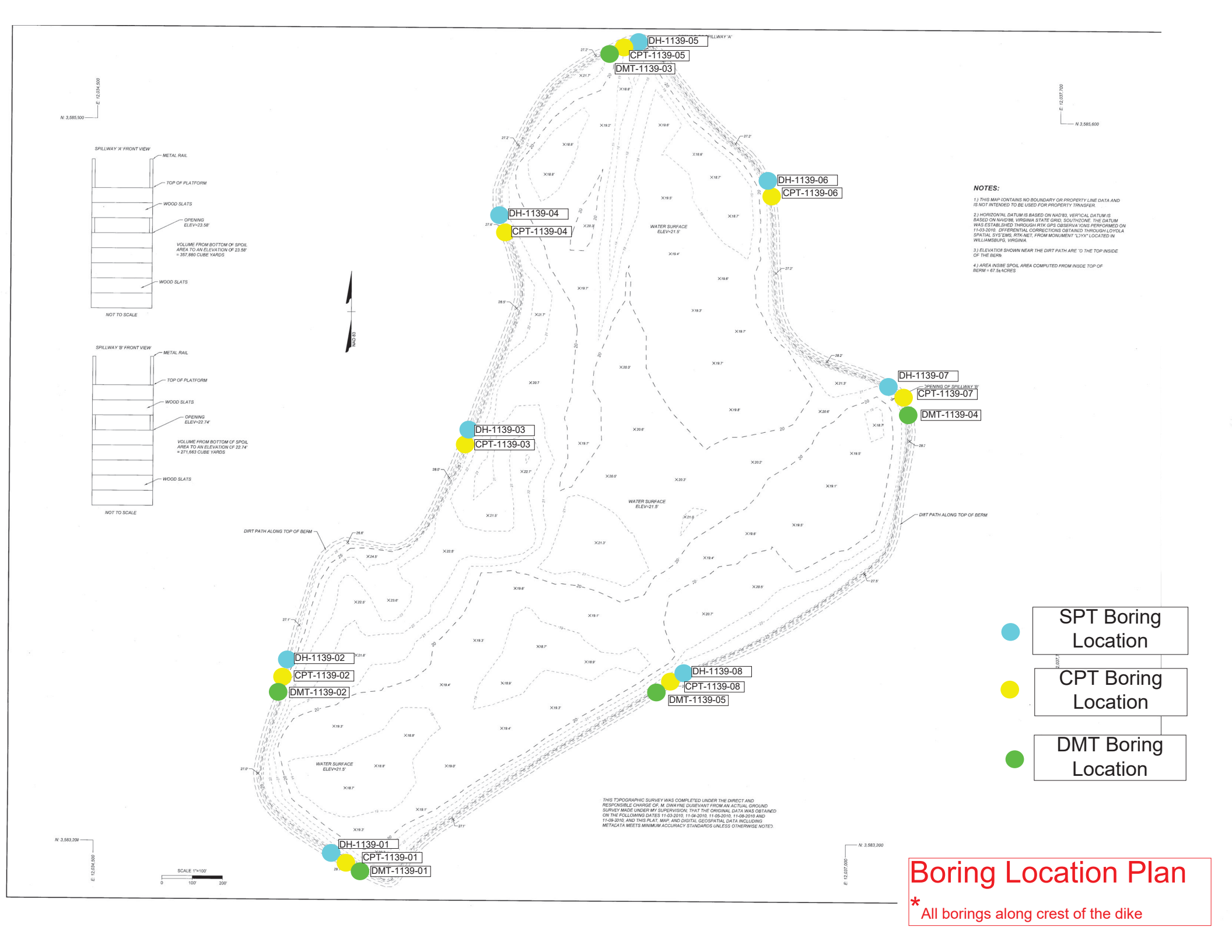
JANUARY 2025

PREPARED BY:
Geo-Environmental Section, Norfolk District
U.S. Army Corps of Engineers
Fort Norfolk, 803 Front Street
Norfolk, VA 23510

This report is provided for information only.
The data contained in this report should be considered as a whole, and decisions should not be based on one location (e.g., one boring) as conditions may vary between locations. Variations in both the nature and extent of the subsurface conditions could be observed during construction. If variations are noted, we should be notified so we can review the conclusions and recommendations drawn from the data in this report, as reflected in the project plans & specifications. This geotechnical data report has been prepared for information only and for the exclusive use of the U.S. Army Corps of Engineers, or their agents, for specific application to the proposed FEDMMA Dike Raising Project at Fort Eustis, Virginia. This report has been prepared in accordance with generally accepted geotechnical engineering practices. No other warranty, expressed or implied, is made.

THIS PAGE LEFT BLANK

SPT boring logs



Boring Location Plan

* All borings along crest of the dike

DRILLING LOG

DIVISION: North Atlantic

INSTALLATION: Fort Eustis

Sheet 1 of 3

1. PROJECT: Fort Eustis Dredged Material Management Area, Newport News, VA

10. COORDINATE SYSTEM: NAD 1983 StatePlane Virginia South FIPS 4502 Feet

VERTICAL: NAVD88

LOCATION COORDINATES: N: 3583103.62 E: 12035408.45

LOCATION METHOD:

2. HOLE NUMBER: DH-1139-01

3. DRILLING AGENCY: Corps of Engineers - CESAS

11. DATE BORING: STARTED Mar 01 2024 COMPLETED Mar 02 2024

4. NAME OF DRILLER: Doug Hutchins

12. HAMMER TYPE: Automatic

EFFICIENCY (%)

5. EQUIPMENT: CME 850

13. SIZE AND TYPE OF BIT: 4.25" HSA

6. DIRECTION OF BORING: Vertical | DEG FROM VERTICAL: 0 | BEARING:

14. ELEVATION SURFACE: 34.6'

15. ELEVATION GROUND WATER:

7. THICKNESS OF OVERBURDEN: 80.0'

16. TOTAL NUMBER CORE BOXES:

8. DEPTH DRILLED INTO ROCK:

17. SIGNATURE AND TITLE OF INSPECTOR: Jack Kulaga

9. TOTAL DEPTH OF BORING: 80.0'

ELEV	DEPTH	BLOWS/0.5ft	N	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	LABORATORY: Gravel	Sand	Fines	LL	PI	MC	ASTM Class	REMARKS
		4 4 5	9		CLAYEY SAND (SC) fine sand; yellowish brown, dry to moist, loose to medium dense, High LL	87	S-1								
		2 1 1	2			40	S-2	0	50	50	67	37	22	SC-H	
27.60	7.00				ELASTIC SILT (MH) medium plasticity, no toughness fines; dark bluish gray to, moist to wet, medium stiff, trace clay, trace shell fragments, trace fine sand										
25.60	9.00	1 2 4	6		SILT (ML) low plasticity fines; dark gray with light gray, moist, medium stiff, trace shell fragments, trace clay, trace fine sand	100	S-3								
		1 2 5	7			67	S-4								
17.60	17.00				ELASTIC SILT (MH) medium plasticity, no toughness fines; dark bluish gray to, wet, very soft, trace clay, fine sand										
15.60	19.00	0													
15.10	19.50	3 5	8		SILTY SAND (SM) fine to medium sand; non plastic fines; light yellowish brown, wet, loose to medium dense, trace clay	100	S-5								
12.60	22.00				LEAN CLAY (CL) medium plasticity fines; dark blackish gray, wet, medium stiff to stiff, trace silt, trace fine sand										
		1 1 1	2		CLAYEY SAND (SC) fine sand; rapid dilatancy, no toughness fines; dark greenish gray, wet, very soft to soft	80	S-6	0	50	50	35	12	35	SC	
7.60	27.00				SILTY SAND (SM) fine to medium sand; low plasticity fines; light orangish brown, moist to wet, loose to medium dense, trace clay, weak cementation										
		1 6 9	15			87	S-7								

(continued on next page)

DRILLING LOG (Cont Sheet)

INSTALLATION: Fort Eustis

PROJECT: Fort Eustis Dredged Material Management Area, Newport News, VA

COORDINATE SYSTEM: NAD 1983 StatePlane Virginia South FIPS 4502 Feet

VERTICAL: NAVD88

LOCATION COORDINATES: N: 3583103.62 E: 12035408.45

LOCATION METHOD:

ELEV	DEPTH	BLOWS/ 0.5ft	N	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	LABORATORY: Gravel	Sand	Fines	LL	PI	MC	ASTM Class	REMARKS
					SILTY SAND (SM) fine to medium sand; low plasticity fines; light orangish brown, moist to wet, loose to medium dense, trace clay, weak cementation										
0.30	34.30	1 2	4			87	S-8								
		2			(CL-ML) medium plasticity fines; light yellowish orange with light gray, wet, medium stiff, trace fine sand										
-2.40	37.00														
					SILTY SAND (SM) fine to medium sand; light yellowish tan, wet, loose, no cementation										
		2 5 3	8			73	S-9	0	78	22			25	SM	
		6 10 4	14			100	S-10								
-14.90	49.50	8 15 4	19			100	S-11								
					LEAN CLAY (CL) medium plasticity fines; light bluish gray, moist to wet, soft, trace fine sand, trace wood										sand came up into augers. Crew pulled augers out of the ground to clear sand out and went back into the hole with a center plug
		2 1 2	3			67	S-12								
-21.90	56.50														
					ELASTIC SILT (MH) fine sand; dark greenish gray, wet, very soft to soft, trace sand, Inorganic High LL											
		0 0 1	1			100	S-13								
						100	DH-1139-1-SH-1	0	2	98	77	41	64	MH	UU Results @ 60 ft: Su=1342.8 psf
		0 0	WO			100	S-14								
-30.40	65.00	0	H												
					FAT CLAY (CH) dark greenish gray, wet, very soft to soft										

(continued on next page)

DRILLING LOG (Cont Sheet)

INSTALLATION: Fort Eustis

PROJECT: Fort Eustis Dredged Material Management Area, Newport News, VA

COORDINATE SYSTEM: NAD 1983 StatePlane Virginia South FIPS 4502 Feet

VERTICAL: NAVD88

LOCATION COORDINATES: N: 3583103.62 E: 12035408.45

LOCATION METHOD:

ELEV	DEPTH	BLOWS/ 0.5ft	N	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	LABORATORY: Gravel	Sand	Fines	LL	PI	MC	ASTM Class	REMARKS
		0			FAT CLAY (CH) dark greenish gray, wet, very soft to soft										
		0	1			100	S-15								
		1													
		0													
		1	2			100	S-16	0	1	99	86	52	69	CH	
		1													
		0													
		0	2			100	S-17								
-45.40	80.00	2			Borehole finished at 80.0										

-35 -40 -45 -50 -55 -60 -65 -70

DRILLING LOG

DIVISION: North Atlantic	INSTALLATION: Fort Eustis		Sheet 1 of 3
1. PROJECT: Fort Eustis Dredged Material Management Area, Newport News, VA	10. COORDINATE SYSTEM: NAD 1983 StatePlane Virginia South FIPS 4502 Feet		VERTICAL: NAVD88
	LOCATION COORDINATES: N: 3583809.69 E: 12035173.92		LOCATION METHOD:
2. HOLE NUMBER: DH-1139-02	3. DRILLING AGENCY: Corps of Engineers - CESAS	11. DATE BORING: STARTED Feb 29 2024	COMPLETED Feb 29 2024
4. NAME OF DRILLER: Doug Hutchins		12. HAMMER TYPE: Automatic	EFFICIENCY (%)
5. EQUIPMENT: CME 850		13. SIZE AND TYPE OF BIT: 4.25" HSA	
6. DIRECTION OF BORING: Vertical	DEG FROM VERTICAL: 0	BEARING:	14. ELEVATION SURFACE: 34.4'
			15. ELEVATION GROUND WATER:
7. THICKNESS OF OVERBURDEN: 80.0'			16. TOTAL NUMBER CORE BOXES:
8. DEPTH DRILLED INTO ROCK:			17. SIGNATURE AND TITLE OF INSPECTOR: Jack Kulaga
9. TOTAL DEPTH OF BORING: 80.0'			

ELEV	DEPTH	BLOWS/0.5ft	N	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	LABORATORY: Gravel	Sand	Fines	LL	PI	MC	ASTM Class	REMARKS
		4, 4, 4	8		FAT CLAY (CH) gray with yellowish brown, dry, soft, little sand, FILL	53	S-1	0	26	74	61	34	30	CH	
		2, 1, 3	4			33	S-2								
27.90	6.50				FAT CLAY (CH) dark bluish gray to dark greenish gray, wet, soft to medium stiff, trace sand										
		2, 1, 5	6			100	S-3								
					wet										
		2, 1, 1	2			93	S-4								
		1, 1, 2	3			100	S-5	0	7	93	81	49	49	CH	
9.40	25.00	0, 1, 2	3			100	S-6	0	1	99	92	48	51	MH	UU Results @ 25 ft: Su=777.6 psf
					ELASTIC SILT (MH) dark bluish gray to dark greenish gray, wet, soft to medium stiff, Inorganic High LL	90	DH-1139-2-SH-1								
		0, 1, 1	2			100	S-7								

(continued on next page)

DRILLING LOG (Cont Sheet)

INSTALLATION: Fort Eustis

PROJECT: Fort Eustis Dredged Material Management Area, Newport News, VA

COORDINATE SYSTEM: NAD 1983 StatePlane Virginia South FIPS 4502 Feet

VERTICAL: NAVD88

LOCATION COORDINATES: N: 3583809.69 E: 12035173.92

LOCATION METHOD:

ELEV	DEPTH	BLOWS/ 0.5ft	N	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	LABORATORY: Gravel	Sand	Fines	LL	PI	MC	ASTM Class	REMARKS
					ELASTIC SILT (MH) dark bluish gray to dark greenish gray, wet, soft to medium stiff, Inorganic High LL										
		0 1 1	2			100	S-8								
-4.60	39.00	1													
		2 6	8		SILTY, CLAYEY SAND (SC-SM) fine to medium sand; rapid dilatancy fines; brownish orange to dark gray, wet, loose	100	S-9								
		3 2 4	6			100	S-10								
		2 4 5	9			100	S-11	0	83	17	25	6	29	SC-SM	
		2 4 5	9			100	S-12								
-22.10	56.50				ELASTIC SILT (MH) fine sand; dark greenish gray, wet, very soft to medium stiff, trace sand, trace shell fragments										
		3 1 1	2			100	S-13								
		2 1 1	2			100	S-14								
						100	DH-1139-2-SH-2	0	4	96	86	43	68	MH	
					discontinue shell fragments										

(continued on next page)

DRILLING LOG (Cont Sheet)

INSTALLATION: Fort Eustis

PROJECT: Fort Eustis Dredged Material Management Area, Newport News, VA

COORDINATE SYSTEM: NAD 1983 StatePlane Virginia South FIPS 4502 Feet

VERTICAL: NAVD88

LOCATION COORDINATES: N: 3583809.69 E: 12035173.92

LOCATION METHOD:

ELEV	DEPTH	BLOWS/ 0.5ft	N	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	LABORATORY: Gravel	Sand	Fines	LL	PI	MC	ASTM Class	REMARKS
		0			ELASTIC SILT (MH) fine sand; dark greenish gray, wet, very soft to medium stiff, trace sand, trace shell fragments										
		0	1			100	S-15								
		1													
		1													
		2	4			100	S-16								
		2													
		2													
		3	5			100	S-17								
-45.60	80.00	2			Borehole finished at 80.0										80 - 80: 4.25" HSA

-35 -40 -45 -50 -55 -60 -65 -70

DRILLING LOG

DIVISION: North Atlantic
INSTALLATION: Fort Eustis
Sheet 1 of 3

1. PROJECT: Fort Eustis Dredged Material Management Area, Newport News, VA
10. COORDINATE SYSTEM: NAD 1983 StatePlane Virginia South FIPS 4502 Feet
VERTICAL: NAVD88
LOCATION COORDINATES: N: 3584520.25 E: 12035730.69
LOCATION METHOD:
2. HOLE NUMBER: DH-1139-03
3. DRILLING AGENCY: Corps of Engineers - CESAS
11. DATE BORING: STARTED Mar 05 2024 COMPLETED Mar 12 2024
4. NAME OF DRILLER: Doug Hutchins
12. HAMMER TYPE: Automatic
EFFICIENCY (%)
5. EQUIPMENT: CME 850
13. SIZE AND TYPE OF BIT: 4.25" HSA
6. DIRECTION OF BORING: Vertical
DEG FROM VERTICAL: 0
BEARING:
14. ELEVATION SURFACE: 33.5'
15. ELEVATION GROUND WATER:
7. THICKNESS OF OVERBURDEN: 80.0'
16. TOTAL NUMBER CORE BOXES:
8. DEPTH DRILLED INTO ROCK:
17. SIGNATURE AND TITLE OF INSPECTOR: Jack Kulaga
9. TOTAL DEPTH OF BORING: 80.0'

ELEV	DEPTH	BLOWS/0.5ft	N	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	LABORATORY: Gravel	Sand	Fines	LL	PI	MC	ASTM Class	REMARKS
		4 3 4	7		SILTY SAND (SM) fine to medium sand; non plastic fines; yellowish brown, dry, medium dense, trace clay	73	S-1								
29.50	4.00	2 4 4	8		(ML) low plasticity fines; dark gray to dark brownish gray, dry, medium stiff, trace clay, trace fine sand	100	S-2								29
27.00	6.50				POORLY GRADED SAND WITH SILT (SP-SM) fine to medium sand; non plastic fines; gray with brownish gray, moist to wet, very loose to loose, trace clay, no cementation										
		3 1 0	1			73	S-3								24
		2 3 3	6			100	S-4								19
14.30	19.20	2 2 2	4		LEAN CLAY (CL) moist to wet, medium stiff to stiff, little sand	80	S-5								14
		3 5 7	12			100	S-6	0	21	79	32	18	19	CL	9
6.50	27.00				SANDY SILT (ML) fine sand; low plasticity fines; brownish tan, moist to wet, medium stiff to stiff, trace clay										
		4 5 7	12			100	S-7								4

(continued on next page)

DRILLING LOG (Cont Sheet)

INSTALLATION: Fort Eustis

PROJECT: Fort Eustis Dredged Material Management Area, Newport News, VA

COORDINATE SYSTEM: NAD 1983 StatePlane Virginia South FIPS 4502 Feet

VERTICAL: NAVD88

LOCATION COORDINATES: N: 3584520.25 E: 12035730.69

LOCATION METHOD:

ELEV	DEPTH	BLOWS/ 0.5ft	N	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	LABORATORY: Gravel	Sand	Fines	LL	PI	MC	ASTM Class	REMARKS
					SANDY SILT (ML) fine sand; low plasticity fines; brownish tan, moist to wet, medium stiff to stiff, trace clay										
		3 4 3	7			0	S-8								
-3.50	37.00														
					LEAN CLAY (CL) bluish gray with brown, moist to wet, stiff, some sand										
		3 4 6	10			100	S-9	0	27	73	28	14	20	CL	
-8.50	42.00														
					POORLY GRADED SAND (SP) fine to medium sand; brown with gray, wet, medium dense, trace silt, no cementation										
		8 7 8	15			73	S-10								
-13.50	47.00														
					SANDY SILT (ML) low plasticity fines; bluish gray to dark gray, wet, very soft to stiff, Inorganic										
		3 3 3	6			100	S-11A								
							S11B								
		0 0 1	1			100	S-12								
						15	DH-113 9-3- SH-1	0	43	57	43	12	23	ML	UU Results @ 55 ft: Su=4896 psf
		0 0 0	WO H			100	S-13								
-28.50	62.00														
					FAT CLAY (CH) fine sand; dark greenish gray, wet, very soft, trace sand										7ft of sand up in auger. Pulled Augers out of ground to get sand out. went back into borehole with a centerplug and added water to keep the sand out of the augers
		0 0 0	WO H				S-14								

(continued on next page)

DRILLING LOG (Cont Sheet)

INSTALLATION: Fort Eustis

PROJECT: Fort Eustis Dredged Material Management Area, Newport News, VA

COORDINATE SYSTEM: NAD 1983 StatePlane Virginia South FIPS 4502 Feet

VERTICAL: NAVD88

LOCATION COORDINATES: N: 3584520.25 E: 12035730.69

LOCATION METHOD:

ELEV	DEPTH	BLOWS/ 0.5ft	N	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	LABORATORY: Gravel	Sand	Fines	LL	PI	MC	ASTM Class	REMARKS
		0 0 1	1		FAT CLAY (CH) fine sand; dark greenish gray, wet, very soft, trace sand	100	S-15	0	3	97	10 3	67	70	CH	
		0 0 0	WO H			100	S-16								
-46.50	80.00	0 0 1	1			100	S-17								
					Borehole finished at 80.0										

-36 -41 -46 -51 -56 -61 -66 -71

DRILLING LOG

DIVISION: North Atlantic

INSTALLATION: Fort Eustis

Sheet 1 of 3

1. PROJECT: Fort Eustis Dredged Material Management Area, Newport News, VA

10. COORDINATE SYSTEM: NAD 1983 StatePlane Virginia South FIPS 4502 Feet

VERTICAL: NAVD88

LOCATION COORDINATES: N: 3585165.29 E: 12035909.64

LOCATION METHOD:

2. HOLE NUMBER: DH-1139-04

3. DRILLING AGENCY: Corps of Engineers - CESAS

11. DATE BORING: STARTED Mar 13 2024; COMPLETED Mar 13 2024

4. NAME OF DRILLER: Doug Hutchins

12. HAMMER TYPE: Automatic

EFFICIENCY (%)

5. EQUIPMENT: CME 850

13. SIZE AND TYPE OF BIT: 4.25" HSA

6. DIRECTION OF BORING: Vertical; DEG FROM VERTICAL: 0; BEARING:

14. ELEVATION SURFACE: 33.8'

15. ELEVATION GROUND WATER:

7. THICKNESS OF OVERBURDEN: 80.0'

16. TOTAL NUMBER CORE BOXES:

8. DEPTH DRILLED INTO ROCK:

17. SIGNATURE AND TITLE OF INSPECTOR: Jack Kulaga

9. TOTAL DEPTH OF BORING: 80.0'

ELEV	DEPTH	BLOWS/0.5ft	N	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	LABORATORY: Gravel	Sand	Fines	LL	PI	MC	ASTM Class	REMARKS
		1 2 2	4		WELL GRADED SAND (SW) dark yellowish brown, moist, very loose to loose, trace silt, trace shell fragments, no cementation	73	S-1								
31.80	2.00				FAT CLAY (CH) dark blackish gray to brownish gray, moist, very soft to soft, little sand										
		0 1 1	2			100	S-2	0	24	76	78	47	47	CH	29
		0 0 1	1			100	S-3								24
		0 0 0	WOH			100	S-4								19
16.80	17.00				FAT CLAY (CH) dark gray to dark blackish gray, moist, very soft, trace sand										
		0 0 0	WOH			100	S-5	0	3	97	11 4	74	68	CH	14
		0 0 0	WOH			100	S-6								9
6.80	27.00				SANDY SILT (ML) low plasticity fines; tannish brown, dry to moist, stiff, trace clay										
		9 6 7	13			67	S-7								4

(continued on next page)

DRILLING LOG (Cont Sheet)

INSTALLATION: Fort Eustis

PROJECT: Fort Eustis Dredged Material Management Area, Newport News, VA

COORDINATE SYSTEM: NAD 1983 StatePlane Virginia South FIPS 4502 Feet

VERTICAL: NAVD88

LOCATION COORDINATES: N: 3585165.29 E: 12035909.64

LOCATION METHOD:

ELEV	DEPTH	BLOWS/ 0.5ft	N	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	LABORATORY: Gravel	Sand	Fines	LL	PI	MC	ASTM Class	REMARKS
					SANDY SILT (ML) low plasticity fines; tannish brown, dry to moist, stiff, trace clay										
		4 7 9	16			100	S-8								
-3.20	37.00														
					SILTY SAND (SM) rapid dilatancy fines; gray to reddish brown, wet, loose, weak cementation										
		2 2 6	8			80	S-9	0	69	31			27	SM	
		2 1 3	4			67	S-10								
-14.20	48.00														
-15.70	49.50	2 3	5		POORLY GRADED SAND WITH SILT (SP-SM) gray, wet, loose, some gravel, no cementation	100	S-11A	32	62	6			13	SP-SM	
		2			FAT CLAY (CH) bluish gray to dark gray, wet, soft, trace sand, trace gravel		S-11B	2	6	92	76	53	36	CH	
		0 1 1	2			100	S-12								Added water to keep sand out of augers
		0 0 0	WOH			100	S-13								
-29.70	63.50														
		0 0 0	WOH		FAT CLAY (CH) bluish gray to dark gray, wet, soft, trace sand	100	S-14	0	3	97	88	55	64	CH	

(continued on next page)

DRILLING LOG (Cont Sheet)

INSTALLATION: Fort Eustis

PROJECT: Fort Eustis Dredged Material Management Area, Newport News, VA

COORDINATE SYSTEM: NAD 1983 StatePlane Virginia South FIPS 4502 Feet

VERTICAL: NAVD88

LOCATION COORDINATES: N: 3585165.29 E: 12035909.64

LOCATION METHOD:

ELEV	DEPTH	BLOWS/ 0.5ft	N	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	LABORATORY: Gravel	Sand	Fines	LL	PI	MC	ASTM Class	REMARKS
		0 0 1	1		FAT CLAY (CH) bluish gray to dark gray, wet, soft, trace sand	100	S-15								
		0 0 1	1			100	S-16								
-46.20	80.00	0 1 1	2			100	S-17								
					Borehole finished at 80.0										

-36 -41 -46 -51 -56 -61 -66 -71

Boring Designation **DH-1139-05**

DRILLING LOG

DIVISION: North Atlantic

INSTALLATION: Fort Eustis

Sheet 1 of 3

1. PROJECT: Fort Eustis Dredged Material Management Area, Newport News, VA

10. COORDINATE SYSTEM: NAD 1983 StatePlane Virginia South FIPS 4502 Feet

VERTICAL: NAVD88

LOCATION COORDINATES: N: 3585863.37 E: 12036276.22

LOCATION METHOD:

2. HOLE NUMBER: DH-1139-05

3. DRILLING AGENCY: Corps of Engineers - CESAS

11. DATE BORING: STARTED Mar 14 2024 COMPLETED Mar 14 2024

4. NAME OF DRILLER: Doug Hutchins

12. HAMMER TYPE: Automatic

EFFICIENCY (%)

5. EQUIPMENT: CME 850

13. SIZE AND TYPE OF BIT: 4.25" HSA

6. DIRECTION OF BORING: Vertical | DEG FROM VERTICAL: 0 | BEARING:

14. ELEVATION SURFACE: 33.7'

15. ELEVATION GROUND WATER:

7. THICKNESS OF OVERBURDEN: 80.0'

16. TOTAL NUMBER CORE BOXES:

8. DEPTH DRILLED INTO ROCK:

17. SIGNATURE AND TITLE OF INSPECTOR: Jack Kulaga

9. TOTAL DEPTH OF BORING: 80.0'

ELEV	DEPTH	BLOWS/ 0.5ft	N	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	LABORATORY: Gravel	Sand	Fines	LL	PI	MC	ASTM Class	REMARKS
		3			POORLY GRADED SAND WITH SILT (SP-SM) fine to										
		3	6		medium sand; non plastic fines; yellowish brown, dry, loose,	80	S-1								
		3			trace clay, weak cementation										
31.70	2.00														
					FAT CLAY (CH) no toughness fines; dark blackish gray to										
					brownish gray, moist, very soft to soft, little sand										
		0													
		1	2			87	S-2	0	15	85	10 0	63	65	CH	
		1													
27.20	6.50														
					SANDY ELASTIC SILT (MH) fine to medium sand; medium										
					plasticity fines; dark gray, moist, very soft to soft, trace clay										
		1													
		1	2			73	S-3								
		1													
22.70	11.00														
					SANDY LEAN CLAY (CL) medium plasticity fines; brownish										
					gray, moist to wet, medium stiff, little wood, few gravel										
		1													
		1	2			100	S-4								
		1													
		4													
		3	5			67	S-5	6	26	68	44	24	29	CL	
		2													
9.70	24.00	6													
		9	18		POORLY GRADED SAND (SP) fine to medium sand; light	53	S-6								
		9			grayish brown, moist, medium dense, trace silt, no										
					cementation										
4.70	29.00	2													
		3	9		SANDY SILT (ML) fine sand; low plasticity fines; orangish	100	S-7								
		6			brown, moist, stiff, trace clay, trace wood										

(continued on next page)

DRILLING LOG (Cont Sheet)

INSTALLATION: Fort Eustis

PROJECT: Fort Eustis Dredged Material Management Area, Newport News, VA

COORDINATE SYSTEM: NAD 1983 StatePlane Virginia South FIPS 4502 Feet

VERTICAL: NAVD88

LOCATION COORDINATES: N: 3585863.37 E: 12036276.22

LOCATION METHOD:

ELEV	DEPTH	BLOWS/ 0.5ft	N	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	LABORATORY: Gravel	Sand	Fines	LL	PI	MC	ASTM Class	REMARKS
0.70	33.00				SANDY SILT (ML) fine sand; low plasticity fines; orangish brown, moist, stiff, trace clay, trace wood										
		3 9 7	16		SILTY SAND (SM) fine to medium sand; non plastic fines; orangish brown with light gray, moist to wet, medium dense, trace clay	100	S-8								
-3.30	37.00				(CL-ML) low plasticity fines; bluish gray with brown, moist to wet, medium stiff, trace fine sand, weak cementation										
		2 3 2	5			100	S-9								
-10.30	44.00	5													
		8 9	17		POORLY GRADED SAND (SP) fine to medium sand; light gray, wet, medium dense, trace silt, no cementation	100	S-10								
-13.80	47.50				FAT CLAY (CH) bluish gray to dark gray, wet, soft to medium stiff, trace fine sand										
		3 2 4	6			100	S-11	0	6	94	57	28	34	CH	
		2 2 2	4			100	S-12								Added water into the augers to keep the sand out
		2 2 2	4			100	S-13								
-28.30	62.00				FAT CLAY (CH) fine sand; high plasticity fines; dark greenish gray, wet, very soft to soft, trace silt, little fine sand										
		2 1 2	3			100	S-14								
						100	DH-1139-5-SH-1	0	14	86	56	28	55	CH	UU Results @ 65 ft: Su=1454.4 psf

(continued on next page)

DRILLING LOG (Cont Sheet)

INSTALLATION: Fort Eustis

PROJECT: Fort Eustis Dredged Material Management Area, Newport News, VA

COORDINATE SYSTEM: NAD 1983 StatePlane Virginia South FIPS 4502 Feet

VERTICAL: NAVD88

LOCATION COORDINATES: N: 3585863.37 E: 12036276.22

LOCATION METHOD:

ELEV	DEPTH	BLOWS/ 0.5ft	N	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	LABORATORY: Gravel	Sand	Fines	LL	PI	MC	ASTM Class	REMARKS
		2 1 1	2		FAT CLAY (CH) fine sand; high plasticity fines; dark greenish gray, wet, very soft to soft, trace silt, little fine sand	100	S-15								
		2 1 2	3			100	S-16								
-46.30	80.00	1 2 1	3			100	S-17								
					Borehole finished at 80.0										

-36 -41 -46 -51 -56 -61 -66 -71

DRILLING LOG

DIVISION: North Atlantic

INSTALLATION: Fort Eustis

Sheet 1 of 3

1. PROJECT: Fort Eustis Dredged Material Management Area, Newport News, VA

10. COORDINATE SYSTEM: NAD 1983 StatePlane Virginia South FIPS 4502 Feet

VERTICAL: NAVD88

LOCATION COORDINATES: N: 3585417.87 E: 12036697.00

LOCATION METHOD:

2. HOLE NUMBER: DH-1139-06

3. DRILLING AGENCY: Corps of Engineers - CESAS

11. DATE BORING: STARTED Mar 15 2024; COMPLETED Mar 15 2024

4. NAME OF DRILLER: Doug Hutchins

12. HAMMER TYPE: Automatic

EFFICIENCY (%):

5. EQUIPMENT: CME 850

13. SIZE AND TYPE OF BIT: 4.25" HSA

6. DIRECTION OF BORING: Vertical; DEG FROM VERTICAL: 0; BEARING:

14. ELEVATION SURFACE: 33.3'

15. ELEVATION GROUND WATER:

7. THICKNESS OF OVERBURDEN: 80.0'

16. TOTAL NUMBER CORE BOXES:

8. DEPTH DRILLED INTO ROCK:

17. SIGNATURE AND TITLE OF INSPECTOR: Jack Kulaga

9. TOTAL DEPTH OF BORING: 80.0'

ELEV	DEPTH	BLOWS/0.5ft	N	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	LABORATORY: Gravel	Sand	Fines	LL	PI	MC	ASTM Class	REMARKS
		3 4 5	9		SANDY FAT CLAY (CH) fine to medium sand; dark yellowish brown, dry, loose	60	S-1	0	45	55	57	29	25	CH	
29.30	4.00	1													
		1 1	2		SANDY ELASTIC SILT (MH) fine to medium sand; medium plasticity fines; dark gray, moist, very soft to soft, trace clay, trace peat	20	S-2								29
		0 0 1	1			100	S-3								24
21.30	12.00														
		1 2 2	4		(CL-ML) low plasticity fines; gray to yellowish brown, moist, soft to medium stiff, trace fine sand, no cementation	100	S-4								19
16.30	17.00														
		1 1 1	2		FAT CLAY (CH) brownish gray to greenish gray, moist to wet, very soft to medium stiff, trace peat, trace silt, trace fine sand	100	S-5	0	2	98	10 9	69	69	CH	14
		0 0 0	WOH			100	S-6								9
6.30	27.00														
		2 8 11	19		POORLY GRADED SAND WITH SILT (SP-SM) fine to medium sand; low plasticity fines; light orangish brown, moist to wet, medium dense, trace clay, trace wood	100	S-7								4

(continued on next page)

DRILLING LOG (Cont Sheet)

INSTALLATION: Fort Eustis

PROJECT: Fort Eustis Dredged Material Management Area, Newport News, VA

COORDINATE SYSTEM: NAD 1983 StatePlane Virginia South FIPS 4502 Feet

VERTICAL: NAVD88

LOCATION COORDINATES: N: 3585417.87 E: 12036697.00

LOCATION METHOD:

ELEV	DEPTH	BLOWS/ 0.5ft	N	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	LABORATORY: Gravel	Sand	Fines	LL	PI	MC	ASTM Class	REMARKS
1.30	32.00				POORLY GRADED SAND WITH SILT (SP-SM) fine to medium sand; low plasticity fines; light orangish brown, moist to wet, medium dense, trace clay, trace wood										
		2 4 7	11		POORLY GRADED SAND (SP) fine to medium sand; pale brownish gray to dark brownish orange, wet, medium dense, trace silt, no cementation	60	S-8								-1
-5.70	39.00	2													
		3 4	7		SILTY SAND (SM) fine to medium sand; light gray, wet, loose, no cementation	100	S-9								-6
		3 3 6	9			100	S-10	1	85	14			26	SM	-11
-13.70	47.00														
		2 2 2	4		ELASTIC SILT (MH) low plasticity fines; bluish gray to dark gray, wet, very soft to soft, few fine sand, Inorganic High LL	100	S-11								-16
		2 1 1	2			100	S-12	0	6	94	83	41	57	MH	-21
		1 1 2	3			100	S-13								-26
-28.70	62.00														
		0 0 1	1		ELASTIC SILT (MH) dark greenish gray, wet, very soft to soft, trace sand, Inorganic High LL	100	S-14								-31
						100	DH-1139-6-SH-1	0	2	98	93	36	73	MH	UU Results @ 65 ft: Su=1756.8 psf

(continued on next page)

DRILLING LOG (Cont Sheet)

INSTALLATION: Fort Eustis

PROJECT: Fort Eustis Dredged Material Management Area, Newport News, VA

COORDINATE SYSTEM: NAD 1983 StatePlane Virginia South FIPS 4502 Feet

VERTICAL: NAVD88

LOCATION COORDINATES: N: 3585417.87 E: 12036697.00

LOCATION METHOD:

ELEV	DEPTH	BLOWS/ 0.5ft	N	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	LABORATORY: Gravel	Sand	Fines	LL	PI	MC	ASTM Class	REMARKS
		1			ELASTIC SILT (MH) dark greenish gray, wet, very soft to soft,										
		1	2		trace sand, Inorganic High LL	100	S-15								
		1													
		0													
		0	1			100	S-16								
		1													
-43.20	76.50														
					(CL-ML) low plasticity fines; grayish green, moist to wet,										
		1			medium stiff, trace shell fragments, trace fine sand										
		3	7			100	S-17								
-46.70	80.00	4													
					Borehole finished at 80.0										

-36 -41 -46 -51 -56 -61 -66 -71

DRILLING LOG

DIVISION: North Atlantic
INSTALLATION: Fort Eustis
Sheet 1 of 3

1. PROJECT: Fort Eustis Dredged Material Management Area, Newport News, VA
10. COORDINATE SYSTEM: NAD 1983 StatePlane Virginia South FIPS 4502 Feet
VERTICAL: NAVD88
LOCATION COORDINATES: N: 3584596.21 E: 12037198.00
LOCATION METHOD:
2. HOLE NUMBER: DH-1139-07
3. DRILLING AGENCY: Corps of Engineers - CESAS
11. DATE BORING: STARTED Mar 04 2024; COMPLETED Mar 05 2024
4. NAME OF DRILLER: Doug Hutchins
12. HAMMER TYPE: Automatic
EFFICIENCY (%)
5. EQUIPMENT: CME 850
13. SIZE AND TYPE OF BIT: 4.25" HSA
6. DIRECTION OF BORING: Vertical; DEG FROM VERTICAL: 0; BEARING:
14. ELEVATION SURFACE: 34.2'
15. ELEVATION GROUND WATER:
7. THICKNESS OF OVERBURDEN: 80.0'
16. TOTAL NUMBER CORE BOXES:
8. DEPTH DRILLED INTO ROCK:
17. SIGNATURE AND TITLE OF INSPECTOR: Jack Kulaga
9. TOTAL DEPTH OF BORING: 80.0'

ELEV	DEPTH	BLOWS/0.5ft	N	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	LABORATORY: Gravel	Sand	Fines	LL	PI	MC	ASTM Class	REMARKS
33.70	0.50	2			Topsoil, SANDY SILT (ML) Inorganic		S-1A	0	45	55	47	19	25	ML	
		3	6		SILTY SAND (SM) fine sand; low plasticity fines; yellowish brown, dry, loose, shell fragments	80	S-1B	0	65	35			20	SM	
		3													
30.70	3.50														
		0			LEAN CLAY (CL) medium plasticity fines; gray, moist to wet, very soft to soft, trace peat, trace silt, trace fine sand										
		0	1			13	S-2								
		1													
		0													
		0	WO			100	S-3								
		0	H												
						0									
		0													
		2	4			67	S-4								
		2													
15.20	19.00	1													
		1	2		ELASTIC SILT (MH) dark gray, wet, very soft to soft, trace sand, Inorganic High LL	100	S-5								
		1													
		0													
		0	WO			100	S-6	0	1	99	11 2	64	81	MH	
		0	H												
7.20	27.00														
					SANDY SILT (ML) fine to medium sand; low plasticity fines; tannish brown, wet, stiff, trace clay										
		3													
		6	15			80	S-7								
		9													

(continued on next page)

DRILLING LOG (Cont Sheet)

INSTALLATION: Fort Eustis

PROJECT: Fort Eustis Dredged Material Management Area, Newport News, VA

COORDINATE SYSTEM: NAD 1983 StatePlane Virginia South FIPS 4502 Feet

VERTICAL: NAVD88

LOCATION COORDINATES: N: 3584596.21 E: 12037198.00

LOCATION METHOD:

ELEV	DEPTH	BLOWS/ 0.5ft	N	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	LABORATORY: Gravel	Sand	Fines	LL	PI	MC	ASTM Class	REMARKS
					SANDY SILT (ML) fine to medium sand; low plasticity fines; tannish brown, wet, stiff, trace clay										
0.20	34.00	2													
		6	14		SILTY, CLAYEY SAND (SC-SM) fine to medium sand; rapid dilatancy fines; light gray, wet, loose to medium dense, no cementation	100	S-8								0
		8													
		2													
		5	10			53	S-9								-5
		5													
		1													
		1	7			73	S-10								-10
		6													
		2													
		6	14			73	S-11								-15
		8													pumped water down augers to keep sand out
		4													
		3	10			100	S-12	4	82	14	23	5	24	SC-SM	-20
		7													
-22.30	56.50				SANDY SILT (ML) fine sand; low plasticity fines; dark greenish gray, wet, medium stiff, few shell fragments, trace clay										
		1													
		3	5			100	S-13								-25
		2													
		2													
		2	5			100	S-14								-30
		3													
-32.30	66.50				SANDY SILT (CL-ML) fine sand; non plastic fines; greenish gray, wet, medium stiff, few shell fragments, trace fine sand										

(continued on next page)

DRILLING LOG (Cont Sheet)

INSTALLATION: Fort Eustis

PROJECT: Fort Eustis Dredged Material Management Area, Newport News, VA

COORDINATE SYSTEM: NAD 1983 StatePlane Virginia South FIPS 4502 Feet

VERTICAL: NAVD88

LOCATION COORDINATES: N: 3584596.21 E: 12037198.00

LOCATION METHOD:

ELEV	DEPTH	BLOWS/ 0.5ft	N	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	LABORATORY: Gravel	Sand	Fines	LL	PI	MC	ASTM Class	REMARKS
		2 3 3	6		SANDY SILT (CL-ML) fine sand; non plastic fines; greenish gray, wet, medium stiff, few shell fragments, trace fine sand	80	S-15								
		2 2 4	6			100	S-16								
		3 3	7			100	S-17								
-45.80	80.00	4			Borehole finished at 80.0										

-35 -40 -45 -50 -55 -60 -65 -70

DRILLING LOG

DIVISION: North Atlantic
INSTALLATION: Fort Eustis
Sheet 1 of 3

1. PROJECT: Fort Eustis Dredged Material Management Area, Newport News, VA
10. COORDINATE SYSTEM: NAD 1983 StatePlane Virginia South FIPS 4502 Feet
VERTICAL: NAVD88
LOCATION COORDINATES: N: 3583768.43 E: 12036436.66
LOCATION METHOD:
2. HOLE NUMBER: DH-1139-08
3. DRILLING AGENCY: Corps of Engineers - CESAS
11. DATE BORING: STARTED Mar 03 2024 COMPLETED Mar 03 2024
4. NAME OF DRILLER: Doug Hutchins
12. HAMMER TYPE: Automatic
EFFICIENCY (%)
5. EQUIPMENT: CME 850
13. SIZE AND TYPE OF BIT: 4.25" HSA
6. DIRECTION OF BORING: Vertical
DEG FROM VERTICAL: 0
BEARING:
14. ELEVATION SURFACE: 34.0'
15. ELEVATION GROUND WATER:
7. THICKNESS OF OVERBURDEN: 80.0'
16. TOTAL NUMBER CORE BOXES:
8. DEPTH DRILLED INTO ROCK:
17. SIGNATURE AND TITLE OF INSPECTOR: Jack Kulaga
9. TOTAL DEPTH OF BORING: 80.0'

ELEV	DEPTH	BLOWS/0.5ft	N	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	LABORATORY: Gravel	Sand	Fines	LL	PI	MC	ASTM Class	REMARKS
		3 4 6	10		SILTY SAND (SM) fine to medium sand; light yellowish brown, dry to moist, loose to medium dense, trace clay, no cementation	67	S-1								
31.50	2.50														
		1 1 2	3		(CL-ML) low plasticity fines; dark gray, moist, soft, trace fine sand	87	S-2								
27.50	6.50														
		1 1 3	4		ELASTIC SILT (MH) medium plasticity fines; dark gray to, moist to wet, soft to medium stiff, some sand, trace peat, Inorganic High LL	100	S-3	0	27	73	71	36	46	MH	
		1 1 2	3			100	S-4								
		1 2 3	5			100	S-5								
10.50	23.50														
		1 2 2	4		ELASTIC SILT WITH SAND (MH) dark gray, moist to wet, soft to medium stiff, trace peat, Inorganic High LL	100	S-6	0	18	82	86	46	45	MH	
					more peat										
7.00	27.00														
		1 2 1	3		FAT CLAY (CH) high plasticity fines; dark gray, wet, soft, trace silt, trace fine sand	100	S-7								

29 24 19 14 9 4

(continued on next page)

DRILLING LOG (Cont Sheet)

INSTALLATION: Fort Eustis

PROJECT: Fort Eustis Dredged Material Management Area, Newport News, VA

COORDINATE SYSTEM: NAD 1983 StatePlane Virginia South FIPS 4502 Feet

VERTICAL: NAVD88

LOCATION COORDINATES: N: 3583768.43 E: 12036436.66

LOCATION METHOD:

ELEV	DEPTH	BLOWS/ 0.5ft	N	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	LABORATORY: Gravel	Sand	Fines	LL	PI	MC	ASTM Class	REMARKS
2.00	32.00				FAT CLAY (CH) high plasticity fines; dark gray, wet, soft, trace silt, trace fine sand	0									
		6 8 9	17		SANDY SILT (ML) fine sand; low plasticity fines; light gray with dark brownish yellow, wet, very stiff, trace clay	100	S-8								
-5.20	39.20	3 8 10	18		POORLY GRADED SAND (SP) fine to medium sand; pale brownish gray to dark brownish orange, wet, medium dense, trace silt, no cementation	80	S-9								
		7 9 10	19			67	S-10								
-12.50	46.50				ELASTIC SILT (MH) dark gray, wet, very soft, trace sand, Inorganic High LL										
		0 0 0	WO H			100	S-11	0	3	97	86	48	69	MH	
-18.00	52.00				CLAYEY SAND (SC) fine sand; medium plasticity fines; dark greenish brown, wet, loose, few silt, no cementation										
		0 1 4	5			100	S-12								
-22.50	56.50				SANDY FAT CLAY (CH) fine sand; high plasticity fines; dark greenish gray, wet, very soft to soft, few shell fragments, trace silt										used water to keep sand out of augers
		1 1 1	2			100	S-13								
-28.00	62.00				SANDY SILT (CL-ML) fine sand; non plastic fines; bluish gray, wet, medium stiff, trace fine sand										
		4 3 3	6			100	S-14								

(continued on next page)

DRILLING LOG (Cont Sheet)

INSTALLATION: Fort Eustis

PROJECT: Fort Eustis Dredged Material Management Area, Newport News, VA

COORDINATE SYSTEM: NAD 1983 StatePlane Virginia South FIPS 4502 Feet

VERTICAL: NAVD88

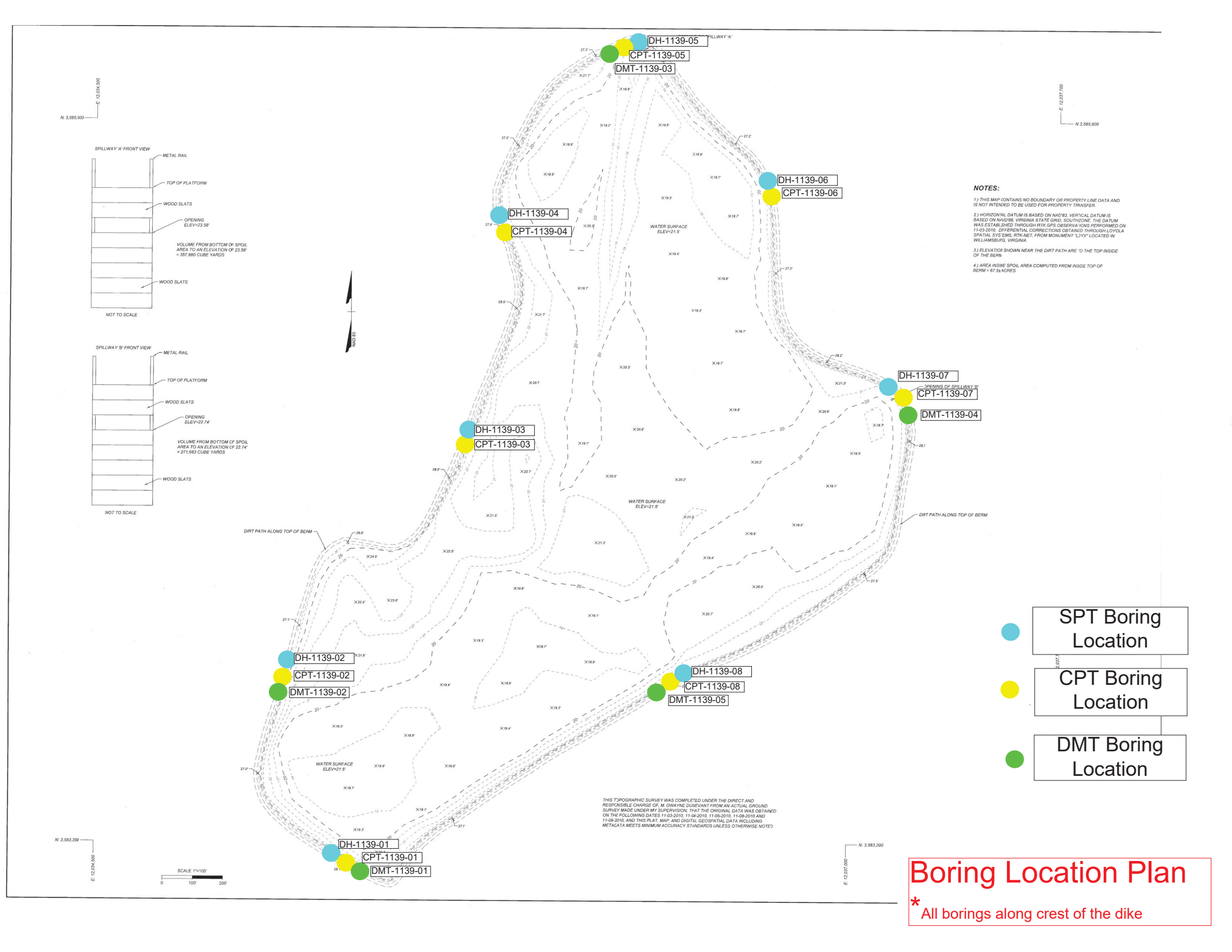
LOCATION COORDINATES: N: 3583768.43 E: 12036436.66

LOCATION METHOD:

ELEV	DEPTH	BLOWS/ 0.5ft	N	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	LABORATORY: Gravel	Sand	Fines	LL	PI	MC	ASTM Class	REMARKS
		3			SANDY SILT (CL-ML) fine sand; non plastic fines; bluish gray, wet, medium stiff, trace fine sand										
		3	6			100	S-15								
		3													
		1													
		3	6			100	S-16								
		3													
		2													
		3	7			100	S-17								
-46.00	80.00	4			Borehole finished at 80.0										

-36 -41 -46 -51 -56 -61 -66 -71

CPT boring logs


DH-1139-05
CPT-1139-05
DMT-1139-03
DH-1139-06
CPT-1139-06
DH-1139-04
CPT-1139-04
DH-1139-07
CPT-1139-07
DMT-1139-04
DH-1139-03
CPT-1139-03
DH-1139-02
CPT-1139-02
DMT-1139-02
DH-1139-08
CPT-1139-08
DMT-1139-05
DH-1139-01
CPT-1139-01
DMT-1139-01
SPILLWAY 'A' FRONT VIEW
METAL RAIL
TOP OF PLATFORM
WOOD SLATS
OPENING ELEV=23.58'
VOLUME FROM BOTTOM OF SPOIL AREA TO AN ELEVATION OF 23.58' = 357,880 CUBE YARDS
WOOD SLATS
NOT TO SCALE
SPILLWAY 'B' FRONT VIEW
METAL RAIL
TOP OF PLATFORM
WOOD SLATS
OPENING ELEV=22.74'
VOLUME FROM BOTTOM OF SPOIL AREA TO AN ELEVATION OF 22.74' = 271,663 CUBE YARDS
WOOD SLATS
NOT TO SCALE
NAD 83
WATER SURFACE ELEV=21.5'
DIRT PATH ALONG TOP OF BERM
DIRT PATH ALONG TOP OF BERM
SCALE 1"=100'
0
100'
200'
NOTES:
1.) THIS MAP CONTAINS NO BOUNDARY OR PROPERTY LINE DATA AND IS NOT INTENDED TO BE USED FOR PROPERTY TRANSFER.
2.) HORIZONTAL DATUM IS BASED ON NAD'83, VERTICAL DATUM IS BASED ON NAVD'88, VIRGINIA STATE GRID, SOUTHZONE. THE DATUM WAS ESTABLSHED THROUGH RTK GPS OBSERVATIONS PERFORMED ON 11-03-2010. DIFFERENTIAL CORRECTIONS OBTAINED THROUGH LOYOLA SPATIAL SYSTEMS, RTK-NET, FROM MONUMENT "LJYX" LOCATED IN WILLIAMSBURG, VIRGINIA.
3.) ELEVATION SHOWN NEAR THE DIRT PATH ARE TO THE TOP INSIDE OF THE BERM
4.) AREA INSIDE SPOIL AREA COMPUTED FROM INSIDE TOP OF BERM = 67.5± ACRES
THIS TOPOGRAPHIC SURVEY WAS COMPLETED UNDER THE DIRECT AND RESPONSIBLE CHARGE OF, M. DWAYNE DUVEVANT FROM AN ACTUAL GROUND SURVEY MADE UNDER MY SUPERVISION; THAT THE ORIGINAL DATA WAS OBTAINED ON THE FOLLOWING DATES 11-03-2010, 11-04-2010, 11-05-2010, 11-08-2010 AND 11-09-2010, AND THIS PLAT, MAP, AND DIGITAL GEOSPATIAL DATA INCLUDING METACATA MEETS MINIMUM ACCURACY STANDARDS UNLESS OTHERWISE NOTED.
SPT Boring Location
CPT Boring Location
DMT Boring Location
Boring Location Plan
* All borings along crest of the dike

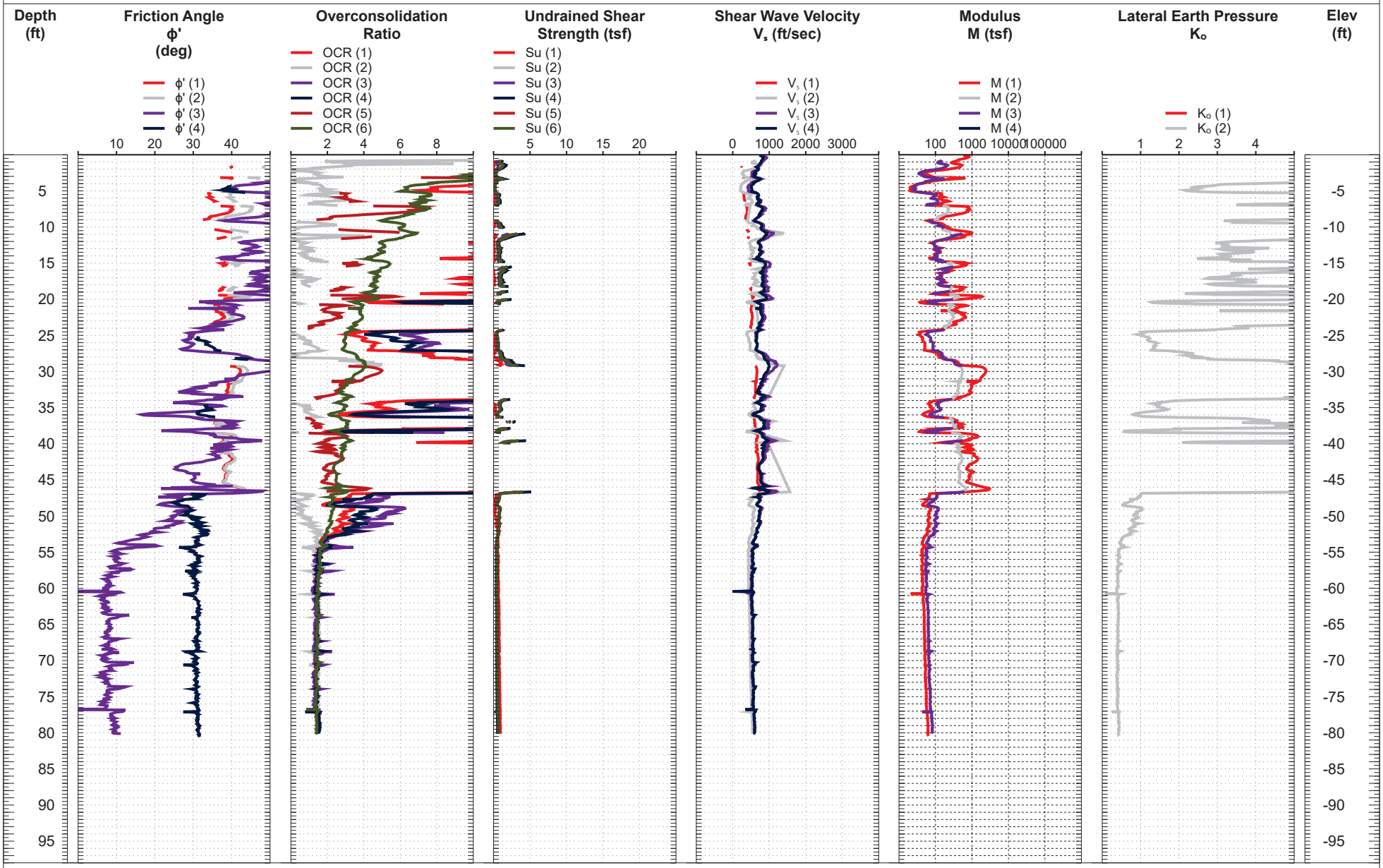
Fort Eustis Dredged Material Management Area
Newport News, VA
Project Number: 2024-SAS-ES-GT-ML-FEDMMA

Cone Penetration Test CPT-1139-01

Date: 28-Feb-2024
Estimated Water Depth: 0.0 ft
Rig/Operator: SAS-Vertek CPT Rig/Colby Brown

Latitude: 37.148308
Longitude: -76.604210
Elevation:

Total Depth: 80.4 ft
Termination Criteria:
Cone Size: 10 cm²



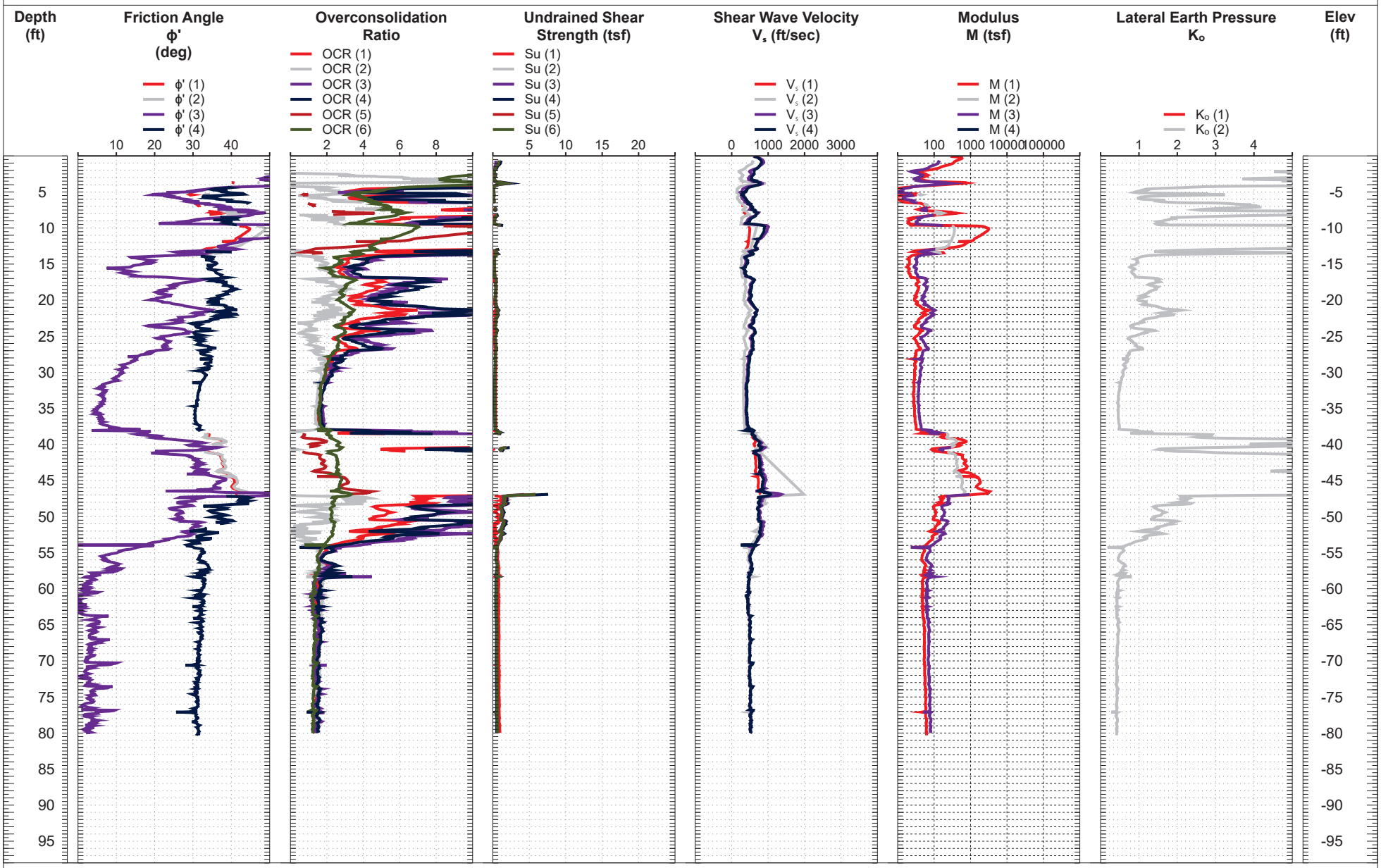
Fort Eustis Dredged Material Management Area
Newport News, VA
Project Number: 2024-SAS-ES-GT-ML-FEDMMA

Cone Penetration Test CPT-1139-02

Date: 28-Feb-2024
Estimated Water Depth: 0.0 ft
Rig/Operator: SAS-Vertek CPT Rig/Colby Brown

Latitude: 37.148311
Longitude: -76.604167
Elevation:

Total Depth: 80.3 ft
Termination Criteria:
Cone Size: 10 cm²



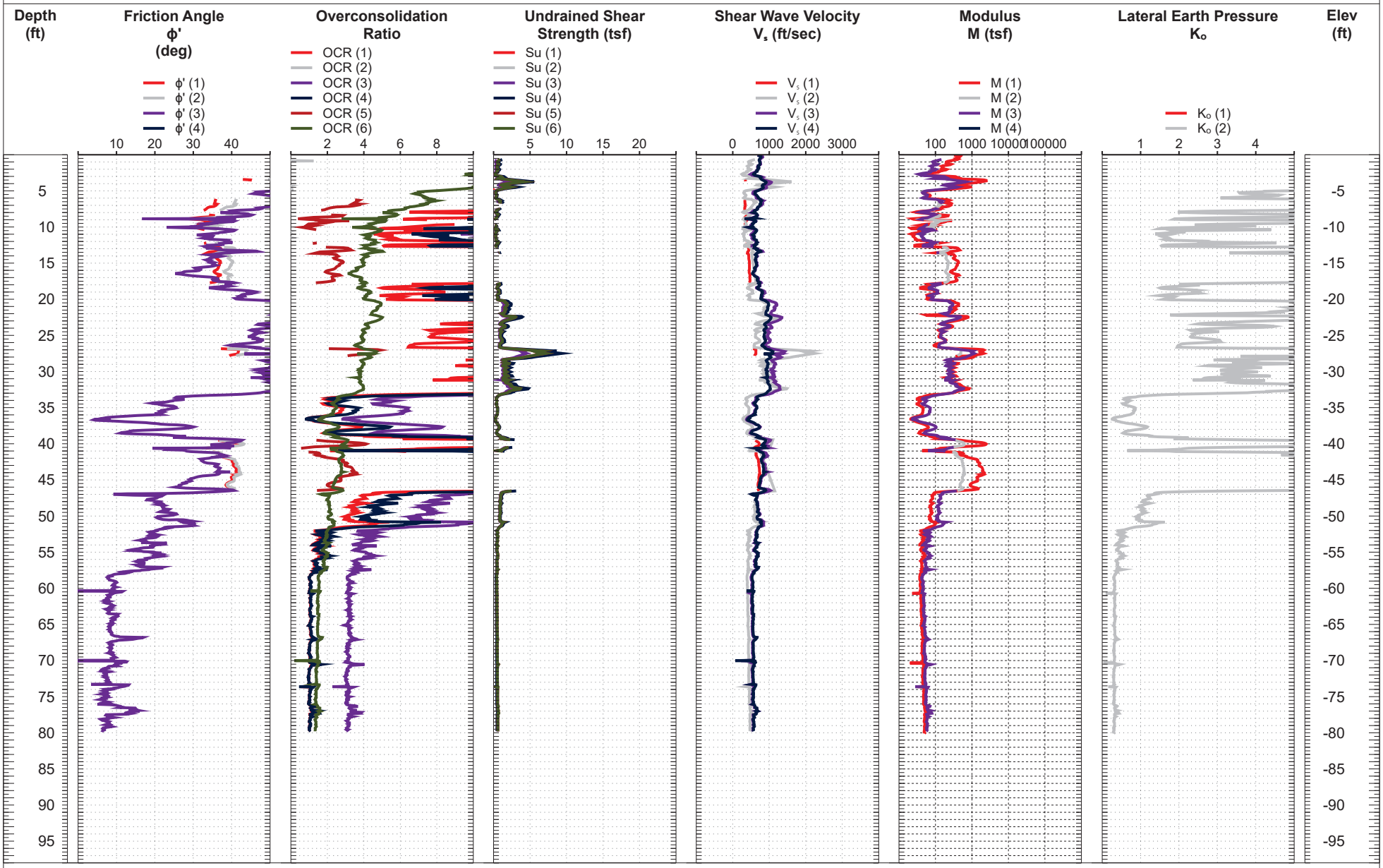
Fort Eustis Dredged Material Management Area
Newport News, VA
Project Number: 2024-SAS-ES-GT-ML-FEDMMA

Cone Penetration Test CPT-1139-03

Date: 27-Feb-2024
Estimated Water Depth: 0.0 ft
Rig/Operator: SAS-Vertek CPT Rig/Colby Brown

Latitude: 37.152180
Longitude: -76.603007
Elevation:

Total Depth: 80.1 ft
Termination Criteria:
Cone Size: 10 cm²



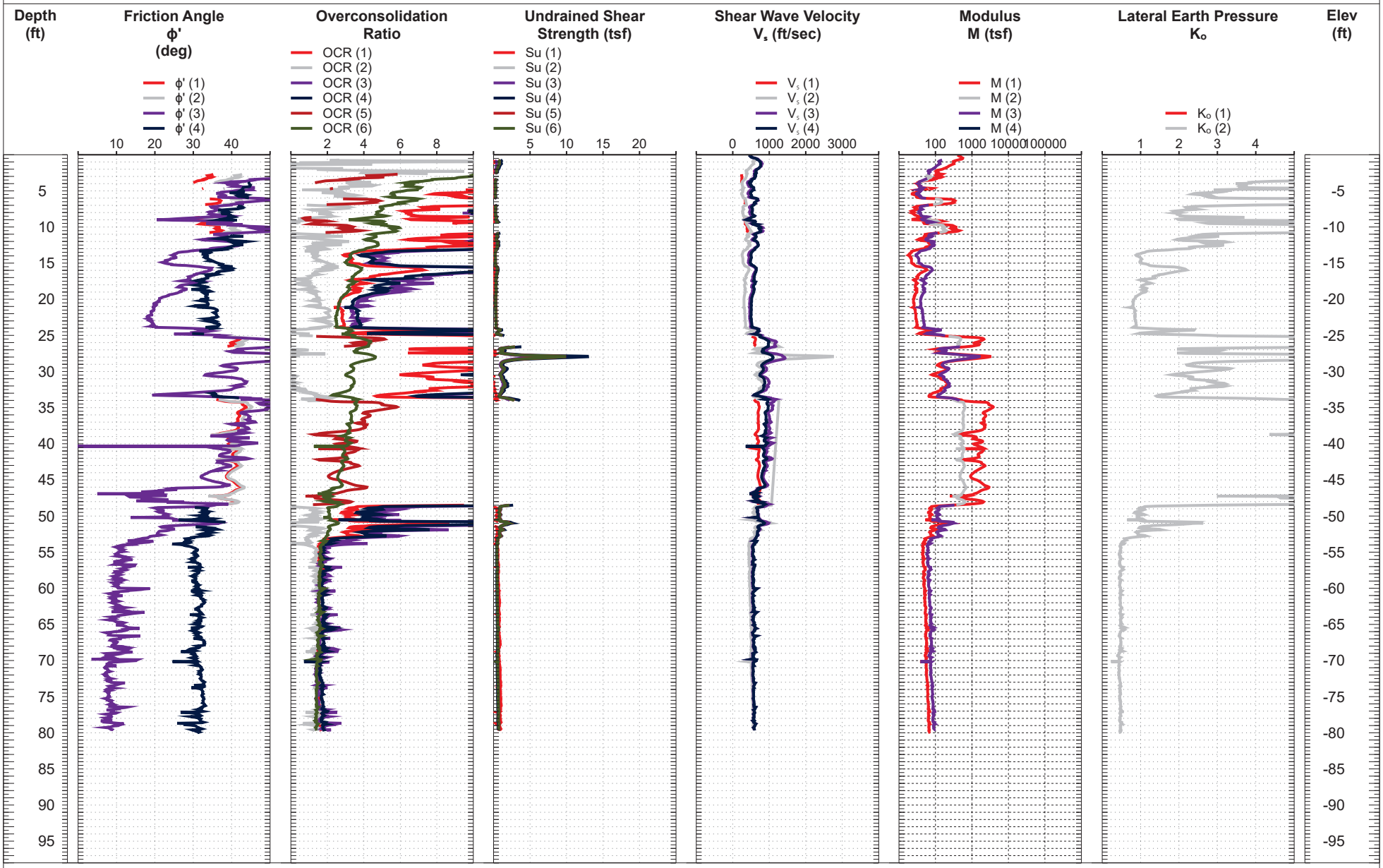
Fort Eustis Dredged Material Management Area
Newport News, VA
Project Number: 2024-SAS-ES-GT-ML-FEDMMA

Cone Penetration Test CPT-1139-04

Date: 27-Feb-2024
Estimated Water Depth: 0.0 ft
Rig/Operator: SAS-Vertek CPT Rig/Colby Brown

Latitude: 37.153942
Longitude: -76.602349
Elevation:

Total Depth: 80.0 ft
Termination Criteria:
Cone Size: 10 cm²



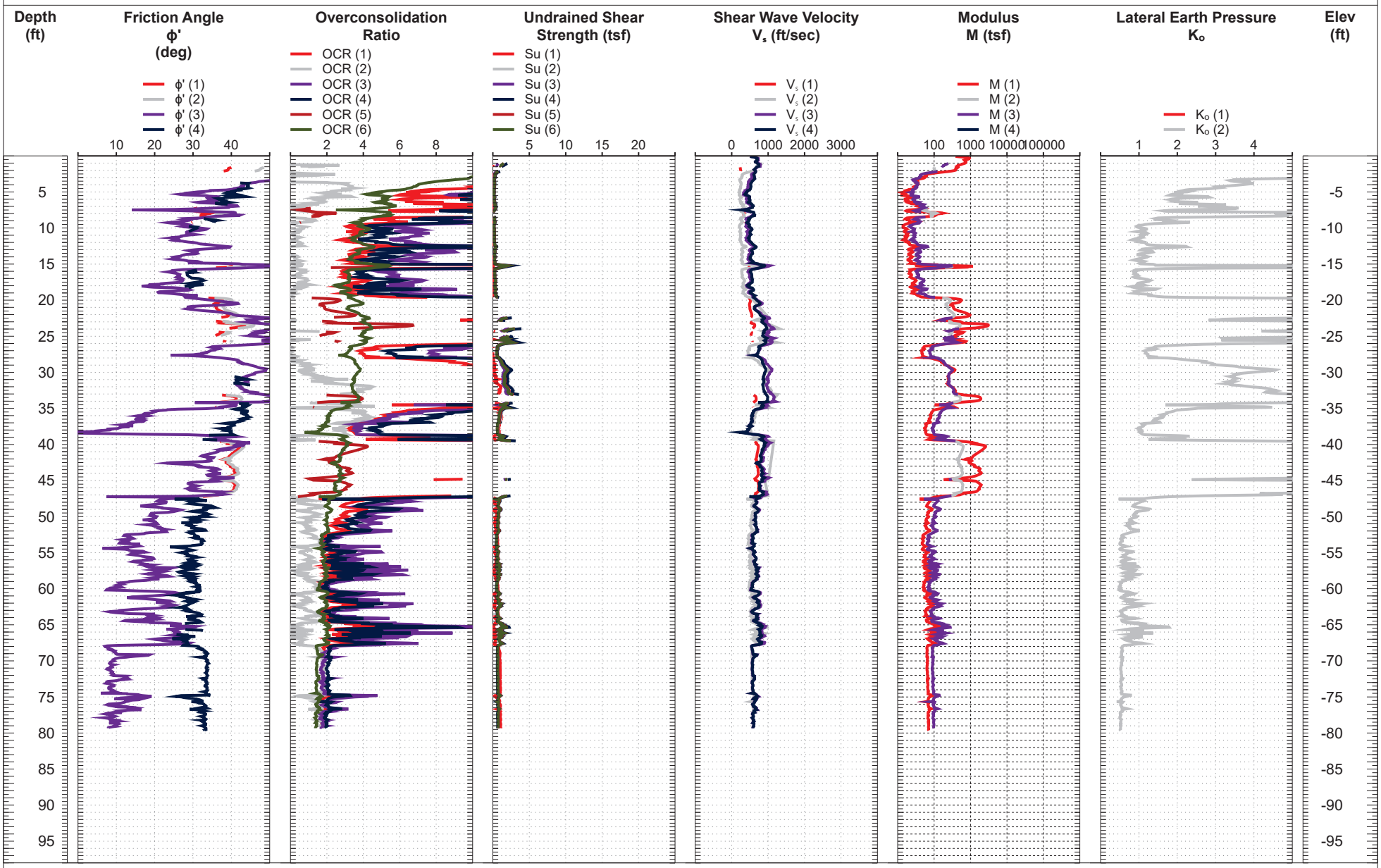
Fort Eustis Dredged Material Management Area
Newport News, VA
Project Number: 2024-SAS-ES-GT-ML-FEDMMA

Cone Penetration Test CPT-1139-05

Date: 27-Feb-2024
Estimated Water Depth: 0.0 ft
Rig/Operator: SAS-Vertek CPT Rig/Colby Brown

Latitude: 37.155839
Longitude: -76.601043
Elevation:

Total Depth: 79.7 ft
Termination Criteria:
Cone Size: 10 cm²



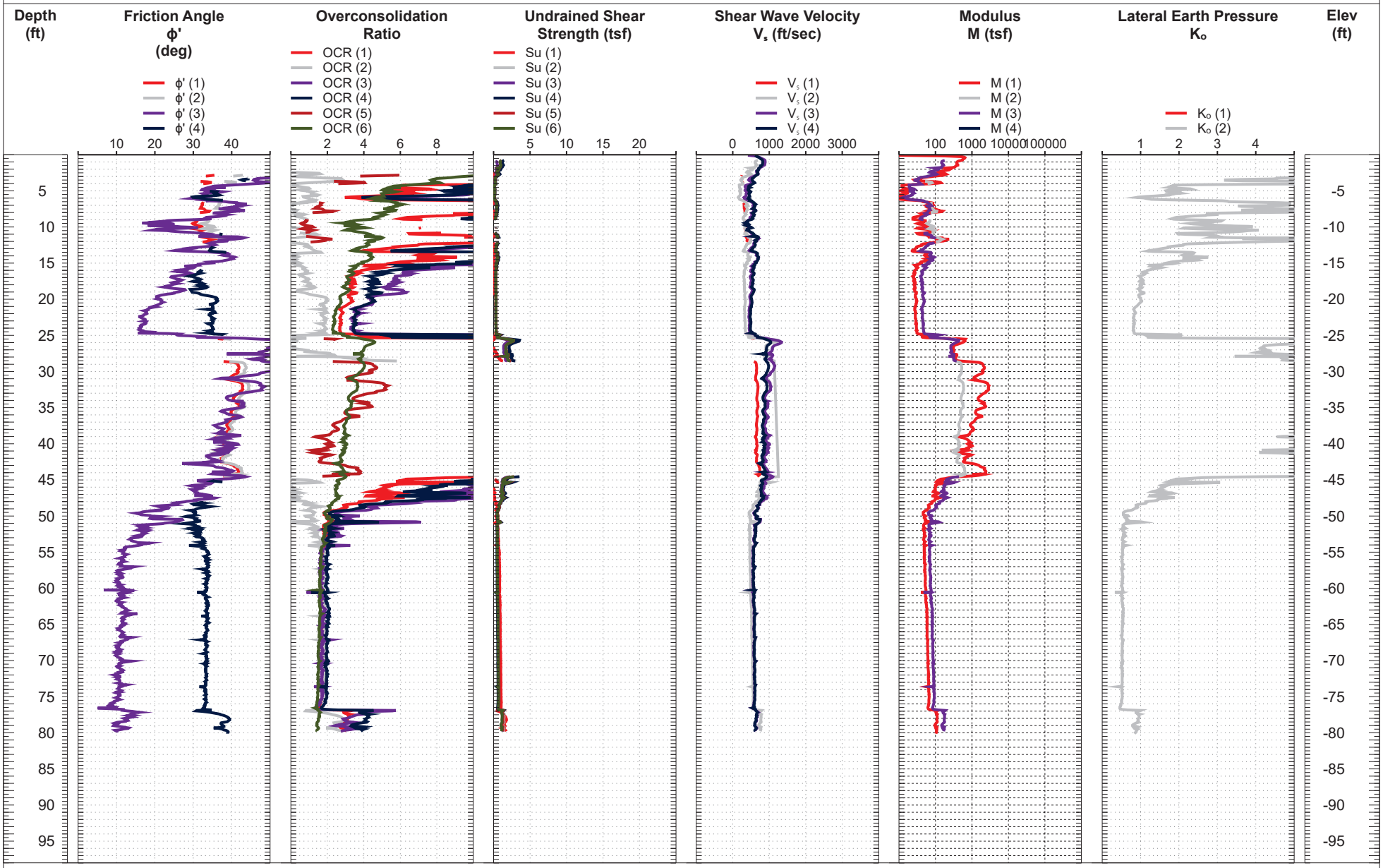
Fort Eustis Dredged Material Management Area
Newport News, VA
Project Number: 2024-SAS-ES-GT-ML-FEDMMA

Cone Penetration Test CPT-1139-06

Date: 28-Feb-2024
Estimated Water Depth: 0.0 ft
Rig/Operator: SAS-Vertek CPT Rig/Colby Brown

Latitude: 37.269312
Longitude: -76.675945
Elevation:

Total Depth: 80.1 ft
Termination Criteria:
Cone Size: 10 cm²



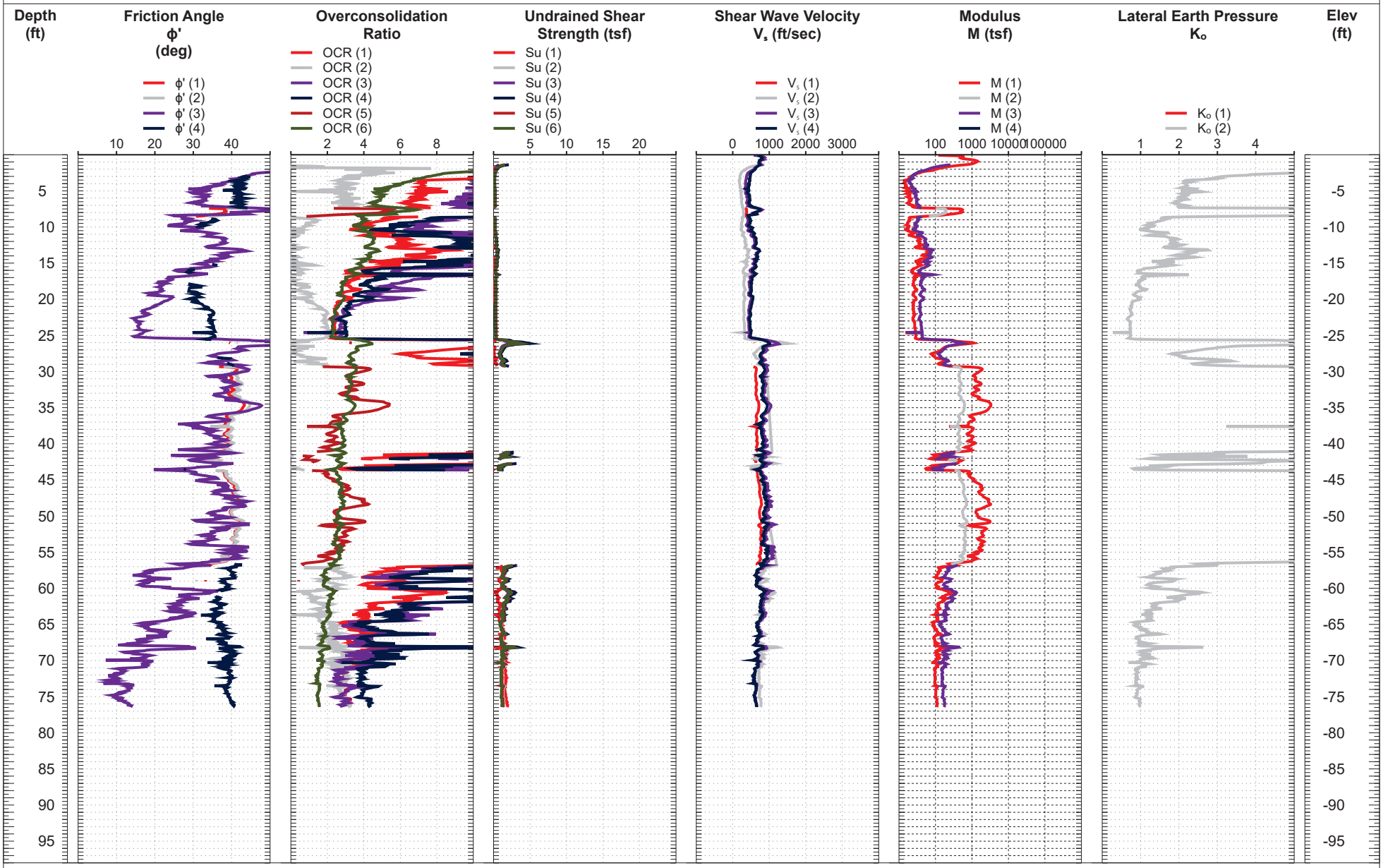
Fort Eustis Dredged Material Management Area
Newport News, VA
Project Number: 2024-SAS-ES-GT-ML-FEDMMA

Cone Penetration Test CPT-1139-07

Date: 28-Feb-2024
Estimated Water Depth: 0.0 ft
Rig/Operator: SAS-Vertek CPT Rig/Colby Brown

Latitude: 37.152304
Longitude: -76.597955
Elevation:

Total Depth: 76.4 ft
Termination Criteria:
Cone Size: 10 cm²



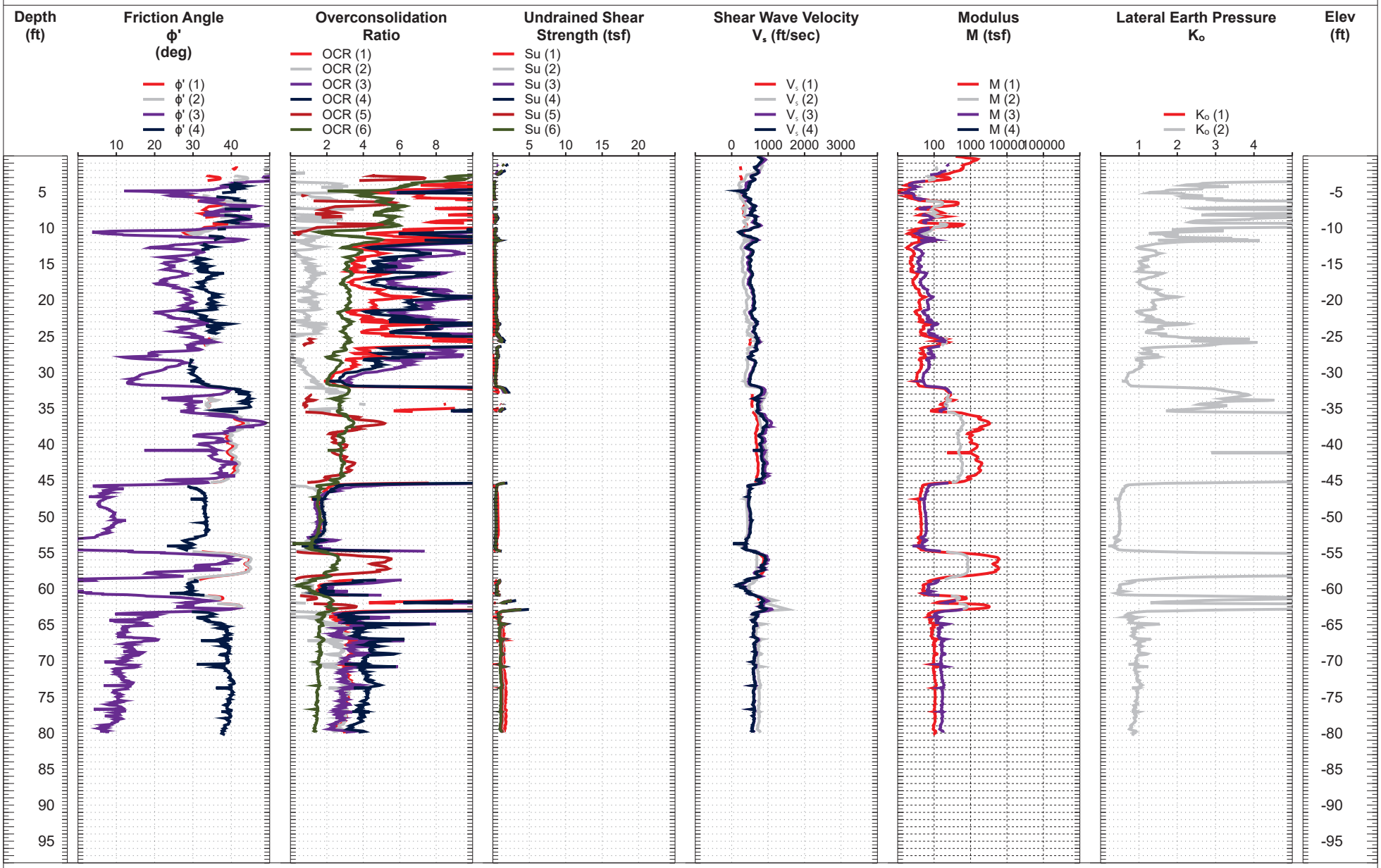
Fort Eustis Dredged Material Management Area
Newport News, VA
Project Number: 2024-SAS-ES-GT-ML-FEDMMA

Cone Penetration Test CPT-1139-08

Date: 28-Feb-2024
Estimated Water Depth: 0.0 ft
Rig/Operator: SAS-Vertek CPT Rig/Colby Brown

Latitude: 37.150051
Longitude: -76.600662
Elevation:

Total Depth: 80.2 ft
Termination Criteria:
Cone Size: 10 cm²



DMT data

DMT-1139-1

Z	Zabs	Thrust	Δ A	Δ B	A	B	C	γ	σ' v	U_o	P_o	P_1	P_2	Id	Ed	Kd	Ud	M	Su	ϕ	ϕ Ax	ϕ Ps	K_o	σ' h	OCR	Soil description
[m]	[m]	[kg]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]	[kN/m³]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]		[MPa]			[MPa]	[kPa]	[Deg]	[Deg]	[Deg]		[kPa]		
0.2	10.47	540	15	36.5	212	510		16.7	3	0	215	474		1.2	9	63		38.1			19.2	20.8				SANDY SILT
0.4	10.27	240	15	36.5	162	406		16.7	7	0	167	370		1.2	7	25		23.6			24.5	25.8				SANDY SILT
0.6	10.07	300	15	36.5	144	385		16.7	10	0	150	348		1.3	6.9	15		19.8			24.5	25.8				SANDY SILT
0.8	9.87	340	15	36.5	164	397		16.7	13	0	170	360		1.1	6.6	13		18	30				2.1	28.5	18	SILT
1	9.67	330	15	36.5	218	380		16.7	17	0	227	344		0.5	4	14		11.2	40				2.2	37.1	20	SILTY CLAY
1.2	9.47	280	15	36.5	174	310		15.7	20	0	185	274		0.5	3.1	9.2		7.4	30				1.7	35	11	SILTY CLAY
1.4	9.27	240	15	36.5	150	280		15.7	23	0	161	244		0.5	2.9	6.9		6.1	24				1.5	33.7	7	SILTY CLAY
1.6	9.07	670	15	36.5	284	785		17.7	26	0	277	748		1.7	16.4	11		41.7			24.5	25.5				SANDY SILT
1.8	8.87	750	15	36.5	279	517		16.7	30	0	285	480		0.7	6.8	9.5		16.7	46				1.8	53.3	11	CLAYEY SILT
2	8.67	800	15	36.5	344	728		17.7	33	0	342	692		1	12.1	10		30.6	57				1.9	62.2	13	SILT
2.2	8.47	1190	15	36.5	251	390		16.7	37	0	262	354		0.4	3.2	7.1		6.9	40				1.5	54.3	7.2	SILTY CLAY
2.4	8.27	1580	15	36.5	408	1328		18.6	40	0	380	1292		2.4	31.6	9.5		77.5			24.6	25.5				SILTY SAND
2.6	8.07	850	15	36.5	236	438		16.7	44	0	243	402		0.7	5.5	5.6		10.4	35				1.3	54.7	4.9	CLAYEY SILT
2.8	7.87	1220	15	36.5	394	1094		18.6	47	0	377	1058		1.8	23.6	8		54			24.5	25.2				SILTY SAND
3	7.67	2030	15	36.5	524	1673		19.6	51	0	484	1636		2.4	40	9.5		98.2			24.8	25.5				SILTY SAND
3.2	7.47	1560	15	36.5	510	1412		19.6	53	2	482	1376		1.9	31	9.1		74.7			24.8	25.5				SILTY SAND
3.4	7.27	890	15	36.5	304	636		17.7	55	3.9	305	600		1	10.2	5.5		19.4	43				1.2	67.9	4.8	SILT
3.6	7.07	820	15	36.5	314	686		17.7	56	5.9	313	650		1.1	11.7	5.4		22.2	43				1.2	69.5	4.8	SILT
3.8	6.87	1020	15	36.5	370	747		17.7	58	7.8	369	710		1	11.9	6.2		24	53				1.4	78.3	5.9	SILT
4	6.67	1180	15	36.5	365	768	28	17.7	60	9.8	362	732	43	1.1	12.8	5.9	0.09	25.3	51				1.3	77.7	5.4	SILT
4.2	6.47	1030	15	36.5	286	525		16.7	61	11.8	292	488		0.7	6.8	4.6		11.6	38				1.1	66.5	3.6	CLAYEY SILT
4.4	6.27	730	15	36.5	297	620		16.7	62	13.7	298	584		1	9.9	4.6		17	38				1.1	67.8	3.6	SILT
4.6	6.07	690	15	36.5	190	620		17.7	64	15.7	186	584		2.3	13.8	2.7		17.9			0	0				SILTY SAND
4.8	5.87	1010	15	36.5	421	1020		17.7	65	17.7	409	984		1.5	19.9	6		39.9			0	0				SANDY SILT
5	5.67	770	15	36.5	203	729		17.7	67	19.6	194	692		2.9	17.3	2.6		22.8			0	0				SILTY SAND
5.2	5.47	550	15	36.5	223	322	140	15.7	69	21.6	236	286	155	0.2	1.7	3.1	0.62	2.3	26				0.8	55.6	2	CLAY
5.4	5.27	480	15	36.5	286	422		16.7	70	23.5	297	386		0.3	3.1	3.9		4.7	36				1	67.6	2.9	CLAY
5.6	5.07	550	15	36.5	306	440		16.7	71	25.5	317	404		0.3	3	4.1		4.8	38				1	71.3	3.1	CLAY
5.8	4.87	680	15	36.5	429	752		17.7	72	27.5	430	716		0.7	9.9	5.6		18.8	57				1.3	90.6	4.9	CLAYEY SILT
6	4.67	1050	15	36.5	315	943		18.6	74	29.4	301	906		2.2	21	3.7		33.2			0	0				SILTY SAND
6.2	4.47	870	15	36.5	235	399	67	16.7	76	31.4	244	362	82	0.6	4.1	2.8	0.24	4.9	26				0.7	56.3	1.7	SILTY CLAY
6.4	4.27	1360	15	36.5	329	1075		18.6	77	33.4	309	1038		2.6	25.3	3.6		40			0	0				SILTY SAND
6.6	4.07	1500	15	36.5	305	1104		18.6	79	35.3	283	1068		3.2	27.2	3.1		40.6			0	0				SILTY SAND
6.8	3.87	1850	15	36.5	441	1211		18.6	81	37.3	420	1174		2	26.2	4.7		47.2			24	24.5				SILTY SAND
7	3.67	1730	15	36.5	417	1187		18.6	82	39.2	396	1150		2.1	26.2	4.3		45.1			24.1	24.5				SILTY SAND
7.2	3.47	1350	15	36.5	315	990		18.6	84	41.2	299	954		2.5	22.7	3.1		32.6			0	0				SILTY SAND
7.4	3.27	940	15	36.5	317	526		16.7	86	43.2	324	490		0.6	5.7	3.3		7.8	35				0.8	72.3	2.2	SILTY CLAY
7.6	3.07	810	15	36.5	368	585		16.7	87	45.1	375	548		0.5	6	3.8		9	42				0.9	82.3	2.7	SILTY CLAY
7.8	2.87	750	15	36.5	529	774		17.7	89	47.1	534	738		0.4	7.1	5.5		13.3	69				1.2	110	4.8	SILTY CLAY
8	2.67	890	15	36.5	445	743	128	17.7	90	49.1	448	706	143	0.7	9	4.4	0.24	14.9	53				1.1	95.7	3.4	CLAYEY SILT
8.2	2.47	980	15	36.5	487	666		16.7	92	51	496	630		0.3	4.6	4.8		8.2	61				1.1	104	4	CLAY

DMT-1139-1

Z	Zabs	Thrust	Δ A	Δ B	A	B	C	γ	σ' v	U_o	P_o	P_1	P_2	Id	Ed	Kd	Ud	M	Su	ϕ	ϕ Ax	ϕ Ps	K_o	σ' h	OCR	Soil description
[m]	[m]	[kg]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]	[kN/m³]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]		[MPa]			[MPa]	[kPa]	[Deg]	[Deg]	[Deg]		[kPa]		
8.4	2.27	1500	15	36.5	688	1403		19.1	93	53	670	1366		1.1	24.2	6.6		50.5	92				1.4	131	6.5	SILT
8.6	2.07	1780	15	36.5	944	1693		19.1	95	54.9	924	1656		0.8	25.4	9.1		61.2	140				1.7	165	11	SILT
8.8	1.87	2360	15	36.5	885	1872		19.1	97	56.9	853	1836		1.2	34.1	8.2		78.6			25	25.2				SANDY SILT
9	1.67	4580	15	36.5	907	2430		19.6	99	58.9	848	2394		2	53.6	8		122.8			25	25.2				SILTY SAND
9.2	1.47	3870	15	36.5	876	2130		19.1	101	60.8	831	2094		1.6	43.8	7.6		98.2			25	25.2				SANDY SILT
9.4	1.27	3620	15	36.5	842	2077		19.1	103	62.8	798	2040		1.7	43.1	7.2		94.1			25	25.2				SANDY SILT
9.6	1.07	4430	15	36.5	1062	2714		21.1	105	64.7	997	2678		1.8	58.3	8.9		139.5			25.3	25.5				SILTY SAND
9.8	0.87	3260	15	36.5	834	2127		19.6	107	66.7	787	2090		1.8	45.2	6.7		96.2			24.8	25				SILTY SAND
10	0.67	2390	15	36.5	660	1640		19.1	109	68.7	629	1604		1.7	33.8	5.1		63.2			24.6	24.8				SANDY SILT
10.2	0.47	2950	15	36.5	694	1716		19.1	111	70.6	660	1680		1.7	35.4	5.3		67.2			24.6	24.8				SANDY SILT
10.4	0.27	2250	15	36.5	630	1579		19.1	112	72.6	600	1542		1.8	32.7	4.7		58.3			0	0				SANDY SILT
10.6	0.07	1780	15	36.5	497	950		17.7	114	74.6	492	914		1	14.6	3.6		21.9	53				0.9	105	2.6	SILT
10.8	-0.13	1470	15	36.5	512	945		17.7	116	76.5	508	908		0.9	13.9	3.7		21	55				0.9	108	2.6	SILT
11	-0.33	1320	15	36.5	558	900	274	17.7	117	78.5	558	864	289	0.6	10.6	4.1	0.44	16.8	63				1	118	3	CLAYEY SILT
11.2	-0.53	1180	15	36.5	522	763		17.7	119	80.4	528	726		0.5	6.9	3.8		10.3	58				0.9	112	2.7	SILTY CLAY
11.4	-0.73	1730	15	36.5	545	1204		17.7	121	82.4	530	1168		1.4	22.1	3.7		34			0	0				SANDY SILT
11.6	-0.93	2600	15	36.5	610	1376		19.1	122	84.4	589	1340		1.5	26	4.1		42.8			0	0				SANDY SILT
11.8	-1.13	2500	15	36.5	553	1207		17.7	124	86.3	538	1170		1.4	22	3.6		33.3			0	0				SANDY SILT
12	-1.33	1520	15	36.5	344	661	42	16.7	126	88.3	346	624	57	1.1	9.7	2	-0.1	8.9	28				0.6	70	1	SILT
12.2	-1.53	4020	15	36.5	649	1905		19.6	127	90.3	604	1868		2.5	43.9	4		73.8			24.2	24.2				SILTY SAND
12.4	-1.73	3760	15	36.5	872	2047		19.1	129	92.2	831	2010		1.6	40.9	5.7		80.4			24.7	24.8				SANDY SILT
12.6	-1.93	3860	15	36.5	862	2322		19.6	131	94.2	807	2286		2.1	51.3	5.4		99.3			24.7	24.8				SILTY SAND
12.8	-2.13	3520	15	36.5	731	2126		19.6	133	96.1	679	2090		2.4	49	4.4		85.8			24.5	24.5				SILTY SAND
13	-2.33	4770	15	36.5	1023	2652	28	19.6	135	98.1	959	2616	43	1.9	57.5	6.4	-0.1	119.5			25	25				SILTY SAND
13.2	-2.53	4620	15	36.5	1035	2403		19.1	137	100	984	2366		1.6	48	6.5		99.8			25	25				SANDY SILT
13.4	-2.73	3680	15	36.5	902	2074		19.1	139	102	861	2038		1.6	40.8	5.5		78.4			24.8	24.8				SANDY SILT
13.6	-2.93	3880	15	36.5	758	2074		19.6	140	104	710	2038		2.2	46.1	4.3		79.5			24.6	24.5				SILTY SAND
13.8	-3.13	4070	15	36.5	737	1974		19.6	142	106	693	1938		2.1	43.2	4.1		72.5			24.3	24.2				SILTY SAND
14	-3.33	3530	15	36.5	788	1935	39	19.1	144	108	748	1898	54	1.8	39.9	4.4	-0.1	69.1			24.6	24.5				SANDY SILT
14.2	-3.53	3000	15	36.5	666	1640		19.6	146	110	635	1604		1.8	33.6	3.6		51.5			0	0				SILTY SAND
14.4	-3.73	3030	15	36.5	671	1673		19.6	148	112	638	1636		1.9	34.6	3.6		52.9			0	0				SILTY SAND
14.6	-3.93	3300	15	36.5	639	1675		19.6	150	114	605	1638		2.1	35.9	3.3		52.5			0	0				SILTY SAND
14.8	-4.13	4600	15	36.5	662	2272		19.6	152	116	599	2236		3.4	56.8	3.2		85.4			24.1	24				SAND
15	-4.33	2360	15	36.5	690	1823	37	19.6	154	118	651	1786	52	2.1	39.4	3.5	-0.1	59.8			0	0				SILTY SAND
15.2	-4.53	1790	15	36.5	661	1068		17.7	156	120	658	1032		0.7	13	3.5		18.3	68				0.9	137	2.3	CLAYEY SILT
15.4	-4.73	1020	15	36.5	629	885		17.7	158	122	634	848		0.4	7.5	3.2		10	64				0.8	132	2.1	SILTY CLAY

DMT-1139-2

Z	Zabs	Thrust	Δ A	Δ B	A	B	C	γ	σ' v	U_o	P_o	P_1	P_2	Id	Ed	Kd	Ud	M	Su	ϕ	ϕ Ax	ϕ Ps	K_o	σ' h	OCR	Soil description
[m]	[m]	[kg]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]	[kN/m³]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]		[MPa]			[MPa]	[kPa]	[Deg]	[Deg]	[Deg]		[kPa]		
0.2	10.48	630	13	34.5	226	886		18.6	3	0	208	852		3.1	22.3	61		94.1			19.2	20.8				SILTY SAND
0.4	10.28	560	13	34.5	241	493		16.7	7	0	244	458		0.9	7.5	34		27.3	55				3.7	26.7	84	SILT
0.6	10.08	290	13	34.5	146	315		15.7	10	0	153	280		0.8	4.4	15		12.7	28				2.3	24.2	22	SILT
0.8	9.88	260	13	34.5	154	306		15.7	14	0	162	272		0.7	3.8	12		10.1	28				2	27.8	16	CLAYEY SILT
1	9.68	380	13	34.5	152	281		15.7	17	0	161	246		0.5	3	9.6		7.3	26				1.8	30	12	SILTY CLAY
1.2	9.48	360	13	34.5	161	269		15.7	20	0	171	234		0.4	2.2	8.6		5.2	27				1.7	33.2	9.7	SILTY CLAY
1.4	9.28	200	13	34.5	146	262		15.7	23	0	156	228		0.5	2.5	6.8		5.2	23				1.4	32.9	6.7	SILTY CLAY
1.6	9.08	380	13	34.5	163	259		15.7	26	0	174	224		0.3	1.8	6.6		3.7	26				1.4	36.9	6.5	CLAY
1.8	8.88	340	13	34.5	187	425		16.7	29	0	190	390		1.1	6.9	6.5		14.4	28				1.4	40.8	6.3	SILT
2	8.68	230	13	34.5	174	276		15.7	33	0	184	242		0.3	2	5.6		3.8	26				1.3	41.2	5	CLAY
2.2	8.48	350	13	34.5	262	423		16.7	36	0	269	388		0.4	4.1	7.5		9.1	41				1.5	54.8	7.9	SILTY CLAY
2.4	8.28	450	13	34.5	455	927		17.7	39	0	447	892		1	15.5	11		40.6	76				2	78	15	SILT
2.6	8.08	370	13	34.5	244	385		16.7	43	0	252	350		0.4	3.4	5.9		6.7	36				1.3	55.6	5.4	SILTY CLAY
2.8	7.88	660	13	34.5	304	565		16.7	46	0	306	530		0.7	7.8	6.7		16.2	46				1.4	65	6.5	CLAYEY SILT
3	7.68	2860	13	34.5	581	2451		19.6	49	0	503	2416		3.8	66.4	10		167.2			24.7	25.5				SAND
3.2	7.48	2660	13	34.5	637	1683		19.1	51	2	600	1648		1.8	36.4	12		96.3			25	25.8				SANDY SILT
3.4	7.28	2580	13	34.5	648	1798		19.6	53	3.9	606	1764		1.9	40.2	11		105.2			25	25.8				SILTY SAND
3.6	7.08	2550	13	34.5	626	1765		19.6	55	5.9	584	1730		2	39.8	11		101.3			24.8	25.5				SILTY SAND
3.8	6.88	2700	13	34.5	712	1976		19.6	57	7.8	664	1942		2	44.3	12		116.7			25.1	25.8				SILTY SAND
4	6.68	1420	13	34.5	469	1221	14	17.7	59	9.8	447	1186	27	1.7	25.7	7.4	0.04	56.8			24.6	25.2				SANDY SILT
4.2	6.48	1200	13	34.5	449	1047		17.7	61	11.8	434	1012		1.4	20.1	7		43.1			24.3	25				SANDY SILT
4.4	6.28	600	13	34.5	278	407		16.7	62	13.7	287	372		0.3	3	4.4		4.9	37				1.1	65.7	3.4	CLAY
4.6	6.08	470	13	34.5	279	435		16.7	64	15.7	287	400		0.4	4	4.3		6.4	36				1	65.6	3.3	SILTY CLAY
4.8	5.88	500	13	34.5	281	437		16.7	65	17.7	289	402		0.4	4	4.2		6.3	36				1	66	3.2	SILTY CLAY
5	5.68	460	13	34.5	325	479	180	16.7	66	19.6	333	444	193	0.4	3.9	4.7	0.55	6.7	43				1.1	73.8	3.8	SILTY CLAY
5.2	5.48	490	13	34.5	330	484		16.7	68	21.6	338	450		0.4	3.9	4.7		6.7	43				1.1	74.7	3.8	SILTY CLAY
5.4	5.28	490	13	34.5	301	407		15.7	69	23.5	311	372		0.2	2.1	4.2		3.4	38				1	70.1	3.1	CLAY
5.6	5.08	520	13	34.5	277	379		15.7	70	25.5	287	344		0.2	2	3.7		3	34				0.9	65.5	2.6	CLAY
5.8	4.88	540	13	34.5	300	414		16.7	71	27.5	310	380		0.3	2.4	4		3.8	37				1	69.7	2.9	CLAY
6	4.68	630	13	34.5	385	587	168	16.7	73	29.4	390	552	181	0.5	5.6	5	0.42	10	50				1.2	83.9	4.1	SILTY CLAY
6.2	4.48	720	13	34.5	404	630		16.7	74	31.4	408	596		0.5	6.5	5.1		11.7	52				1.2	87	4.3	SILTY CLAY
6.4	4.28	730	13	34.5	303	481		16.7	76	33.4	309	446		0.5	4.8	3.7		7	35				0.9	69.4	2.6	SILTY CLAY
6.6	4.08	700	13	34.5	300	473		16.7	77	35.3	307	438		0.5	4.6	3.5		6.6	34				0.9	68.8	2.4	SILTY CLAY
6.8	3.88	700	13	34.5	261	402		16.7	78	37.3	269	368		0.4	3.4	3		4.3	28				0.8	60.8	1.8	SILTY CLAY
7	3.68	620	13	34.5	240	372		15.7	80	39.2	249	338		0.4	3.1	2.6		3.5	25				0.7	55.9	1.5	SILTY CLAY
7.2	3.48	800	13	34.5	284	391	135	15.7	81	41.2	294	356	148	0.3	2.2	3.1	0.42	2.8	31				0.8	65.6	2	CLAY
7.4	3.28		13	34.5	275	443		16.7	82	43.2	282	408		0.5	4.4	2.9		5.4	29				0.8	62.7	1.8	SILTY CLAY
7.6	3.08	850	13	34.5	270	415		16.7	83	45.1	278	380		0.4	3.6	2.8		4.2	28				0.7	61.6	1.7	SILTY CLAY
7.8	2.88	870	13	34.5	290	461		16.7	85	47.1	297	426		0.5	4.5	2.9		5.6	30				0.8	65.5	1.8	SILTY CLAY
8	2.68	950	13	34.5	372	576	108	16.7	86	49.1	377	542	121	0.5	5.7	3.8	0.22	8.6	42				1	81.7	2.7	SILTY CLAY
8.2	2.48	950	13	34.5	340	496		16.7	87	51	348	462		0.4	4	3.4		5.5	37				0.9	75.8	2.3	SILTY CLAY

DMT-1139-2

Z	Zabs	Thrust	Δ A	Δ B	A	B	C	γ	σ' v	U_o	P_o	P_1	P_2	Id	Ed	Kd	Ud	M	Su	ϕ	ϕ Ax	ϕ Ps	K_o	σ' h	OCR	Soil description
[m]	[m]	[kg]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]	[kN/m³]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]		[MPa]			[MPa]	[kPa]	[Deg]	[Deg]	[Deg]		[kPa]		
8.4	2.28	960	13	34.5	364	522		16.7	89	53	371	488		0.4	4	3.6		5.8	41				0.9	80.4	2.5	SILTY CLAY
8.6	2.08	900	13	34.5	355	471		16.7	90	54.9	365	436		0.2	2.5	3.4		3.5	39				0.9	78.9	2.3	CLAY
8.8	1.88	900	13	34.5	326	453		16.7	92	56.9	335	418		0.3	2.9	3		3.7	34				0.8	72.6	1.9	CLAY
9	1.68	880	13	34.5	333	470		16.7	93	58.9	342	436		0.3	3.3	3		4.2	35				0.8	73.7	1.9	SILTY CLAY
9.2	1.48	1020	13	34.5	238	346	130	15.7	94	60.8	248	312	143	0.3	2.2	2	0.44	1.9	21				0.5	50.9	1	SILTY CLAY
9.4	1.28	1030	13	34.5	372	490		16.7	96	62.8	381	456		0.2	2.6	3.3		3.5	40				0.9	81.7	2.2	CLAY
9.6	1.08	1090	13	34.5	378	493		16.7	97	64.7	388	458		0.2	2.5	3.3		3.4	40				0.9	82.8	2.2	CLAY
9.8	0.88	990	13	34.5	362	481		16.7	98	66.7	371	446		0.3	2.6	3.1		3.4	37				0.8	79.2	2	CLAY
10	0.68	1010	13	34.5	357	460	245	15.7	100	68.7	367	426	258	0.2	2	3	0.63	2.6	36				0.8	78.1	1.9	CLAY
10.2	0.48	1140	13	34.5	343	451		15.7	101	70.6	353	416		0.2	2.2	2.8		2.6	34				0.7	74.6	1.7	CLAY
10.4	0.28	1170	13	34.5	351	448		15.7	102	72.6	362	414		0.2	1.8	2.8		2.2	35				0.8	76.2	1.7	CLAY
10.6	0.08	1010	13	34.5	348	460		15.7	103	74.6	358	426		0.2	2.4	2.7		2.8	34				0.7	75.1	1.6	CLAY
10.8	-0.12	1100	13	34.5	377	490		16.7	104	76.5	387	456		0.2	2.4	3		3	38				0.8	81.2	1.9	CLAY
11	-0.32	1200	13	34.5	394	513	268	16.7	106	78.5	403	478	281	0.2	2.6	3.1	0.62	3.4	40				0.8	84.6	2	CLAY
11.2	-0.52	1940	13	34.5	257	878		17.7	107	80.4	241	844		3.7	20.9	1.5		17.8			0	0				SAND
11.4	-0.72	2780	13	34.5	559	1527		19.6	109	82.4	526	1492		2.2	33.5	4.1		56.1			24	24.2				SILTY SAND
11.6	-0.92	2730	13	34.5	721	1628		19.1	111	84.4	691	1594		1.5	31.3	5.5		60.1			24.6	24.8				SANDY SILT
11.8	-1.12	2150	13	34.5	485	747		17.7	112	86.3	487	712		0.6	7.8	3.6		11.3	51				0.9	101	2.5	SILTY CLAY
12	-1.32	1850	13	34.5	484	836	12	17.7	114	88.3	482	802	25	0.8	11.1	3.4	-0.2	15.8	50				0.9	100	2.3	SILT
12.2	-1.52	2250	13	34.5	390	977		18.6	116	90.3	376	942		2	19.7	2.5		23.5			0	0				SILTY SAND
12.4	-1.72	2630	13	34.5	710	1551		19.1	117	92.2	683	1516		1.4	28.9	5		53			0	0				SANDY SILT
12.6	-1.92	2560	13	34.5	473	1213		18.6	119	94.2	451	1178		2	25.2	3		34.7			0	0				SILTY SAND
12.8	-2.12	4200	13	34.5	743	2269		19.6	121	96.1	682	2234		2.7	53.9	4.8		99.8			24.4	24.5				SILTY SAND
13	-2.32	5170	13	34.5	1252	2956	41	20.6	123	98.1	1182	2922	54	1.6	60.4	8.8	-0	143.6			25.4	25.5				SANDY SILT
13.2	-2.52	4230	13	34.5	1096	2512		20.6	125	100	1041	2478		1.5	49.9	7.5		110.9			25.2	25.2				SANDY SILT
13.4	-2.72	3130	13	34.5	823	1806		19.1	127	102	789	1772		1.4	34.1	5.4		64.8			24.7	24.8				SANDY SILT
13.6	-2.92	2700	13	34.5	383	1015		18.6	129	104	367	980		2.3	21.3	2		22.3			0	0				SILTY SAND
13.8	-3.12	3330	13	34.5	583	1654		19.6	131	106	545	1620		2.5	37.3	3.4		56.4			24	24				SILTY SAND
14	-3.32	4010	13	34.5	897	2254	37	19.6	133	108	845	2220	50	1.9	47.7	5.5	-0.1	92.7			24.8	24.8				SILTY SAND
14.2	-3.52	4800	13	34.5	1137	2652		20.6	135	110	1077	2618		1.6	53.5	7.2		116.6			25.3	25.2				SANDY SILT
14.4	-3.72	5240	13	34.5	1179	2861		20.6	137	112	1110	2826		1.7	59.6	7.3		130.9			25.3	25.2				SANDY SILT
14.6	-3.92	5900	13	34.5	1345	3081		20.6	139	114	1274	3046		1.5	61.5	8.3		143			25.3	25.2				SANDY SILT
14.8	-4.12	6240	13	34.5	1356	3199		20.6	141	116	1279	3164		1.6	65.4	8.2		151.4			25.3	25.2				SANDY SILT
15	-4.32	5920	13	34.5	1169	2802	44	20.6	143	118	1103	2768	57	1.7	57.8	6.9	-0.1	123.7			25.1	25				SANDY SILT
15.2	-4.52	3900	13	34.5	641	2000		19.6	146	120	588	1966		2.9	47.8	3.2		72.2			24.1	24				SILTY SAND
15.4	-4.72	1950	13	34.5	1254	1780		18.6	148	122	1243	1746		0.5	17.4	7.6		38.7	172				1.5	228	8	SILTY CLAY

DMT-1139-3B

Z	Zabs	Thrust	Δ A	Δ B	A	B	C	γ	σ' v	U_o	P_o	P_1	P_2	Id	Ed	Kd	Ud	M	Su	ϕ	ϕ Ax	ϕ Ps	K_o	σ' h	OCR	Soil description
[m]	[m]	[kg]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]	[kN/m³]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]		[MPa]			[MPa]	[kPa]	[Deg]	[Deg]	[Deg]		[kPa]		
0.2	10.47	550	12.5	51.5	133	637		17.7	3	0	124	586		3.7	16	36		59.7			19.2	20.8				SAND
0.4	10.27	430	12.5	51.5	164	430		16.7	7	0	166	378		1.3	7.4	24		24.5			24.5	25.8				SANDY SILT
0.6	10.07	320	12.5	51.5	142	395		16.7	10	0	145	344		1.4	6.9	14		19.5			24.5	25.8				SANDY SILT
0.8	9.87	290	12.5	51.5	157	352		15.7	14	0	163	300		0.8	4.8	12		12.7	28				2.1	27.9	16	SILT
1	9.67	230	12.5	51.5	135	325		15.7	17	0	141	274		0.9	4.6	8.4		10.7	22				1.7	27.6	9.4	SILT
1.2	9.47	180	12.5	51.5	144	267		15.7	20	0	154	216		0.4	2.1	7.7		4.8	24				1.6	31	8.2	SILTY CLAY
1.4	9.27	175	12.5	51.5	129	246		15.7	23	0	139	194		0.4	1.9	6		3.8	20				1.3	30.4	5.6	SILTY CLAY
1.6	9.07	200	12.5	51.5	174	309		15.7	26	0	183	258		0.4	2.6	7		5.5	28				1.5	38.2	7	SILTY CLAY
1.8	8.87	270	12.5	51.5	169	538		17.7	29	0	166	486		1.9	11.1	5.7		21.9			0	0				SILTY SAND
2	8.67	285	12.5	51.5	205	379		16.7	33	0	212	328		0.5	4	6.5		8.2	31				1.4	45.5	6.2	SILTY CLAY
2.2	8.47	290	12.5	51.5	146	352		15.7	36	0	151	300		1	5.2	4.2		8.4	20				1	36.9	3.2	SILT
2.4	8.27	305	12.5	51.5	212	486		16.7	39	0	214	434		1	7.7	5.4		14.5	30				1.2	48.4	4.8	SILT
2.6	8.07	330	12.5	51.5	189	581		17.7	43	0	185	530		1.9	12	4.3		20.5			0	0				SILTY SAND
2.8	7.87	300	12.5	51.5	114	269		15.7	46	0	122	218		0.8	3.3	2.6		3.8	14				0.7	32.5	1.5	CLAYEY SILT
3	7.67	370	12.5	51.5	126	262		15.7	49	0	135	210		0.6	2.6	2.7		3.1	16				0.7	35.8	1.6	SILTY CLAY
3.2	7.47	320	12.5	51.5	113	224		15.7	50	2	123	172		0.4	1.7	2.4		1.8	14				0.7	32.6	1.3	SILTY CLAY
3.4	7.27	400	12.5	51.5	121	238		15.7	52	3.9	131	186		0.4	1.9	2.5		2	15				0.7	34.1	1.4	SILTY CLAY
3.6	7.07	400	12.5	51.5	162	341		15.7	53	5.9	169	290		0.7	4.2	3.1		5.5	20				0.8	42.4	2	CLAYEY SILT
3.8	6.87	480	12.5	51.5	133	286		15.7	54	7.8	141	234		0.7	3.2	2.5		3.5	15				0.7	35.8	1.4	CLAYEY SILT
4	6.67	420	12.5	51.5	198	347	66	15.7	55	9.8	206	296	78	0.5	3.1	3.6	0.35	4.5	25				0.9	49.7	2.5	SILTY CLAY
4.2	6.47	340	12.5	51.5	151	263		15.7	56	11.8	161	212		0.3	1.7	2.6		2	18				0.7	39.8	1.6	SILTY CLAY
4.4	6.27	340	12.5	51.5	171	285		15.7	58	13.7	181	234		0.3	1.8	2.9		2.2	20				0.8	44	1.8	CLAY
4.6	6.07	660	12.5	51.5	501	1362		19.6	59	15.7	474	1310		1.8	29	7.8		65.8			0	0				SILTY SAND
4.8	5.87	720	12.5	51.5	236	422		16.7	61	17.7	242	370		0.6	4.4	3.7		6.6	29				0.9	56.3	2.6	SILTY CLAY
5	5.67	550	12.5	51.5	275	461	113	16.7	62	19.6	281	410	126	0.5	4.4	4.2	0.4	7.2	35				1	63.6	3.2	SILTY CLAY
5.2	5.47	380	12.5	51.5	247	385		15.7	63	21.6	256	334		0.3	2.7	3.7		4	30				0.9	58.8	2.6	SILTY CLAY
5.4	5.27	580	12.5	51.5	213	358		15.7	65	23.5	221	306		0.4	3	3.1		3.8	24				0.8	51.6	1.9	SILTY CLAY
5.6	5.07	860	12.5	51.5	267	442		16.7	66	25.5	274	390		0.5	4	3.8		6.1	32				0.9	62	2.7	SILTY CLAY
5.8	4.87	1600	12.5	51.5	311	1041		18.6	67	27.5	290	990		2.7	24.3	3.9		40.4			23.6	24.2				SILTY SAND
6	4.67	2370	12.5	51.5	609	1617		19.6	69	29.4	574	1566		1.8	34.4	7.9		78.3			24.7	25.2				SILTY SAND
6.2	4.47	2700	12.5	51.5	843	1944		19.1	71	31.4	804	1892		1.4	37.8	11		97.5			25.2	25.8				SANDY SILT
6.4	4.27	4000	12.5	51.5	879	2435		19.6	73	33.4	817	2384		2	54.4	11		139.7			25.2	25.8				SILTY SAND
6.6	4.07	4000	12.5	51.5	1149	2769		20.6	75	35.3	1084	2718		1.6	56.7	14		159.9			25.3	25.8				SANDY SILT
6.8	3.87	2870	12.5	51.5	867	2286		19.6	77	37.3	812	2234		1.8	49.4	10		123.8			25	25.5				SILTY SAND
7	3.67	3280	12.5	51.5	337	1420		18.6	79	39.2	299	1368		4.1	37.1	3.3		57			23.5	24				SAND
7.2	3.47	5500	12.5	51.5	1519	3932		20.6	81	41.2	1414	3880		1.8	85.6	17		257.1			25.3	25.8				SANDY SILT
7.4	3.27	3000	12.5	51.5	709	1824		19.1	83	43.2	669	1772		1.8	38.3	7.6		85.6			24.8	25.2				SANDY SILT
7.6	3.07	3850	12.5	51.5	1039	2686		20.6	85	45.1	972	2634		1.8	57.7	11		149.2			25.4	25.8				SANDY SILT
7.8	2.87	2540	12.5	51.5	838	1473		19.1	87	47.1	822	1422		0.8	20.8	8.9		49.6	124				1.7	149	10	CLAYEY SILT
8	2.67	1710	12.5	51.5	453	687	230	17.7	89	49.1	457	636	242	0.4	6.2	4.6	0.47	10.6	55				1.1	96.9	3.7	SILTY CLAY
8.2	2.47	1040	12.5	51.5	297	549		16.7	90	51	300	498		0.8	6.8	2.8		8.2	30				0.7	66	1.7	CLAYEY SILT

DMT-1139-3B

Z	Zabs	Thrust	Δ A	Δ B	A	B	C	γ	σ' v	U_o	P_o	P_1	P_2	Id	Ed	Kd	Ud	M	Su	ϕ	ϕ Ax	ϕ Ps	K_o	σ' h	OCR	Soil description
[m]	[m]	[kg]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]	[kN/m³]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]		[MPa]			[MPa]	[kPa]	[Deg]	[Deg]	[Deg]		[kPa]		
8.4	2.27	1020	12.5	51.5	252	452		16.7	92	53	258	400		0.7	5	2.2		4.8	23				0.6	55.5	1.2	CLAYEY SILT
8.6	2.07	1070	12.5	51.5	295	561		16.7	93	54.9	297	510		0.9	7.4	2.6		8.4	29				0.7	64.7	1.5	SILT
8.8	1.87	1070	12.5	51.5	351	484		16.7	94	56.9	360	432		0.2	2.5	3.2		3.4	38				0.8	78.3	2.1	CLAY
9	1.67	1060	12.5	51.5	662	1202	75	17.7	96	58.9	651	1150	88	0.8	17.3	6.2	0.05	34.9	86				1.3	129	5.8	SILT
9.2	1.47	1910	12.5	51.5	1003	1783		19.1	97	60.8	980	1732		0.8	26.1	9.4		63.7	149				1.8	173	11	SILT
9.4	1.27	2140	12.5	51.5	1104	1959		19.1	99	62.8	1077	1908		0.8	28.8	10		72.7	168				1.9	185	13	SILT
9.6	1.07	2080	12.5	51.5	1242	2062		19.1	101	64.7	1217	2010		0.7	27.5	11		72.3	196				2	201	15	CLAYEY SILT
9.8	0.87	2250	12.5	51.5	1427	2267		20.6	103	66.7	1401	2216		0.6	28.3	13		77.6	234				2.2	222	19	CLAYEY SILT
10	0.67	2060	12.5	51.5	1767	2655	711	20.1	105	68.7	1738	2604	724	0.5	30	16	0.39	88.2	308				2.4	255	25	SILTY CLAY
10.2	0.47	2650	12.5	51.5	1386	2337		20.6	107	70.6	1354	2286		0.7	32.3	12		86.3	221				2.1	220	16	CLAYEY SILT
10.4	0.27	4500	12.5	51.5	1120	2850		20.6	109	72.6	1049	2798		1.8	60.7	8.9		145.3			25.3	25.5				SANDY SILT
10.6	0.07	3810	12.5	51.5	827	2414		19.6	111	74.6	763	2362		2.3	55.5	6.2		114.4			24.8	25				SILTY SAND
10.8	-0.13	2300	12.5	51.5	919	1350		18.6	113	76.5	913	1298		0.5	13.4	7.4		29.3	128				1.5	172	7.7	SILTY CLAY
11	-0.33	1690	12.5	51.5	648	938	345	17.7	115	78.5	649	886	358	0.4	8.2	5	0.49	14.7	79				1.2	133	4.1	SILTY CLAY
11.2	-0.53	1390	12.5	51.5	608	858		17.7	117	80.4	611	806		0.4	6.8	4.5		11.5	72				1.1	126	3.6	SILTY CLAY
11.4	-0.73	1390	12.5	51.5	606	803		17.7	118	82.4	612	752		0.3	4.8	4.5		8.1	71				1.1	127	3.5	CLAY
11.6	-0.93	1540	12.5	51.5	585	841		17.7	120	84.4	588	790		0.4	7	4.2		11.3	67				1	123	3.2	SILTY CLAY
11.8	-1.13	1450	12.5	51.5	611	844		17.7	121	86.3	615	792		0.3	6.2	4.4		10.1	71				1.1	127	3.4	SILTY CLAY
12	-1.33	1500	12.5	51.5	622	816	370	17.7	123	88.3	628	764	382	0.3	4.7	4.4	0.55	7.8	72				1.1	130	3.4	CLAY
12.2	-1.53	1585	12.5	51.5	829	1010		17.7	125	90.3	836	958		0.2	4.3	6		8.4	108				1.3	164	5.5	CLAY
12.4	-1.73	2570	12.5	51.5	631	792		16.7	126	92.2	639	740		0.2	3.5	4.3		5.8	73				1.1	132	3.3	CLAY
12.6	-1.93	5080	12.5	51.5	823	2697		19.6	127	94.2	745	2646		2.9	65.9	5.1		126.1			24.7	24.8				SILTY SAND
12.8	-2.13	6770	12.5	51.5	1484	3596		20.6	129	96.1	1394	3544		1.7	74.6	10		186.7			25.5	25.5				SANDY SILT
13	-2.33	5340	12.5	51.5	1256	2968		20.6	132	98.1	1186	2916		1.6	60	8.3		139.1			25.3	25.2				SANDY SILT
13.2	-2.53	4000	12.5	51.5	772	2263		19.6	134	100	713	2212		2.4	52	4.6		93.3			24.5	24.5				SILTY SAND
13.4	-2.73	4580	12.5	51.5	1013	2529		19.1	136	102	953	2478		1.8	52.9	6.3		108.9			25	25				SANDY SILT
13.6	-2.93	4650	12.5	51.5	886	2268		19.6	138	104	833	2216		1.9	48	5.3		91.3			24.8	24.8				SILTY SAND
13.8	-3.13	3890	12.5	51.5	732	2013		19.6	140	106	684	1962		2.2	44.3	4.1		74.9			24.3	24.2				SILTY SAND
14	-3.33	5370	12.5	51.5	1098	3023	34	21.1	142	108	1017	2972	46	2.2	67.8	6.4	-0.1	141.8			25.1	25				SILTY SAND
14.2	-3.53	5000	12.5	51.5	1194	2834		20.6	144	110	1128	2782		1.6	57.4	7.1		124.5			25.1	25				SANDY SILT
14.4	-3.73	5790	12.5	51.5	1261	3424		21.1	146	112	1169	3372		2.1	76.5	7.2		168.3			25.4	25.2				SILTY SAND
14.6	-3.93	5000	12.5	51.5	1047	2681		19.6	148	114	981	2630		1.9	57.2	5.9		114.2			24.9	24.8				SILTY SAND
14.8	-4.13	3670	12.5	51.5	652	1681		19.6	150	116	616	1630		2	35.2	3.3		51.9			24.1	24				SILTY SAND
15	-4.33	2085	12.5	51.5	420	1001	41	18.6	152	118	407	950	54	1.9	18.8	1.9	-0.2	17.6			0	0				SILTY SAND
15.2	-4.53	1570	12.5	51.5	335	604		16.7	154	120	337	552		1	7.5	1.4		6.3	22				0.4	57.2	0.6	SILT
15.4	-4.73	1520	12.5	51.5	480	740		16.7	155	122	483	688		0.6	7.1	2.3		7.2	41				0.6	97.5	1.3	SILTY CLAY

DMT-1139-4

Z	Zabs	Thrust	Δ A	Δ B	A	B	C	γ	σ' v	U_o	P_o	P_1	P_2	Id	Ed	Kd	Ud	M	Su	ϕ	ϕ Ax	ϕ Ps	K_o	σ' h	OCR	Soil description
[m]	[m]	[kg]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]	[kN/m³]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]		[MPa]			[MPa]	[kPa]	[Deg]	[Deg]	[Deg]		[kPa]		
0.2	10.47	900	13	44.5	175	926		17.7	3	0	153	882		4.8	25.3	45		99.2			30	31.1				SAND
0.4	10.27	570	13	44.5	123	503		17.7	7	0	120	458		2.8	11.8	17		35.5			24.5	25.8				SILTY SAND
0.6	10.07	230	13	44.5	126	302		15.7	10	0	133	258		0.9	4.3	13		11.8	23				2.1	22.3	18	SILT
0.8	9.87	200	13	44.5	128	247		15.7	14	0	138	202		0.5	2.2	10		5.6	23				1.9	25.2	13	SILTY CLAY
1	9.67	200	13	44.5	118	241		15.7	17	0	128	196		0.5	2.4	7.6		5.3	20				1.6	25.9	8.1	SILTY CLAY
1.2	9.47	220	13	44.5	126	236		15.7	20	0	136	192		0.4	1.9	6.9		4	20				1.4	28.7	6.8	SILTY CLAY
1.4	9.27	210	13	44.5	126	225		15.7	23	0	137	180		0.3	1.5	5.9		3	20				1.3	30.1	5.5	CLAY
1.6	9.07	180	13	44.5	123	215		15.7	26	0	134	170		0.3	1.3	5.1		2.3	19				1.2	30.9	4.4	CLAY
1.8	8.87	240	13	44.5	138	232		15.7	29	0	149	188		0.3	1.3	5.1		2.4	21				1.2	34.4	4.3	CLAY
2	8.67	300	13	44.5	165	293		15.7	32	0	174	248		0.4	2.6	5.4		4.8	25				1.2	39.6	4.7	SILTY CLAY
2.2	8.47	640	13	44.5	179	749		17.7	36	0	166	704		3.2	18.7	4.7		34.4			23.5	24.5				SILTY SAND
2.4	8.27	720	13	44.5	214	393		16.7	39	0	221	348		0.6	4.4	5.6		8.5	32				1.3	49.4	5.1	SILTY CLAY
2.6	8.07	290	13	44.5	149	251		15.7	42	0	160	206		0.3	1.6	3.8		2.4	21				0.9	39.9	2.7	CLAY
2.8	7.87	250	13	44.5	148	236		14.7	46	0	159	192		0.2	1.1	3.5		1.6	20				0.9	40.5	2.4	MUD
3	7.67	330	13	44.5	147	250	73	15.7	49	0	158	206	86	0.3	1.7	3.3		2.2	20				0.8	40.6	2.1	CLAY
3.2	7.47	340	13	44.5	193	316		15.7	50	2	203	272		0.3	2.4	4		3.7	26				1	49.3	3	SILTY CLAY
3.4	7.27	410	13	44.5	221	382		16.7	51	3.9	229	338		0.5	3.8	4.4		6.3	30				1.1	54	3.4	SILTY CLAY
3.6	7.07	440	13	44.5	183	319		15.7	52	5.9	192	274		0.4	2.9	3.6		4.1	24				0.9	47.1	2.5	SILTY CLAY
3.8	6.87	460	13	44.5	197	331		15.7	53	7.8	206	286		0.4	2.8	3.7		4.1	25				0.9	49.7	2.6	SILTY CLAY
4	6.67	460	13	44.5	243	412	84	16.7	55	9.8	250	368	97	0.5	4.1	4.4	0.36	6.7	32				1.1	57.8	3.4	SILTY CLAY
4.2	6.47	460	13	44.5	213	353		15.7	56	11.8	222	308		0.4	3	3.8		4.5	27				0.9	52.5	2.7	SILTY CLAY
4.4	6.27	450	13	44.5	210	321		15.7	57	13.7	220	276		0.3	1.9	3.6		2.8	26				0.9	52.1	2.5	CLAY
4.6	6.07	440	13	44.5	197	306		15.7	58	15.7	207	262		0.3	1.9	3.3		2.6	24				0.8	49.3	2.2	CLAY
4.8	5.87	380	13	44.5	189	289		15.7	60	17.7	200	244		0.2	1.5	3.1		2	22				0.8	47.5	1.9	CLAY
5	5.67	430	13	44.5	192	296	114	15.7	61	19.6	203	252	127	0.3	1.7	3	0.59	2.2	22				0.8	47.8	1.9	CLAY
5.2	5.47	490	13	44.5	218	334		15.7	62	21.6	228	290		0.3	2.1	3.3		2.9	26				0.9	52.9	2.2	CLAY
5.4	5.27	530	13	44.5	184	295		15.7	63	23.5	194	250		0.3	1.9	2.7		2.3	20				0.7	45.4	1.6	CLAY
5.6	5.07	340	13	44.5	219	364		15.7	64	25.5	228	320		0.5	3.2	3.1		4.2	25				0.8	52.4	2	SILTY CLAY
5.8	4.87	510	13	44.5	193	323		15.7	65	27.5	202	278		0.4	2.6	2.7		3	21				0.7	46.5	1.6	SILTY CLAY
6	4.67	530	13	44.5	245	362	151	15.7	67	29.4	255	318	164	0.3	2.2	3.4	0.6	3	28				0.9	57.6	2.3	CLAY
6.2	4.47	550	13	44.5	264	389		15.7	68	31.4	274	344		0.3	2.5	3.6		3.6	31				0.9	61.2	2.5	CLAY
6.4	4.27	550	13	44.5	276	393		15.7	69	33.4	286	348		0.3	2.2	3.7		3.2	32				0.9	63.5	2.6	CLAY
6.6	4.07	560	13	44.5	272	385		15.7	70	35.3	282	340		0.2	2	3.5		2.9	31				0.9	62.6	2.4	CLAY
6.8	3.87	540	13	44.5	275	407		15.7	71	37.3	284	362		0.3	2.7	3.5		3.8	31				0.9	62.8	2.4	CLAY
7	3.67	600	13	44.5	295	419	206	15.7	72	39.2	305	374	219	0.3	2.4	3.7	0.68	3.6	34				0.9	66.7	2.6	CLAY
7.2	3.47	610	13	44.5	314	440		16.7	74	41.2	324	396		0.3	2.5	3.8		3.8	37				1	70.2	2.8	CLAY
7.4	3.27	590	13	44.5	321	442		15.7	75	43.2	331	398		0.2	2.3	3.8		3.5	37				1	71.5	2.8	CLAY
7.6	3.07	790	13	44.5	292	446		16.7	76	45.1	300	402		0.4	3.5	3.3		4.8	32				0.9	65.3	2.2	SILTY CLAY
7.8	2.87	1500	13	44.5	383	635		16.7	78	47.1	386	590		0.6	7.1	4.4		11.7	45				1.1	81.6	3.4	CLAYEY SILT
8	2.67	3530	13	44.5	1108	2696		20.6	79	49.1	1044	2652		1.6	55.8	13		151.7			25.3	25.8				SANDY SILT
8.2	2.47	1750	13	44.5	524	956		17.7	81	51	518	912		0.8	13.6	5.8		26.5	67				1.3	104	5.2	SILT

DMT-1139-4

Z	Zabs	Thrust	Δ A	Δ B	A	B	C	γ	σ' v	U_o	P_o	P_1	P_2	Id	Ed	Kd	Ud	M	Su	ϕ	ϕ Ax	ϕ Ps	K_o	σ' h	OCR	Soil description
[m]	[m]	[kg]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]	[kN/m³]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]		[MPa]			[MPa]	[kPa]	[Deg]	[Deg]	[Deg]		[kPa]		
8.4	2.27	1150	13	44.5	428	685		17.7	83	53	431	640		0.6	7.3	4.6		12.3	51				1.1	89.9	3.6	SILTY CLAY
8.6	2.07	1150	13	44.5	359	599		16.7	84	54.9	363	554		0.6	6.6	3.7		9.8	39				0.9	77.4	2.6	CLAYEY SILT
8.8	1.87	1160	13	44.5	434	802		17.7	86	56.9	431	758		0.9	11.3	4.4		18.9	50				1.1	90.1	3.4	SILT
9	1.67	1770	13	44.5	443	773	140	17.7	87	58.9	442	728	153	0.8	9.9	4.4	0.25	16.5	51				1.1	92.2	3.4	CLAYEY SILT
9.2	1.47	3390	13	44.5	858	2180		19.1	89	60.8	808	2136		1.8	46.1	8.4		107.7			24.9	25.2				SANDY SILT
9.4	1.27	3640	13	44.5	910	2364		19.6	91	62.8	853	2320		1.9	50.9	8.7		120.6			25.2	25.5				SILTY SAND
9.6	1.07	3410	13	44.5	783	2072		19.6	93	64.7	734	2028		1.9	44.9	7.2		98.5			24.9	25.2				SILTY SAND
9.8	0.87	2880	13	44.5	606	1663		19.6	95	66.7	569	1618		2.1	36.4	5.3		69.7			24.4	24.8				SILTY SAND
10	0.67	2600	13	44.5	557	1568		19.6	96	68.7	522	1524		2.2	34.7	4.7		62.7			24.2	24.5				SILTY SAND
10.2	0.47	3070	13	44.5	419	1512		18.6	98	70.6	380	1468		3.5	37.7	3.1		56.4			23.7	24				SAND
10.4	0.27	5180	13	44.5	1240	3170		21.1	100	72.6	1159	3126		1.8	68.2	11		175.8			25.5	25.8				SILTY SAND
10.6	0.07	4320	13	44.5	940	2493		19.6	102	74.6	878	2448		2	54.5	7.8		123.8			25	25.2				SILTY SAND
10.8	-0.13	2950	13	44.5	712	1808		19.6	104	76.5	673	1764		1.8	37.8	5.7		74.6			24.5	24.8				SILTY SAND
11	-0.33	2660	13	44.5	556	1504		19.6	106	78.5	524	1460		2.1	32.4	4.2		54.9			24	24.2				SILTY SAND
11.2	-0.53	2900	13	44.5	720	1822		19.6	108	80.4	681	1778		1.8	38.1	5.5		73.9			24.6	24.8				SILTY SAND
11.4	-0.73	2750	13	44.5	784	2066		19.6	110	82.4	736	2022		2	44.6	5.9		89.7			24.6	24.8				SILTY SAND
11.6	-0.93	2830	13	44.5	675	1734		19.6	112	84.4	638	1690		1.9	36.5	4.9		67			24.3	24.5				SILTY SAND
11.8	-1.13	3170	13	44.5	761	1915		19.6	114	86.3	719	1870		1.8	40	5.5		77.6			24.6	24.8				SILTY SAND
12	-1.33	2830	13	44.5	699	1750		19.6	116	88.3	662	1706		1.8	36.2	4.9		66.4			24.4	24.5				SILTY SAND
12.2	-1.53	2960	13	44.5	736	1869		19.6	118	90.3	695	1824		1.9	39.2	5.1		73.2			24.6	24.8				SILTY SAND
12.4	-1.73	3320	13	44.5	871	2007		19.1	120	92.2	830	1962		1.5	39.3	6.1		79.8			24.9	25				SANDY SILT
12.6	-1.93	3550	13	44.5	852	2020		19.1	122	94.2	809	1976		1.6	40.5	5.9		80.5			24.7	24.8				SANDY SILT
12.8	-2.13	3470	13	44.5	907	2095		19.1	124	96.1	863	2050		1.6	41.2	6.2		84			24.9	25				SANDY SILT
13	-2.33	2480	13	44.5	649	1610	19	19.6	126	98.1	617	1566	32	1.8	32.9	4.1	-0.1	54.8			0	0				SILTY SAND
13.2	-2.53	1890	13	44.5	278	511		16.7	128	100	282	466		1	6.4	1.4		5.4	18				0.4	48	0.6	SILT
13.4	-2.73	1950	13	44.5	330	532		16.7	129	102	336	488		0.7	5.3	1.8		4.5	25				0.5	63.5	0.9	CLAYEY SILT
13.6	-2.93	2390	13	44.5	642	1344		19.1	130	104	623	1300		1.3	23.5	4		37.5			0	0				SANDY SILT
13.8	-3.13	1770	13	44.5	616	1201		17.7	132	106	603	1156		1.1	19.2	3.8		29.4	64				0.9	124	2.7	SILT
14	-3.33	1400	13	44.5	390	945	27	18.6	134	108	378	900	40	1.9	18.1	2	-0.3	18.1			0	0				SILTY SAND
14.2	-3.53	3010	13	44.5	316	1437		18.6	136	110	276	1392		6.7	38.7	1.2		32.9			0	0				SAND
14.4	-3.73	4350	13	44.5	804	2261		19.6	137	112	747	2216		2.3	51	4.6		91.5			24.5	24.5				SILTY SAND
14.6	-3.93	3980	13	44.5	851	2256		19.6	139	114	797	2212		2.1	49.1	4.9		90.2			24.6	24.5				SILTY SAND
14.8	-4.13	4130	13	44.5	1110	2985		21.1	141	116	1032	2940		2.1	66.2	6.5		138.9			25.1	25				SILTY SAND
15	-4.33	4800	13	44.5	1152	3529	35	21.1	144	118	1049	3484	48	2.6	84.5	6.5	-0.1	178.6			25.1	25				SILTY SAND
15.2	-4.53	5650	13	44.5	1422	3790		21.1	146	120	1319	3746		2	84.2	8.2		195.1			25.4	25.2				SILTY SAND
15.4	-4.73	7560	13	44.5	1505	4314		21.1	148	122	1380	4270		2.3	100.3	8.5		235.7			25.4	25.2				SILTY SAND

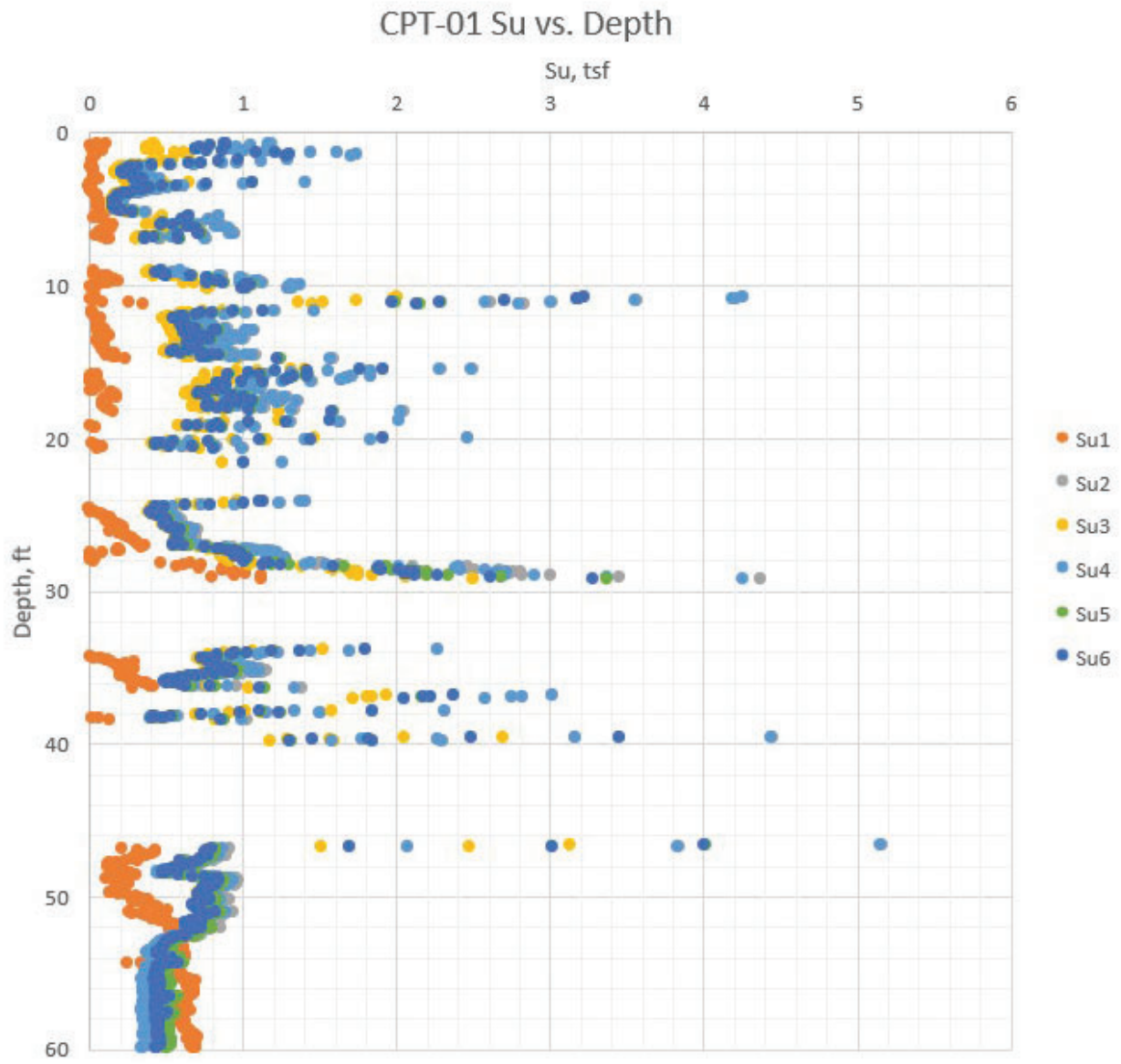
DMT-1139-5

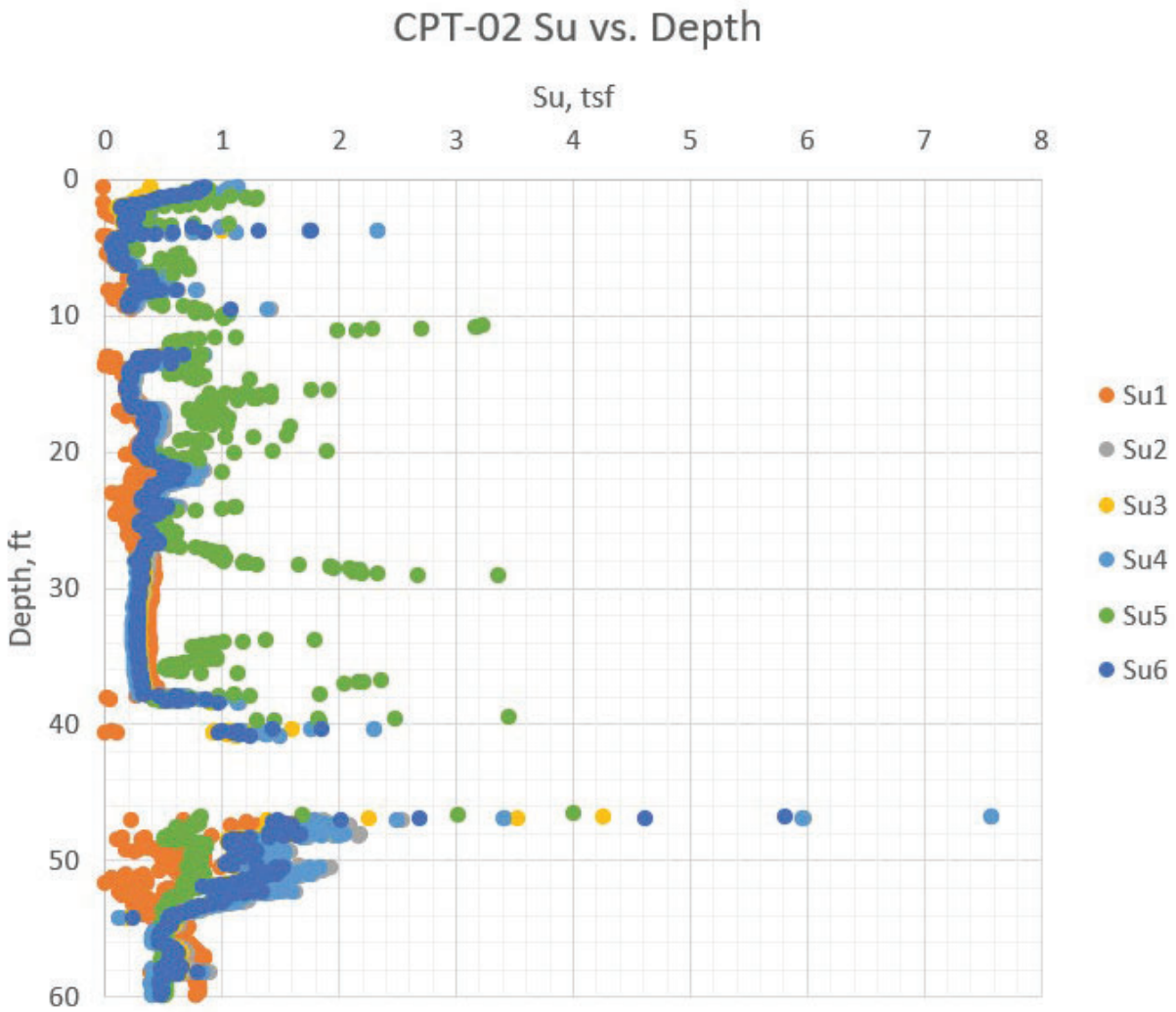
Z	Zabs	Thrust	Δ A	Δ B	A	B	C	γ	σ' v	U_o	P_o	P_1	P_2	Id	Ed	Kd	Ud	M	Su	ϕ	ϕ Ax	ϕ Ps	K_o	σ' h	OCR	Soil description
[m]	[m]	[kg]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]	[kN/m³]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]		[MPa]			[MPa]	[kPa]	[Deg]	[Deg]	[Deg]		[kPa]		
0.2	10.47	840	14.5	41.5	187	584		17.7	3	0	184	542		1.94	12.4	54		51			19.2	20.8				SILTY SAND
0.4	10.27	1020	14.5	41.5	293	846		18.6	7	0	283	804		1.85	18.1	41		69.4			24.5	25.8				SILTY SAND
0.6	10.07	1020	14.5	41.5	319	1062		18.6	11	0	299	1020		2.41	25	28		87			24.5	25.8				SILTY SAND
0.8	9.87	860	14.5	41.5	255	657		16.7	14	0	252	616		1.44	12.6	18		38.2			24.6	25.8				SANDY SILT
1	9.67	620	14.5	41.5	195	384		16.7	18	0	203	342		0.69	4.8	11		12.7	35				2	35.4	15	CLAYEY SILT
1.2	9.47	350	14.5	41.5	143	358		15.7	21	0	150	316		1.12	5.8	7.1		12.5	23				1.5	31.1	7.2	SILT
1.4	9.27	280	14.5	41.5	132	227		15.7	24	0	145	186		0.28	1.4	6		2.8	21				1.3	31.8	5.5	CLAY
1.6	9.07	260	14.5	41.5	125	216		15.7	27	0	138	174		0.27	1.3	5		2.3	19				1.2	31.9	4.2	CLAY
1.8	8.87	980	14.5	41.5	89	830		17.7	30	0	69	788		10.4	25	2.3		30.3			22.4	23.5				SAND
2	8.67	1050	14.5	41.5	343	1022		18.6	34	0	326	980		2	22.7	9.6		55.9			24.6	25.5				SILTY SAND
2.2	8.47	300	14.5	41.5	162	278		15.7	38	0	174	236		0.36	2.2	4.6		3.7	24				1.1	41.2	3.7	SILTY CLAY
2.4	8.27	410	14.5	41.5	200	475		16.7	41	0	204	434		1.13	8	5		14.4	28				1.2	47.3	4.2	SILT
2.6	8.07	660	14.5	41.5	352	1038		18.6	44	0	335	996		1.97	23	7.6		51.4			24.4	25.2				SILTY SAND
2.8	7.87	550	14.5	41.5	226	542		16.7	48	0	228	500		1.2	9.5	4.7		16.7	31				1.1	53.6		SANDY SILT
3	7.67	680	14.5	41.5	172	386		16.7	51	0	179	344		0.93	5.8	3.5		8.3	23				0.9	45.4	2.4	SILT
3.2	7.47	900	14.5	41.5	234	716		17.7	53	2	227	674		1.99	15.5	4.3		26.5			23.5	24.2				SILTY SAND
3.4	7.27	420	14.5	41.5	183	290		15.7	54	3.9	195	248		0.28	1.9	3.5		2.7	24				0.9	48.4	2.4	CLAY
3.6	7.07	370	14.5	41.5	157	254		15.7	55	5.9	169	212		0.26	1.5	3		1.9	20				0.8	42.9	1.8	CLAY
3.8	6.87	390	14.5	41.5	159	275		15.7	57	7.8	170	234		0.39	2.2	2.9		2.7	20				0.8	42.8	1.8	SILTY CLAY
4	6.67	380	14.5	41.5	148	233	75	14.7	58	9.8	161	192	90	0.2	1.1	2.6	0.53	1.2	18				0.7	40.3	1.5	MUD
4.2	6.47	360	14.5	41.5	140	205		13.7	59	11.8	154	164		0.07	0.3	2.4		0.3	16				0.7	38.3	1.3	MUD/PEAT
4.4	6.27	410	14.5	41.5	212	337		15.7	60	13.7	223	296		0.35	2.5	3.5		3.6	27				0.9	53.1	2.4	SILTY CLAY
4.6	6.07	400	14.5	41.5	180	289		15.7	61	15.7	192	248		0.32	1.9	2.9		2.4	21				0.8	46.3	1.8	CLAY
4.8	5.87	420	14.5	41.5	162	257		15.7	62	17.7	175	216		0.26	1.4	2.5		1.6	18				0.7	42	1.4	CLAY
5	5.67	480	14.5	41.5	181	277		15.7	63	19.6	194	236		0.24	1.5	2.8		1.7	21				0.7	46.1	1.7	CLAY
5.2	5.47	480	14.5	41.5	183	292	93	15.7	64	21.6	195	250	108	0.32	1.9	2.7	0.5	2.2	21				0.7	46	1.6	CLAY
5.4	5.27	450	14.5	41.5	200	306		15.7	65	23.5	212	264		0.28	1.8	2.9		2.2	23				0.8	49.6	1.8	CLAY
5.6	5.07	520	14.5	41.5	275	422		16.7	67	25.5	285	380		0.37	3.3	3.9		5.1	34				1	64.3	2.8	SILTY CLAY
5.8	4.87	560	14.5	41.5	284	438		16.7	68	27.5	294	396		0.39	3.6	3.9		5.5	35				1	65.8	2.9	SILTY CLAY
6	4.67	560	14.5	41.5	266	433		16.7	69	29.4	275	392		0.47	4	3.5		5.8	31				0.9	62.2	2.4	SILTY CLAY
6.2	4.47	570	14.5	41.5	243	443	96	16.7	71	31.4	250	402	110	0.69	5.2	3.1	0.36	6.8	27				0.8	56.9	2	CLAYEY SILT
6.4	4.27	610	14.5	41.5	224	352		15.7	72	33.4	235	310		0.38	2.6	2.8		3.1	24				0.7	53.3	1.7	SILTY CLAY
6.6	4.07	590	14.5	41.5	251	367		15.7	73	35.3	263	326		0.28	2.2	3.1		2.8	28				0.8	59	2	CLAY
6.8	3.87	690	14.5	41.5	312	463		16.7	74	37.3	322	422		0.35	3.5	3.8		5.2	37				1	70.8	2.7	SILTY CLAY
7	3.67	690	14.5	41.5	313	473	151	16.7	76	39.2	322	432	166	0.39	3.8	3.7	0.45	5.6	36				0.9	70.8	2.6	SILTY CLAY
7.2	3.47	750	14.5	41.5	431	639		16.7	77	41.2	438	598		0.4	5.5	5.1		10.1	55				1.2	91.3	4.4	SILTY CLAY
7.4	3.27	840	14.5	41.5	343	575		16.7	79	43.2	349	534		0.6	6.4	3.9		9.8	40				1	75.7	2.8	CLAYEY SILT
7.6	3.07	1152	14.5	41.5	346	956		18.6	80	45.1	333	914		2.02	20.2	3.6		31.2			0	0				SILTY SAND
7.8	2.87	1310	14.5	41.5	365	819		17.7	82	47.1	360	778		1.34	14.5	3.8		22.6			0	0				SANDY SILT
8	2.67	910	14.5	41.5	219	328	121	15.7	83	49.1	231	286	136	0.31	1.9	2.2	0.48	1.8	20				0.6	49.3	1.1	CLAY
8.2	2.47	720	14.5	41.5	232	339		15.7	84	51	244	298		0.28	1.9	2.3		1.8	22				0.6	52.2	1.2	CLAY

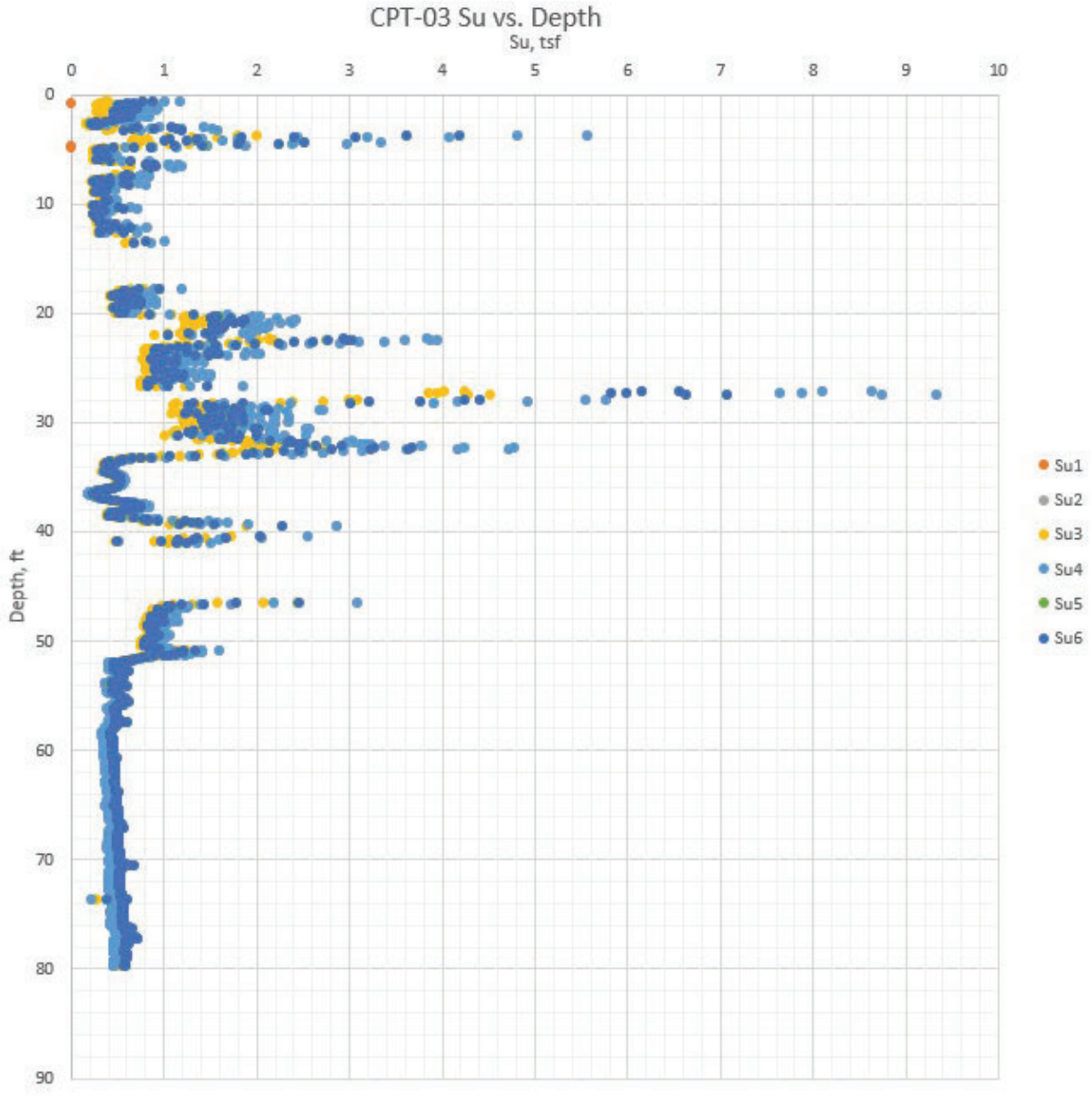
DMT-1139-5

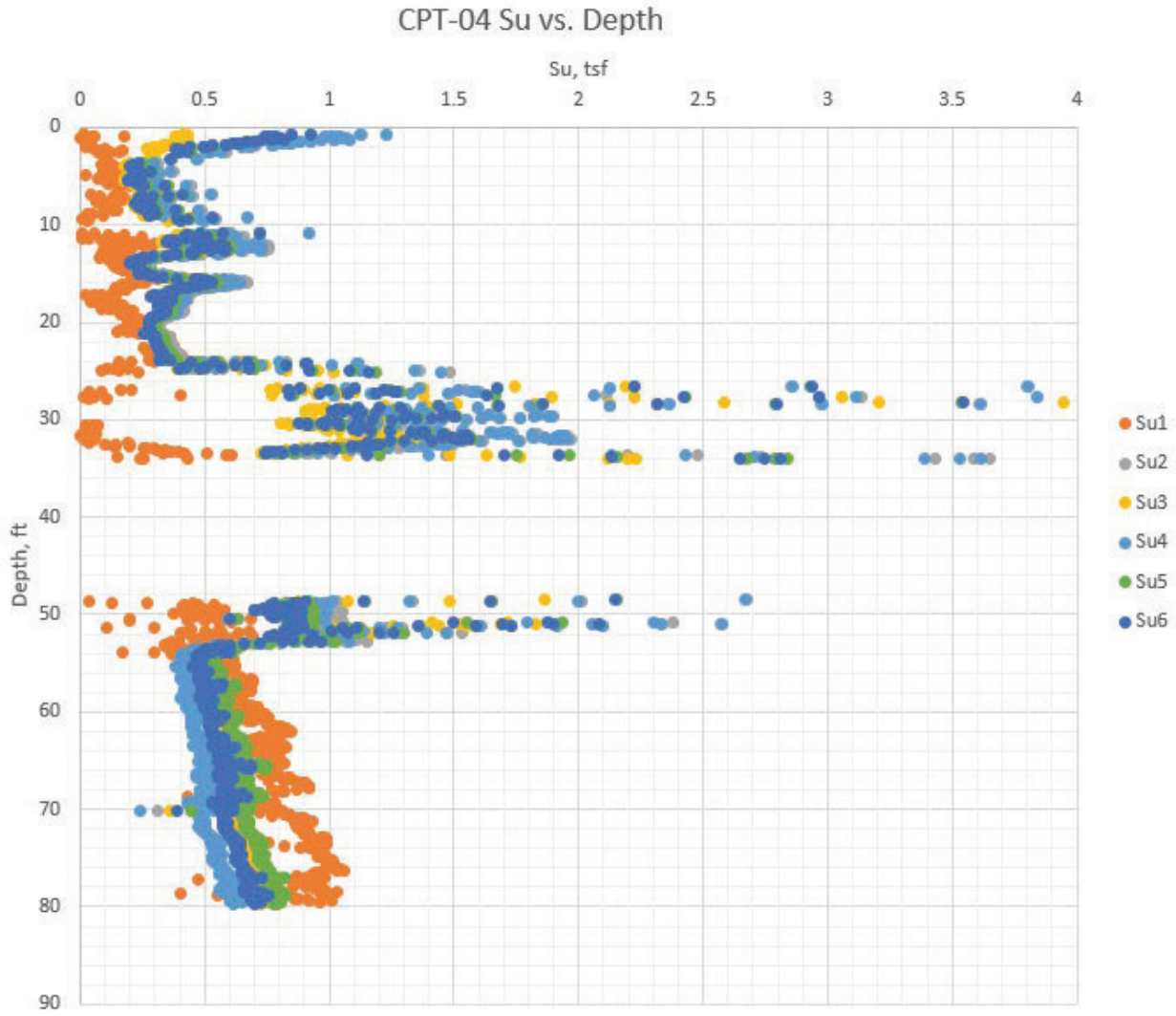
Z	Zabs	Thrust	Δ A	Δ B	A	B	C	γ	σ' v	U_o	P_o	P_1	P_2	Id	Ed	Kd	Ud	M	Su	ϕ	ϕ Ax	ϕ Ps	K_o	σ' h	OCR	Soil description
[m]	[m]	[kg]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]	[kN/m³]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]		[MPa]			[MPa]	[kPa]	[Deg]	[Deg]	[Deg]		[kPa]		
8.4	2.27	840	14.5	41.5	217	349		15.7	86	53	228	308		0.46	2.8	2		2.4	19				0.6	47.5	1	SILTY CLAY
8.6	2.07	1490	14.5	41.5	303	643		16.7	87	54.9	303	602		1.2	10.3	2.9		13.1			0	0				SANDY SILT
8.8	1.87	1490	14.5	41.5	347	487		16.7	88	56.9	357	446		0.29	3.1	3.4		4.3	38				0.9	76.7	2.3	CLAY
9	1.67	950	14.5	41.5	360	520	233	16.7	90	58.9	369	478	248	0.35	3.8	3.5	0.61	5.4	39				0.9	78.9	2.4	SILTY CLAY
9.2	1.47	1055	14.5	41.5	370	731		17.7	91	60.8	369	690		1.04	11.1	3.4		15.8	39				0.9	78.8	2.3	SILT
9.4	1.27	1030	14.5	41.5	429	573		16.7	92	62.8	439	532		0.25	3.2	4.1		5.1	49				1	92.2	3	CLAY
9.6	1.07	1130	14.5	41.5	533	769		17.7	94	64.7	538	728		0.4	6.6	5		11.8	66				1.2	110	4.2	SILTY CLAY
9.8	0.87	1580	14.5	41.5	883	1340		18.6	95	66.7	877	1298		0.52	14.6	8.5		34.1	128				1.7	158	9.6	SILTY CLAY
10	0.67	1690	14.5	41.5	828	1224	413	18.6	97	68.7	826	1182	428	0.47	12.4	7.8	0.47	27.8	117				1.6	152	8.3	SILTY CLAY
10.2	0.47	1850	14.5	41.5	941	1324		18.6	99	70.6	939	1282		0.4	11.9	8.8		28.2	138				1.7	168	10	SILTY CLAY
10.4	0.27	1860	14.5	41.5	964	1311		18.6	101	72.6	964	1270		0.34	10.6	8.9		25.2	142				1.7	171	10	SILTY CLAY
10.6	0.07	2070	14.5	41.5	1047	1594		18.6	102	74.6	1037	1552		0.54	17.9	9.4		43.6	156				1.8	181	11	SILTY CLAY
10.8	-0.13	2530	14.5	41.5	1308	2017		18.6	104	76.5	1290	1976		0.57	23.8	12		62.9	207				2	210	16	SILTY CLAY
11	-0.33	2290	14.5	41.5	788	1361	118	19.1	106	78.5	777	1320	132	0.78	18.8	6.6	0.08	39.1	103				1.4	149	6.4	CLAYEY SILT
11.2	-0.53	3600	14.5	41.5	531	1714		19.6	108	80.4	489	1672		2.9	41.1	3.8		67.8			24	24.2				SILTY SAND
11.4	-0.73	5400	14.5	41.5	1242	2810		20.6	110	82.4	1181	2768		1.45	55.1	10		137.7			25.3	25.5				SANDY SILT
11.6	-0.93	4850	14.5	41.5	982	2684		19.6	112	84.4	914	2642		2.08	60	7.4		133.2			25.1	25.2				SILTY SAND
11.8	-1.13	5800	14.5	41.5	1199	3019		20.6	114	86.3	1125	2978		1.78	64.3	9.1		155			25.4	25.5				SANDY SILT
12	-1.33	4710	14.5	41.5	1027	2666		21.1	116	88.3	962	2624		1.9	57.7	7.5		128.8			25.1	25.2				SILTY SAND
12.2	-1.53	3980	14.5	41.5	831	2135		19.6	118	90.3	783	2094		1.89	45.5	5.9		90.8			24.6	24.8				SILTY SAND
12.4	-1.73	4050	14.5	41.5	857	2391		19.6	120	92.2	798	2350		2.2	53.9	5.9		108.1			24.7	24.8				SILTY SAND
12.6	-1.93	4770	14.5	41.5	1180	2985		21.1	122	94.2	1107	2944		1.81	63.7	8.3		148			25.2	25.2				SILTY SAND
12.8	-2.13	4940	14.5	41.5	1168	2641		20.6	125	96.1	1112	2600		1.47	51.6	8.2		118.9			25.2	25.2				SANDY SILT
13	-2.33	4990	14.5	41.5	1121	2628	35	20.6	127	98.1	1063	2586	50	1.58	52.9	7.6	-0.1	118.3			25.2	25.2				SANDY SILT
13.2	-2.53	5300	14.5	41.5	1076	2644		20.6	129	100	1015	2602		1.74	55.1	7.1		119.8			25	25				SANDY SILT
13.4	-2.73	4900	14.5	41.5	921	2348		19.6	131	102	867	2306		1.88	50	5.8		99.6			24.7	24.8				SILTY SAND
13.6	-2.93	6040	14.5	41.5	1187	2928		20.6	133	104	1117	2886		1.75	61.4	7.6		137.6			25.3	25.2				SANDY SILT
13.8	-3.13	5320	14.5	41.5	1123	2649		20.6	135	106	1064	2608		1.61	53.6	7.1		116.2			25	25				SANDY SILT
14	-3.33	5630	14.5	41.5	978	2637	43	19.6	137	108	912	2596	58	2.09	58.4	5.9	-0.1	117			24.8	24.8				SILTY SAND
14.2	-3.53	5310	14.5	41.5	1149	2573		20.6	139	110	1095	2532		1.46	49.8	7.1		107.9			25.1	25				SANDY SILT
14.4	-3.73	2600	14.5	41.5	543	1264		17.7	141	112	524	1222		1.69	24.2	2.9		32.1			0	0				SANDY SILT
14.6	-3.93	1600	14.5	41.5	508	698		16.7	143	114	516	656		0.35	4.9	2.8		5.9	48				0.7	106	1.7	SILTY CLAY
14.8	-4.13	1460	14.5	41.5	552	700		16.7	144	116	562	658		0.22	3.4	3.1		4.3	55				0.8	116	2	CLAY
15	-4.33	1400	14.5	41.5	573	731	405	16.7	146	118	582	690	420	0.23	3.7	3.2	0.65	4.9	57				0.8	120	2.1	CLAY
15.2	-4.53	1630	14.5	41.5	589	734		16.7	147	120	599	692		0.19	3.2	3.3		4.4	60				0.8	123	2.1	CLAY
15.4	-4.73	1750	14.5	41.5	568	724		16.7	148	122	578	682		0.23	3.6	3.1		4.7	56				0.8	119	2	CLAY

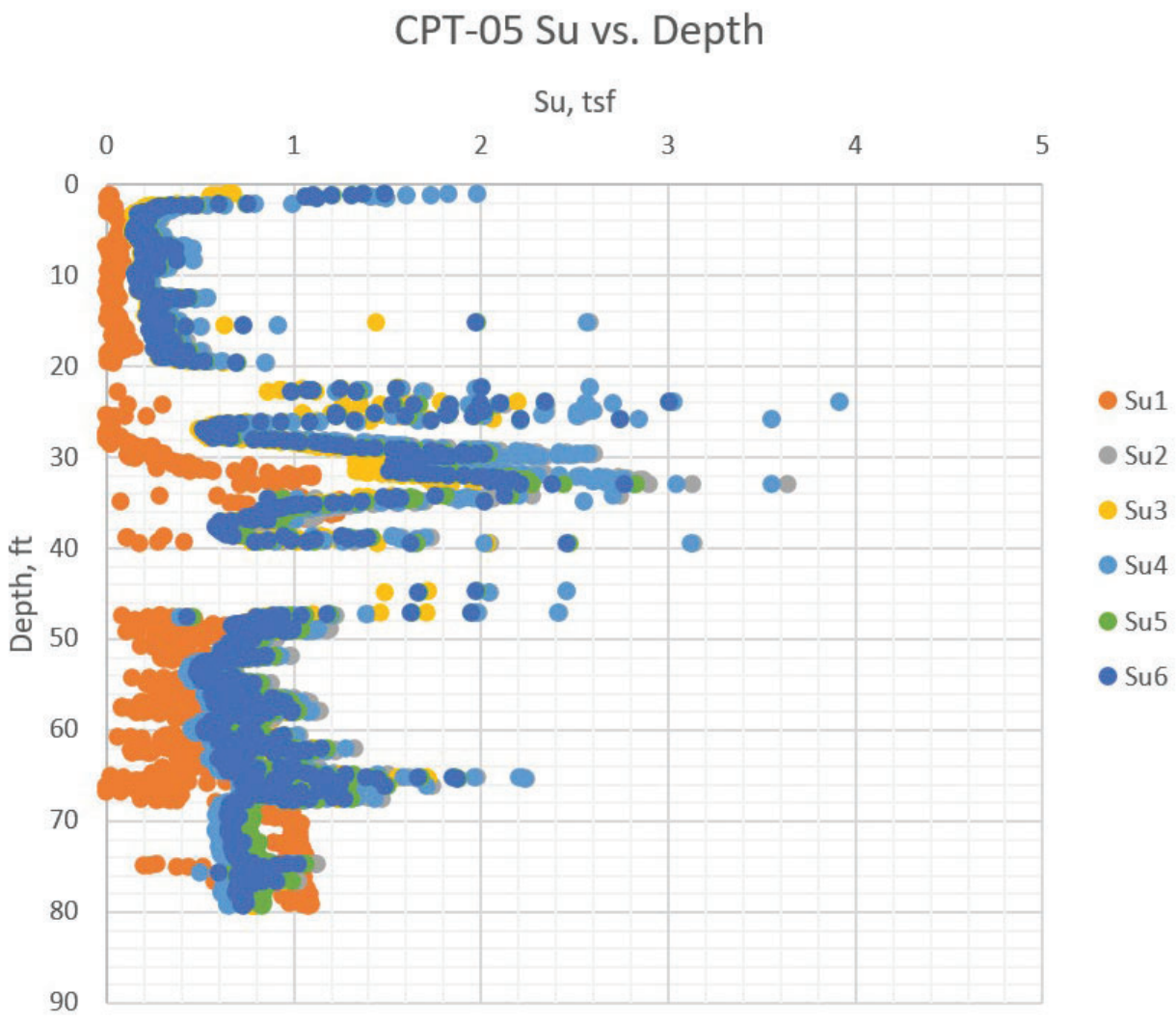
Su vs Depth Charts


CPT-01 Su vs. Depth
Su, tsf
0
1
2
3
4
5
6
Depth, ft
0
10
20
30
40
50
60
Su1
Su2
Su3
Su4
Su5
Su6


CPT-02 Su vs. Depth
Su, tsf
0
1
2
3
4
5
6
7
8
Depth, ft
0
10
20
30
40
50
60
Su1
Su2
Su3
Su4
Su5
Su6

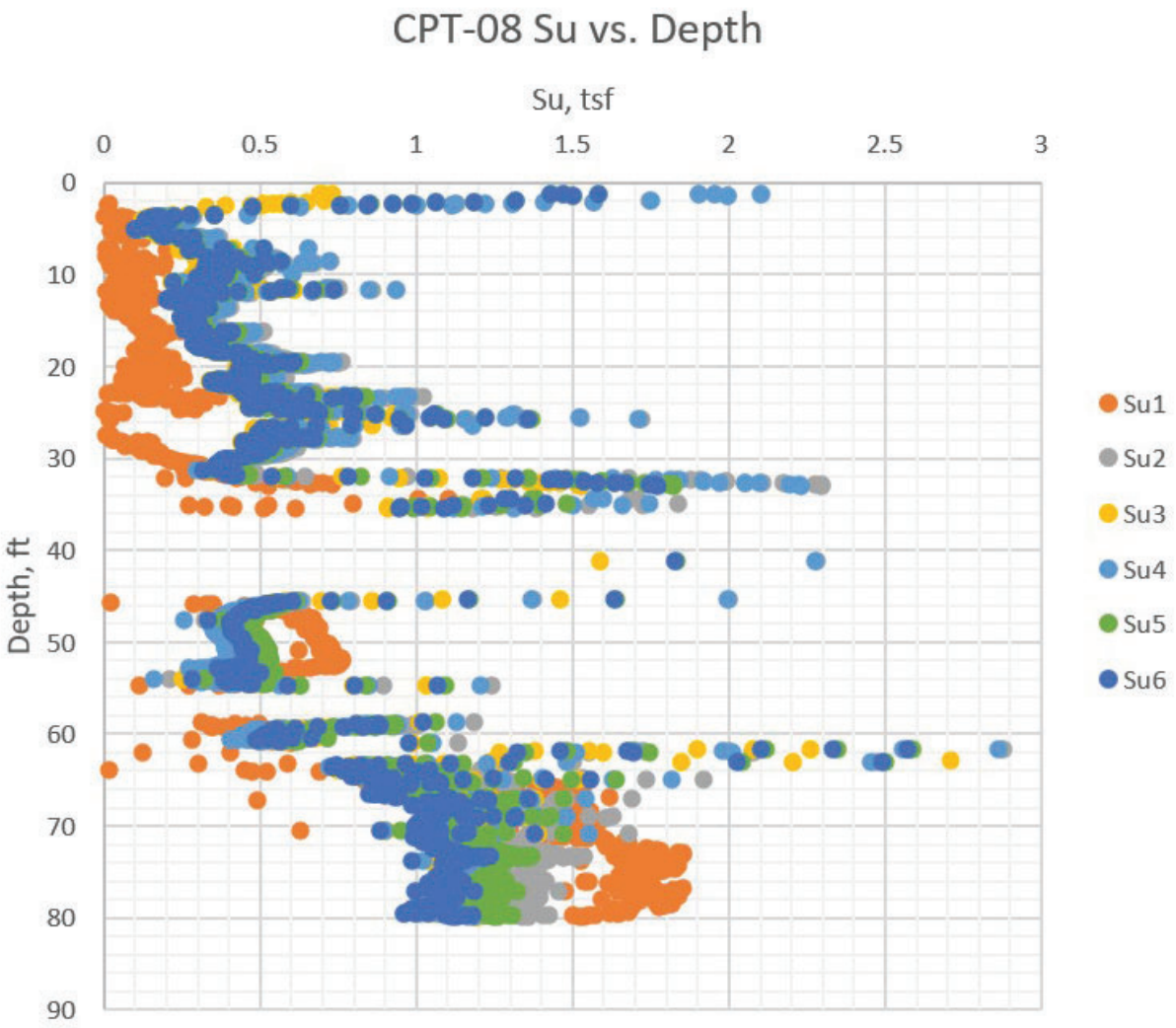

CPT-03 Su vs. Depth
Su, tsf
0
1
2
3
4
5
6
7
8
9
10
Depth, ft
0
10
20
30
40
50
60
70
80
90
Su1
Su2
Su3
Su4
Su5
Su6


CPT-04 Su vs. Depth
Su, tsf
0
0.5
1
1.5
2
2.5
3
3.5
4
Depth, ft
0
10
20
30
40
50
60
70
80
90
Su1
Su2
Su3
Su4
Su5
Su6

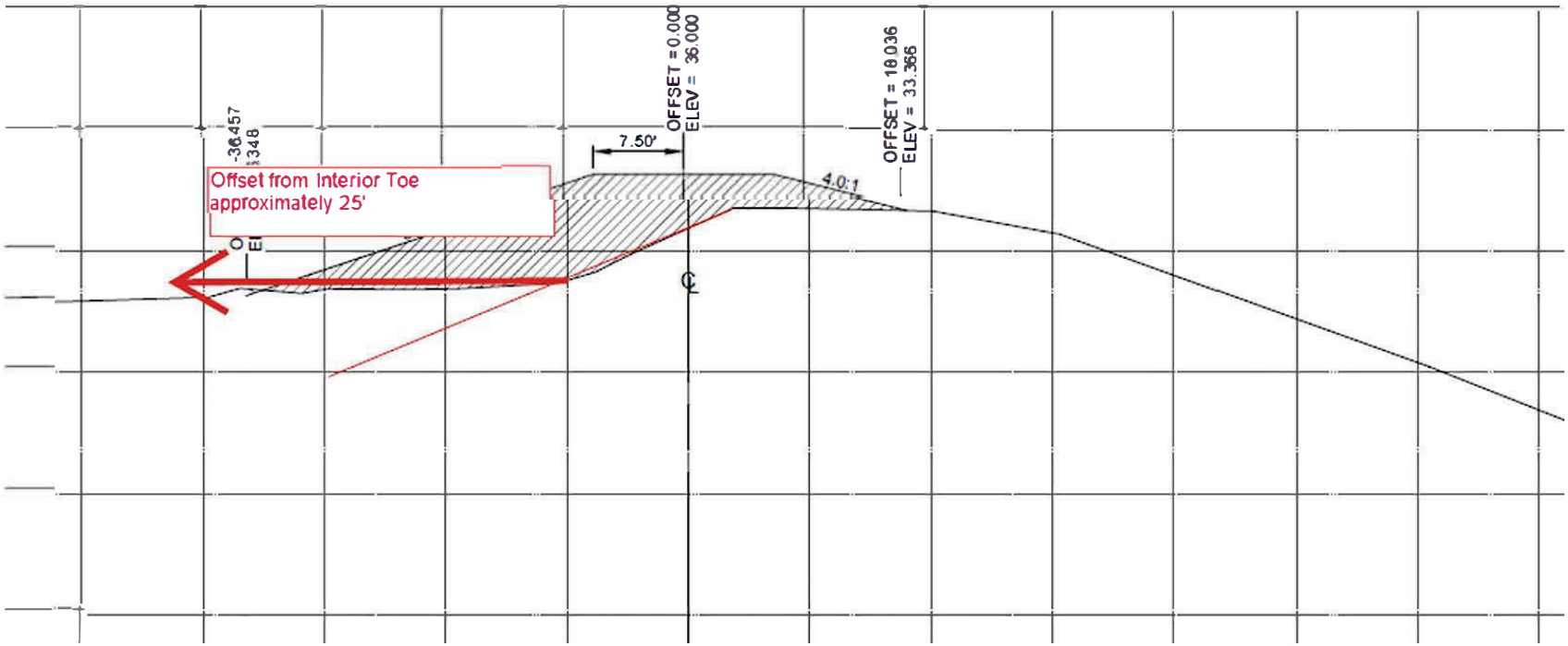

CPT-05 Su vs. Depth
Su, tsf
0
1
2
3
4
5
Depth, ft
0
10
20
30
40
50
60
70
80
90
Su1
Su2
Su3
Su4
Su5
Su6

CPT-06 Su vs. Depth
Su, tsf
0
0.5
1
1.5
2
2.5
3
3.5
4
Depth, ft
0
10
20
30
40
50
60
70
80
90
Su1
Su2
Su3
Su4
Su5
Su6

CPT-07 Su vs. Depth
Su, tsf
0
1
2
3
4
5
6
Depth, ft
0
10
20
30
40
50
60
70
80
90
Su1
Su2
Su3
Su4
Su5
Su6


CPT-08 Su vs. Depth
Su, tsf
0
0.5
1
1.5
2
2.5
3
Depth, ft
0
10
20
30
40
50
60
70
80
90
Su1
Su2
Su3
Su4
Su5
Su6

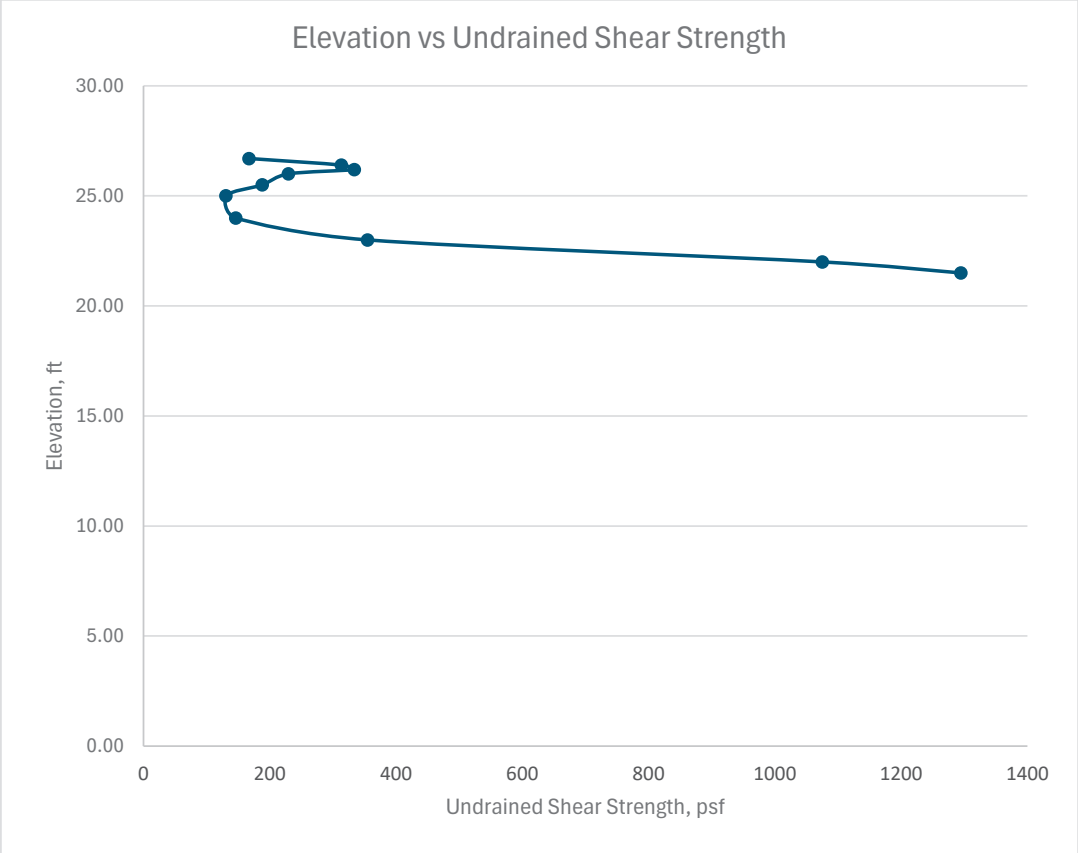
Vane Shear Results


-36.457
1348
OFFSET = 0.000
ELEV = 36.000
7.50'
OFFSET = 18.036
ELEV = 33.366
4.0:1
Offset from Interior Toe
approximately 25'
℄

VST-1139-01 XS2
Date: 2/18/2025
Surface Elevation: 27.0

Depth from Surface	Elevation of Test	Test Value (kPa)	Undrained Strength (psf)
0.30	26.70	16.0	167
0.60	26.40	30.0	313
0.80	26.20	32.0	334
1.00	26.00	22.0	230
1.50	25.50	18.0	188
2.00	25.00	12.5	131
3.00	24.00	14.0	146
4.00	23.00	34.0	355
5.00	22.00	103.0	1075
5.50	21.50	124.0	1295

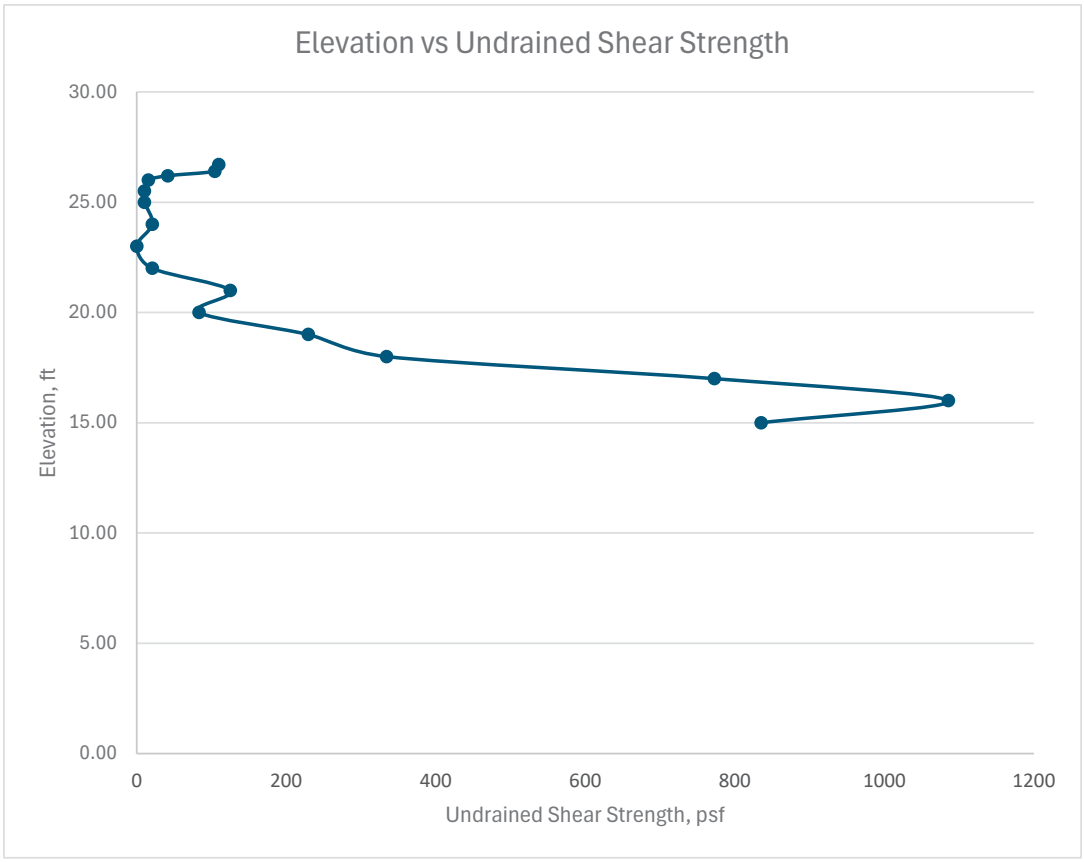
NOTE: Refusal below 5.5 feet



VST-1139-02 XS5
Date: 2/18/2025
Surface Elevation: 27.0

Depth from Surface	Elevation of Test	Test Value (kPa)	Undrained Strength (psf)
0.30	26.70	10.5	110
0.60	26.40	10.0	104
0.80	26.20	4.0	42
1.00	26.00	1.5	16
1.50	25.50	1.0	10
2.00	25.00	1.0	10
3.00	24.00	2.0	21
4.00	23.00	0.0	0
5.00	22.00	2.0	21
6.00	21.00	12.0	125
7.00	20.00	8.0	84
8.00	19.00	22.0	230
9.00	18.00	32.0	334
10.00	17.00	74.0	773
11.00	16.00	104.0	1086
12.00	15.00	80.0	835

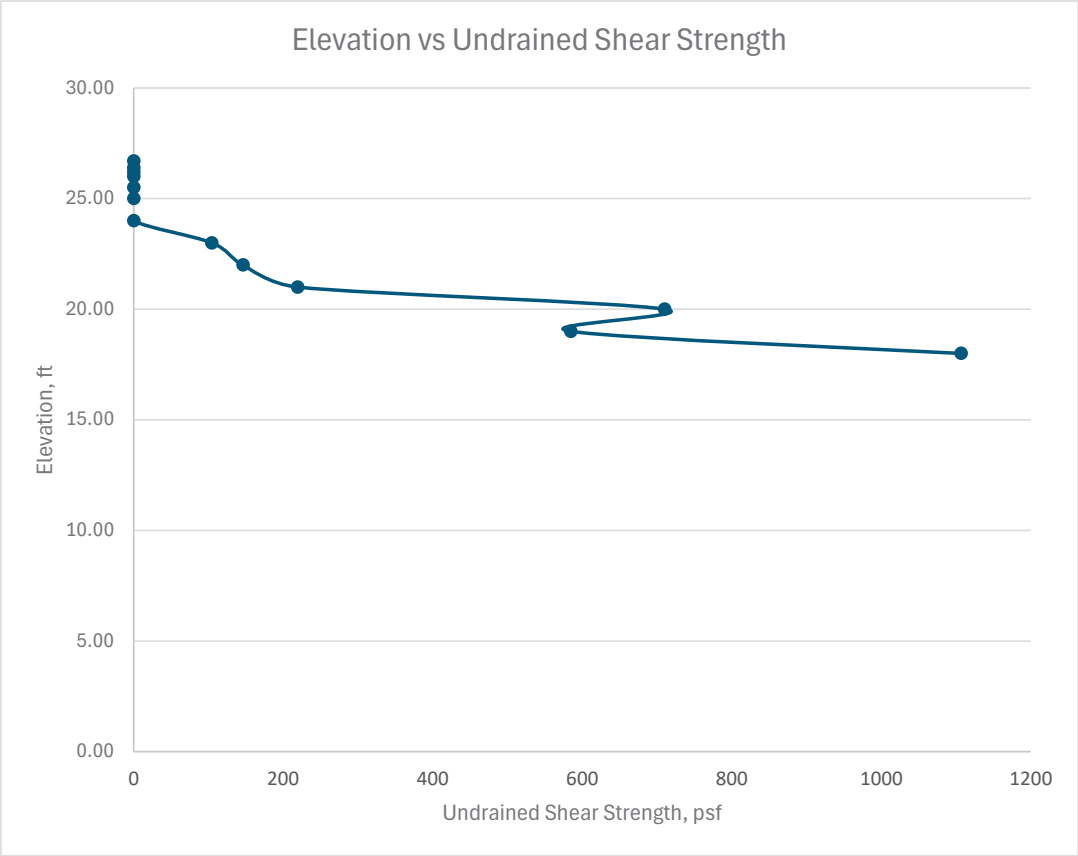
NOTE: Refusal below 12.0 feet



VST-1139-03 XS6
Date: 2/18/2025
Surface Elevation: 27.0

Depth from Surface	Elevation of Test	Test Value (kPa)	Undrained Strength (psf)
0.30	26.70	0.0	0
0.60	26.40	0.0	0
0.80	26.20	0.0	0
1.00	26.00	0.0	0
1.50	25.50	0.0	0
2.00	25.00	0.0	0
3.00	24.00	0.0	0
4.00	23.00	10.0	104
5.00	22.00	14.0	146
6.00	21.00	21.0	219
7.00	20.00	68.0	710
8.00	19.00	56.0	585
9.00	18.00	106.0	1107

NOTE: Refusal below 10.0 feet



Test Pit Results

FEDMMA Test Pit Results, 10/8/2024

Sample ID #	Actual Sample Position		Water Table Depth (ft)	Depth of Pit (ft)	Length of Pit (ft)	Width of Pit (ft)	Notes
	LAT	LON					
TP-1139-01	37° 9'3.34"N	76°36'15.07"W	6.0	6.0	5.0	5.0	**SW-SM on top of CL**
TP-1139-02	37° 9'1.40"N	76°36'17.12"W	6.0	6.0	9.8	5.0	**SM on top of CL**
TP-1139-03	37° 8'59.61"N	76°36'15.20"W	6.0	6.0	5.0	5.0	**SM on top of CL**
TP-1139-04	37° 8'59.41"N	76°36'11.70"W	4.5	6.5	8.0	5.2	**CL**
TP-1139-05	37° 9'2.13"N	76°36'12.34"W	---	6.7	8.0	7.0	**SW and SP-SM on top of CL**
TP-1139-06	37° 9'3.03"N	76°36'10.80"W	4.0	7.0	7.0	6.0	**SP-SM or SP-SC on top of CL**
TP-1139-07	37° 9'5.44"N	76°36'11.05"W	3.8	3.8	10.8	7.0	**SP-SM or SP-SC on top of CL**
TP-1139-08	37° 9'8.93"N	76°36'9.38"W	4.2	4.2	9.0	5.8	**CL**
TP-1139-09	37° 9'11.77"N	76°36'7.60"W	3.3	3.3	8.6	5.4	**CL**
TP-1139-10	37° 9'13.07"N	76°36'7.92"W	3.0	3.0	7.0	5.5	**SW**
TP-1139-11	37° 9'9.07"N	76°36'4.28"W	5.0	6.0	8.0	6.0	**CL**
TP-1139-12	37° 9'4.57"N	76°36'2.99"W	2.5	2.5	6.0	5.0	**CL**
TP-1139-13	37° 9'3.02"N	76°36'6.08"W	4.0	4.0	9.0	4.8	**CL**

Test	Total Depth Explored (ft)	Approximate Sand Layer Thickness (ft)	Assumed Area (ft^2)	% Sand Content in Sand Layer	% Sand Content in Depth Explored
TP-1139-01	6	1.5	29,606	93.2%	23%
TP-1139-02	6	0.67	47,791	48.1%	5%
TP-1139-03	6	1	107,216	65.0%	11%
TP-1139-05	6.7	1	66,898	85.2%	13%
TP-1139-06	7	0.5	91,706	95.2%	7%
TP-1139-07	3.8	0.67	77,854	93.5%	16%
TP-1139-10	3	1	71,569	92.1%	31%
		Total Area	**492,640**	**Avg Sand Content**	**15%**

Total Material Needed	63,302	CY	See Sheets VH 303 and VH-304
Minimum Sand Required	31,651	CY	Assuming minimum of 50% sand
Minimum Sand Required	854,577	CF	Minimun Sand Required (CY) * 27
Average Depth of Excavation	11.4	FT	Minimum Sand Required / (Total Area * Avg Sand Content)

TP-1139-10
TP-1139-09
TP-1139-08
TP-1139-11
TP-1139-07
TP-1139-12
TP-1139-01
TP-1139-06
TP-1139-13
TP-1139-02
TP-1139-05
TP-1139-03
TP-1139-04
Wilson Ave
Mulberry Island Rd
Mulberry Island Rd
Image Landsat / Copernicus

TP-1139-01

Depth [ft]	Field Classification of Materials
0 - 1.5	WELL GRADED SAND WITH SILT (SW-SM); light brown-orange and light gray, well-graded medium sand, rapid dilatancy, low toughness and plasticity
1.5 - 6	LEAN CLAY (CL); "muck", dark gray

TP-1139-01

TP-1139-02

Depth [ft]	Field Classification of Materials
0 - 0.67	SILTY SAND (SM); light-dark gray w/ trace orange-brown, none to slow dilatancy, low toughness, no odor
0.67 - 6	LEAN CLAY (CL); "muck", dark gray

TP-1139-02

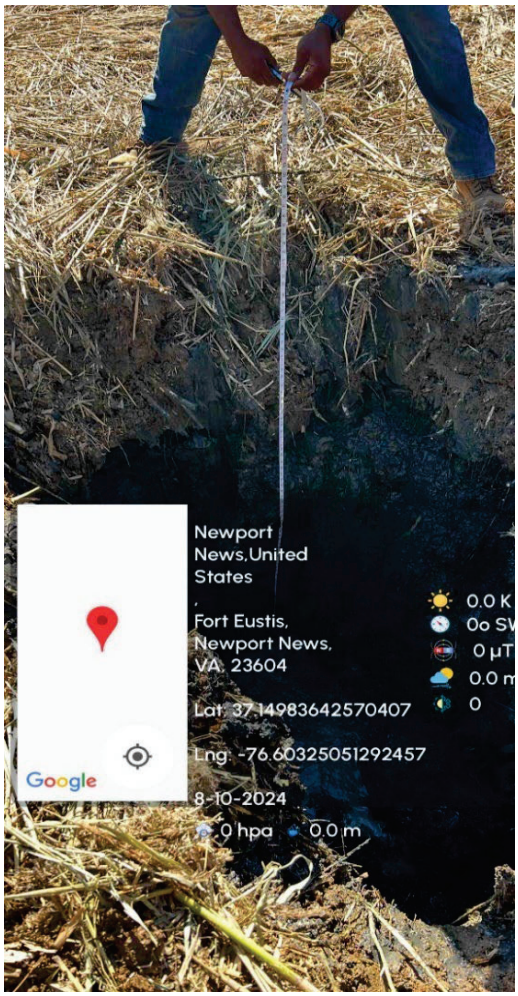
TP-1139-03

Depth [ft]	Field Classification of Materials
0-1	SILTY SAND (SM); light gray, fine sand, rapid dilatancy, low plasticity and toughness, mild odor
1-6	LEAN CLAY (CL); "muck", dark gray

TP-1139-03

TP-1139-04

Depth [ft]	Field Classification of Materials
0 - 6	LEAN CLAY (CL); "muck", dark gray



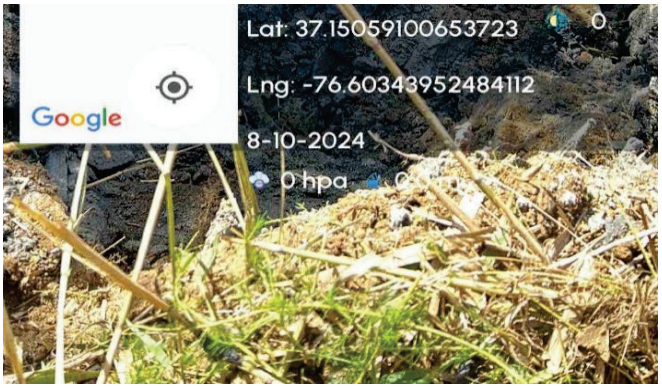
TP-1139-05

Depth [ft]	Field Classification of Materials
0 - 3.5	---
3.5 - 4	WELL-GRADED SAND (SW); light brown, medium-coarse, well-graded sand
4 - 4.5	POORLY GRADED SAND WITH SILT (SP-SM); light gray, fine, poorly graded sand
4.5 - 6	LEAN CLAY (CL); "muck", dark gray

TP-1139-05

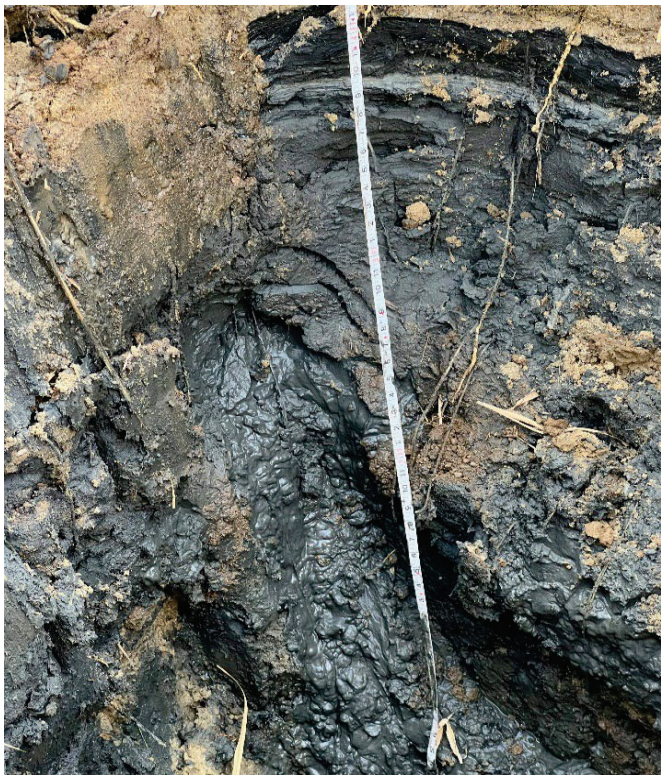
Newport
News,United
States
Fort Eustis,
Newport News,
VA, 23604
0.0 K
0o SW
0 µT
0.0 m

TP-1139-05


Google
Lat: 37.15059100653723
Lng: -76.60343952484112
8-10-2024
0 hpa

TP-1139-06

Depth [ft]	Field Classification of Materials
0 - 1.5	---
1.5 - 2	POORLY GRADED SAND WITH SILT OR CLAY (SP-SM/SP-SC); tan, coarse, poorly graded sand, no dilatancy, mild odor
2 - 7	LEAN CLAY (CL); "muck", dark gray



TP-1139-06

TP-1139-06

TP-1139-07

Depth [ft]	Field Classification of Materials
0 - 2	---
2 - 2.67	WELL-GRADED SAND WITH SILT OR CLAY (SW-SM/SW-SC); light brown, coarse, well-graded sand, mild odor
2.67 - 3.8	LEAN CLAY (CL); "muck", dark gray

TP-1139-07

TP-1139-08

Depth [ft]	Field Classification of Materials
0 - 4.16	LEAN CLAY (CL); "muck", dark gray

TP-1139-08

TP-1139-09

Depth [ft]	Field Classification of Materials
0 - 3.3	LEAN CLAY (CL); "muck", dark gray

TP-1139-10

Depth [ft]	Field Classification of Materials
0 - 2	---
2 - 3	WELL-GRADED SAND (SW);light brown-light gray, moist to wet, coarse, well-graded sand with shell fragments, no odor

TP-1139-10

TP-1139-11

Depth [ft]	Field Classification of Materials
0 - 5	LEAN CLAY (CL); "muck", strong odor

TP-1139-12

Depth [ft]	Field Classification of Materials
0 - 2.5	LEAN CLAY (CL); "muck", strong odor

TP-1139-13

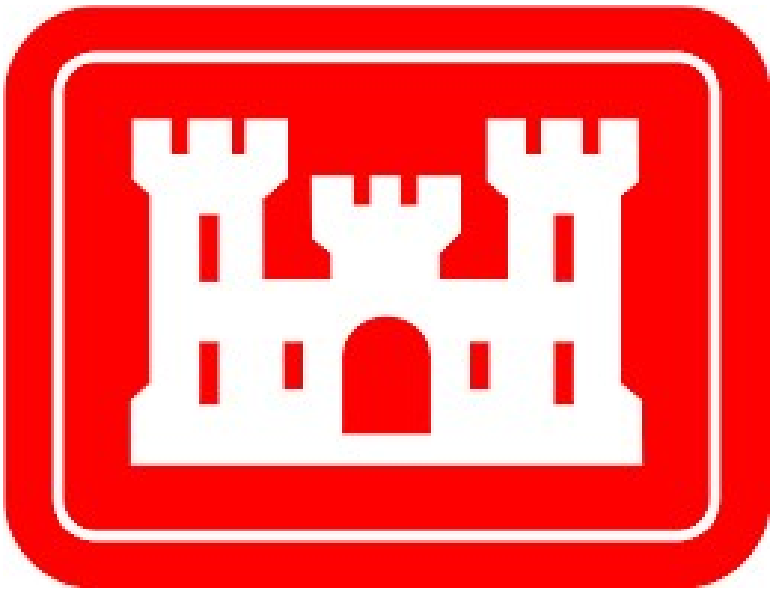
Depth [ft]	Field Classification of Materials
0 - 4	LEAN CLAY (CL); "muck", strong odor

TP-1139-13

TP-1139-13

U.S. Army Corps of Engineers

Baltimore District



Materials and Instrumentation Unit

FEDMMA (interior),

Fort Eustis, VA.

Date: February 2020

Pages: 1-12 of 12

Prepared by: Estes, R.

Ray, D.

TP-3
SP-SM
TP-4
CH
TP-2
CH
TP-5
MH
TP-7
MH
TP-1
CH/CL
TP-6
CH
TP-8
CH
TP-9
TP-10
© 2018 Google

VISUAL-MANUAL CLASSIFICATION

(Test method: ASTM D 2488)

PROJECT: FEDMMA (interior) **DATE:** JAN 2020

AREA: Fort Eustis, VA **CLASSIFIED BY:** Estes, R.

SAMPLE NO.	DEPTH (ft)	VISUAL CLASSIFICATION	SYMBOL
TP-1			
Jar-1	0.0-2.0	Moist grey-brown sandy fat clay w/ trace of gravel	(CH)
Jar-2	2.0-4.0	Very moist grey-brown clayey sand w/ trace of gravel	(SC)
TP-2			
Jar-1	0.0-2.0	Moist brown fat clay with sand.	(CH)
Jar-2	4.0-6.0	Moist grey-brown fat clay w/ sand and trace organics	(CH)
TP-3			
Jar-1	2.0-4.0	Wet light brown-grey poorly graded sand with silt and gravel.	(SP-SM)
TP-4			
Jar-1	2.0-4.0	Moist grey-brown fat clay with sand.	(CH)
TP-5			
Jar-1	0.0-2.0	Moist grey-brown elastic silt w/ sand and trace roots	(MH)
TP-6			
Jar-1	2.0-4.0	Moist grey-brown fat clay with sand.	(CH)
TP-7			
Jar-1	0.0-2.0	Moist grey-brown elastic silt w/ sand and trace roots	(MH)
TP-8			
Jar-1	0.0-2.0	Moist grey-brown fat clay w/ sand and trace roots.	(CH)

LABORATORY TEST RESULTS

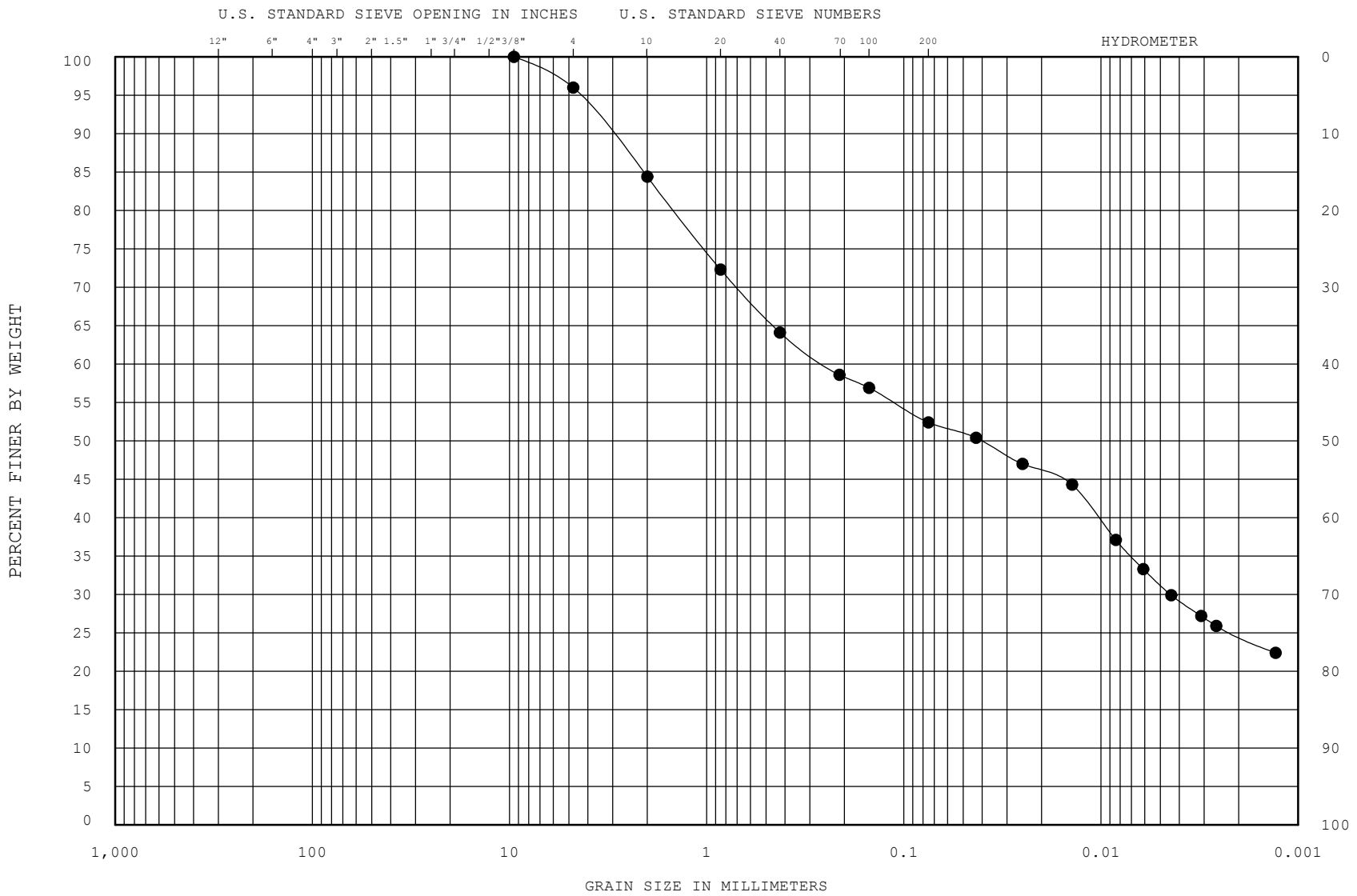
PROJECT:	FEDMMA (interior)	**DATE:**	February 2020
AREA:	Fort Eustis VA	**Page:**	1 of 1

TEST: Natural Moisture Contents (ASTM D 2216 Method B) & Atterberg Limits (ASTM D 4318)
Amount of Material in Soils Finer than No. 40 (0.42 mm) Sieve (ASTM D1140)

Hole No.	Sample No.		Depth (ft)	Moisture Content %	LOI	LL	PL	PI	Atterberg Classification	Symbol
TP-1	Jar-	1	0.0-2.0	30.8		65	18	47	Fat Clay	CH
TP-1	Jar-	2	2.0-4.0	26.7		45	17	28	Lean Clay	CL
TP-2	Jar-	1	0.0-2.0	69.4		109	42	67	Fat Clay	CH
TP-2	Jar-	2	4.0-6.0	39.4		64	28	36	Fat Clay	CH
TP-3	Jar-	1	2.0-4.0	15.0		NP	NP	NP		SP-SM*
TP-4	Jar-	1	2.0-4.0	59.0	5.4	80	30	50	Fat Clay	CH
TP-5	Jar-	1	0.0-2.0	38.1		89	40	49	Elastic Silt	MH
TP-6	Jar-	1	2.0-4.0	80.9		115	37	78	Fat Clay	CH
TP-7	Jar-	1	0.0-2.0	68.1		107	44	63	Elastic Silt	MH
TP-8	Jar-	1	0.0-2.0	72.6		86	36	50	Fat Clay	CH

* Classification based on visual identification or gradation curve.
NP: Non-Plastic

Note: The Atterberg Limits test is only performed on minus No. 40 material portion of a sample and does not represent the entire sample. Refer to the Visual Classification or the Gradation Analysis for the complete classification.



Legend	Sample No.	Depth (ft)	Classification (ASTM D 2487)		Nat wc%	LL	PL	PI
—●—	Jar-1	0.0-2.0	SANDY FAT CLAY	CH	30.8	65	18	47
—⊠—								
—▲—								
—★—								

REMARKS :

PROJECT: *FEDMMA (interior)*

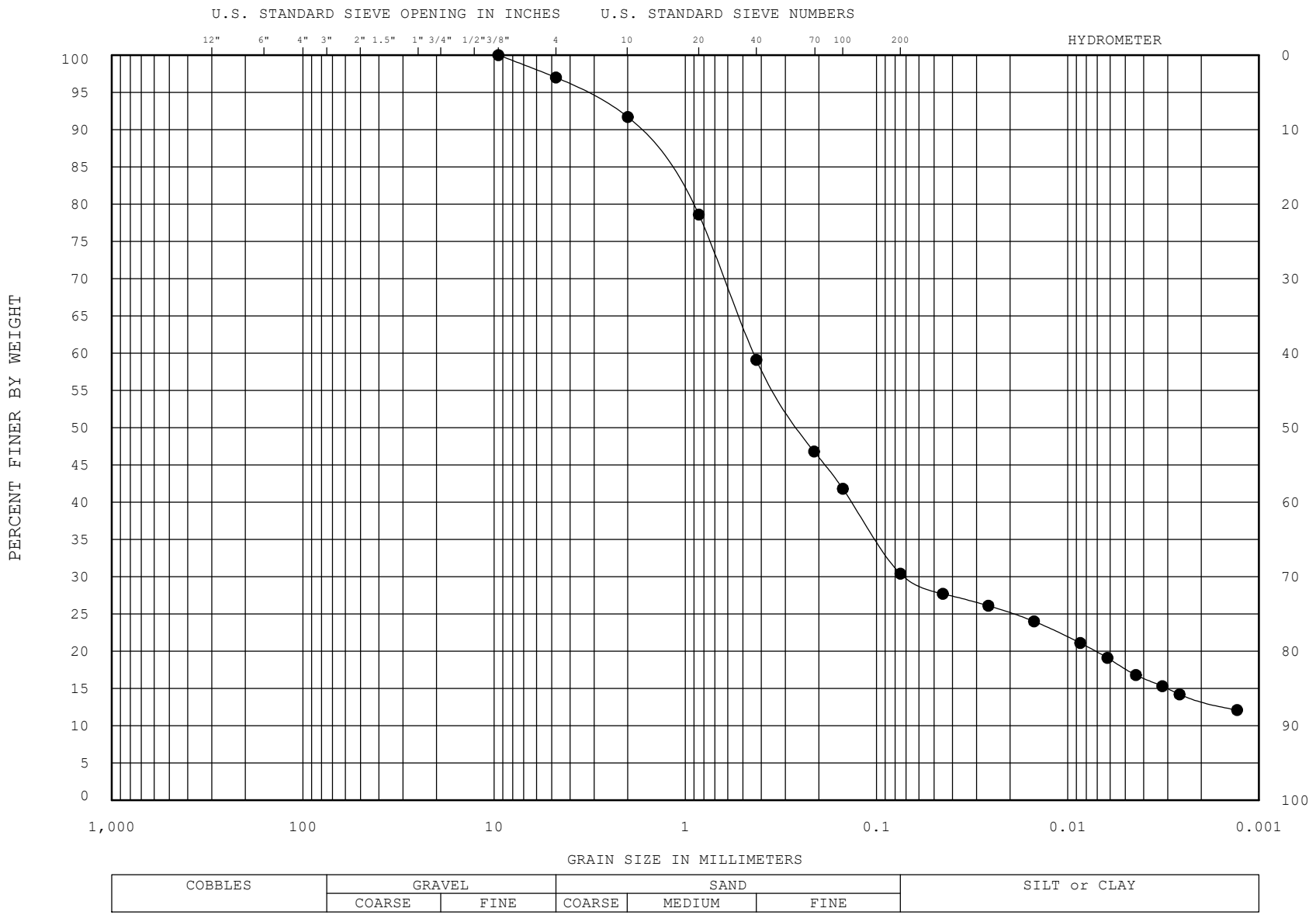
AREA: *Fort Eustis*

BORING NO.: *TP-1*

DATE:

ENG FORM ENG2087FORT EUSTIS FEDMMA(INTERIOR)2020.GPJ

GRADATION CURVES TEST METHODS: ASTM D 422, D4318, D2216



Legend	Sample No.	Depth (ft)	Classification (ASTM D 2487)		Nat wc%	LL	PL	PI
—●—	Jar-2	2.0-4.0	CLAYEY SAND	SC	26.7	45	17	28
—⊠—								
—▲—								
—★—								

REMARKS :

ENG FORM ENG2087FORT EUSTIS FEDMMA(INTERIOR)2020.GPJ

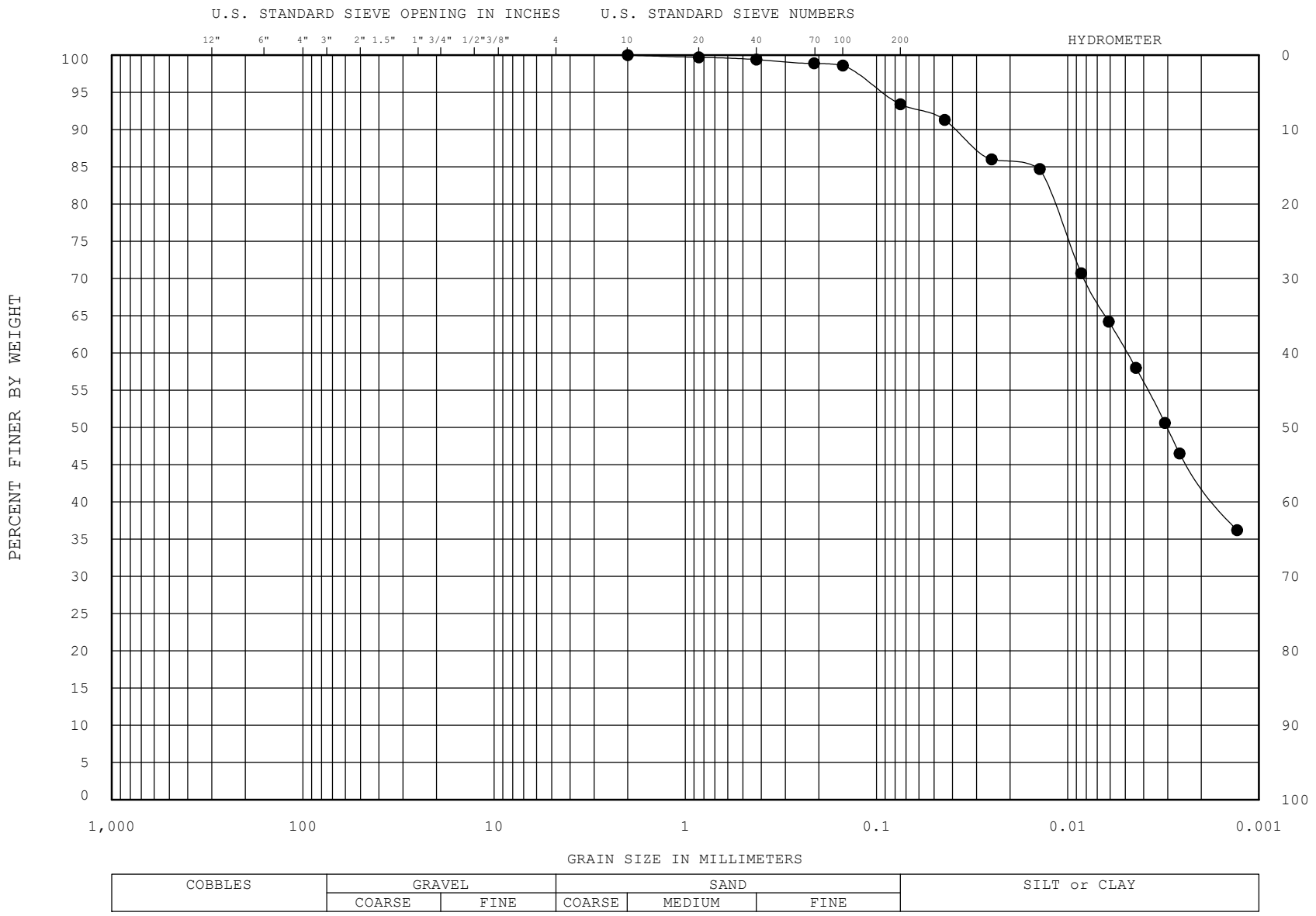
GRADATION CURVES TEST METHODS: ASTM D 422, D4318, D2216

PROJECT: *FEDMMA (interior)*

AREA: *Fort Eustis*

BORING NO.: *TP-1*

DATE:



Legend	Sample No.	Depth (ft)	Classification (ASTM D 2487)		Nat wc%	LL	PL	PI
—●—	Jar-1	0.0-2.0	FAT CLAY with SAND	CH	69.4	109	42	67
—⊠—								
—▲—								
—★—								

REMARKS :

PROJECT: *FEDMMA (interior)*

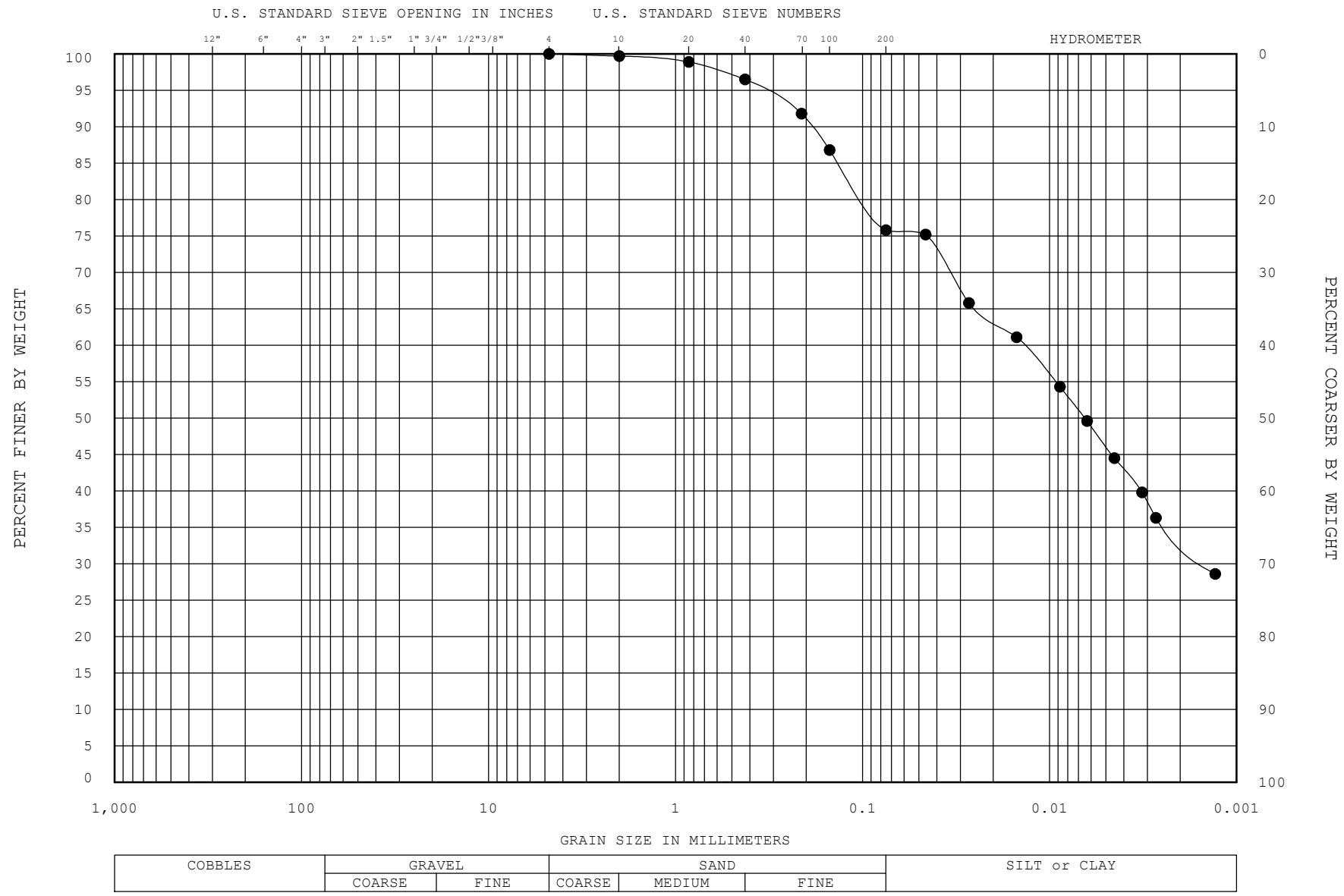
AREA: *Fort Eustis*

BORING NO.: *TP-2*

DATE:

ENG FORM ENG2087FORT EUSTIS FEDMMA(INTERIOR)2020.GPJ

GRADATION CURVES TEST METHODS: ASTM D 422, D4318, D2216



Legend	Sample No.	Depth (ft)	Classification (ASTM D 2487)		Nat wc%	LL	PL	PI
—●—	Jar-2	4.0-6.0	FAT CLAY with SAND	CH	39.4	64	28	36
—⊠—								
—▲—								
—★—								

REMARKS :

ENG FORM ENG2087FORT EUSTIS FEDMMA(INTERIOR)2020.GPJ

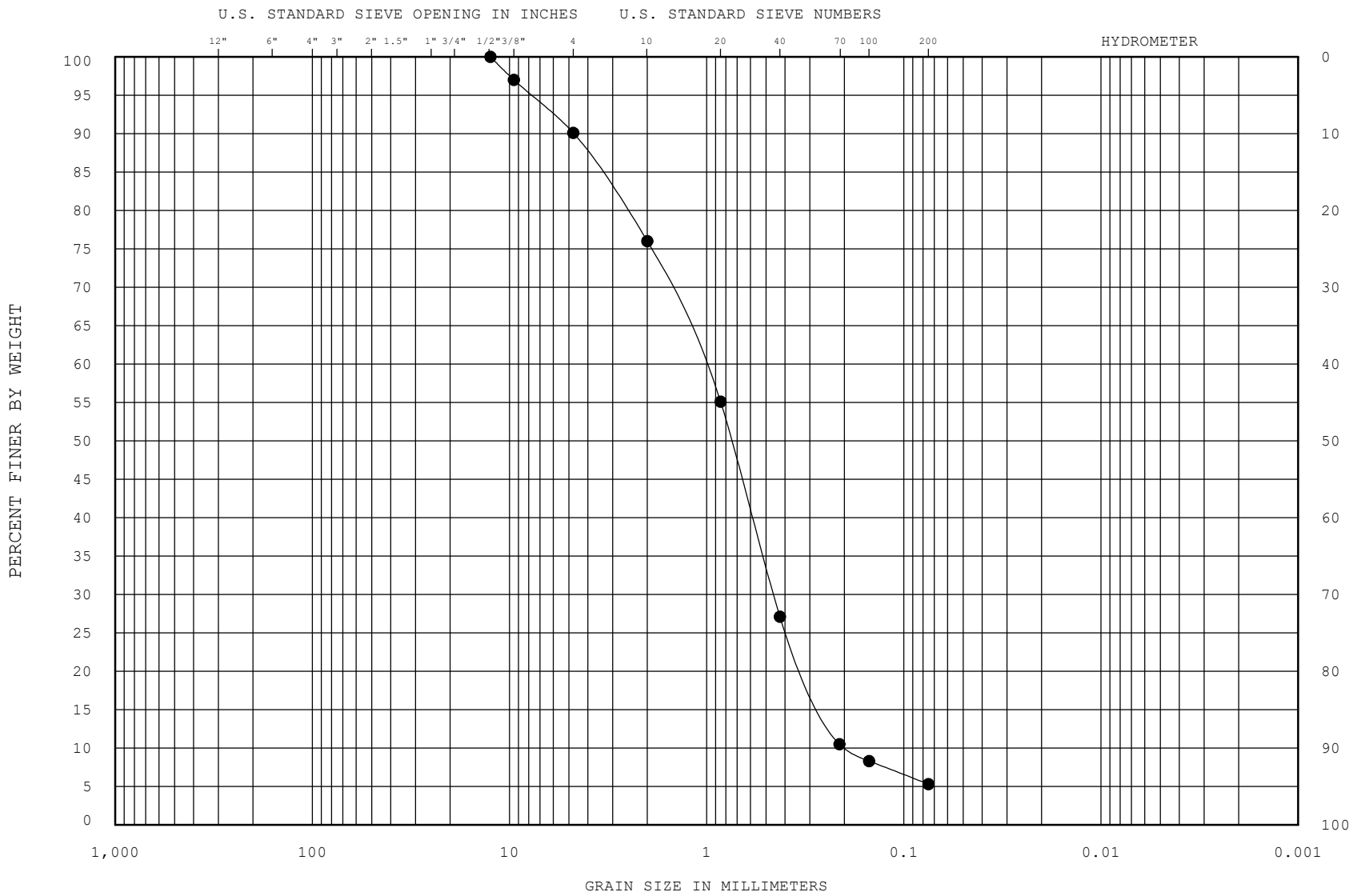
GRADATION CURVES TEST METHODS: ASTM D 422, D4318, D2216

PROJECT: *FEDMMA (interior)*

AREA: *Fort Eustis*

BORING NO.: *TP-2*

DATE:



Legend	Sample No.	Depth (ft)	Classification (ASTM D 2487)		Nat wc%	LL	PL	PI
—●—	Jar-1	2.0-4.0	POORLY GRADED SAND with SILT	SP-SM	15.0	NP	NP	NP
—⊠—								
—▲—								
—★—								

REMARKS :

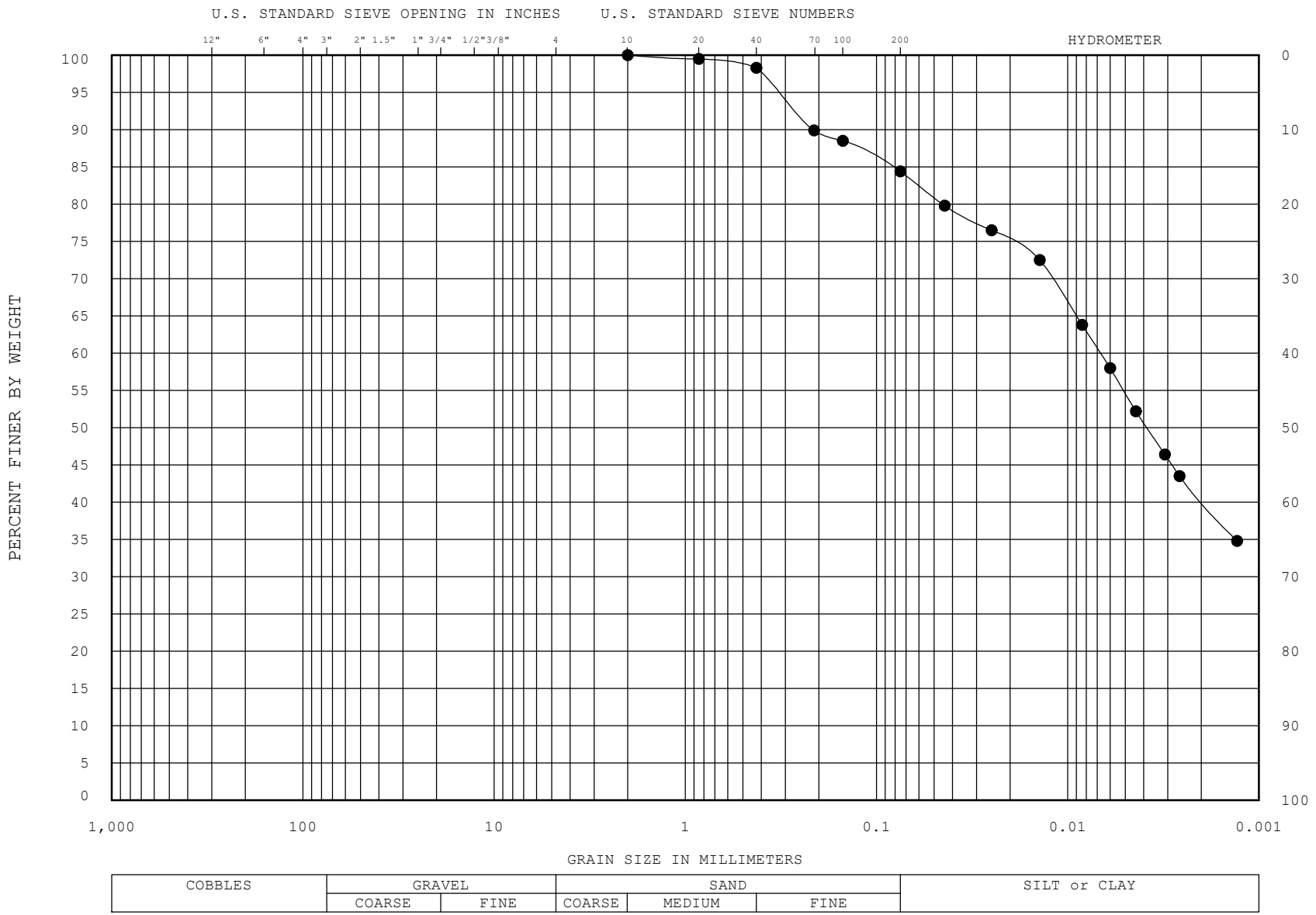
PROJECT: *FEDMMA (interior)*

AREA: *Fort Eustis*

BORING NO.: *TP-3*

DATE:

GRADATION CURVES TEST METHODS: ASTM D 422, D4318, D2216



Legend	Sample No.	Depth (ft)	Classification (ASTM D 2487)		Nat wc%	LL	PL	PI
—●—	Jar-1	2.0-4.0	FAT CLAY with SAND	CH	59.0	80	30	50
—⊠—								
—▲—								
—★—								

REMARKS :

ENG FORM ENG2087FORT EUSTIS FEDMMA(INTERIOR)2020.GPJ

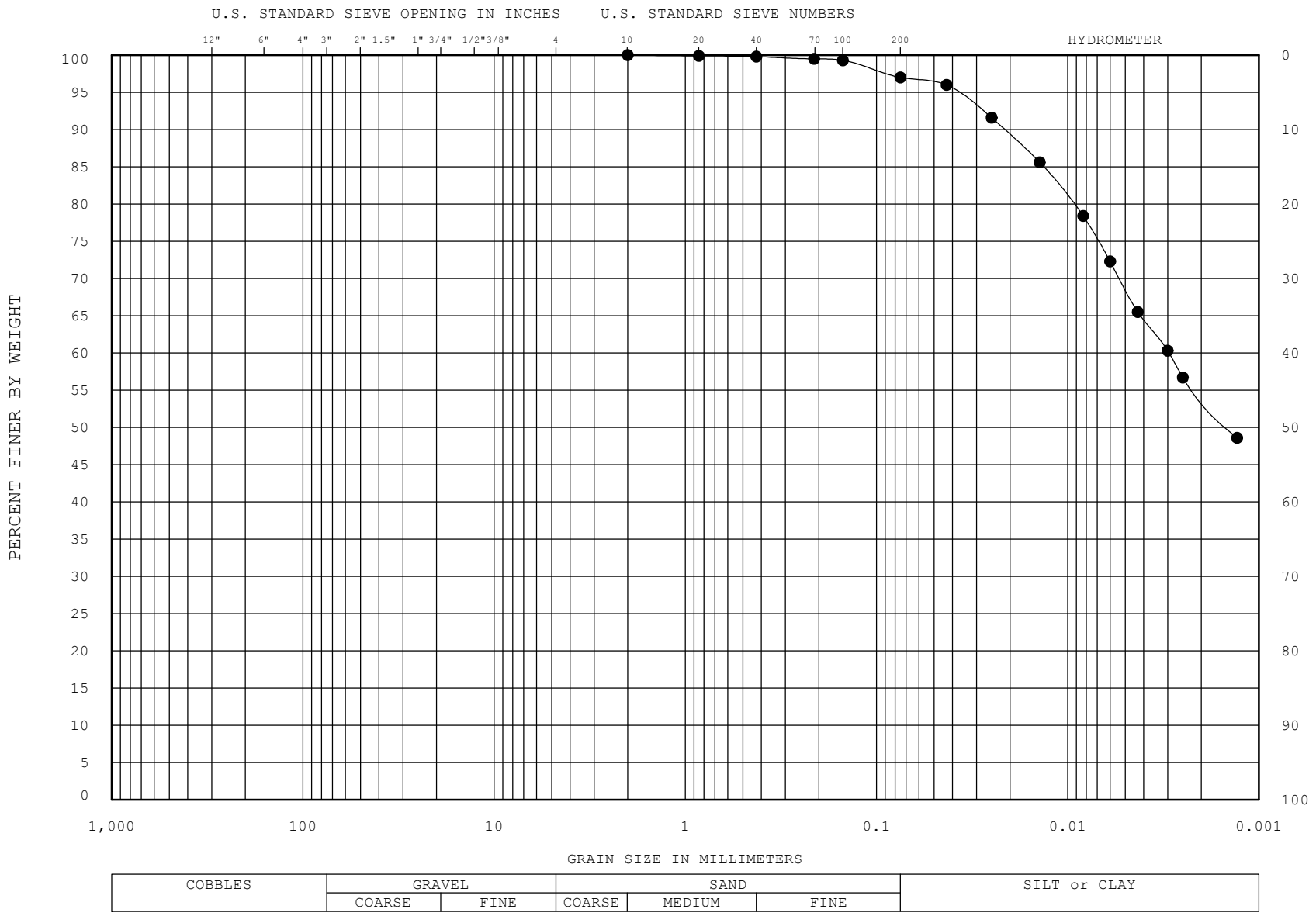
GRADATION CURVES TEST METHODS: ASTM D 422, D4318, D2216

PROJECT: *FEDMMA (interior)*

AREA: *Fort Eustis*

BORING NO.: *TP-4*

DATE:



Legend	Sample No.	Depth (ft)	Classification (ASTM D 2487)	Nat wc%	LL	PL	PI
—●—	Jar-1	0.0-2.0	ELASTIC SILT MH	38.1	89	40	49
—⊠—							
—▲—							
—★—							

REMARKS :

ENG FORM ENG2087FORT EUSTIS FEDMMA(INTERIOR)2020.GPJ

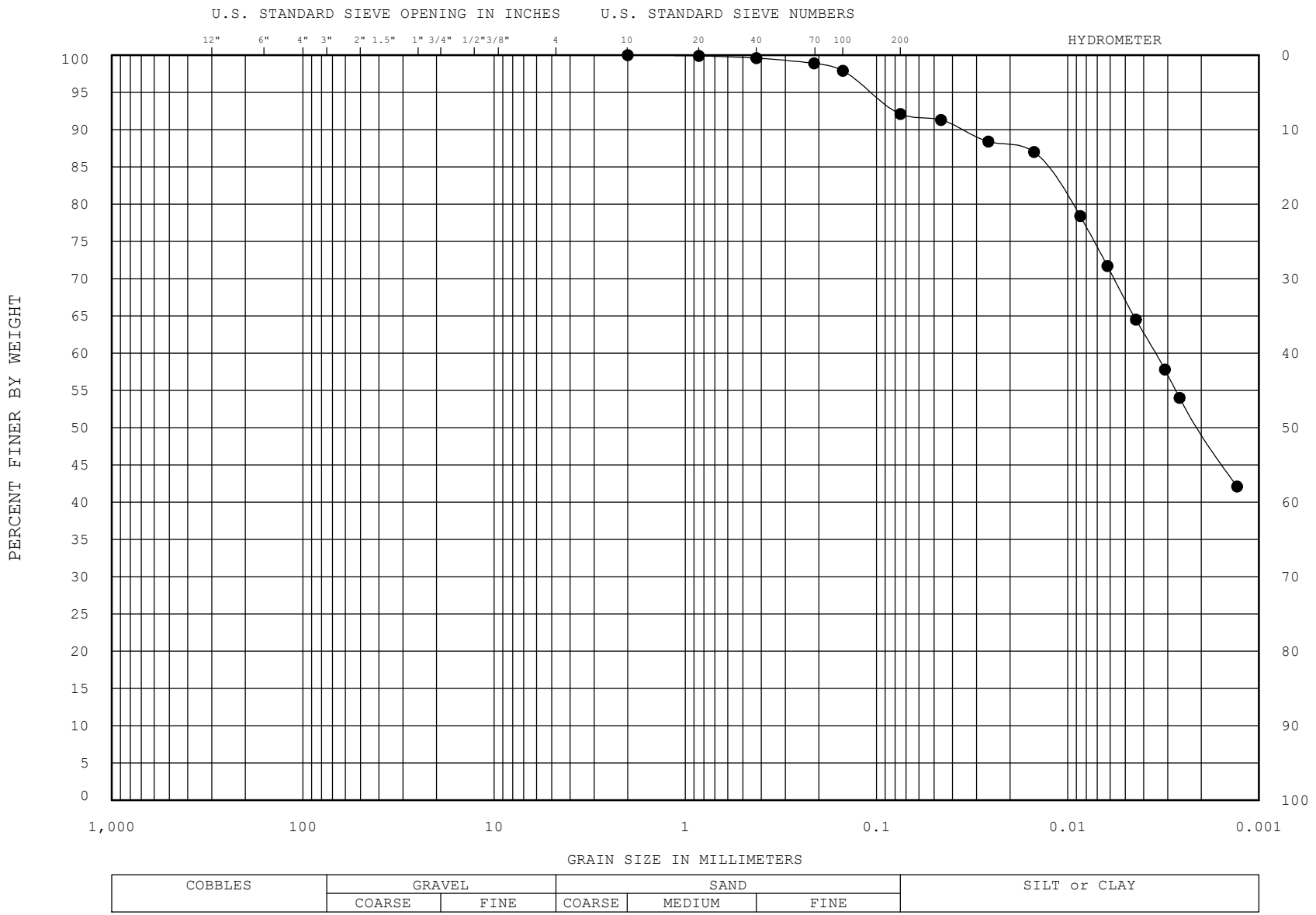
GRADATION CURVES TEST METHODS: ASTM D 422, D4318, D2216

PROJECT: *FEDMMA (interior)*

AREA: *Fort Eustis*

BORING NO.: *TP-5*

DATE:



Legend	Sample No.	Depth (ft)	Classification (ASTM D 2487)		Nat wc%	LL	PL	PI
—●—	Jar-1	2.0-4.0	FAT CLAY trace of SAND	CH	80.9	115	37	78
—⊠—								
—▲—								
—★—								

REMARKS :

ENG FORM ENG2087FORT EUSTIS FEDMMA(INTERIOR)2020.GPJ

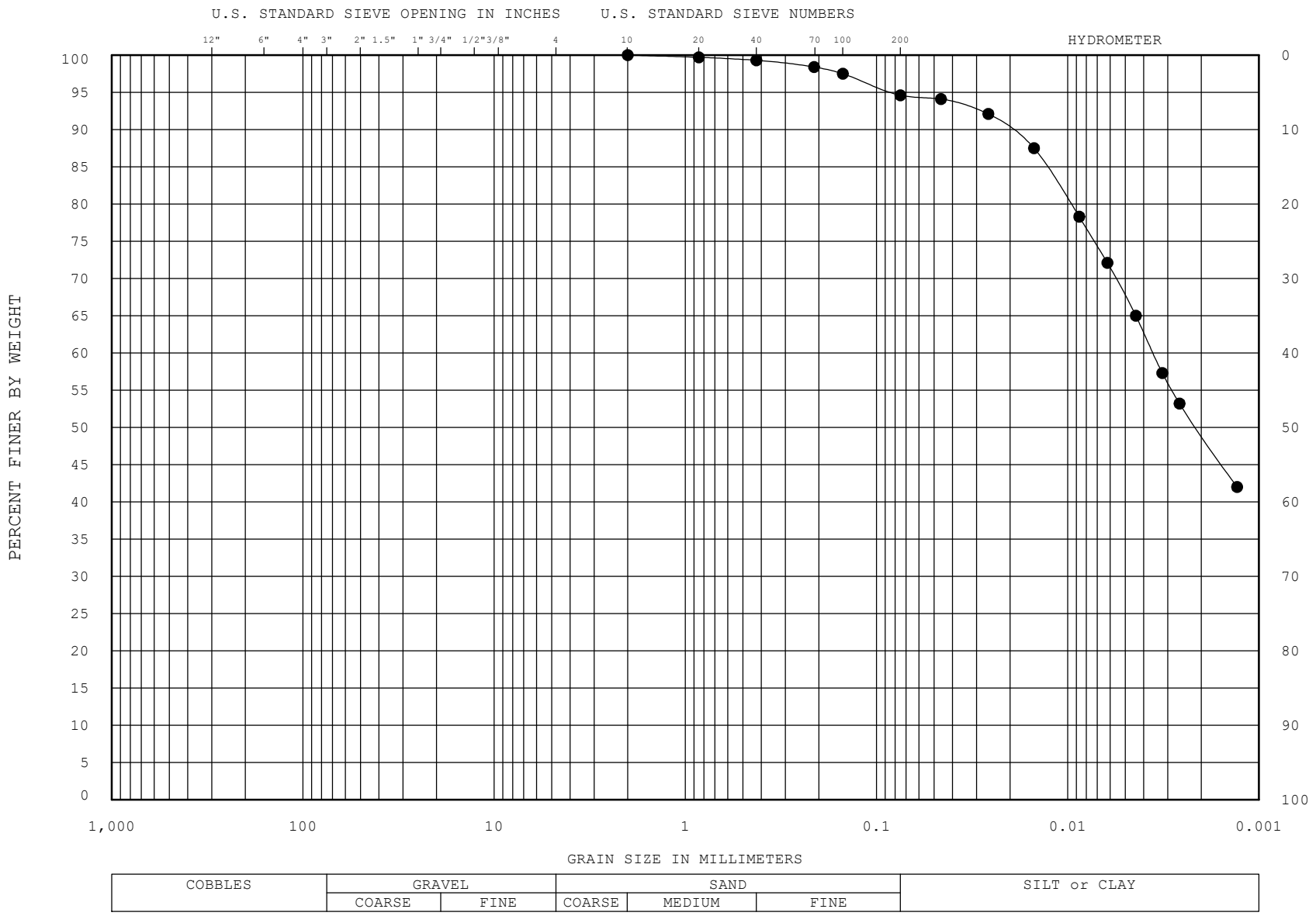
GRADATION CURVES TEST METHODS: ASTM D 422, D4318, D2216

PROJECT: *FEDMMA (interior)*

AREA: *Fort Eustis*

BORING NO.: *TP-6*

DATE:



Legend	Sample No.	Depth (ft)	Classification (ASTM D 2487)		Nat wc%	LL	PL	PI
—●—	Jar-1	0.0-2.0	ELASTIC SILT with SAND	MH	68.1	107	44	63
—⊠—								
—▲—								
—★—								

REMARKS :

ENG FORM ENG2087FORT EUSTIS FEDMMA(INTERIOR)2020.GPJ

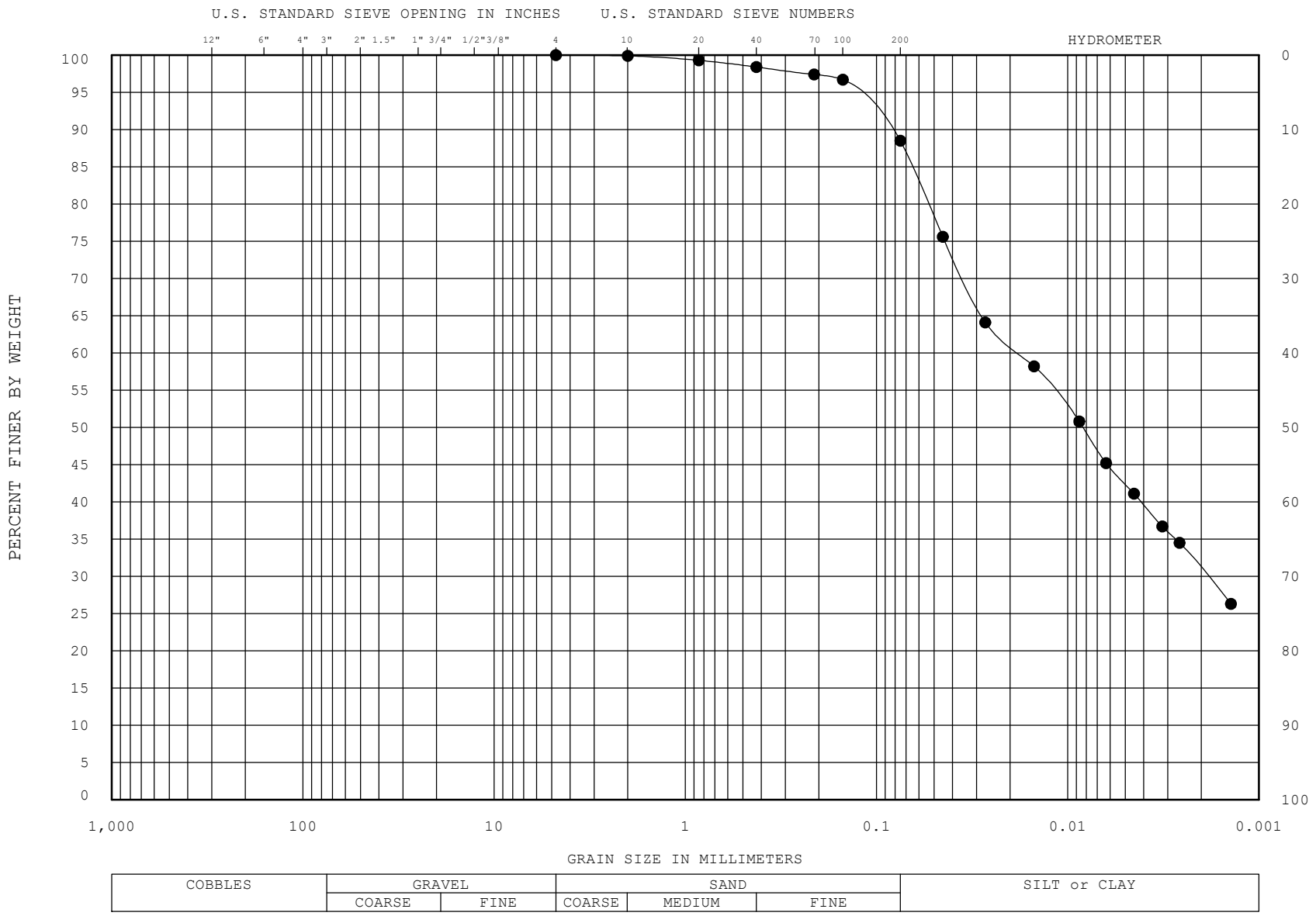
GRADATION CURVES TEST METHODS: ASTM D 422, D4318, D2216

PROJECT: *FEDMMA (interior)*

AREA: *Fort Eustis*

BORING NO.: *TP-7*

DATE:



Legend	Sample No.	Depth (ft)	Classification (ASTM D 2487)		Nat wc%	LL	PL	PI
—●—	Jar-1	0.0-2.0	FAT CLAY with SAND	CH	72.6	86	36	50
—⊠—								
—▲—								
—★—								

REMARKS :

PROJECT: *FEDMMA (interior)*

AREA: *Fort Eustis*

BORING NO.: *TP-8*

DATE:

ENG FORM ENG2087FORT EUSTIS FEDMMA(INTERIOR)2020.GPJ

GRADATION CURVES TEST METHODS: ASTM D 422, D4318, D2216

End of Report.

2024 SPT Laboratory Data

U.S. Army Corps of Engineers, Savannah District
Materials Testing Regional Technical Center of Expertise

Work Order No. 44307J
Requisition No. W26GLG33625848

7/15/2024

				Grain-Size Analysis - Percent Passing (%)													
				Sieve	2 in.	1-1/2 in.	1 in.	3/4 in.	1/2 in.	3/8 in.	No. 4	No. 10	No. 20	No. 40	No. 60	No. 100	No. 140	No. 200
Lab No.	Hole No.	Sample No.	Depth	Size (mm)	50.8	38.1	25.4	19.1	12.7	9.52	4.75	2.00	0.84	0.42	0.25	0.149	0.105	0.075
E4/19139	DH-1139-01	SH-1	60.0 - 62.0		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.8	99.6	99.4	99.2	97.8
E4/19140	DH-1139-02	SH-1	25.0 - 27.0		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.8	99.5	99.3	98.9
E4/19141	DH-1139-02	SH-2	65.0 - 67.0		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.6	98.7	97.7	97.1	96.2
E4/19142	DH-1139-03	SH-1	55.0 - 57.0		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	98.4	89.1	75.2	65.7	61.5	56.6
E4/19143	DH-1139-05	SH-1	65.0 - 67.0		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.5	96.7	91.6	85.8
E4/19144	DH-1139-06	SH-1	65.0 - 67.0		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.7	99.4	99.1	98.3
E4/19148	DH-1139-01	S-2	3.5 - 5.0		100.0	100.0	100.0	100.0	100.0	100.0	99.5	99.1	97.5	94.7	87.7	67.2	58.3	49.7
E4/19152	DH-1139-01	S-6	23.5 - 25.0		100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.7	99.0	95.8	87.5	65.8	49.8
E4/19155	DH-1139-01	S-9	38.5 - 40.0		100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.7	96.1	79.6	53.4	32.8	25.4	21.9
E4/19162	DH-1139-01	S-16	73.5 - 75.0		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.7	99.5	99.3	99.1	98.6
E4/19164	DH-1139-02	S-1	0.0 - 1.5		100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.7	97.8	94.7	91.6	86.4	81.4	74.4
E4/19168	DH-1139-02	S-5	18.5 - 20.0		100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.5	99.1	98.5	97.4	95.8	92.8
E4/19174	DH-1139-02	S-11	48.5 - 50.0		100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.7	95.4	74.7	33.6	21.8	16.9
E4/19186	DH-1139-03	S-6	23.5 - 25.0		100.0	100.0	100.0	100.0	100.0	100.0	99.8	99.7	99.5	98.9	96.9	90.9	85.3	79.2
E4/19188	DH-1139-03	S-9	38.5 - 40.0		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.7	98.7	95.0	87.0	80.1	72.6
E4/19194	DH-1139-03	S-15	68.5 - 70.0		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.6	99.0	98.2	97.7	96.9
E4/19198	DH-1139-04	S-2	3.5 - 5.0		100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.6	98.2	96.0	91.9	83.3	80.2	76.5
E4/19201	DH-1139-04	S-5	18.5 - 20.0		100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.7	99.3	98.6	97.9	97.5	97.3
E4/19205	DH-1139-04	S-9	38.5 - 40.0		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.6	92.8	54.7	39.1	30.7
E4/19207A	DH-1139-04	S-11A	48.5 - 49.5		100.0	100.0	100.0	100.0	100.0	88.8	68.3	55.4	44.2	38.3	17.4	9.1	7.1	6.1
E4/19207B	DH-1139-04	S-11B	49.5 - 50.0		100.0	100.0	100.0	100.0	100.0	100.0	97.9	97.8	97.0	96.0	94.3	93.4	93.1	91.9
E4/19210	DH-1139-04	S-14	63.5 - 65.0		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	98.8	98.1	97.9	97.3
E4/19215	DH-1139-05	S-2	3.5 - 5.0		100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.0	97.0	95.2	93.0	89.5	87.4	85.0
E4/19218	DH-1139-05	S-5	18.5 - 20.0		100.0	100.0	100.0	100.0	94.3	93.8	93.5	92.6	90.7	89.2	84.8	75.6	71.2	67.6
E4/19224	DH-1139-05	S-11	48.5 - 50.0		100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.9	99.8	99.4	97.9	95.9	95.3	93.7
E4/19231	DH-1139-06	S-1	0.0 - 1.5		100.0	100.0	100.0	100.0	100.0	100.0	99.8	99.3	97.4	93.5	87.1	70.4	62.1	54.7
E4/19235	DH-1139-06	S-5	18.5 - 20.0		100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.9	99.6	99.2	98.9	98.6	98.4	98.2
E4/19240	DH-1139-06	S-10	43.5 - 45.0		100.0	100.0	100.0	100.0	100.0	100.0	99.4	99.3	98.2	90.3	63.6	27.6	17.9	14.0
E4/19242	DH-1139-06	S-12	53.5 - 55.0		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.8	98.6	96.7	96.0	94.2
E4/19248A	DH-1139-07	S-1A	0.0 - 0.5		100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.2	97.4	93.9	87.2	68.0	61.6	55.3
E4/19248B	DH-1139-07	S-1B	0.5 - 1.5		100.0	100.0	100.0	100.0	100.0	100.0	99.7	98.2	92.1	84.3	74.1	47.1	39.5	34.6
E4/19253	DH-1139-07	S-6	23.5 - 25.0		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.9	99.7	99.4	99.2	99.0
E4/19259	DH-1139-07	S-12	53.5 - 55.0		100.0	100.0	100.0	100.0	99.1	98.6	95.9	92.8	91.1	89.3	65.9	25.3	19.3	14.2
E4/19267	DH-1139-08	S-3	8.5 - 10.0		100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.5	97.5	94.9	91.8	85.8	80.1	72.9
E4/19270	DH-1139-08	S-6	23.5 - 25.0		100.0	100.0	100.0	100.0	100.0	100.0	100.0	98.9	97.0	95.6	93.1	88.0	84.7	81.6
E4/19275	DH-1139-08	S-11	48.5 - 50.0		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.6	98.9	98.1	97.6	97.4

U.S. Army Corps of Engineers, Savannah District
Materials Testing Regional Technical Center of Expertise

Work Order No. W26GLG33625848
Requisition No. 44307J

7/15/2024

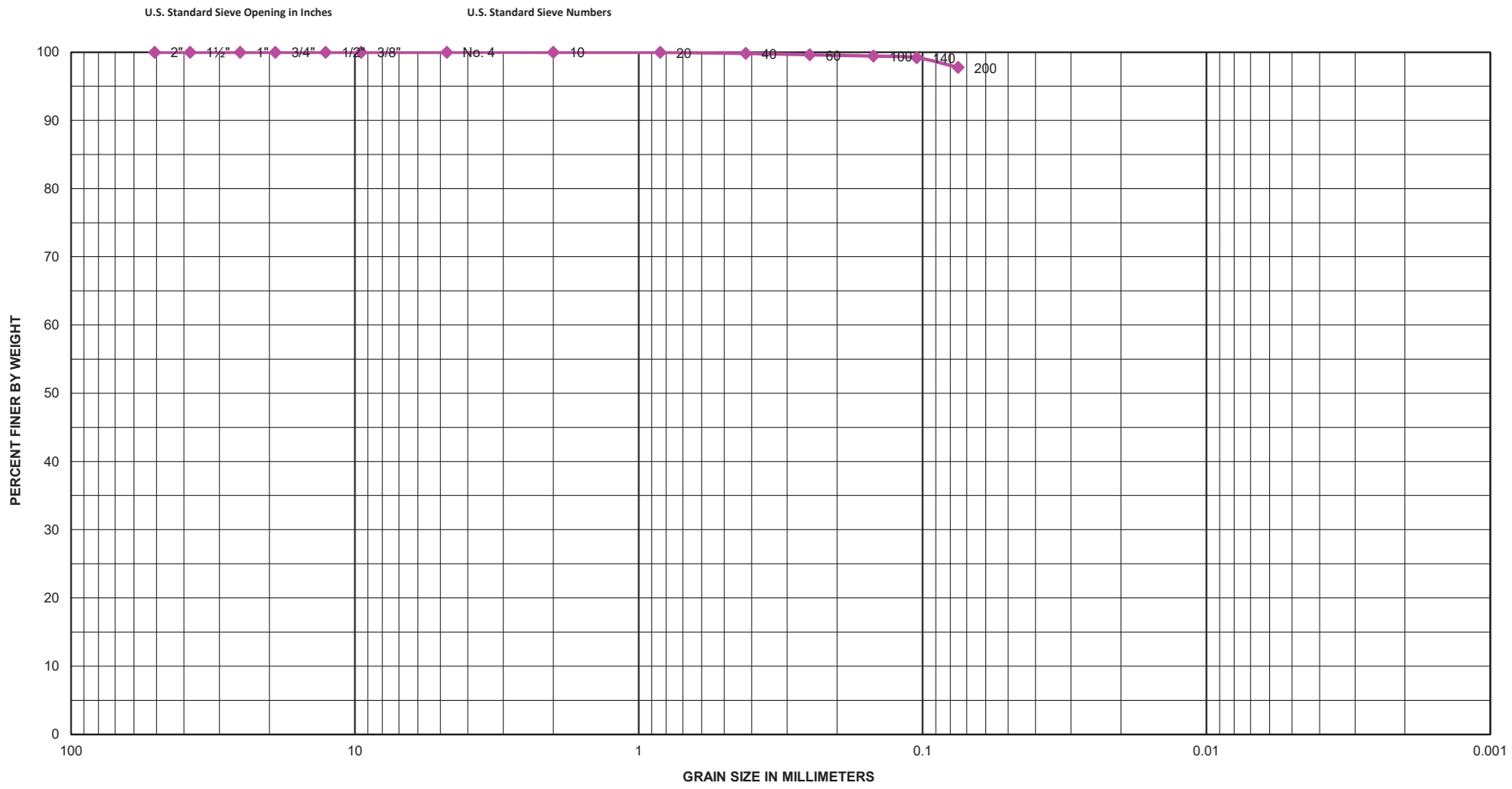
Test #	Lab No.	Hole No.	Sample No.	Depth	D422 Grain Size		D2216	D4318 Atterberg Limits			Color	D2487 Unified Soil Classification System
					Pass No. 4	Pass No. 200	MC%	LL	PL	PI		
1	E4/19139	DH-1139-01	SH-1	60.0 - 62.0	100.0	97.8	63.85	77	36	41	Dark Greenish Gray & Red	Inorganic Silt High LL (MH), with a trace of sand.
2	E4/19140	DH-1139-02	SH-1	25.0 - 27.0	100.0	98.9	50.60	92	44	48	Brown & Red	Inorganic Silt High LL (MH), with a trace of sand.
3	E4/19141	DH-1139-02	SH-2	65.0 - 67.0	100.0	96.2	68.36	86	43	43	Dark Gray	Inorganic Silt High LL (MH), with a trace of sand.
4	E4/19142	DH-1139-03	SH-1	55.0 - 57.0	100.0	56.6	22.50	43	31	12	Brown & Dark Gray	Sandy Inorganic Silt (ML).
5	E4/19143	DH-1139-05	SH-1	65.0 - 67.0	100.0	85.8	54.55	56	28	28	Dark Gray, Gray & Red	Fat Clay (CH), with a little sand.
6	E4/19144	DH-1139-06	SH-1	65.0 - 67.0	100.0	98.3	73.39	93	57	36	Dark Gray, Gray & Red	Inorganic Silt High LL (MH), with a trace of sand.
7	E4/19148	DH-1139-01	S-2	3.5 - 5.0	99.5	49.7	22.34	67	30	37	Gray & Reddish Yellow	Clayey Sand High LL (SC-H).
8	E4/19152	DH-1139-01	S-6	23.5 - 25.0	100.0	49.8	34.89	35	23	12	Gray, Dark Gray & Reddish Yellow	Clayey Sand (SC).
9	E4/19155	DH-1139-01	S-9	38.5 - 40.0	100.0	21.9	24.67	NP	NP	NP	Light Gray & Yellow	Silty Sand (SM).
10	E4/19162	DH-1139-01	S-16	73.5 - 75.0	100.0	98.6	69.03	86	34	52	Gray	Fat Clay (CH), with a trace of sand.
11	E4/19164	DH-1139-02	S-1	0.0 - 1.5	100.0	74.4	29.73	61	27	34	Gray & Reddish Yellow	Fat Clay (CH), with some sand.
12	E4/19168	DH-1139-02	S-5	18.5 - 20.0	100.0	92.8	48.79	81	32	49	Gray, Dark Gray & Strong Brown	Fat Clay (CH), with a trace of sand.
13	E4/19174	DH-1139-02	S-11	48.5 - 50.0	100.0	16.9	29.01	25	19	6	Reddish Yellow & Gray	Clayey Silty Sand (SC-SM).
14	E4/19186	DH-1139-03	S-6	23.5 - 25.0	99.8	79.2	18.62	32	14	18	Light Yellowish Brown & Light Gray	Lean Clay (CL), with some sand.
15	E4/19188	DH-1139-03	S-9	38.5 - 40.0	100.0	72.6	20.31	28	14	14	Light Gray & Reddish Yellow	Lean Clay (CL), with some sand.
16	E4/19194	DH-1139-03	S-15	68.5 - 70.0	100.0	96.9	69.73	103	36	67	Dark Gray & Light Brown	Fat Clay (CH), with a trace of sand.
17	E4/19198	DH-1139-04	S-2	3.5 - 5.0	100.0	76.5	47.15	78	31	47	Dark Gray, Gray & Light Brown	Fat Clay (CH), with some sand.
18	E4/19201	DH-1139-04	S-5	18.5 - 20.0	100.0	97.3	67.81	114	40	74	Dark Gray, Gray & Reddish Yellow	Fat Clay (CH), with a trace of sand.
19	E4/19205	DH-1139-04	S-9	38.5 - 40.0	100.0	30.7	27.01	NP	NP	NP	Light Gray, Reddish Yellow & Red	Silty Sand (SM).
20	E4/19207A	DH-1139-04	S-11A	48.5 - 49.5	68.3	6.1	13.22	NP	NP	NP	Gray & Very Pale Brown	Poorly Graded Silty Sand (SP-SM), with some gravel.
21	E4/19207B	DH-1139-04	S-11B	49.5 - 50.0	97.9	91.9	36.48	76	23	53	Light Greenish Gray & Very Pale Brown	Fat Clay (CH), with a trace of sand and a trace of gravel.
22	E4/19210	DH-1139-04	S-14	63.5 - 65.0	100.0	97.3	64.23	88	33	55	Gray & Pale Brown	Fat Clay (CH), with a trace of sand.
23	E4/19215	DH-1139-05	S-2	3.5 - 5.0	99.9	85.0	64.71	100	37	63	Brown, Gray, Dark Gray & Reddish Brown	Fat Clay (CH), with a little sand.
24	E4/19218	DH-1139-05	S-5	18.5 - 20.0	93.5	67.6	29.00	44	20	24	Very Pale Brown, Yellowish Brown, Gray & Dark Gray	Lean Clay (CL), with some sand, and a trace of gravel.
25	E4/19224	DH-1139-05	S-11	48.5 - 50.0	99.9	93.7	33.69	57	29	28	Bluish Gray, Yellowish Brown & Very Pale Brown	Fat Clay (CH), with a trace of sand.
26	E4/19231	DH-1139-06	S-1	0.0 - 1.5	99.8	54.7	24.95	57	28	29	Grayish Brown & Yellowish Brown	Sandy Fat Clay (CH).
27	E4/19235	DH-1139-06	S-5	18.5 - 20.0	99.9	98.2	68.51	109	40	69	Gray, Dark Gray & Dark Yellowish Brown	Fat Clay (CH), with a trace of sand.
28	E4/19240	DH-1139-06	S-10	43.5 - 45.0	99.4	14.0	25.84	NP	NP	NP	Gray & Yellowish Brown	Silty Sand (SM).
29	E4/19242	DH-1139-06	S-12	53.5 - 55.0	100.0	94.2	57.04	83	42	41	Bluish Gray & Yellowish Brown	Inorganic Silt High LL (MH), with a trace of sand.
30	E4/19248A	DH-1139-07	S-1A	0.0 - 0.5	100.0	55.3	24.96	47	28	19	Gray & Yellowish Brown	Sandy Inorganic Silt (ML).
31	E4/19248B	DH-1139-07	S-1B	0.5 - 1.5	99.7	34.6	20.40				Yellowish Brown & Dark Yellowish Brown	(Visual) Silty Sand (SM).
32	E4/19253	DH-1139-07	S-6	23.5 - 25.0	100.0	99.0	80.93	112	48	64	Dark Gray & Yellowish Brown	Inorganic Silt High LL (MH), with a trace of sand.
33	E4/19259	DH-1139-07	S-12	53.5 - 55.0	95.9	14.2	24.34	23	18	5	Gray, White & Yellowish Brown	Clayey Silty Sand (SC-SM).
34	E4/19267	DH-1139-08	S-3	8.5 - 10.0	99.9	72.9	46.32	71	35	36	Gray, Yellowish Brown & Yellowish Red	Inorganic Silt High LL (MH), with some sand.
35	E4/19270	DH-1139-08	S-6	23.5 - 25.0	100.0	81.6	45.18	86	40	46	Gray, Yellowish Brown & Very Pale Brown	Inorganic Silt High LL (MH), with a little sand.
36	E4/19275	DH-1139-08	S-11	48.5 - 50.0	100.0	97.4	68.50	86	38	48	Bluish Gray, Yellowish Brown & Yellowish Red	Inorganic Silt High LL (MH), with a trace of sand.

U.S. Army Corps of Engineers, Savannah District

Materials Testing Regional Technical Center of Expertise

Work Order No. 44307J

Requisition No. W26GLG33625848



Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI
SH-1	60.0 - 62.0	Dark Greenish Gray & Red, Inorganic Silt High LL (MH), with a trace of sand.	63.85	77	36	41

GRADATION CURVES

Project	FEDMMA Testing
Location	Fort Eustis, Virginia
Contract No.	
Lab No.	E4/19139
Boring No.	DH-1139-01
Date	15-Jul-24

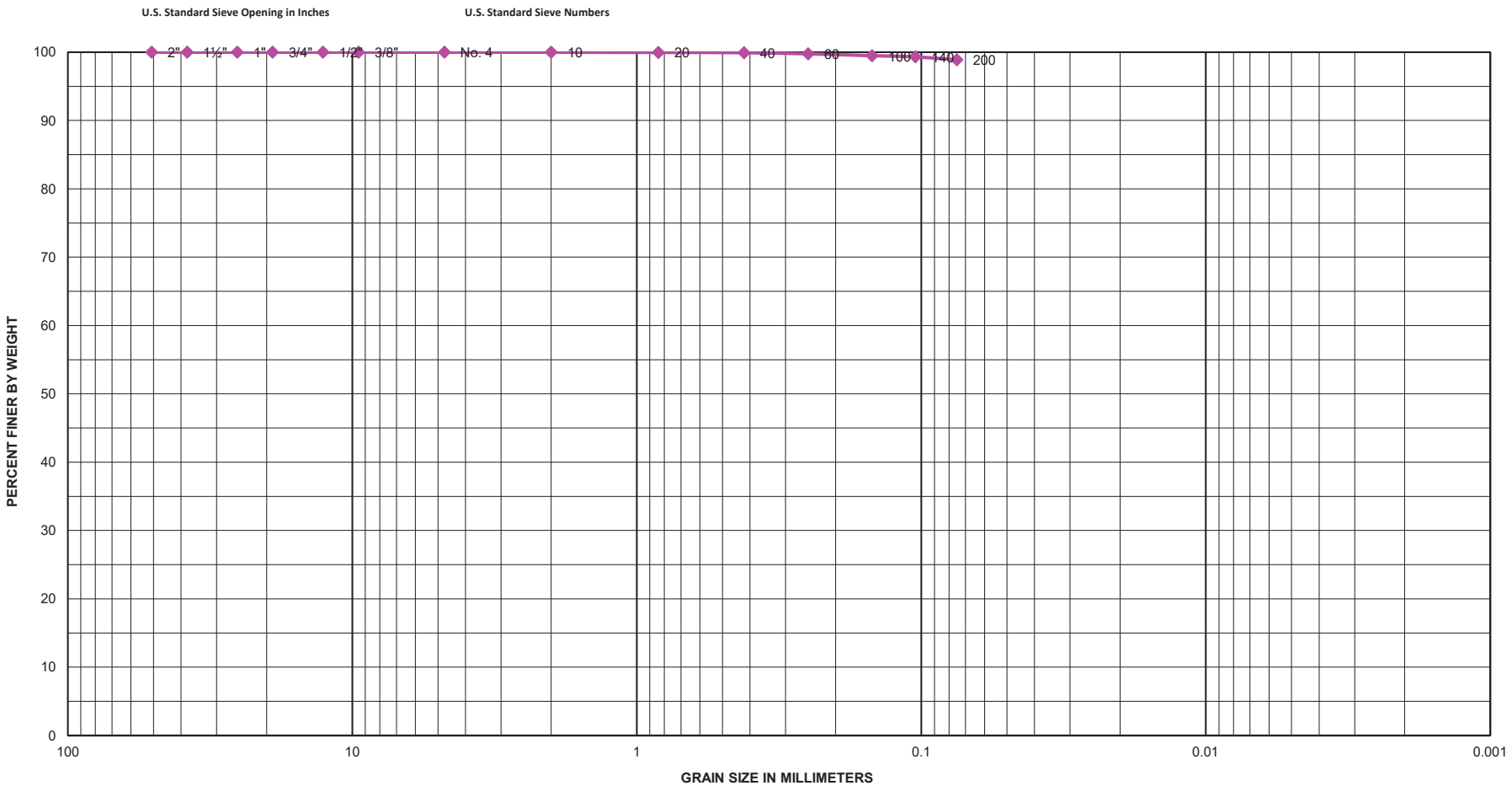
Tests Conducted in General Accordance with ASTM's D422, D4318, D2216, D854, & D2487.

U.S. Army Corps of Engineers, Savannah District

Materials Testing Regional Technical Center of Expertise

Work Order No. 44307J

Requisition No. W26GLG33625848



Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI
SH-1	25.0 - 27.0	Brown & Red, Inorganic Silt High LL (MH), with a trace of sand.	50.6	92	44	48

Project FEDMMA Testing

Location Fort Eustis, Virginia

Contract No.

Lab No. E4/19140

Boring No. DH-1139-02

Date 15-Jul-24

Tests Conducted in General Accordance with ASTM's D422, D4318, D2216, D854, & D2487.

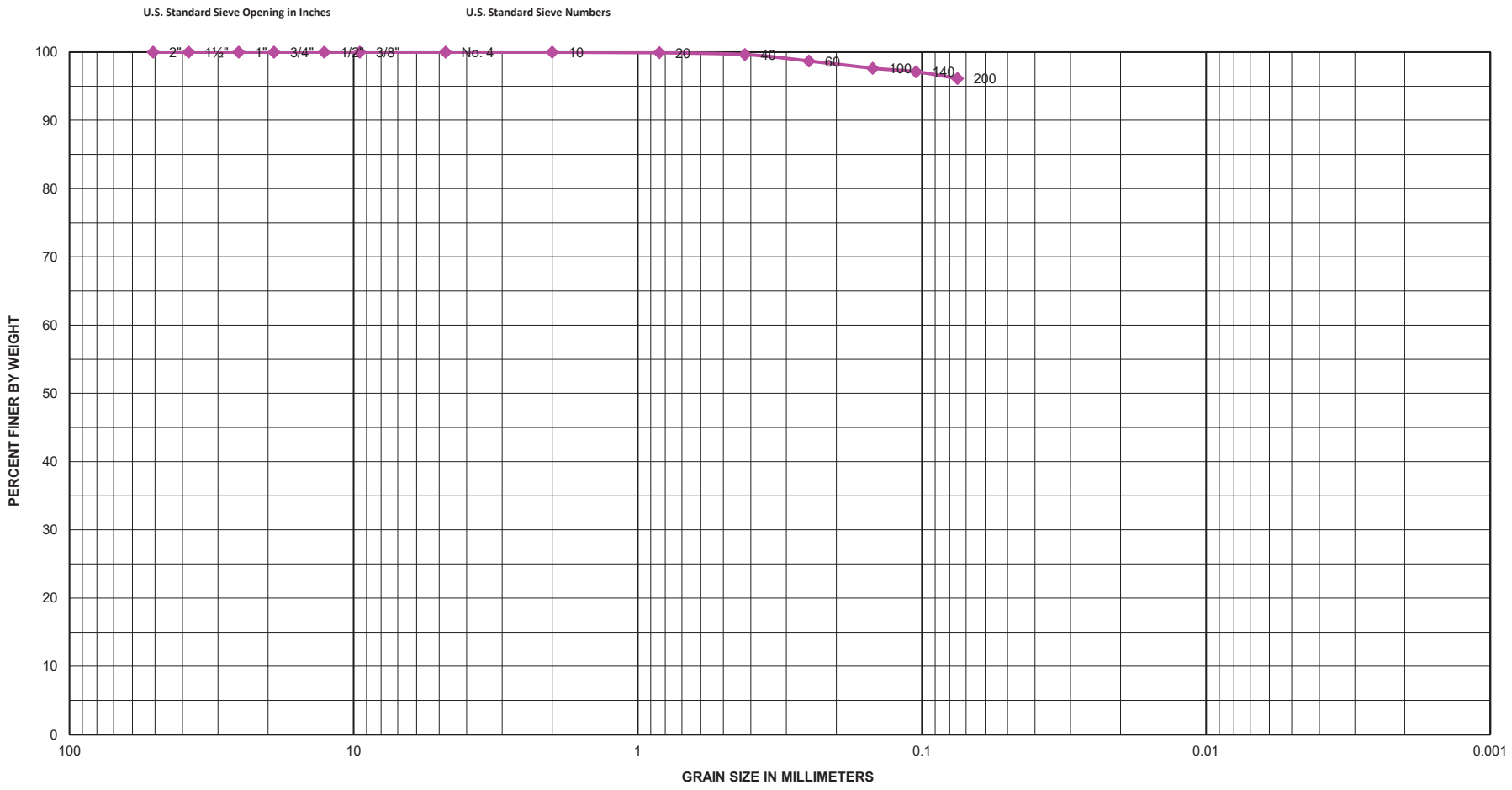
GRADATION CURVES

U.S. Army Corps of Engineers, Savannah District

Materials Testing Regional Technical Center of Expertise

Work Order No. 44307J

Requisition No. W26GLG33625848



Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI
SH-2	65.0 - 67.0	Dark Gray, Inorganic Silt High LL (MH), with a trace of sand.	68.36	86	43	43

Project FEDMMA Testing

Location Fort Eustis, Virginia

Contract No.

Lab No. E4/19141

Boring No. DH-1139-02

Date 15-Jul-24

Tests Conducted in General Accordance with ASTM's D422, D4318, D2216, D854, & D2487.

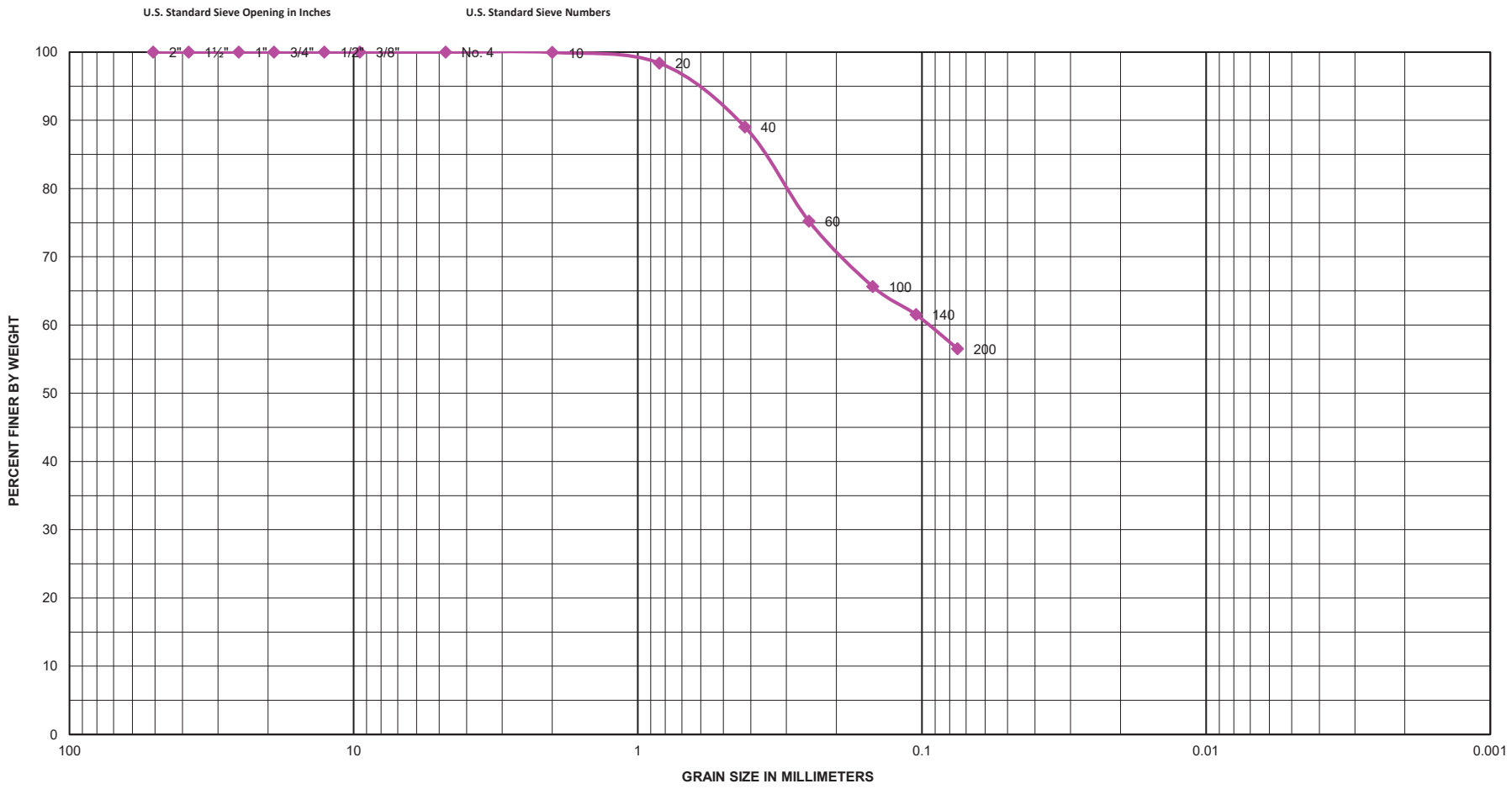
GRADATION CURVES

U.S. Army Corps of Engineers, Savannah District

Materials Testing Regional Technical Center of Expertise

Work Order No. 44307J

Requisition No. W26GLG33625848



Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI
SH-1	55.0 - 57.0	Brown & Dark Gray, Sandy Inorganic Silt (ML).	22.5	43	31	12

GRADATION CURVES

Project	FEDMMA Testing
Location	Fort Eustis, Virginia
Contract No.	
Lab No.	E4/19142
Boring No.	DH-1139-03
Date	15-Jul-24

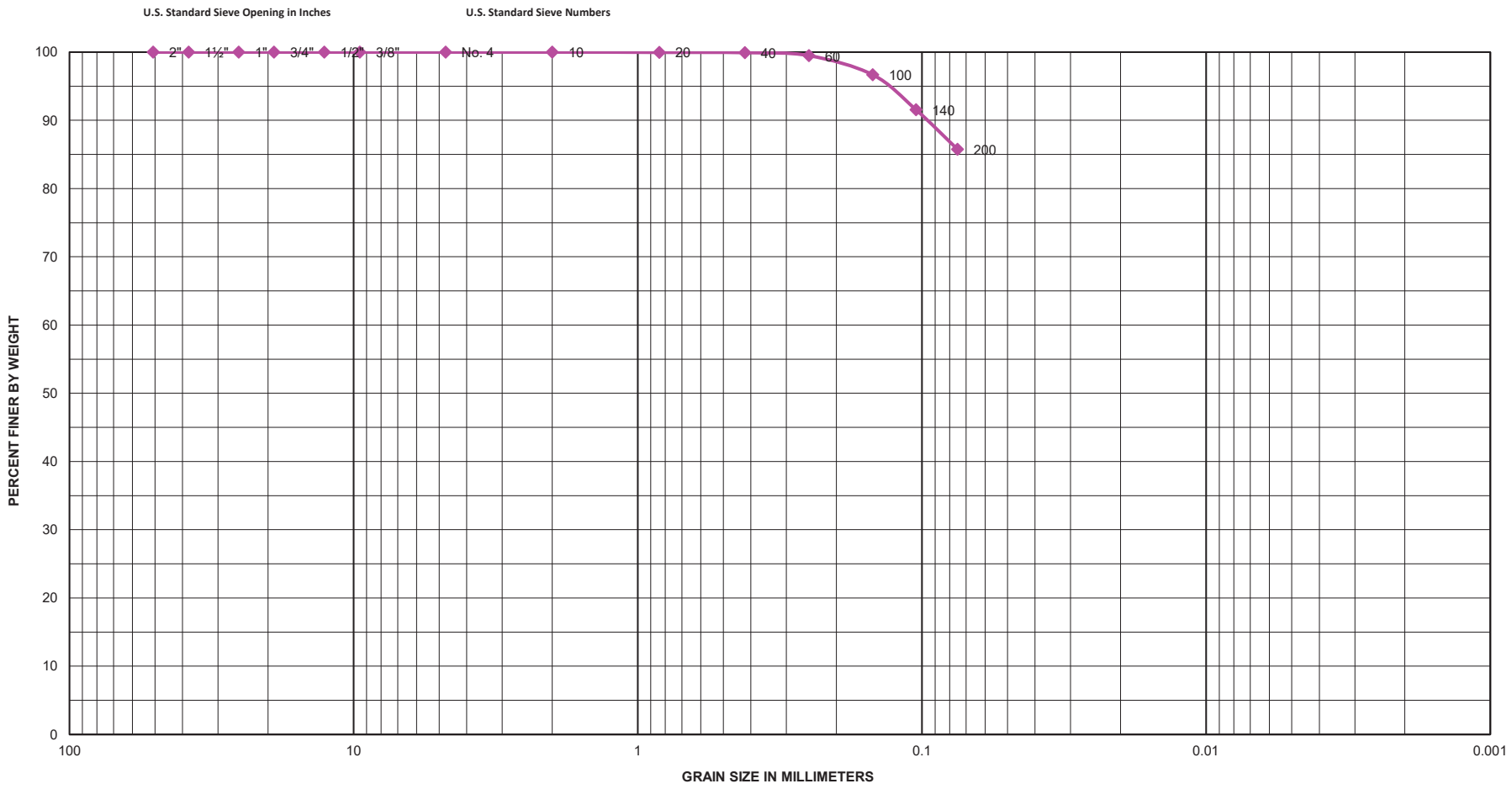
Tests Conducted in General Accordance with ASTM's D422, D4318, D2216, D854, & D2487.

U.S. Army Corps of Engineers, Savannah District

Materials Testing Regional Technical Center of Expertise

Work Order No. 44307J

Requisition No. W26GLG33625848



Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI
SH-1	65.0 - 67.0	Dark Gray, Gray & Red, Fat Clay (CH), with a little sand.	54.55	56	28	28

GRADATION CURVES

Project FEDMMA Testing

Location Fort Eustis, Virginia

Contract No.

Lab No. E4/19143

Boring No. DH-1139-05

Date 15-Jul-24

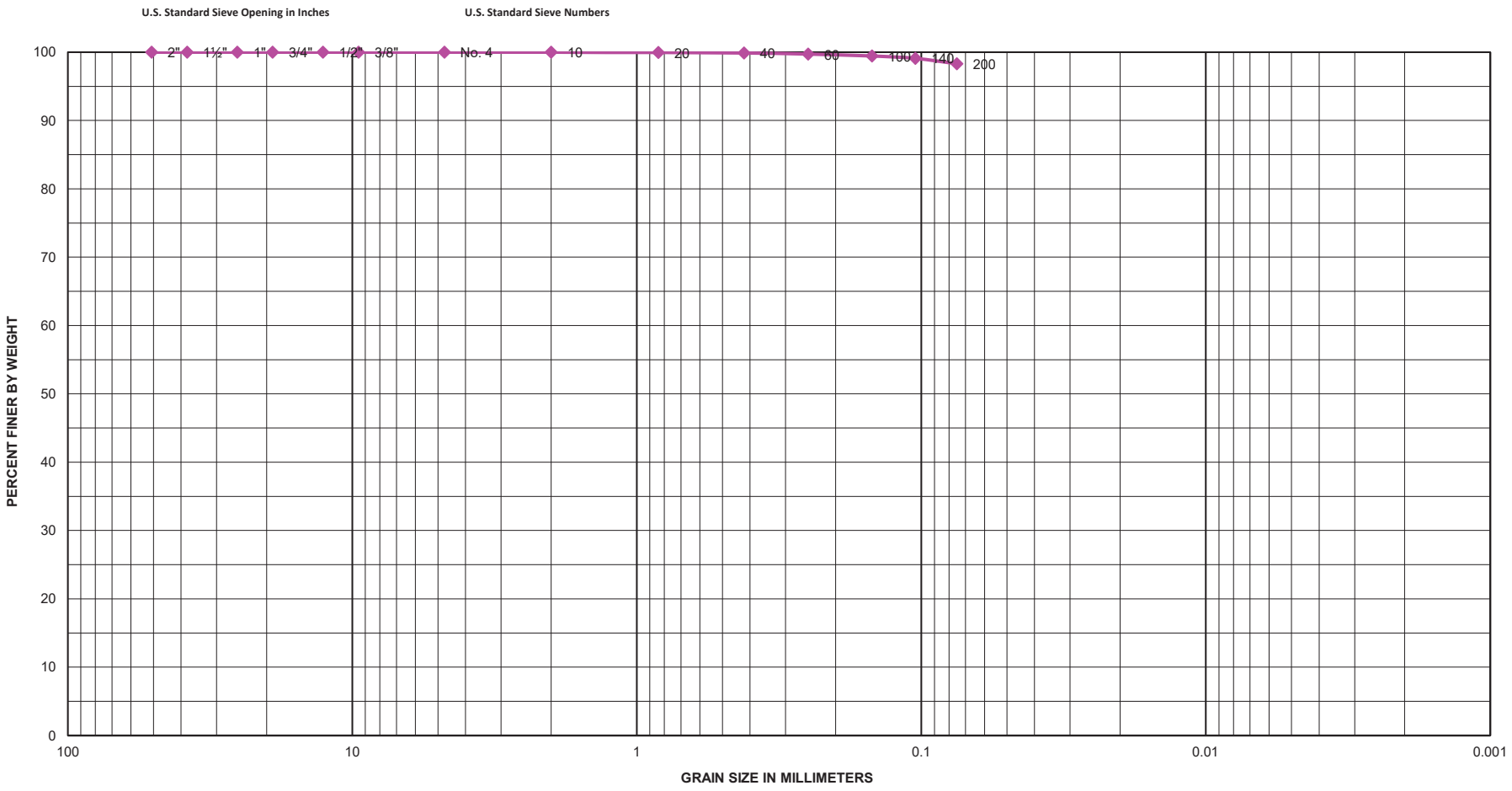
Tests Conducted in General Accordance with ASTM's D422, D4318, D2216, D854, & D2487.

U.S. Army Corps of Engineers, Savannah District

Materials Testing Regional Technical Center of Expertise

Work Order No. 44307J

Requisition No. W26GLG33625848



Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI
SH-1	65.0 - 67.0	Dark Gray, Gray & Red, Inorganic Silt High LL (MH), with a trace of sand.	73.39	93	57	36

Project FEDMMA Testing

Location Fort Eustis, Virginia

Contract No.

Lab No. E4/19144

Boring No. DH-1139-06

Date 15-Jul-24

Tests Conducted in General Accordance with ASTM's D422, D4318, D2216, D854, & D2487.

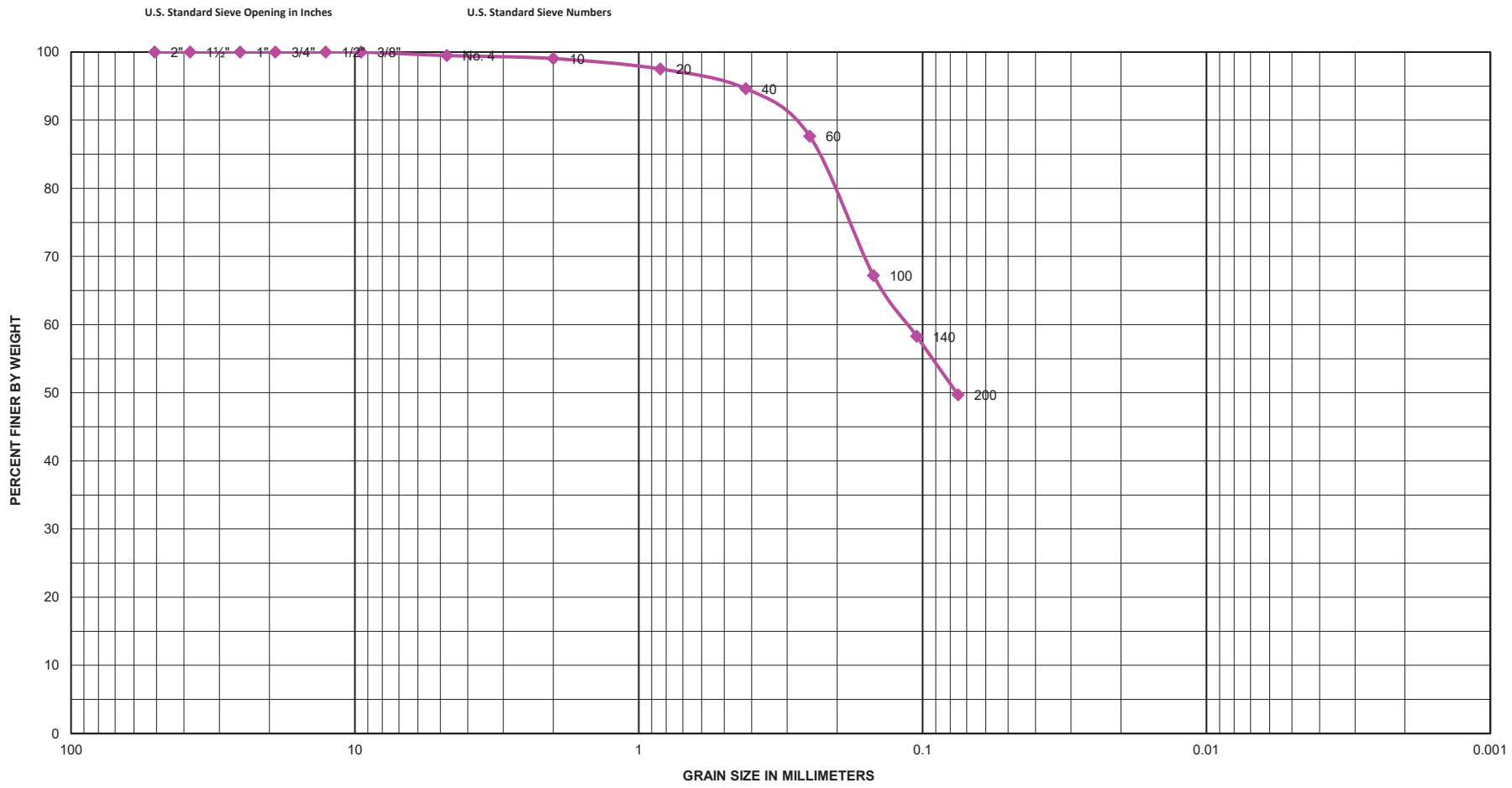
GRADATION CURVES

U.S. Army Corps of Engineers, Savannah District

Materials Testing Regional Technical Center of Expertise

Work Order No. 44307J

Requisition No. W26GLG33625848



Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI
S-2	3.5 - 5.0	Gray & Reddish Yellow, Clayey Sand High LL (SC-H).	22.34	67	30	37

GRADATION CURVES

Project FEDMMA Testing

Location Fort Eustis, Virginia

Contract No.

Lab No. E4/19148

Boring No. DH-1139-01

Date 15-Jul-24

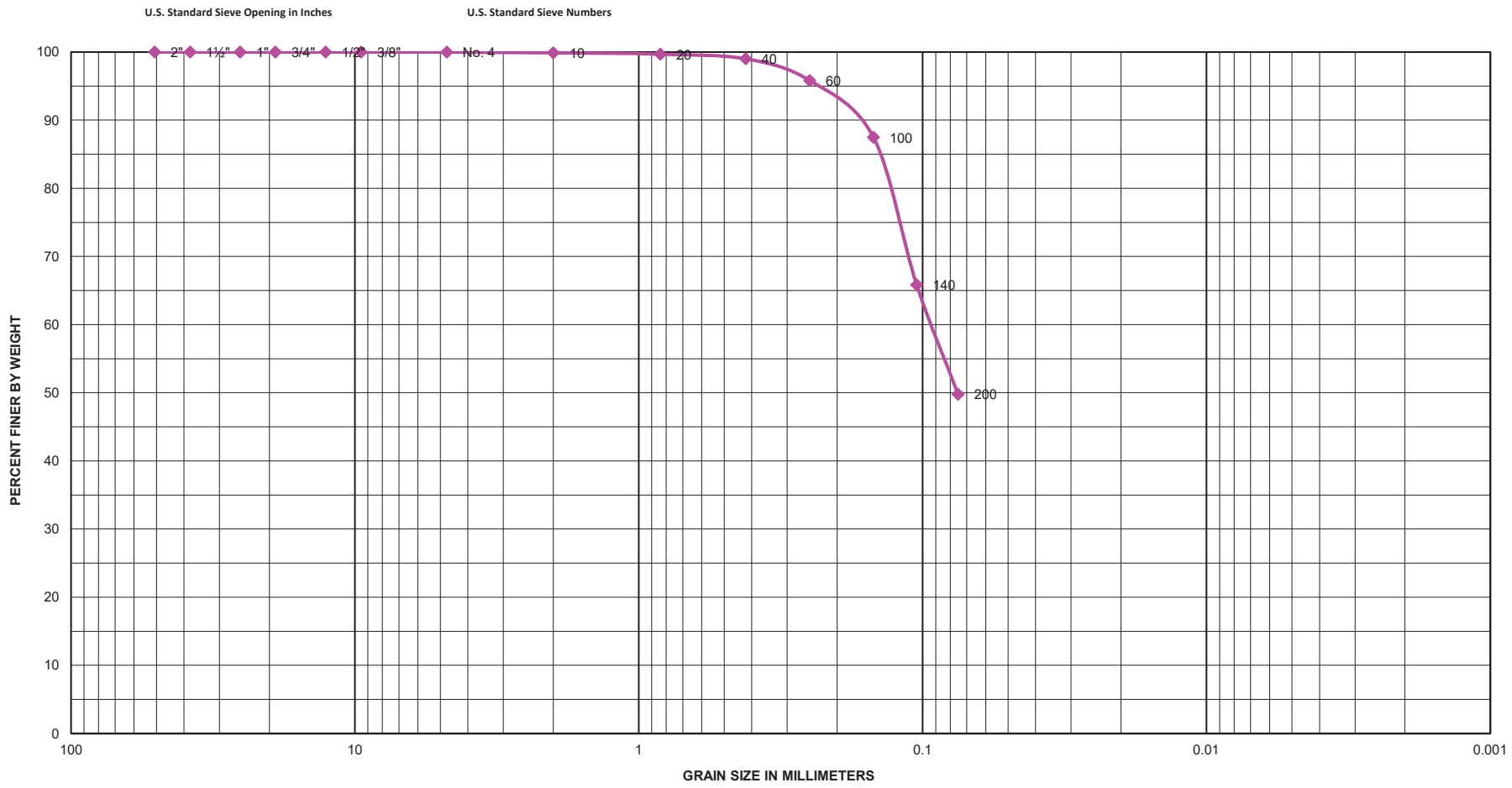
Tests Conducted in General Accordance with ASTM's D422, D4318, D2216, D854, & D2487.

U.S. Army Corps of Engineers, Savannah District

Materials Testing Regional Technical Center of Expertise

Work Order No. 44307J

Requisition No. W26GLG33625848



Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI
S-6	23.5 - 25.0	Gray, Dark Gray & Reddish Yellow, Clayey Sand (SC).	34.89	35	23	12

Project	FEDMMA Testing
Location	Fort Eustis, Virginia
Contract No.	
Lab No.	E4/19152
Boring No.	DH-1139-01
Date	15-Jul-24

Tests Conducted in General Accordance with ASTM's D422, D4318, D2216, D854, & D2487.

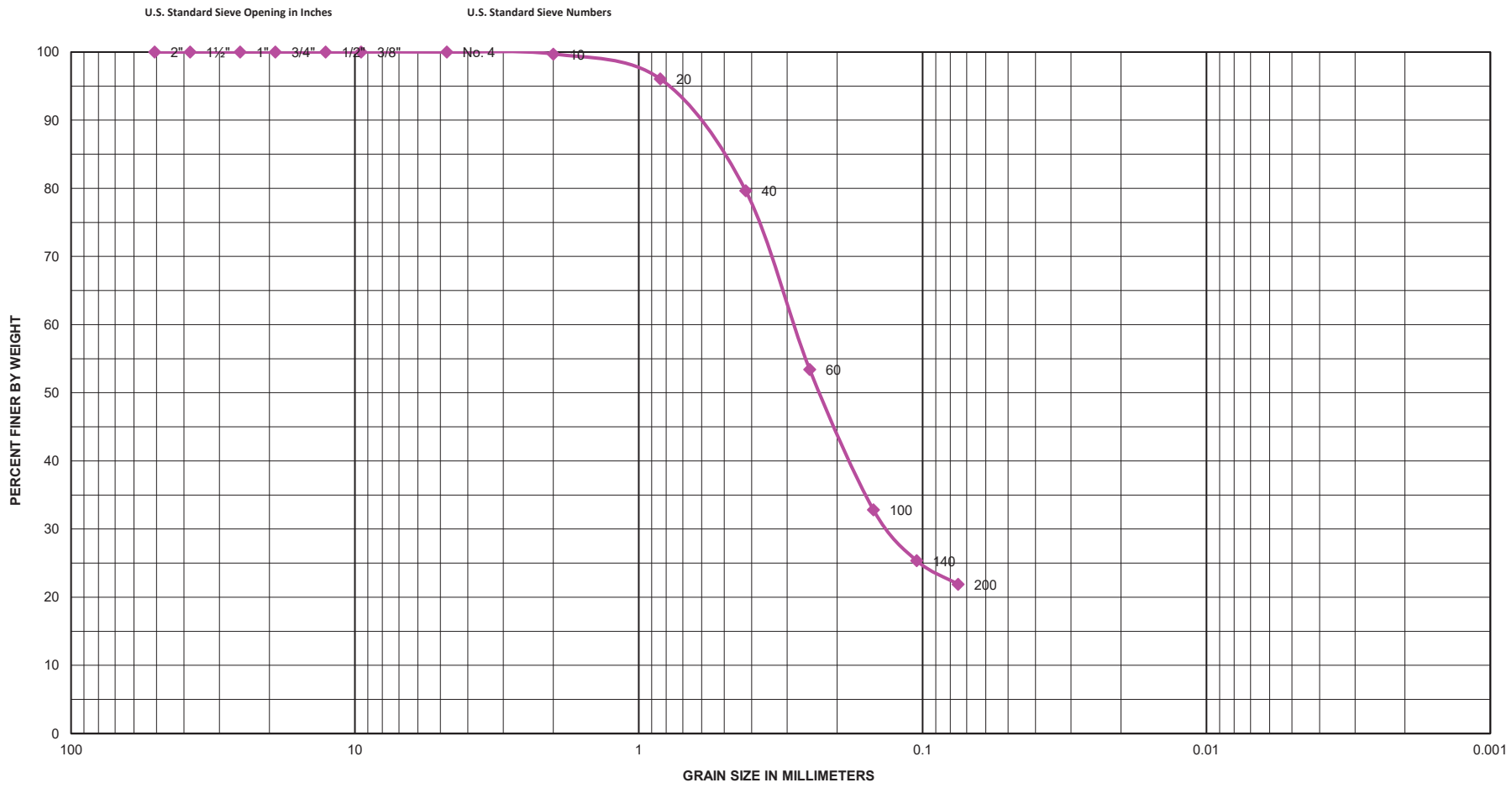
GRADATION CURVES

U.S. Army Corps of Engineers, Savannah District

Materials Testing Regional Technical Center of Expertise

Work Order No. 44307J

Requisition No. W26GLG33625848



Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI
S-9	38.5 - 40.0	Light Gray & Yellow, Silty Sand (SM).	24.67	NP	NP	NP

Project FEDMMA Testing

Location Fort Eustis, Virginia

Contract No.

Lab No. E4/19155

Boring No. DH-1139-01

Date 15-Jul-24

Tests Conducted in General Accordance with ASTM's D422, D4318, D2216, D854, & D2487.

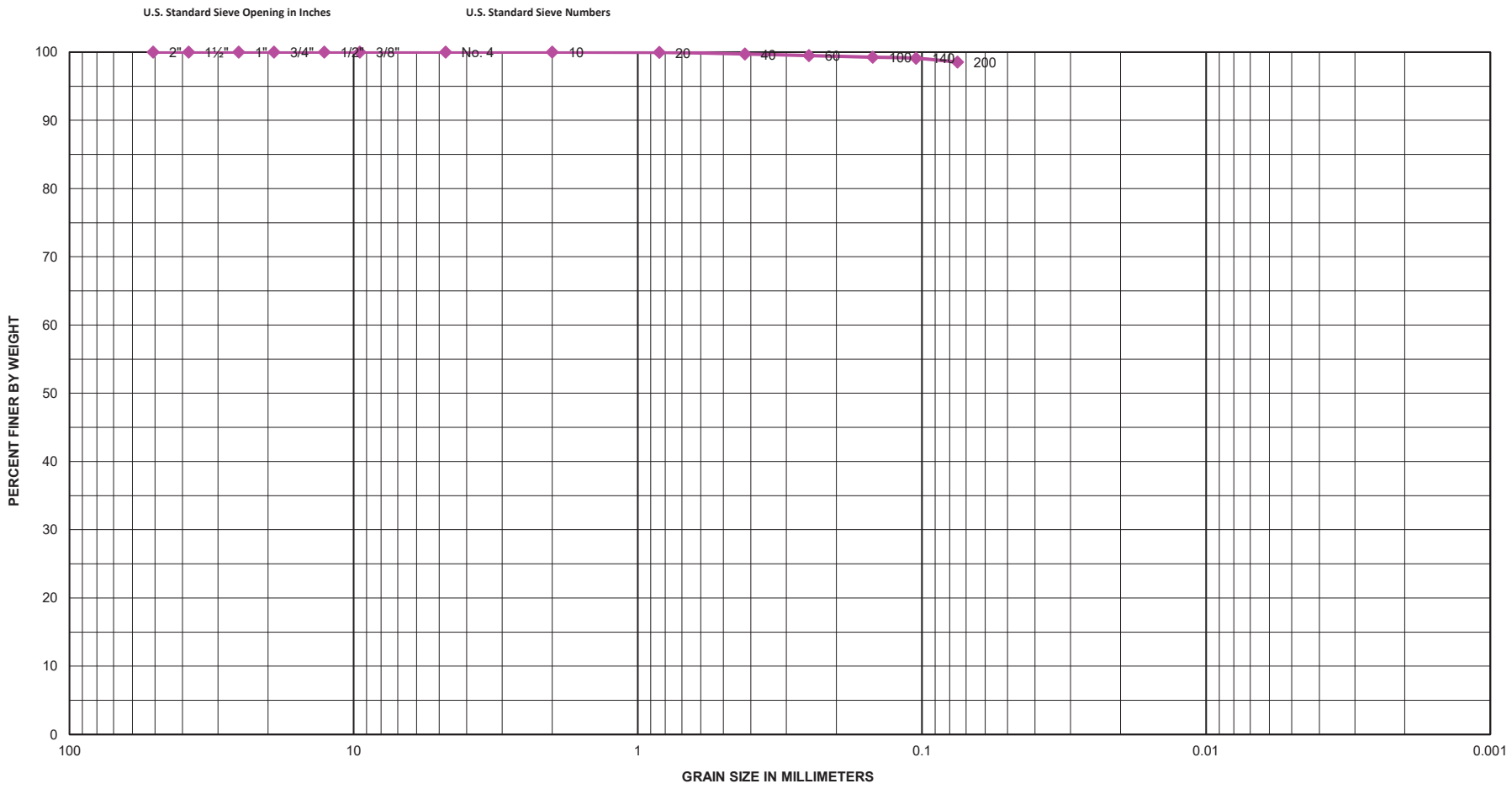
GRADATION CURVES

U.S. Army Corps of Engineers, Savannah District

Materials Testing Regional Technical Center of Expertise

Work Order No. 44307J

Requisition No. W26GLG33625848



Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI
S-16	73.5 - 75.0	Gray, Fat Clay (CH), with a trace of sand.	69.03	86	34	52

GRADATION CURVES

Project FEDMMA Testing

Location Fort Eustis, Virginia

Contract No.

Lab No. E4/19162

Boring No. DH-1139-01

Date 15-Jul-24

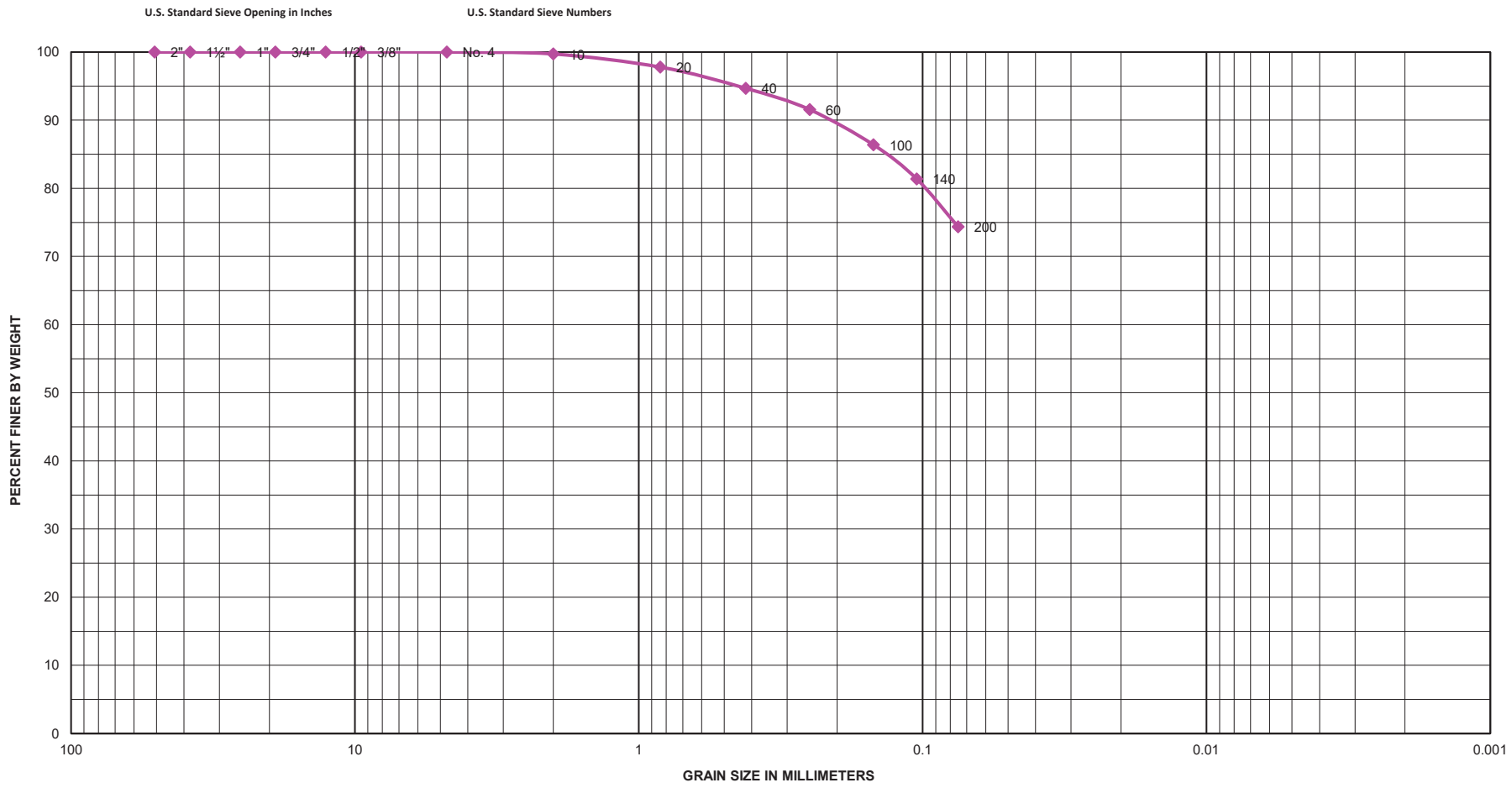
Tests Conducted in General Accordance with ASTM's D422, D4318, D2216, D854, & D2487.

U.S. Army Corps of Engineers, Savannah District

Materials Testing Regional Technical Center of Expertise

Work Order No. 44307J

Requisition No. W26GLG33625848



Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI
S-1	0.0 - 1.5	Gray & Reddish Yellow, Fat Clay (CH), with some sand.	29.73	61	27	34

GRADATION CURVES

Project	FEDMMA Testing
Location	Fort Eustis, Virginia
Contract No.	
Lab No.	E4/19164
Boring No.	DH-1139-02
Date	15-Jul-24

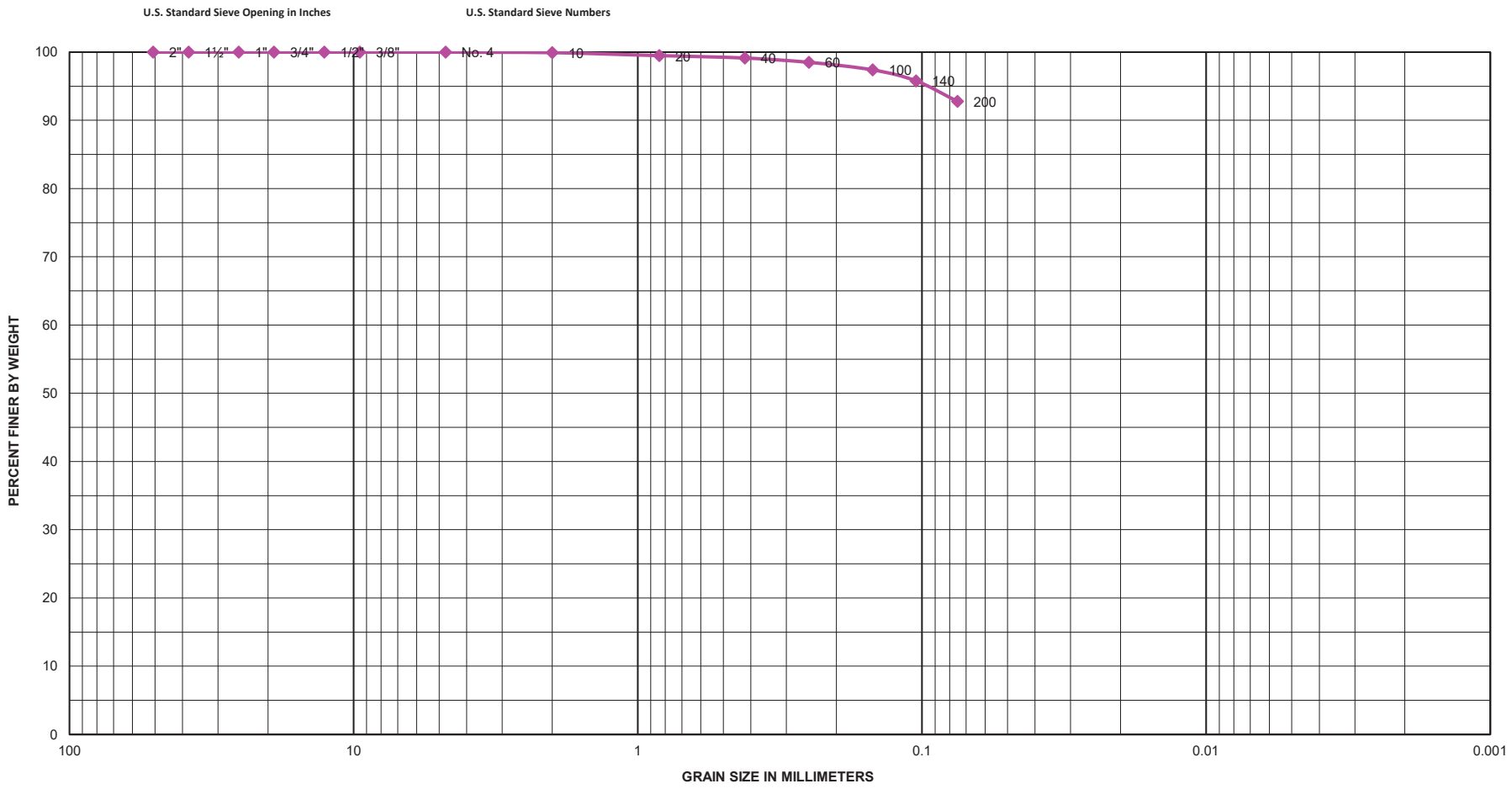
Tests Conducted in General Accordance with ASTM's D422, D4318, D2216, D854, & D2487.

U.S. Army Corps of Engineers, Savannah District

Materials Testing Regional Technical Center of Expertise

Work Order No. 44307J

Requisition No. W26GLG33625848



Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI
S-5	18.5 - 20.0	Gray, Dark Gray & Strong Brown, Fat Clay (CH), with a trace of sand.	48.79	81	32	49

Project FEDMMA Testing

Location Fort Eustis, Virginia

Contract No.

Lab No. E4/19168

Boring No. DH-1139-02

Date 15-Jul-24

Tests Conducted in General Accordance with ASTM's D422, D4318, D2216, D854, & D2487.

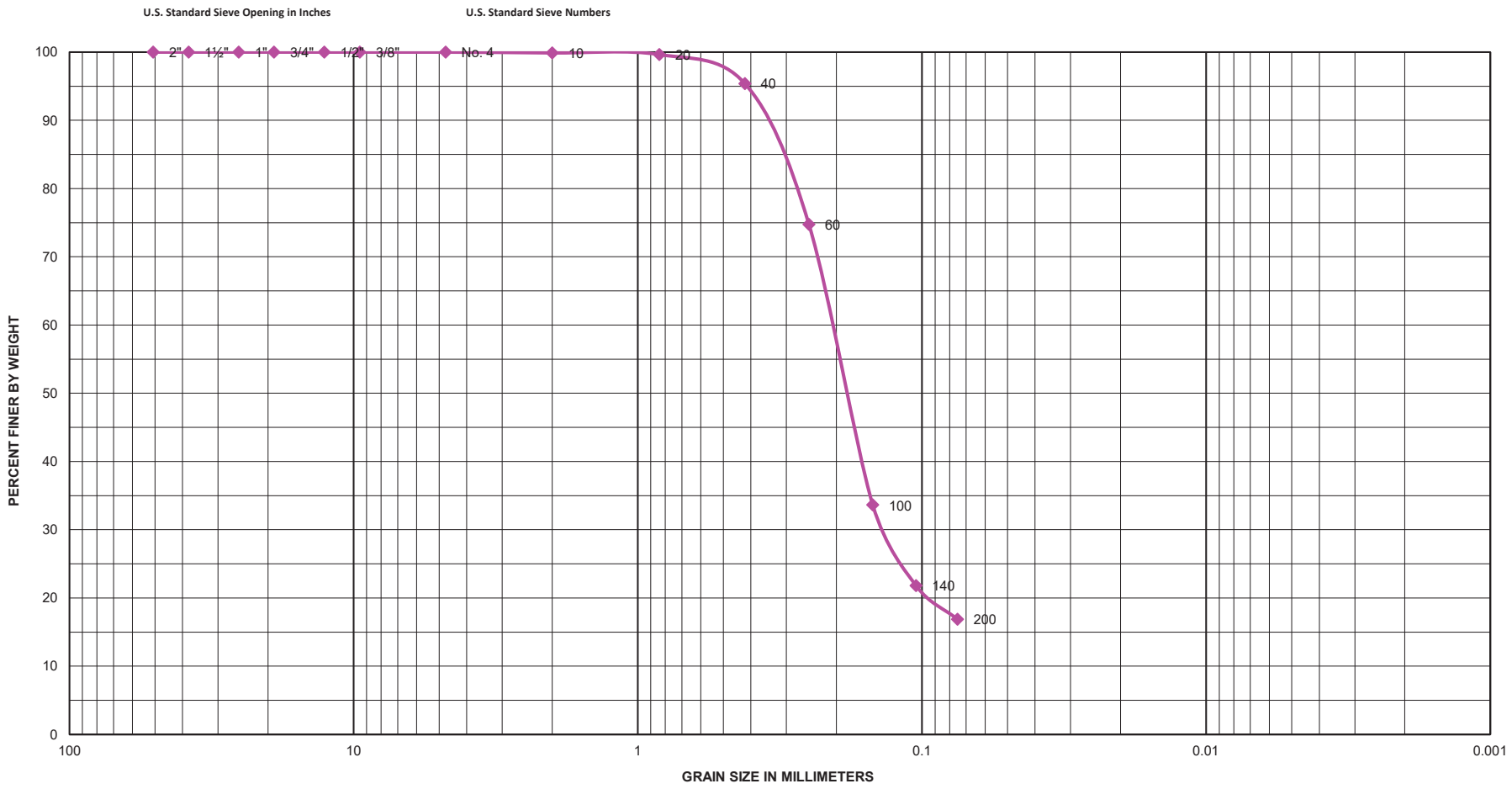
GRADATION CURVES

U.S. Army Corps of Engineers, Savannah District

Materials Testing Regional Technical Center of Expertise

Work Order No. 44307J

Requisition No. W26GLG33625848



Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI
S-11	48.5 - 50.0	Reddish Yellow & Gray, Clayey Silty Sand (SC-SM).	29.01	25	19	6

GRADATION CURVES

Project	FEDMMA Testing
Location	Fort Eustis, Virginia
Contract No.	
Lab No.	E4/19174
Boring No.	DH-1139-02
Date	15-Jul-24

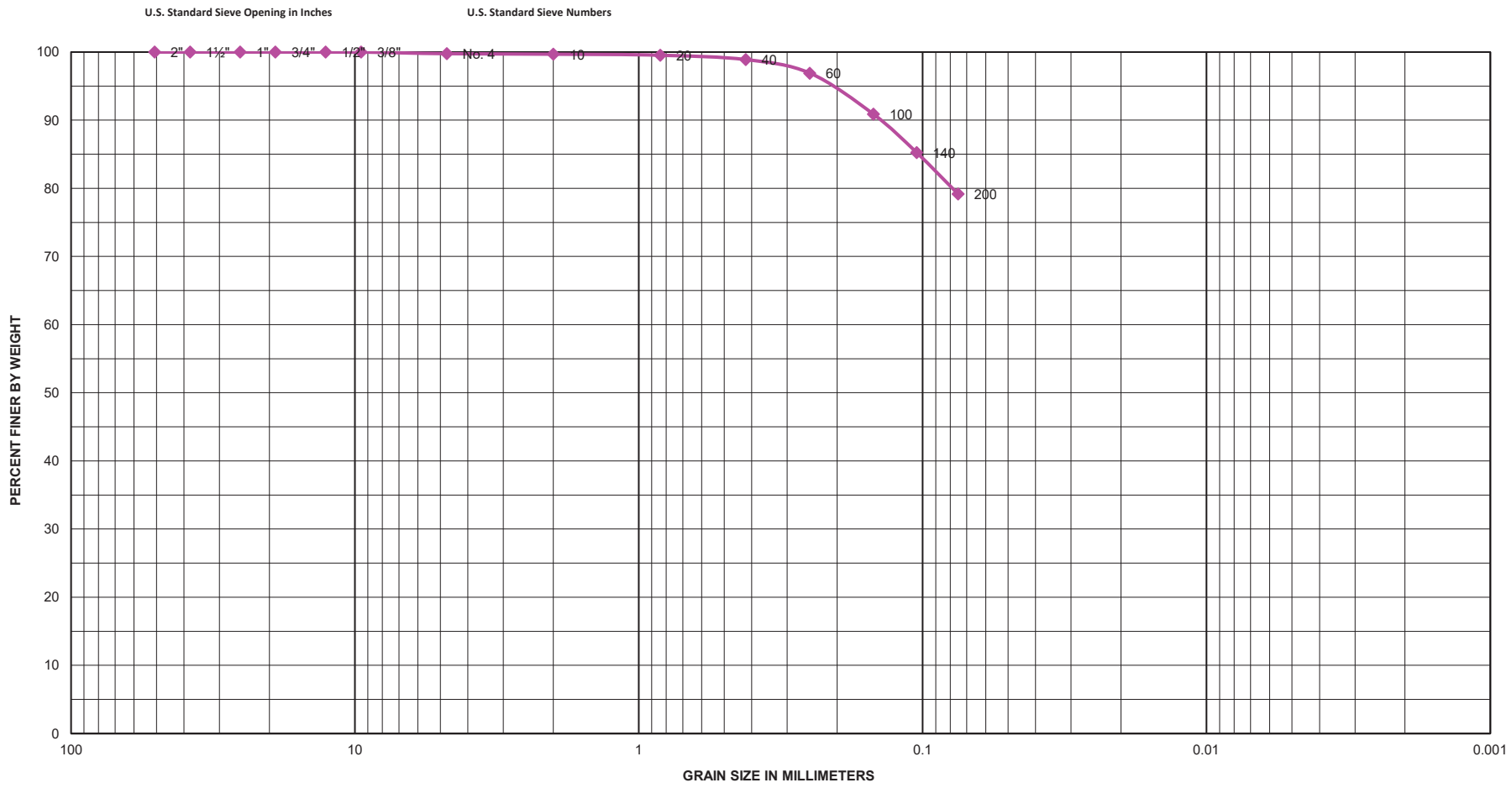
Tests Conducted in General Accordance with ASTM's D422, D4318, D2216, D854, & D2487.

U.S. Army Corps of Engineers, Savannah District

Materials Testing Regional Technical Center of Expertise

Work Order No. 44307J

Requisition No. W26GLG33625848



Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI
S-6	23.5 - 25.0	Light Yellowish Brown & Light Gray, Lean Clay (CL), with some sand.	18.62	32	14	18

Project FEDMMA Testing

Location Fort Eustis, Virginia

Contract No.

Lab No. E4/19186

Boring No. DH-1139-03

Date 15-Jul-24

Tests Conducted in General Accordance with ASTM's D422, D4318, D2216, D854, & D2487.

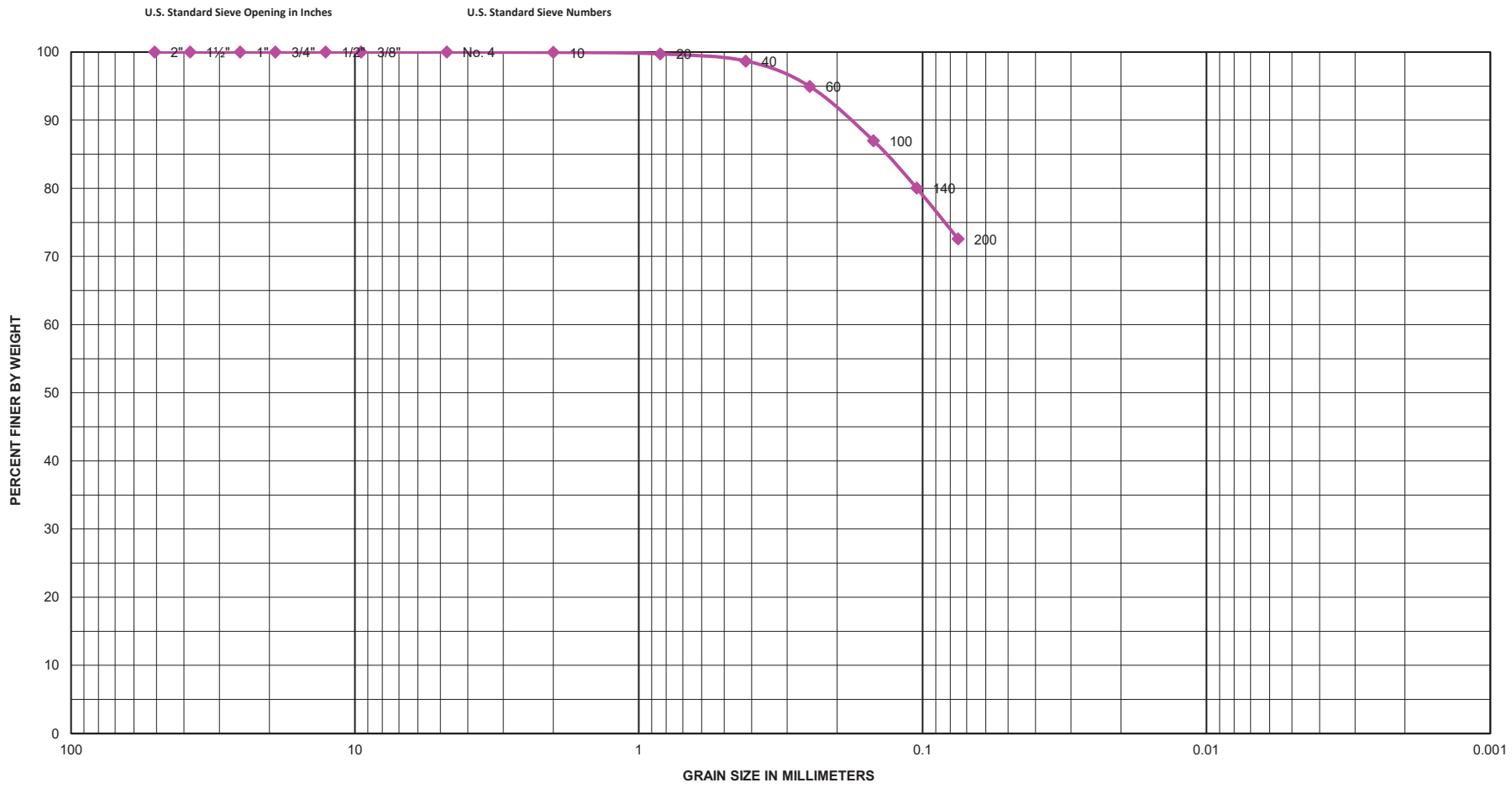
GRADATION CURVES

U.S. Army Corps of Engineers, Savannah District

Materials Testing Regional Technical Center of Expertise

Work Order No. 44307J

Requisition No. W26GLG33625848



Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI
S-9	38.5 - 40.0	Light Gray & Reddish Yellow, Lean Clay (CL), with some sand.	20.31	28	14	14

GRADATION CURVES

Project	FEDMMA Testing
Location	Fort Eustis, Virginia
Contract No.	
Lab No.	E4/19188
Boring No.	DH-1139-03
Date	15-Jul-24

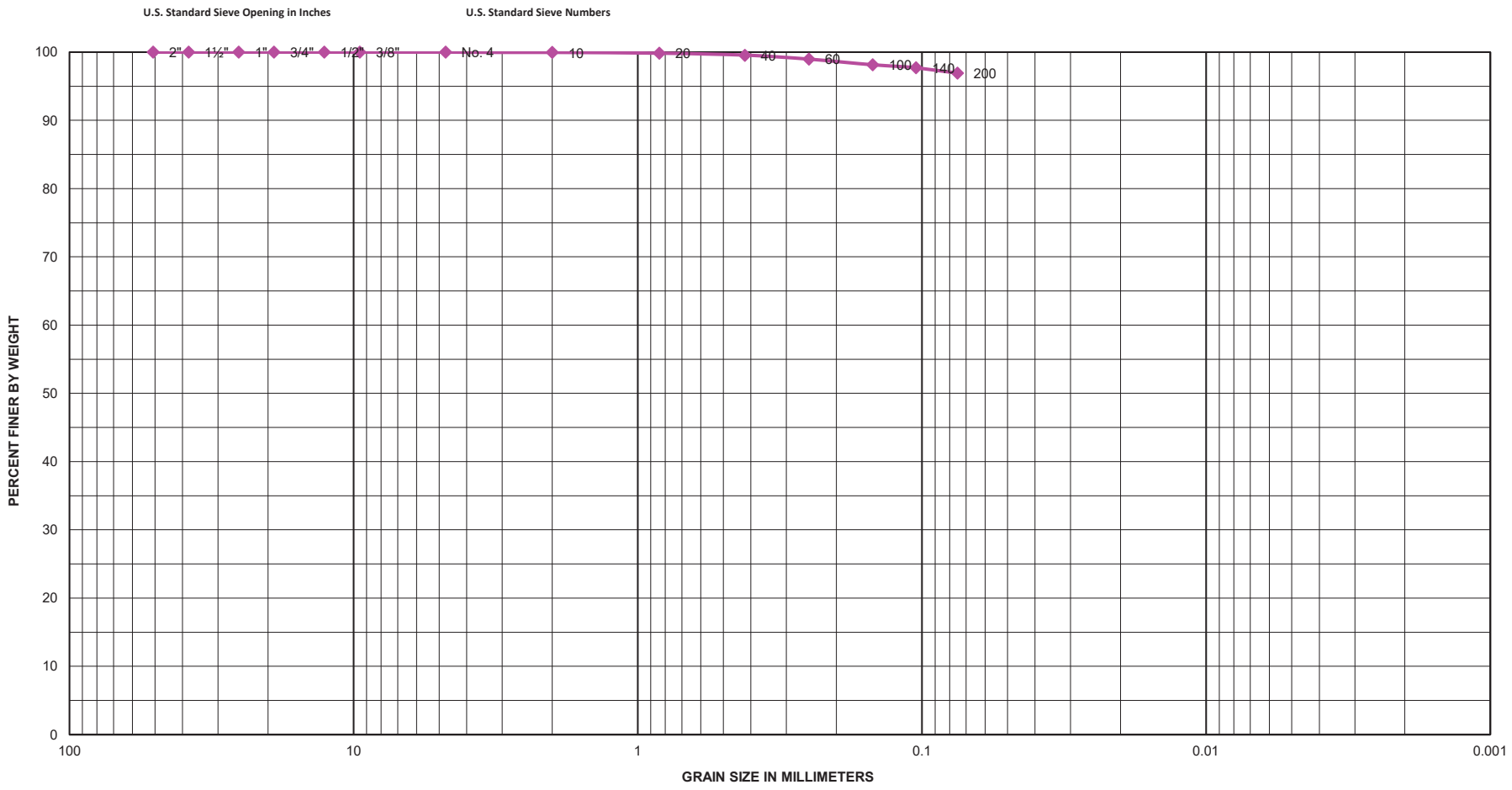
Tests Conducted in General Accordance with ASTM's D422, D4318, D2216, D854, & D2487.

U.S. Army Corps of Engineers, Savannah District

Materials Testing Regional Technical Center of Expertise

Work Order No. 44307J

Requisition No. W26GLG33625848



Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI
S-15	68.5 - 70.0	Dark Gray & Light Brown, Fat Clay (CH), with a trace of sand.	69.73	103	36	67

Project FEDMMA Testing

Location Fort Eustis, Virginia

Contract No.

Lab No. E4/19194

Boring No. DH-1139-03

GRADATION CURVES

Date 15-Jul-24

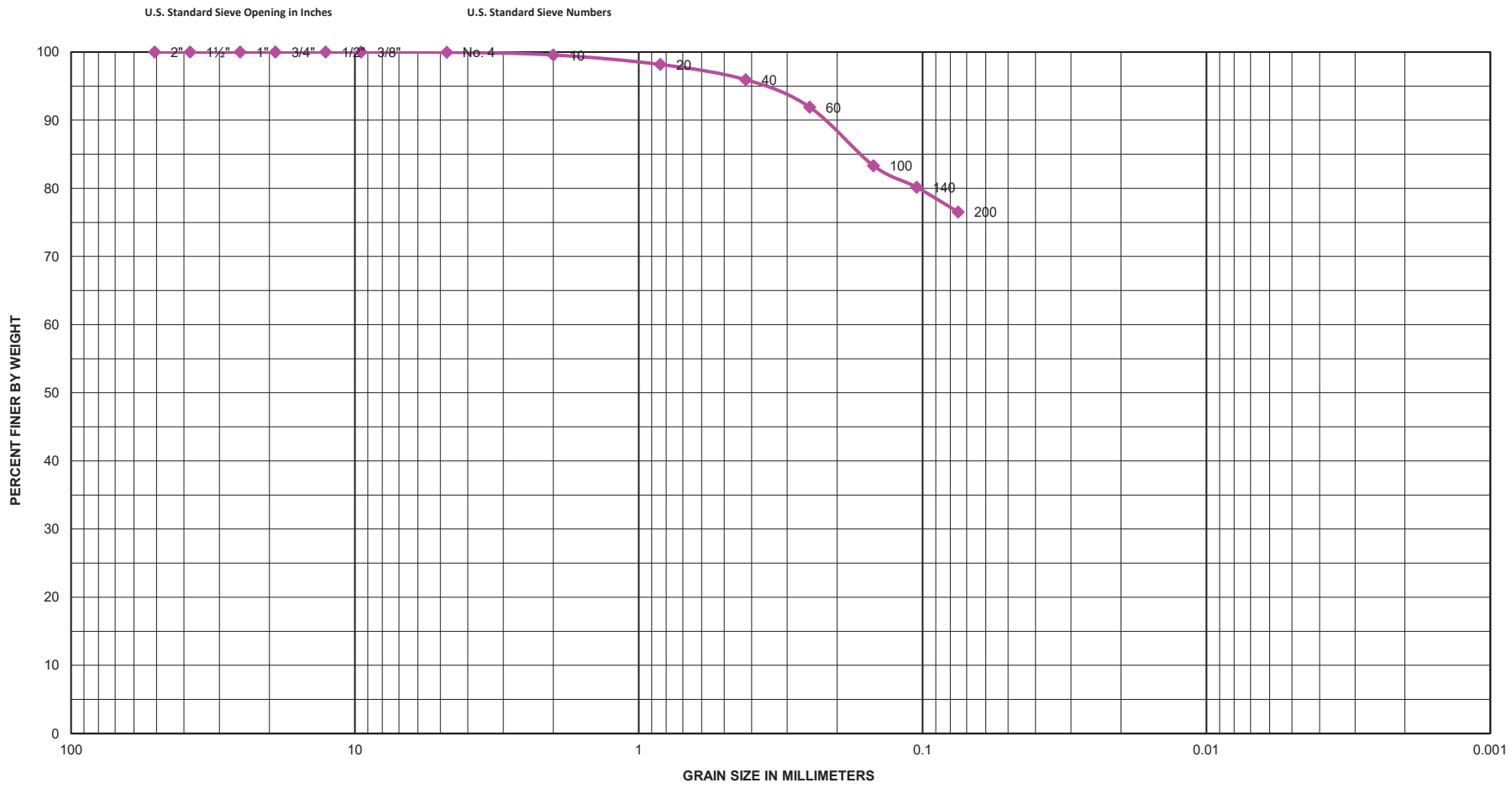
Tests Conducted in General Accordance with ASTM's D422, D4318, D2216, D854, & D2487.

U.S. Army Corps of Engineers, Savannah District

Materials Testing Regional Technical Center of Expertise

Work Order No. 44307J

Requisition No. W26GLG33625848



Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI
S-2	3.5 - 5.0	Dark Gray, Gray & Light Brown, Fat Clay (CH), with some sand.	47.15	78	31	47

GRADATION CURVES

Project	FEDMMA Testing
Location	Fort Eustis, Virginia
Contract No.	
Lab No.	E4/19198
Boring No.	DH-1139-04
Date	15-Jul-24

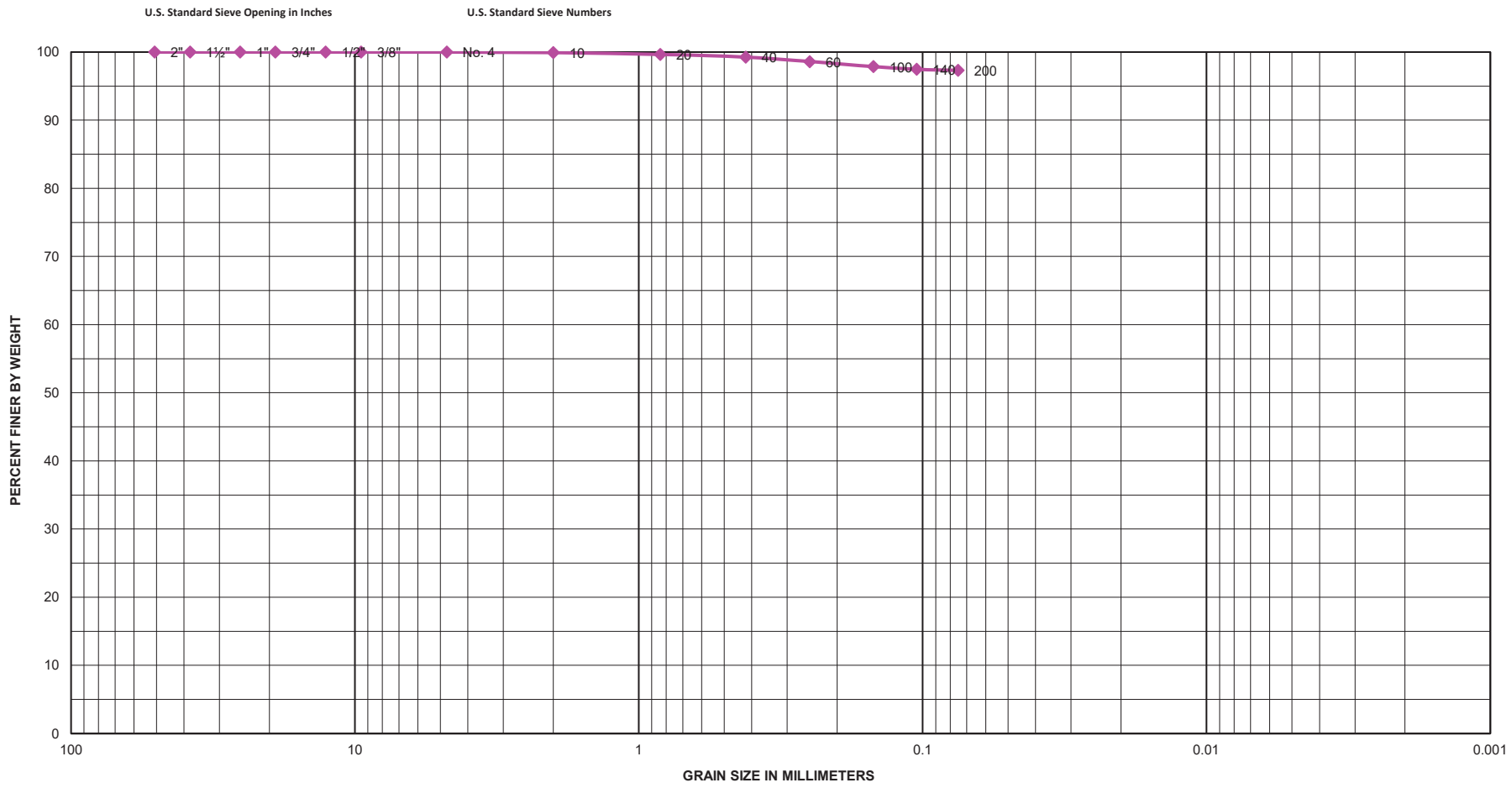
Tests Conducted in General Accordance with ASTM's D422, D4318, D2216, D854, & D2487.

U.S. Army Corps of Engineers, Savannah District

Materials Testing Regional Technical Center of Expertise

Work Order No. 44307J

Requisition No. W26GLG33625848



Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI
S-5	18.5 - 20.0	Dark Gray, Gray & Reddish Yellow, Fat Clay (CH), with a trace of sand.	67.81	114	40	74

Project FEDMMA Testing

Location Fort Eustis, Virginia

Contract No.

Lab No. E4/19201

Boring No. DH-1139-04

Date 15-Jul-24

Tests Conducted in General Accordance with ASTM's D422, D4318, D2216, D854, & D2487.

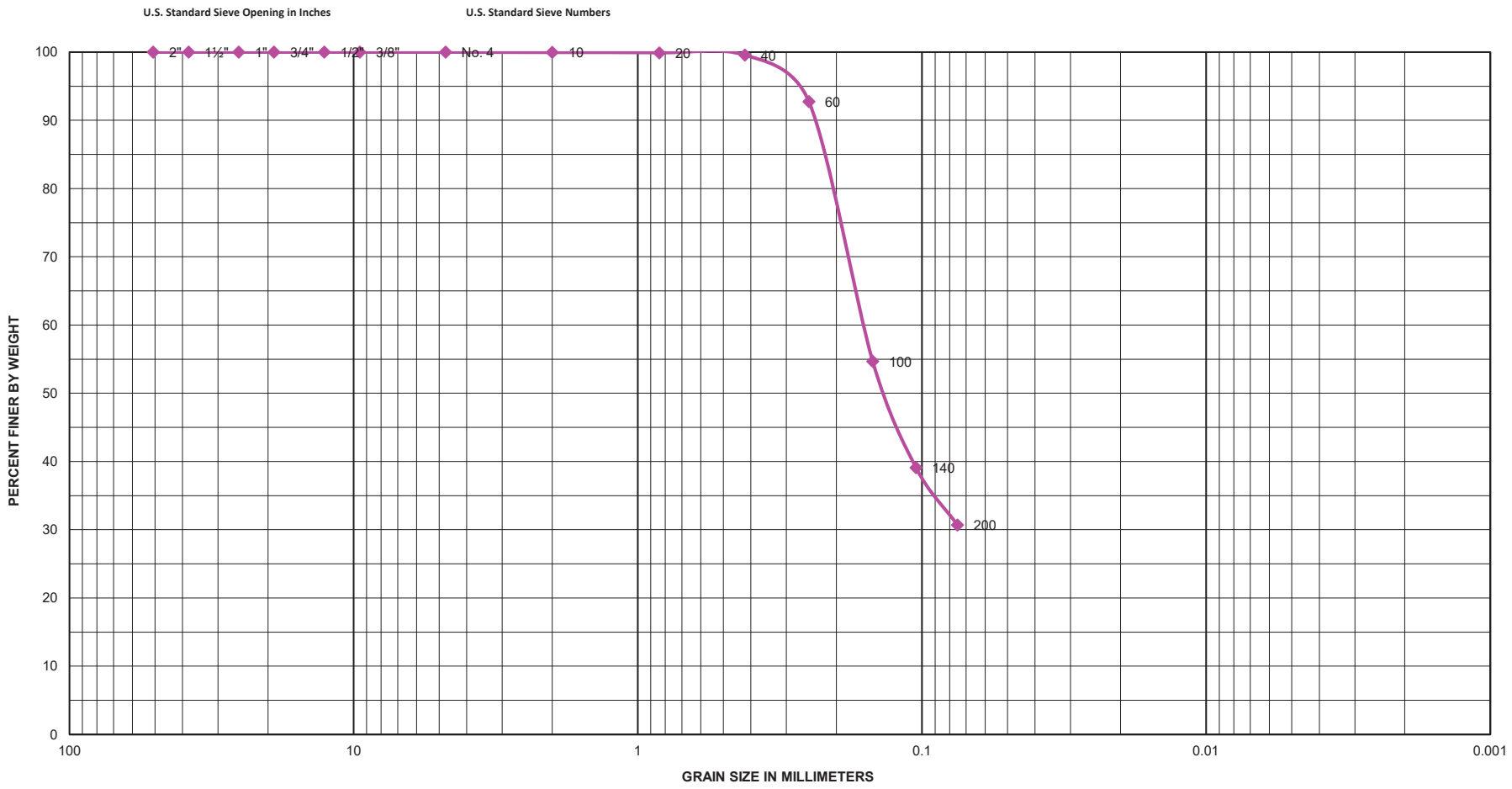
GRADATION CURVES

U.S. Army Corps of Engineers, Savannah District

Materials Testing Regional Technical Center of Expertise

Work Order No. 44307J

Requisition No. W26GLG33625848



Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI
S-9	38.5 - 40.0	Light Gray, Reddish Yellow & Red, Silty Sand (SM).	27.01	NP	NP	NP

GRADATION CURVES

Project FEDMMA Testing

Location Fort Eustis, Virginia

Contract No.

Lab No. E4/19205

Boring No. DH-1139-04

Date 15-Jul-24

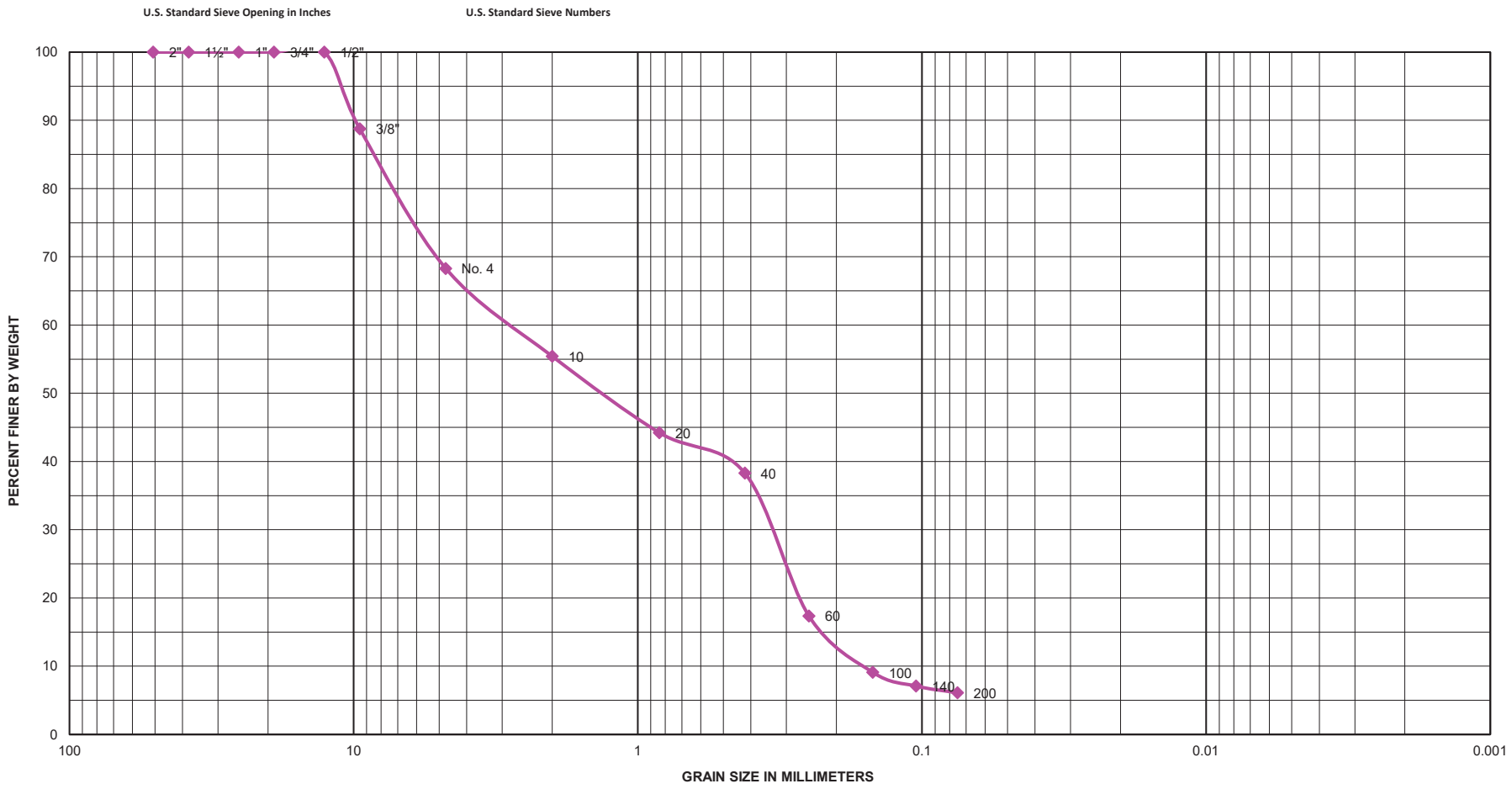
Tests Conducted in General Accordance with ASTM's D422, D4318, D2216, D854, & D2487.

U.S. Army Corps of Engineers, Savannah District

Materials Testing Regional Technical Center of Expertise

Work Order No. 44307J

Requisition No. W26GLG33625848



Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI
S-11A	48.5 - 49.5	Gray & Very Pale Brown, Poorly Graded Silty Sand (SP-SM), with some gravel.	13.22	NP	NP	NP

GRADATION CURVES

Project FEDMMA Testing

Location Fort Eustis, Virginia

Contract No.

Lab No. E4/19207A

Boring No. DH-1139-04

Date 15-Jul-24

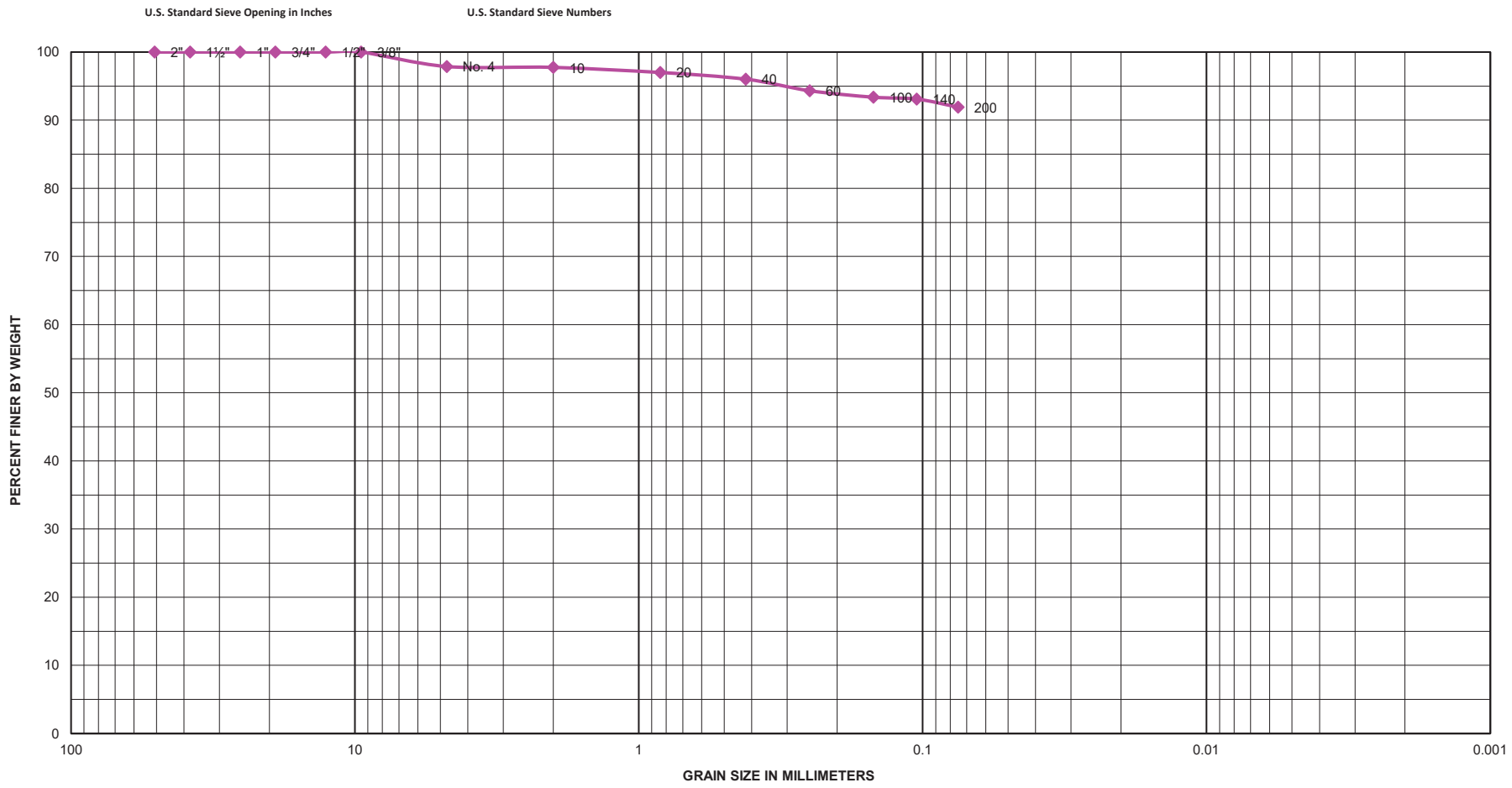
Tests Conducted in General Accordance with ASTM's D422, D4318, D2216, D854, & D2487.

U.S. Army Corps of Engineers, Savannah District

Materials Testing Regional Technical Center of Expertise

Work Order No. 44307J

Requisition No. W26GLG33625848



Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI
S-11B	49.5 - 50.0	Light Greenish Gray & Very Pale Brown, Fat Clay (CH), with a trace of sand and a trace of gravel.	36.48	76	23	53

Project	FEDMMA Testing
Location	Fort Eustis, Virginia
Contract No.	
Lab No.	E4/19207B
Boring No.	DH-1139-04
Date	15-Jul-24

Tests Conducted in General Accordance with ASTM's D422, D4318, D2216, D854, & D2487.

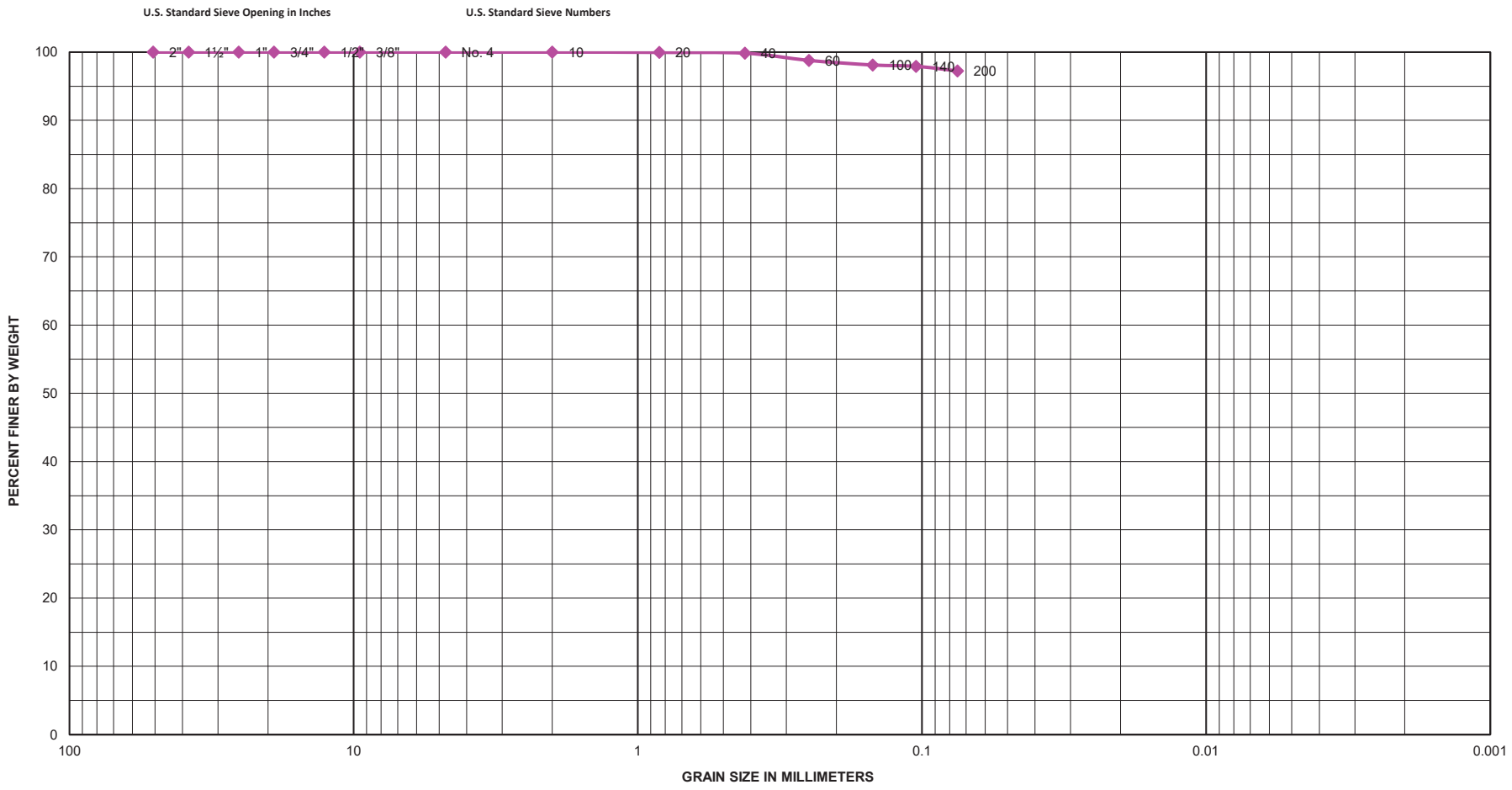
GRADATION CURVES

U.S. Army Corps of Engineers, Savannah District

Materials Testing Regional Technical Center of Expertise

Work Order No. 44307J

Requisition No. W26GLG33625848



Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI
S-14	63.5 - 65.0	Gray & Pale Brown, Fat Clay (CH), with a trace of sand.	64.23	88	33	55

GRADATION CURVES

Project FEDMMA Testing

Location Fort Eustis, Virginia

Contract No.

Lab No. E4/19210

Boring No. DH-1139-04

Date 15-Jul-24

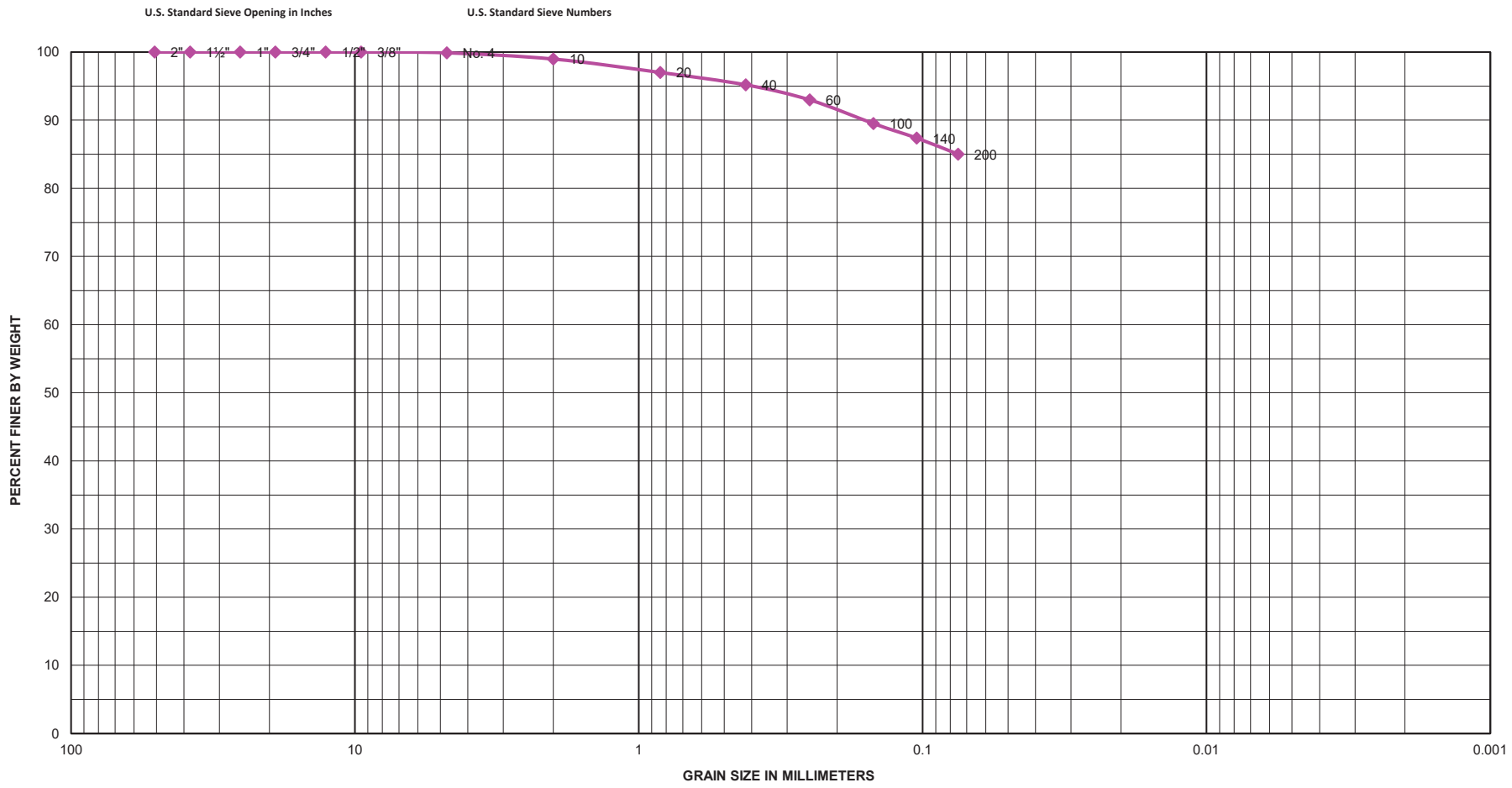
Tests Conducted in General Accordance with ASTM's D422, D4318, D2216, D854, & D2487.

U.S. Army Corps of Engineers, Savannah District

Materials Testing Regional Technical Center of Expertise

Work Order No. 44307J

Requisition No. W26GLG33625848



Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI
S-2	3.5 - 5.0	Brown, Gray, Dark Gray & Reddish Brown, Fat Clay (CH), with a little sand.	64.71	100	37	63

Project FEDMMA Testing

Location Fort Eustis, Virginia

Contract No.

Lab No. E4/19215

Boring No. DH-1139-05

Date 15-Jul-24

Tests Conducted in General Accordance with ASTM's D422, D4318, D2216, D854, & D2487.

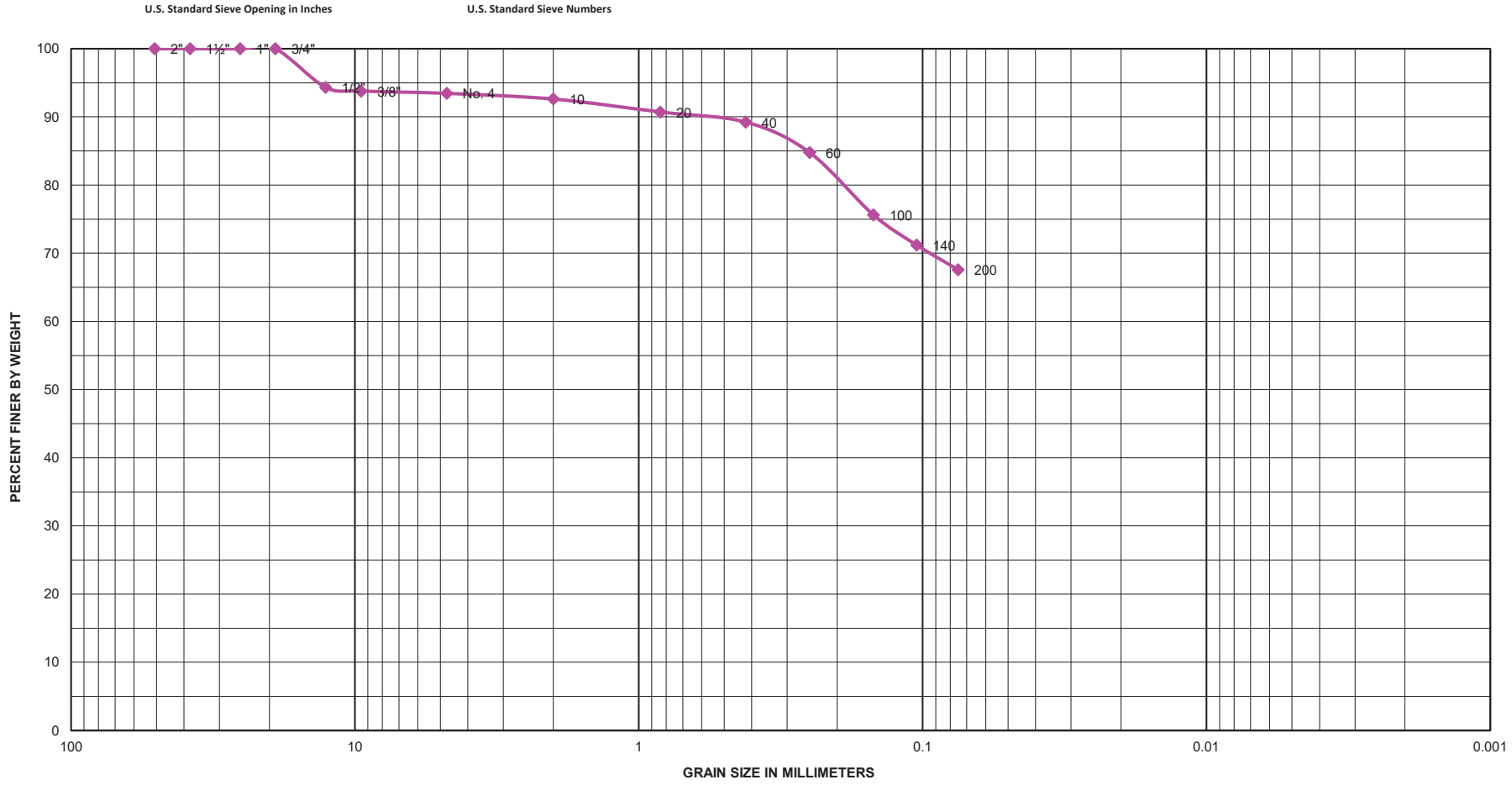
GRADATION CURVES

U.S. Army Corps of Engineers, Savannah District

Materials Testing Regional Technical Center of Expertise

Work Order No. 44307J

Requisition No. W26GLG33625848



Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI
S-5	18.5 - 20.0	Very Pale Brown, Yellowish Brown, Gray & Dark Gray, Lean Clay (CL), with some sand, and a trace of gravel.	29	44	20	24

GRADATION CURVES

Project	FEDMMA Testing
Location	Fort Eustis, Virginia
Contract No.	
Lab No.	E4/19218
Boring No.	DH-1139-05
Date	15-Jul-24

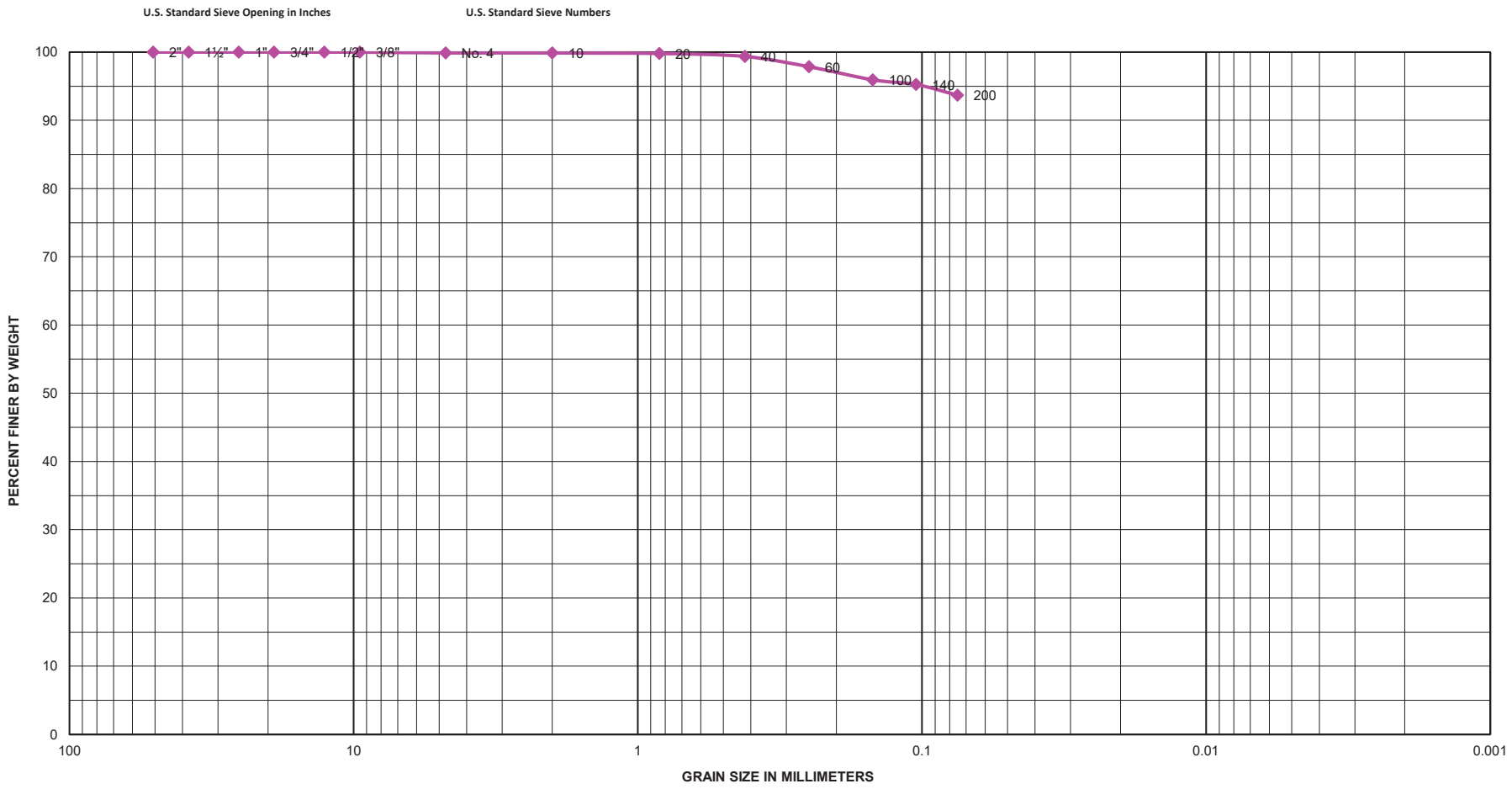
Tests Conducted in General Accordance with ASTM's D422, D4318, D2216, D854, & D2487.

U.S. Army Corps of Engineers, Savannah District

Materials Testing Regional Technical Center of Expertise

Work Order No. 44307J

Requisition No. W26GLG33625848



Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI
S-11	48.5 - 50.0	Bluish Gray, Yellowish Brown & Very Pale Brown, Fat Clay (CH), with a trace of sand.	33.69	57	29	28

GRADATION CURVES

Project FEDMMA Testing

Location Fort Eustis, Virginia

Contract No.

Lab No. E4/19224

Boring No. DH-1139-05

Date 15-Jul-24

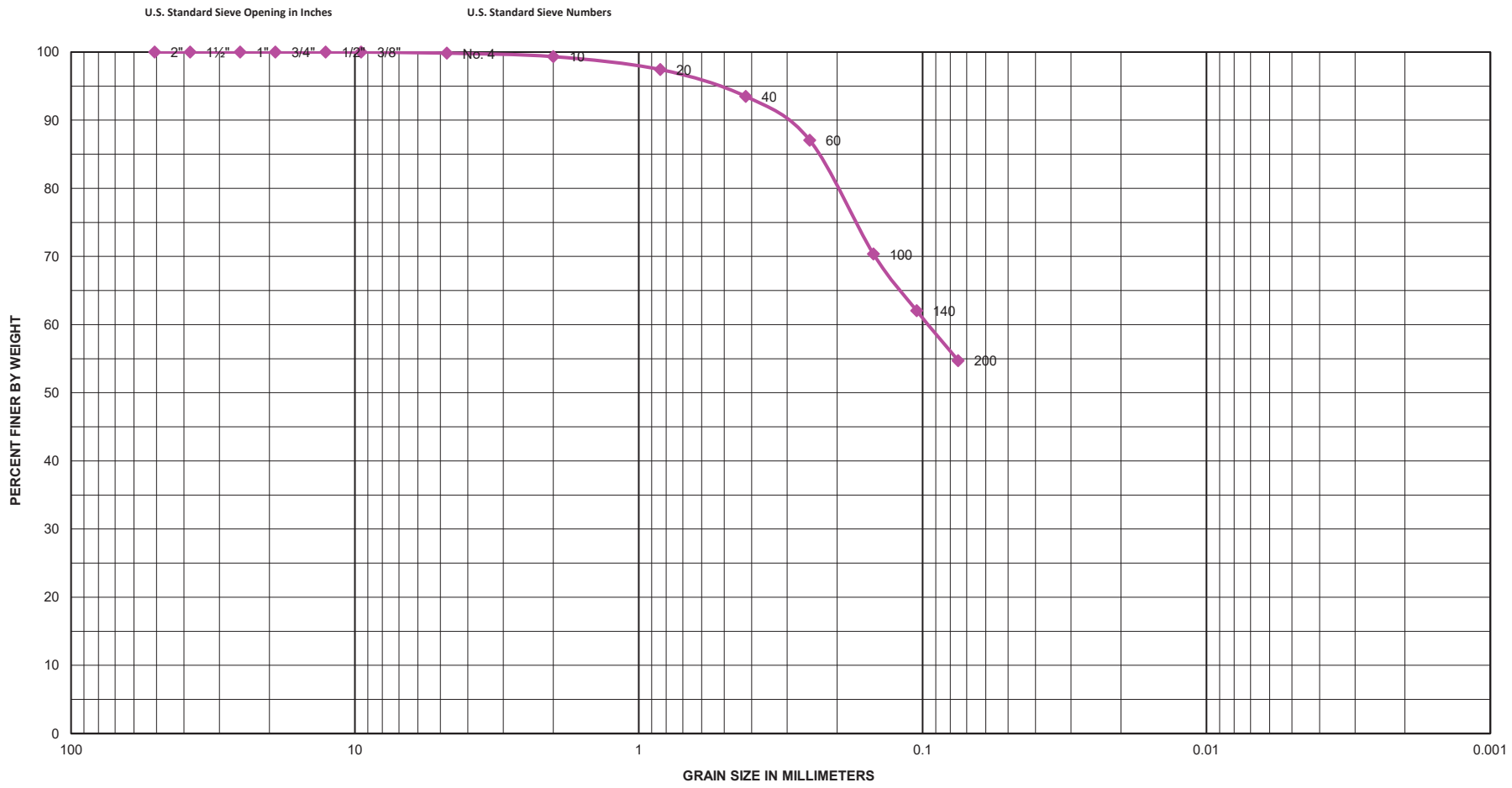
Tests Conducted in General Accordance with ASTM's D422, D4318, D2216, D854, & D2487.

U.S. Army Corps of Engineers, Savannah District

Materials Testing Regional Technical Center of Expertise

Work Order No. 44307J

Requisition No. W26GLG33625848



Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI
S-1	0.0 - 1.5	Grayish Brown & Yellowish Brown, Sandy Fat Clay (CH).	24.95	57	28	29

GRADATION CURVES

Project	FEDMMA Testing
Location	Fort Eustis, Virginia
Contract No.	
Lab No.	E4/19231
Boring No.	DH-1139-06
Date	15-Jul-24

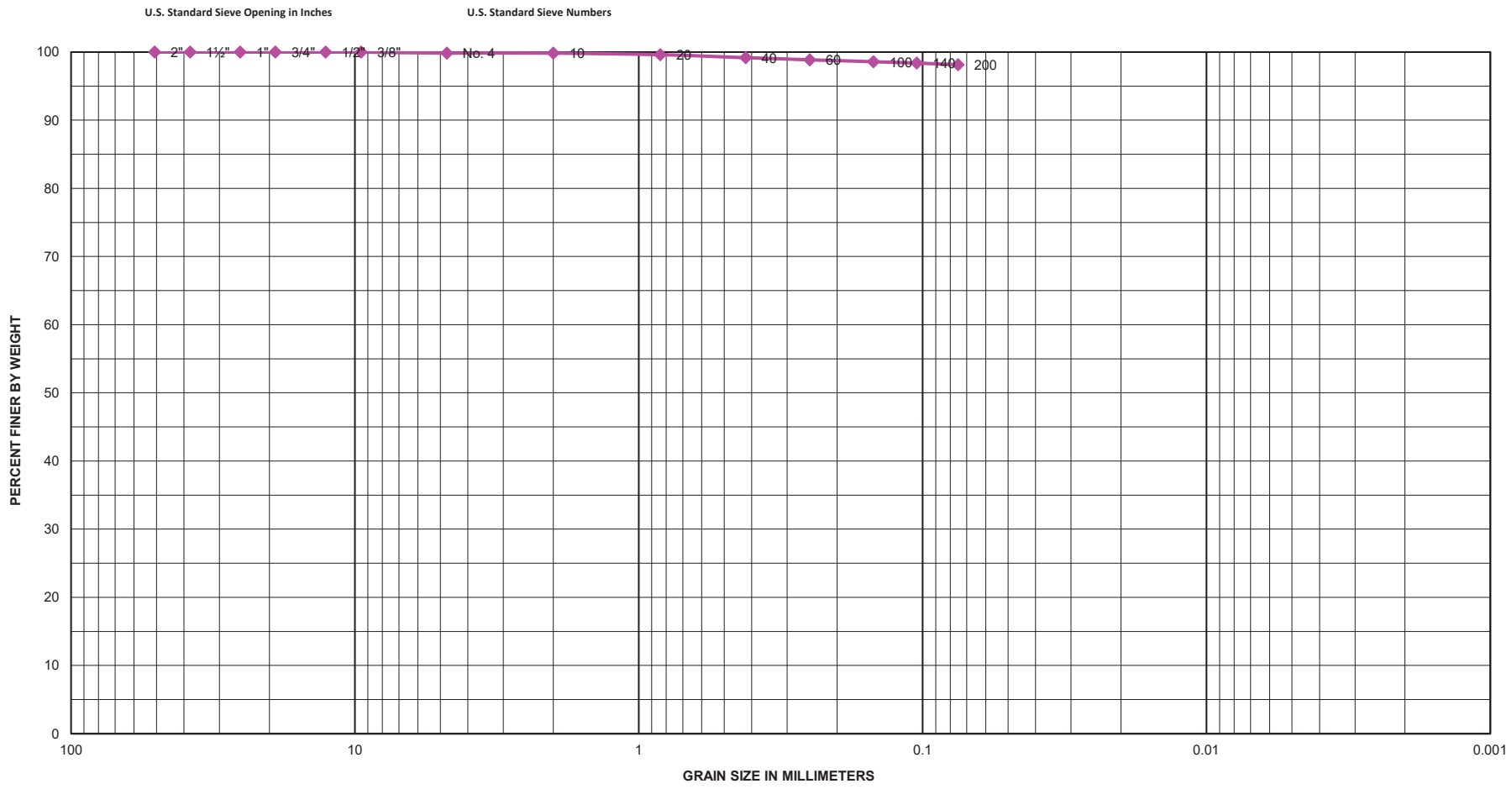
Tests Conducted in General Accordance with ASTM's D422, D4318, D2216, D854, & D2487.

U.S. Army Corps of Engineers, Savannah District

Materials Testing Regional Technical Center of Expertise

Work Order No. 44307J

Requisition No. W26GLG33625848



Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI
S-5	18.5 - 20.0	Gray, Dark Gray & Dark Yellowish Brown, Fat Clay (CH), with a trace of sand.	68.51	109	40	69

GRADATION CURVES

Project FEDMMA Testing

Location Fort Eustis, Virginia

Contract No.

Lab No. E4/19235

Boring No. DH-1139-06

Date 15-Jul-24

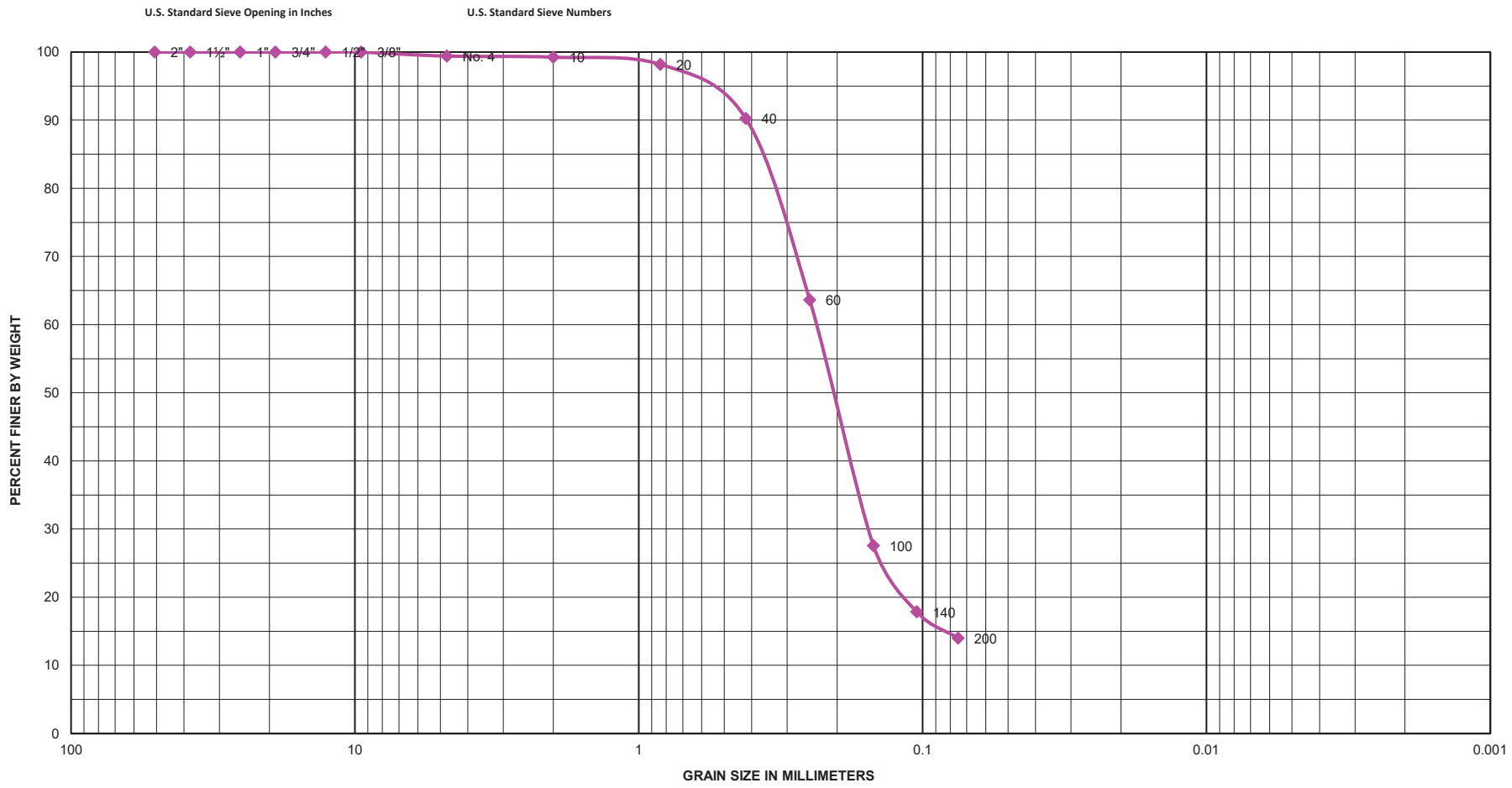
Tests Conducted in General Accordance with ASTM's D422, D4318, D2216, D854, & D2487.

U.S. Army Corps of Engineers, Savannah District

Materials Testing Regional Technical Center of Expertise

Work Order No. 44307J

Requisition No. W26GLG33625848



Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI
S-10	43.5 - 45.0	Gray & Yellowish Brown, Silty Sand (SM).	25.84	NP	NP	NP

Project FEDMMA Testing

Location Fort Eustis, Virginia

Contract No.

Lab No. E4/19240

Boring No. DH-1139-06

Date 15-Jul-24

Tests Conducted in General Accordance with ASTM's D422, D4318, D2216, D854, & D2487.

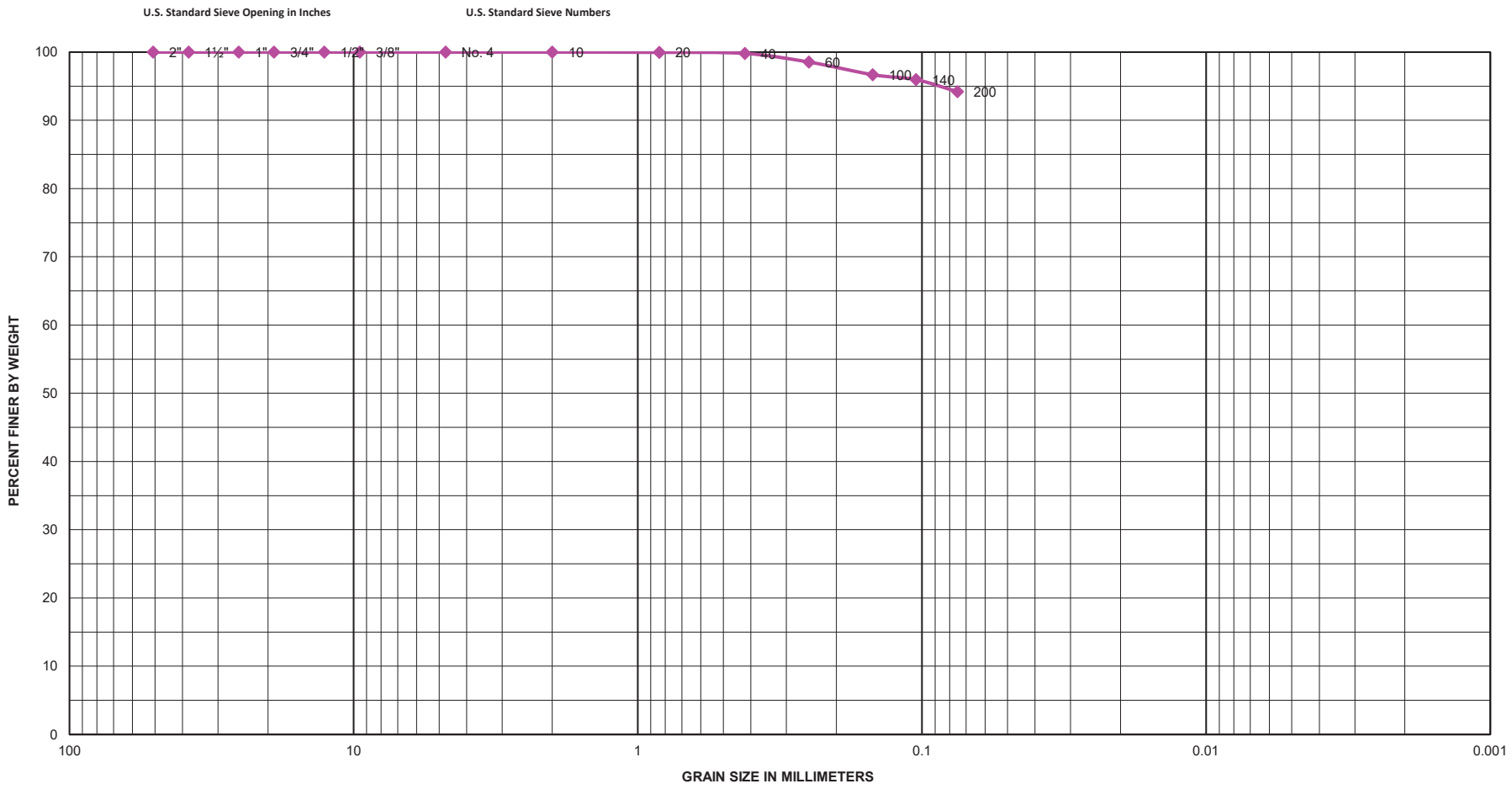
GRADATION CURVES

U.S. Army Corps of Engineers, Savannah District

Materials Testing Regional Technical Center of Expertise

Work Order No. 44307J

Requisition No. W26GLG33625848



Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI
S-12	53.5 - 55.0	Bluish Gray & Yellowish Brown, Inorganic Silt High LL (MH), with a trace of sand.	57.04	83	42	41

Project FEDMMA Testing

Location Fort Eustis, Virginia

Contract No.

Lab No. E4/19242

Boring No. DH-1139-06

Date 15-Jul-24

Tests Conducted in General Accordance with ASTM's D422, D4318, D2216, D854, & D2487.

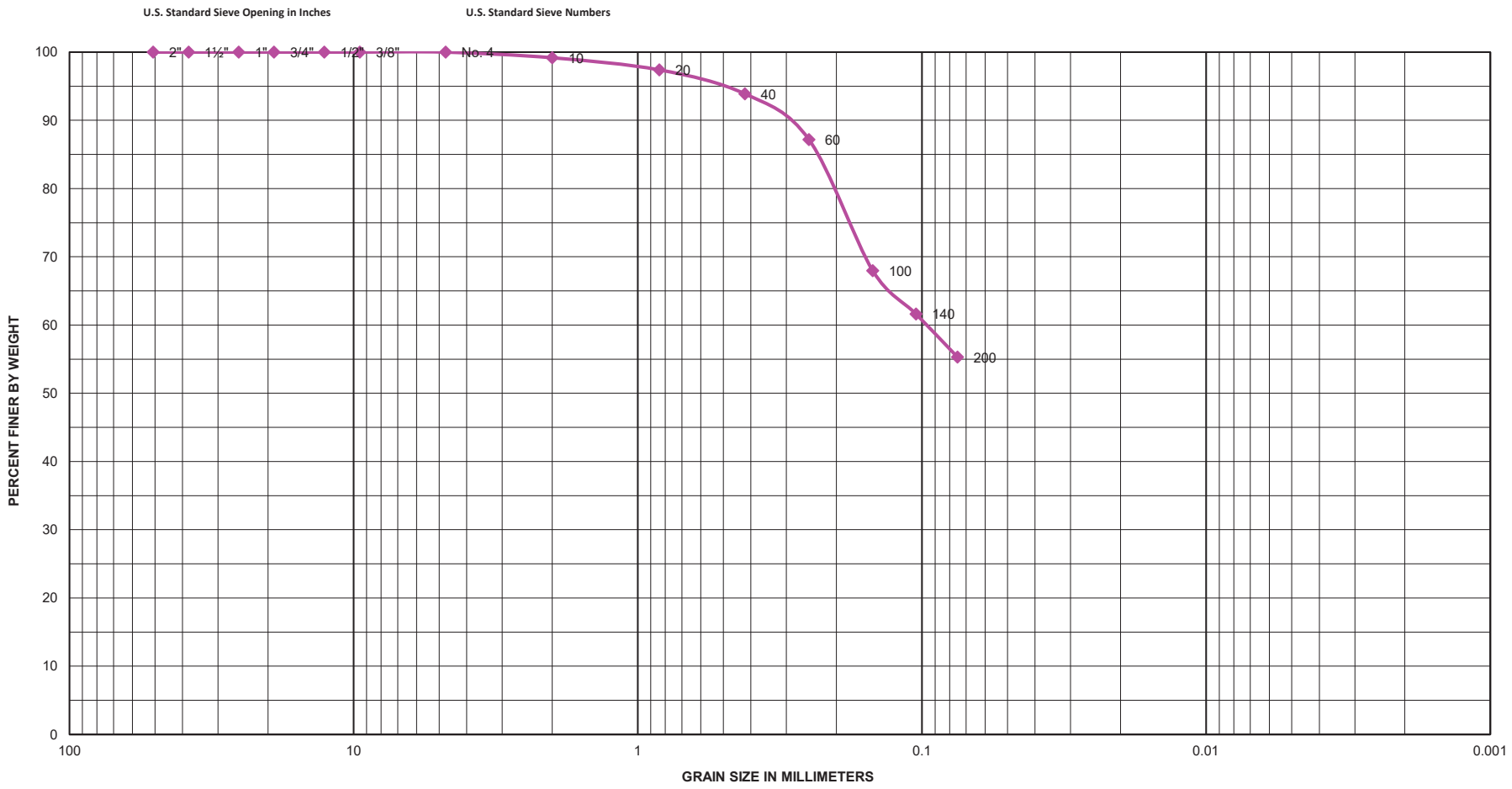
GRADATION CURVES

U.S. Army Corps of Engineers, Savannah District

Materials Testing Regional Technical Center of Expertise

Work Order No. 44307J

Requisition No. W26GLG33625848



Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI
S-1A	0.0 - 0.5	Gray & Yellowish Brown, Sandy Inorganic Silt (ML).	24.96	47	28	19

GRADATION CURVES

Project	FEDMMA Testing
Location	Fort Eustis, Virginia
Contract No.	
Lab No.	E4/19248A
Boring No.	DH-1139-07
Date	15-Jul-24

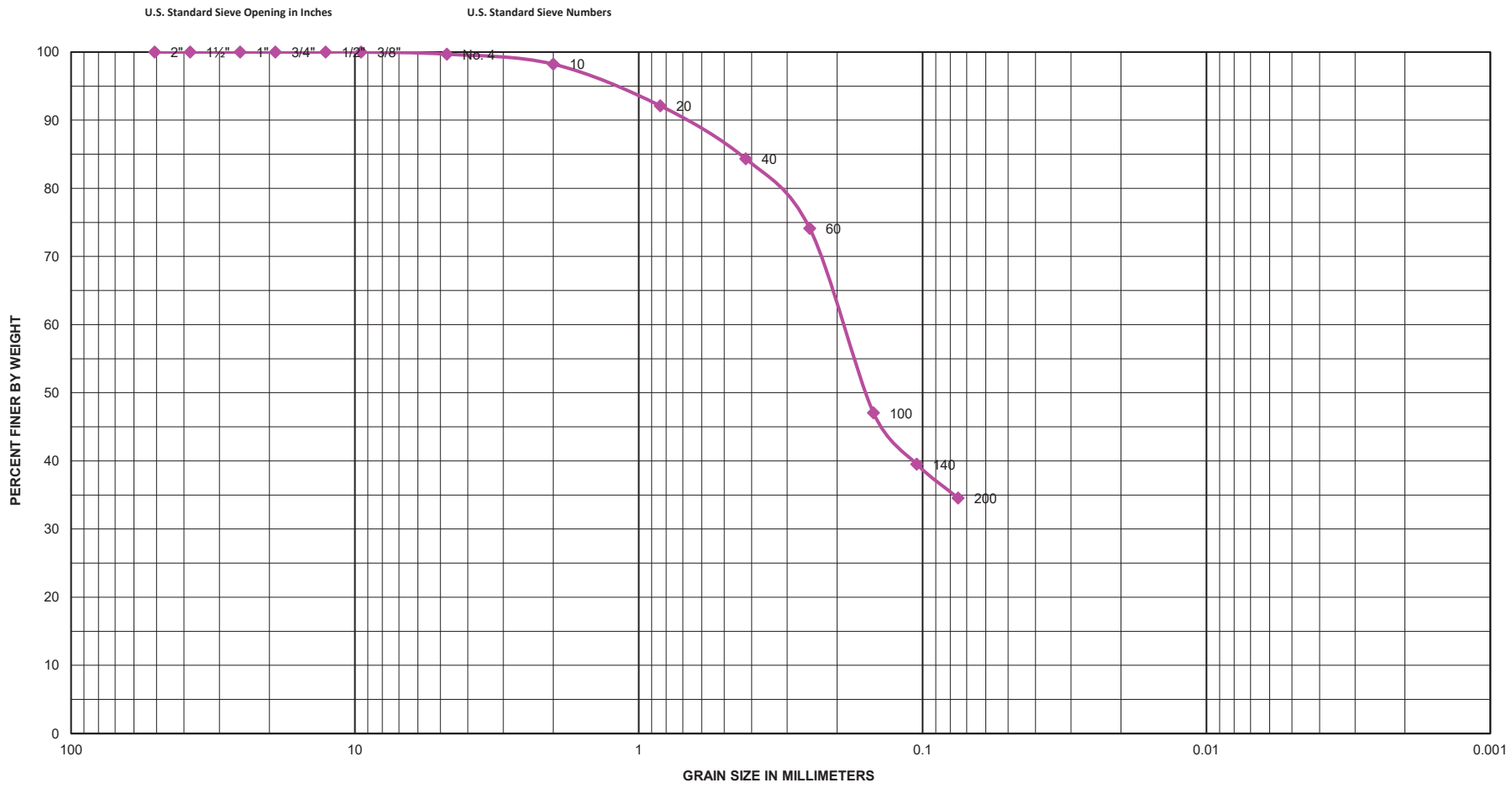
Tests Conducted in General Accordance with ASTM's D422, D4318, D2216, D854, & D2487.

U.S. Army Corps of Engineers, Savannah District

Materials Testing Regional Technical Center of Expertise

Work Order No. 44307J

Requisition No. W26GLG33625848



Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI
S-1B	0.5 - 1.5	Yellowish Brown & Dark Yellowish Brown, (Visual) Silty Sand (SM).	20.4			

GRADATION CURVES

Project FEDMMA Testing

Location Fort Eustis, Virginia

Contract No.

Lab No. E4/19248B

Boring No. DH-1139-07

Date 15-Jul-24

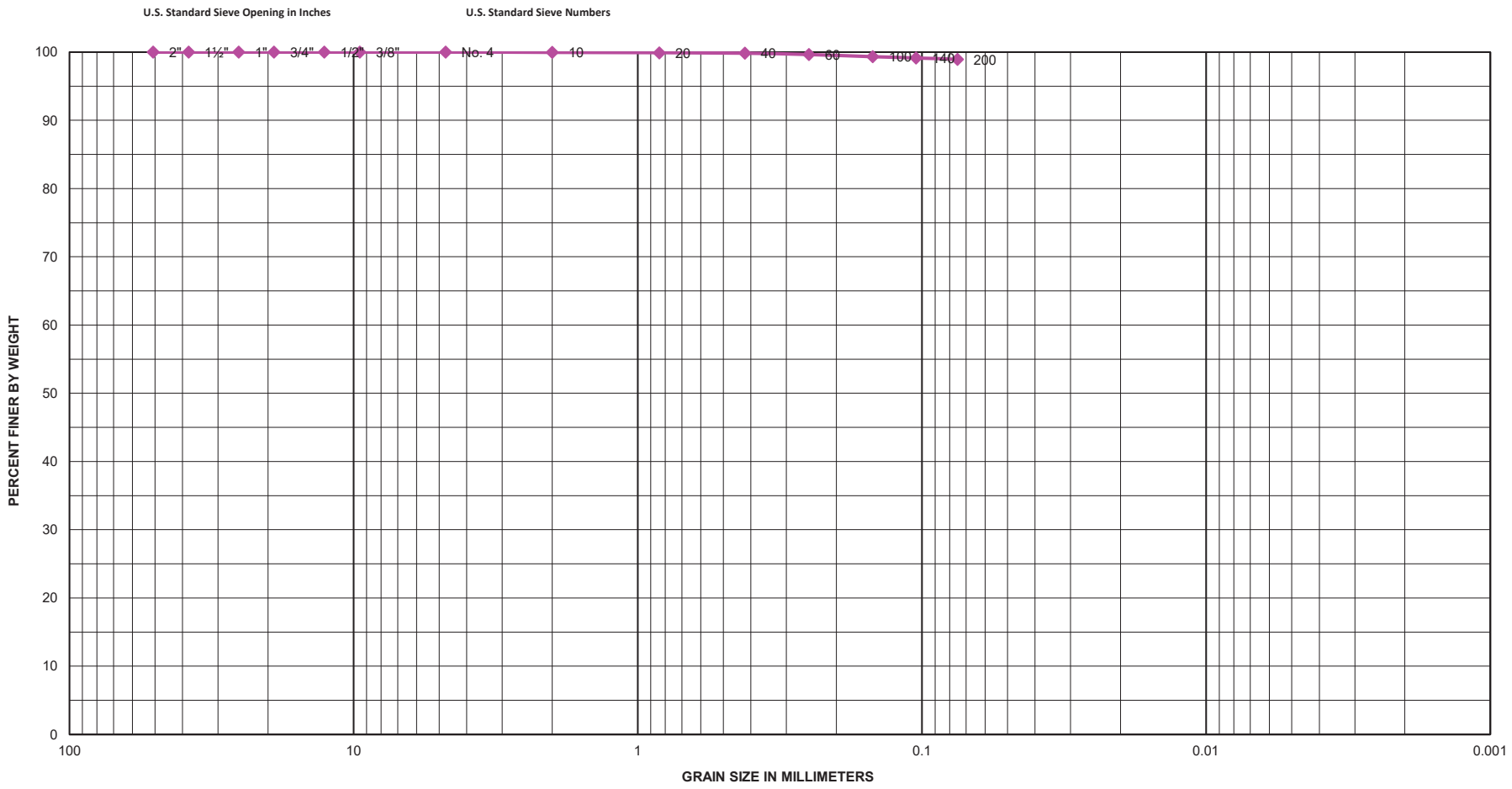
Tests Conducted in General Accordance with ASTM's D422, D4318, D2216, D854, & D2487.

U.S. Army Corps of Engineers, Savannah District

Materials Testing Regional Technical Center of Expertise

Work Order No. 44307J

Requisition No. W26GLG33625848



Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI
S-6	23.5 - 25.0	Dark Gray & Yellowish Brown, Inorganic Silt High LL (MH), with a trace of sand.	80.93	112	48	64

Project FEDMMA Testing

Location Fort Eustis, Virginia

Contract No.

Lab No. E4/19253

Boring No. DH-1139-07

Date 15-Jul-24

Tests Conducted in General Accordance with ASTM's D422, D4318, D2216, D854, & D2487.

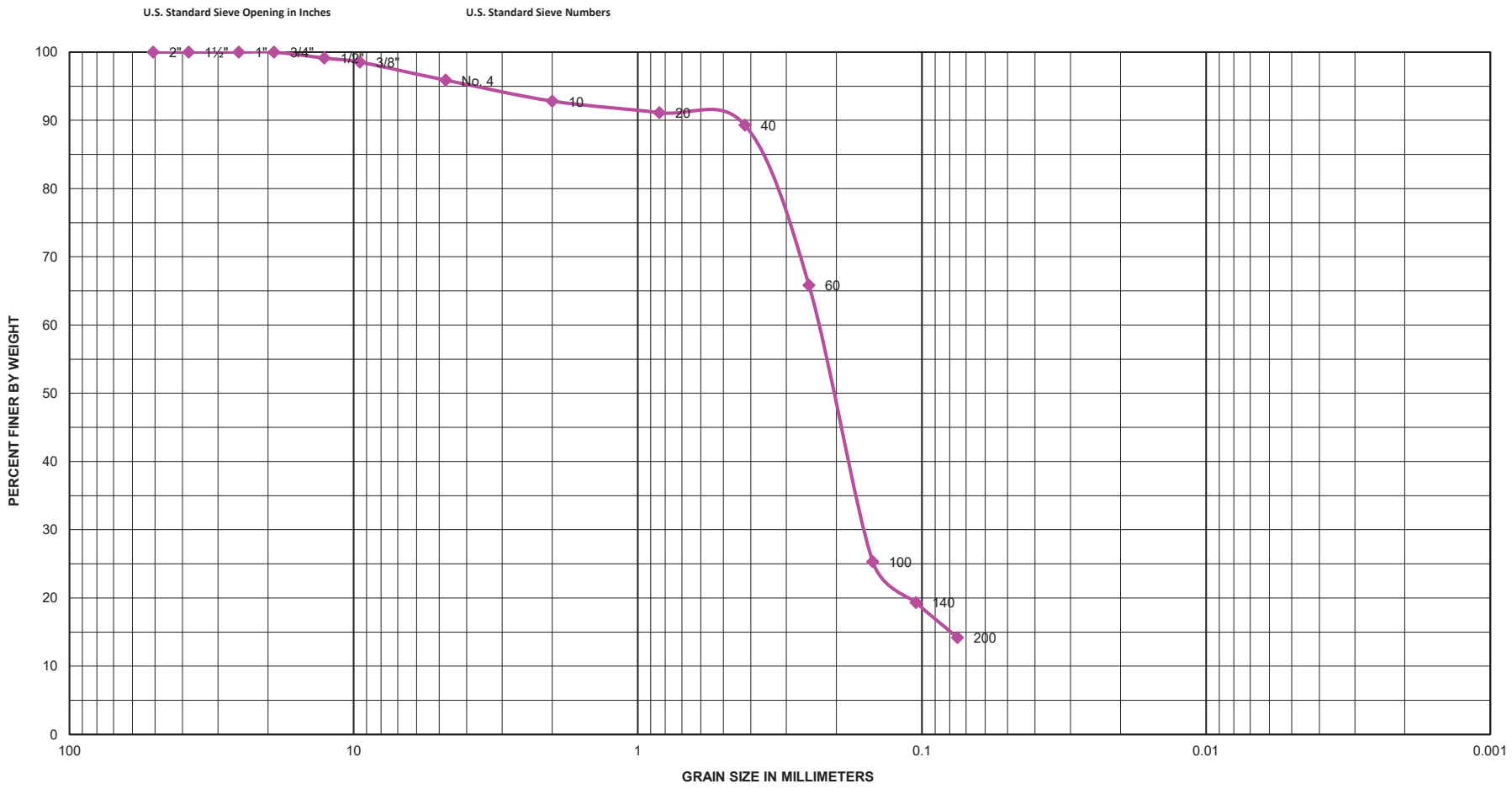
GRADATION CURVES

U.S. Army Corps of Engineers, Savannah District

Materials Testing Regional Technical Center of Expertise

Work Order No. 44307J

Requisition No. W26GLG33625848



Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI
S-12	53.5 - 55.0	Gray, White & Yellowish Brown, Clayey Silty Sand (SC-SM).	24.34	23	18	5

Project FEDMMA Testing

Location Fort Eustis, Virginia

Contract No.

Lab No. E4/19259

Boring No. DH-1139-07

Date 15-Jul-24

Tests Conducted in General Accordance with ASTM's D422, D4318, D2216, D854, & D2487.

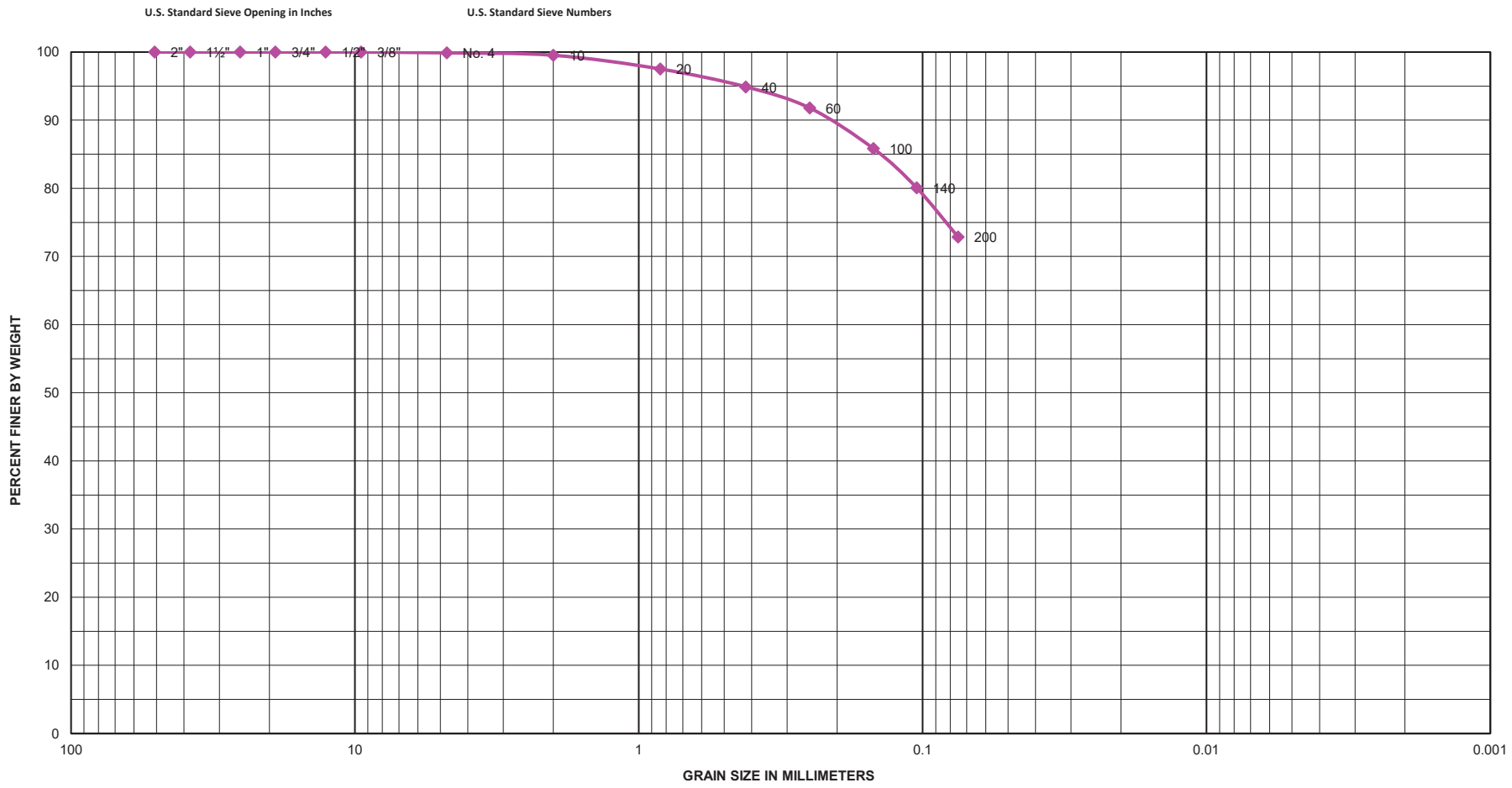
GRADATION CURVES

U.S. Army Corps of Engineers, Savannah District

Materials Testing Regional Technical Center of Expertise

Work Order No. 44307J

Requisition No. W26GLG33625848



Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI
S-3	8.5 - 10.0	Gray, Yellowish Brown & Yellowish Red, Inorganic Silt High LL (MH), with some sand.	46.32	71	35	36

Project FEDMMA Testing

Location Fort Eustis, Virginia

Contract No.

Lab No. E4/19267

Boring No. DH-1139-08

GRADATION CURVES

Date 15-Jul-24

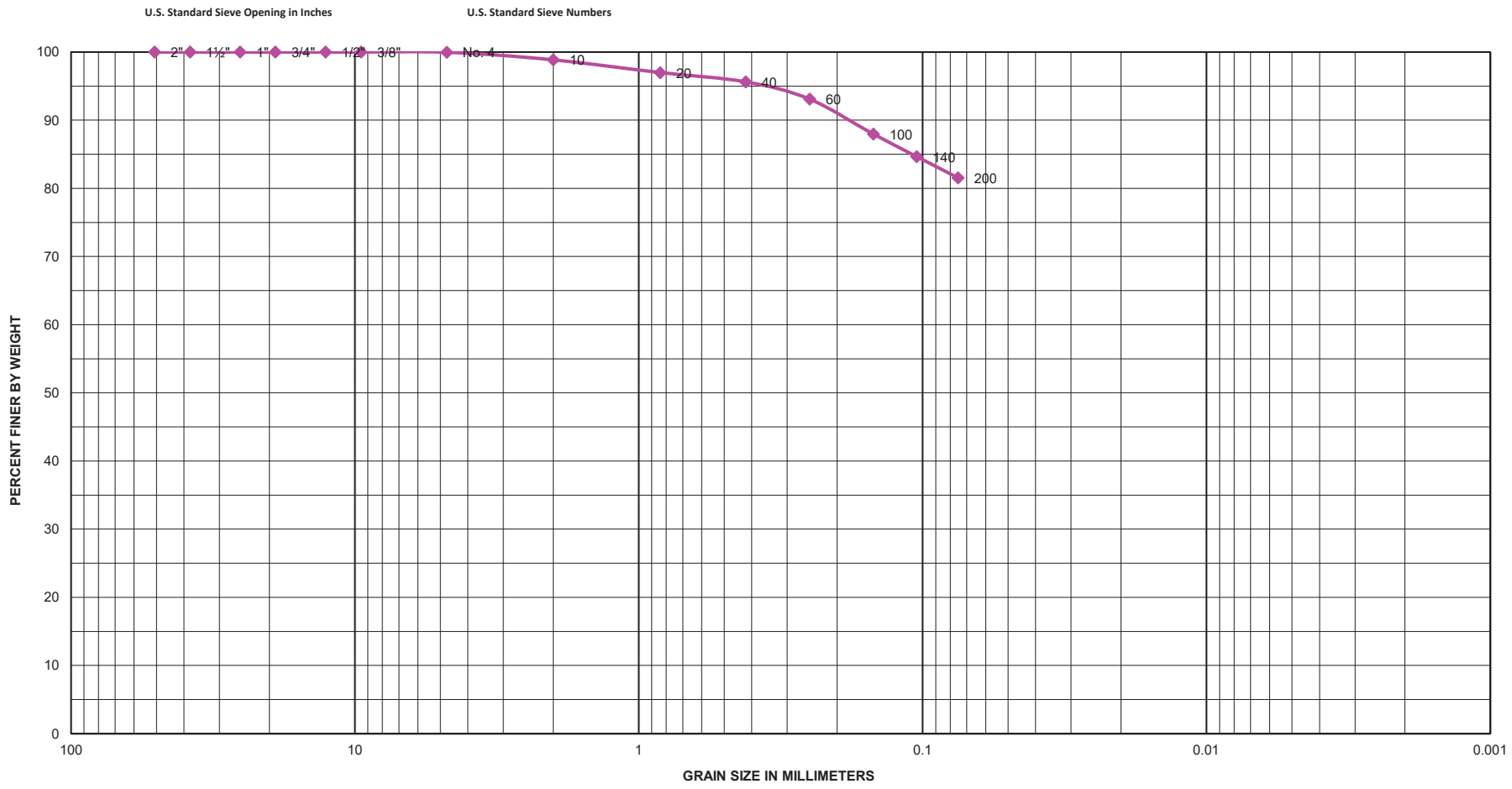
Tests Conducted in General Accordance with ASTM's D422, D4318, D2216, D854, & D2487.

U.S. Army Corps of Engineers, Savannah District

Materials Testing Regional Technical Center of Expertise

Work Order No. 44307J

Requisition No. W26GLG33625848



Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI
S-6	23.5 - 25.0	Gray, Yellowish Brown & Very Pale Brown, Inorganic Silt High LL (MH), with a little sand.	45.18	86	40	46

GRADATION CURVES

Project FEDMMA Testing

Location Fort Eustis, Virginia

Contract No.

Lab No. E4/19270

Boring No. DH-1139-08

Date 15-Jul-24

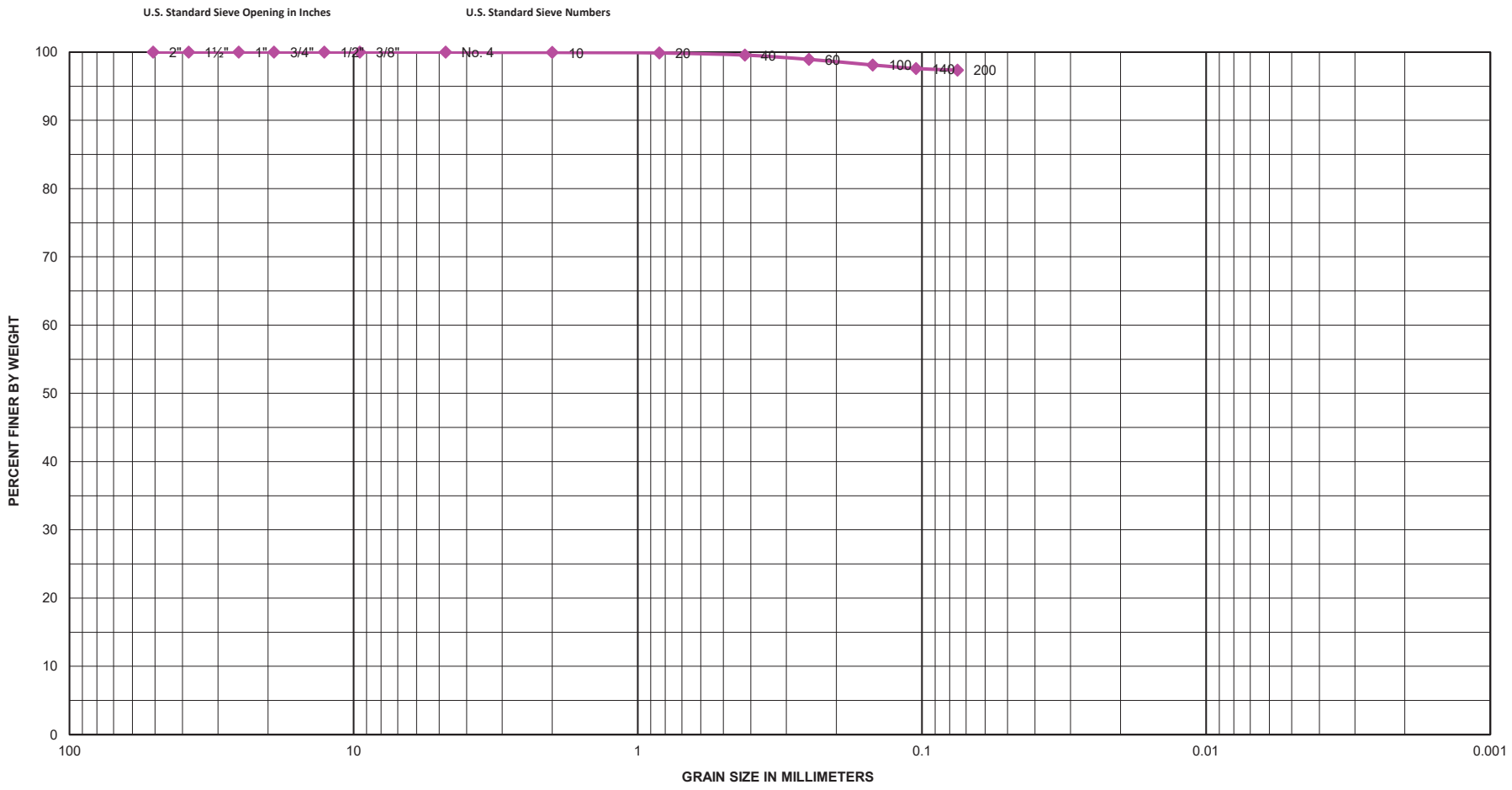
Tests Conducted in General Accordance with ASTM's D422, D4318, D2216, D854, & D2487.

U.S. Army Corps of Engineers, Savannah District

Materials Testing Regional Technical Center of Expertise

Work Order No. 44307J

Requisition No. W26GLG33625848



Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI
S-11	48.5 - 50.0	Bluish Gray, Yellowish Brown & Yellowish Red, Inorganic Silt High LL (MH), with a trace of sand.	68.5	86	38	48

Project FEDMMA Testing

Location Fort Eustis, Virginia

Contract No.

Lab No. E4/19275

Boring No. DH-1139-08

Date 15-Jul-24

Tests Conducted in General Accordance with ASTM's D422, D4318, D2216, D854, & D2487.

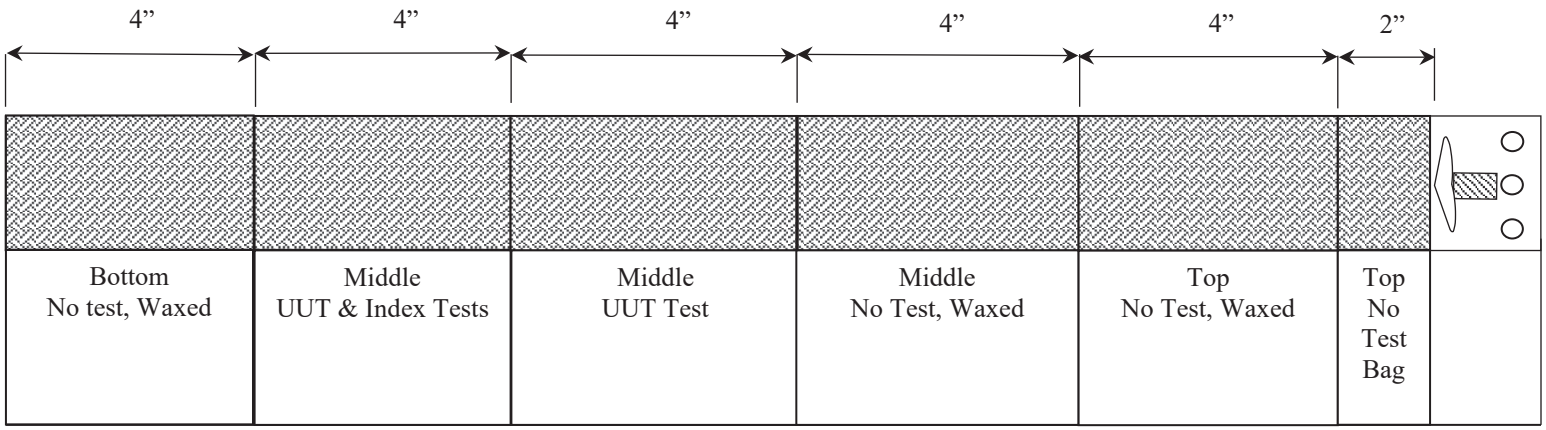
GRADATION CURVES

TUBE CLASSIFICATION

ASTM D2487

PROJECT: FEDMMA,
AREA: Norfolk District

DATE: 15 July 2024



Remarks: Dark Greenish Gray & Red, Inorganic Silt High LL (MH), with a trace of sand.

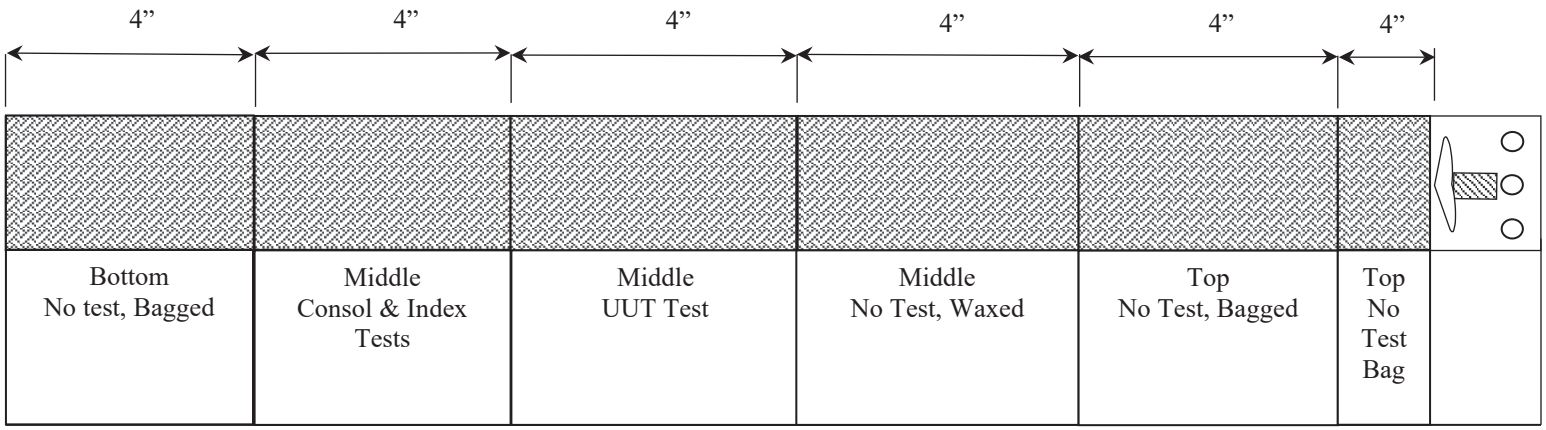
Hole #/Sample #	Laboratory #	Depth (ft)
DH-1139-01, SH-1	E4/19139	60.0-62.0

TUBE CLASSIFICATION

ASTM D2487

PROJECT: FEDMMA,
AREA: Norfolk District

DATE: 15 July 2024



Remarks: Brown & Red, Inorganic Silt High LL (MH), with a trace of sand.

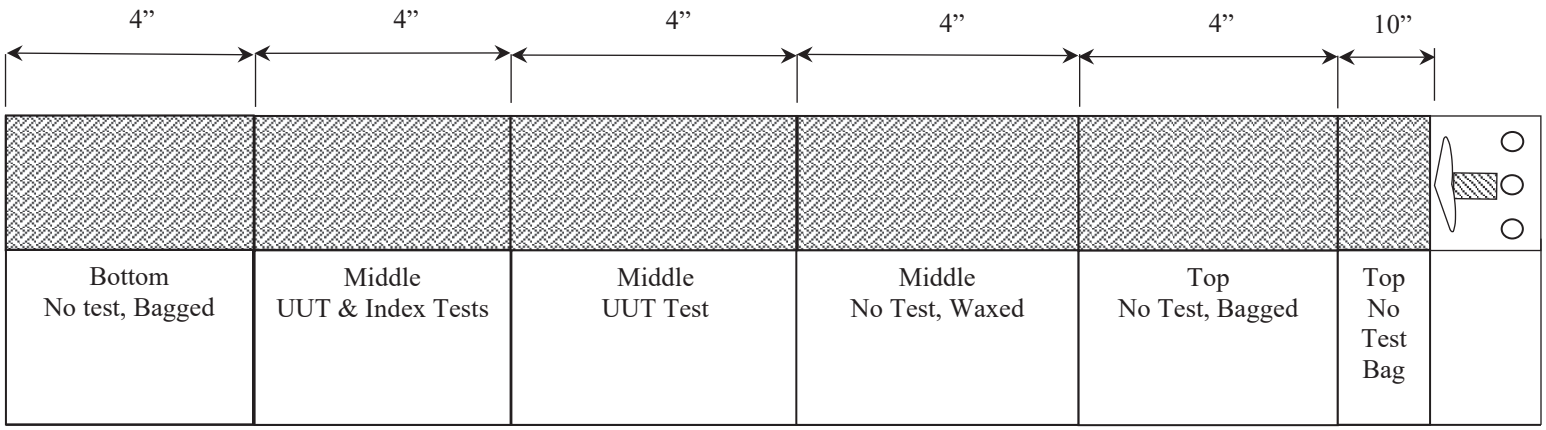
Hole #/Sample #	Laboratory #	Depth (ft)
DH-1139-02, SH-1	E4/19140	25.0-27.0

TUBE CLASSIFICATION

ASTM D2487

PROJECT: FEDMMA,
AREA: Norfolk District

DATE: 15 July 2024



Remarks: Dark Gray, Inorganic Silt High LL (MH), with a trace of sand, with Red, Silty Sand (SM) at top.

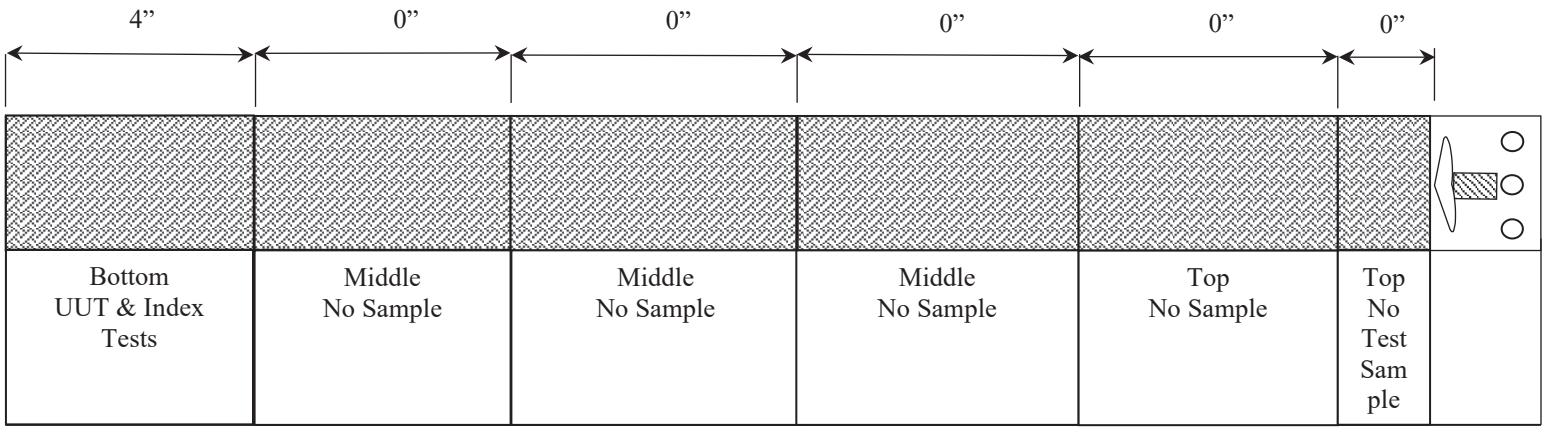
Hole #/Sample #	Laboratory #	Depth (ft)
DH-1139-02, SH-2	E4/19141	65.0-67.0

TUBE CLASSIFICATION

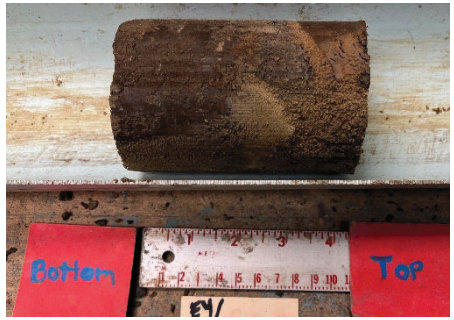
ASTM D2487

PROJECT: FEDMMA,
AREA: Norfolk District

DATE: 15 July 2024



Remarks: Brown & Dark Gray, Sandy Inorganic Silt (ML).



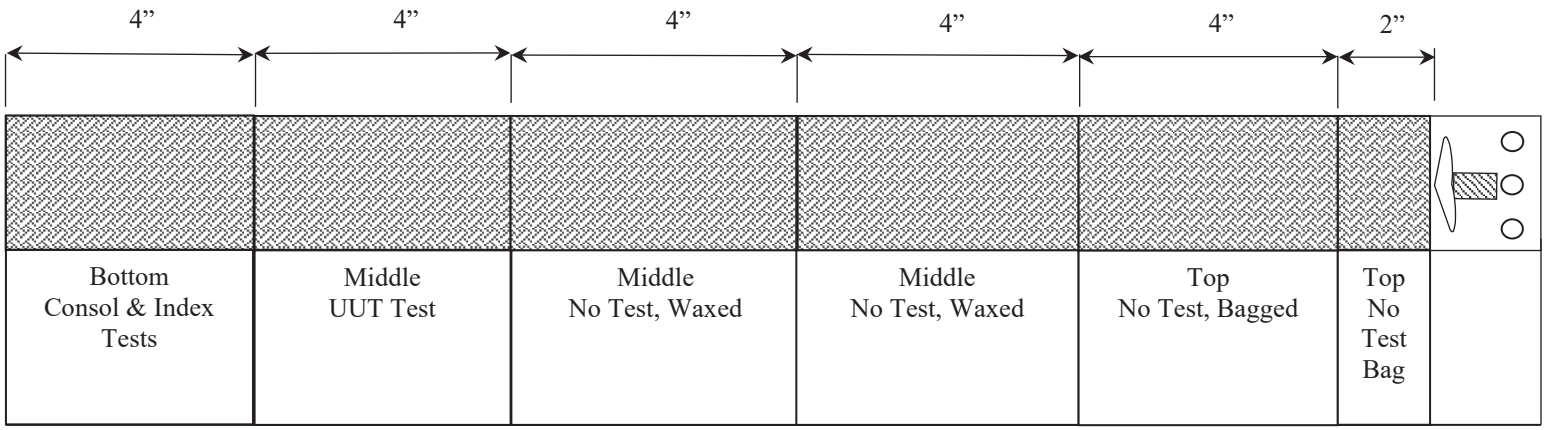
Hole #/Sample #	Laboratory #	Depth (ft)
DH-1139-03, SH-1	E4/19142	55.0-57.0

TUBE CLASSIFICATION

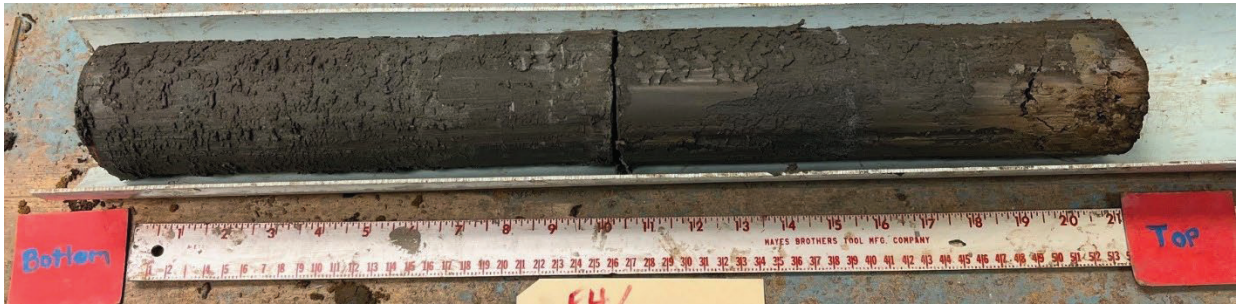
ASTM D2487

PROJECT: FEDMMA,
AREA: Norfolk District

DATE: 15 July 2024



Remarks: Dark Gray, Gray & Red, Fat Clay (CH), with a little sand.



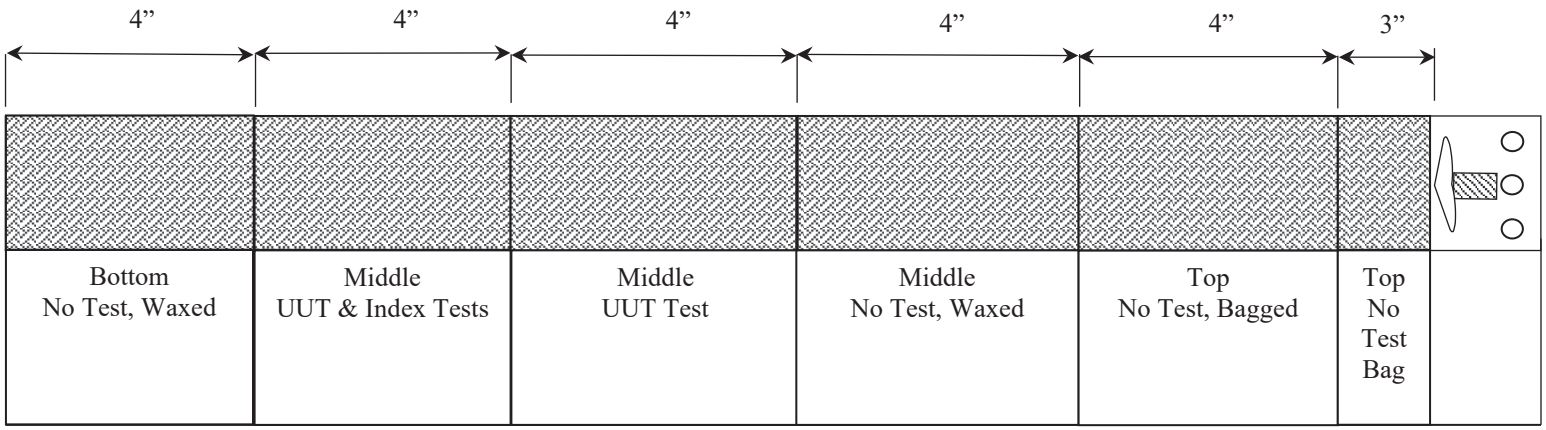
Hole #/Sample #	Laboratory #	Depth (ft)
DH-1139-05, SH-1	E4/19143	65.0-67.0

TUBE CLASSIFICATION

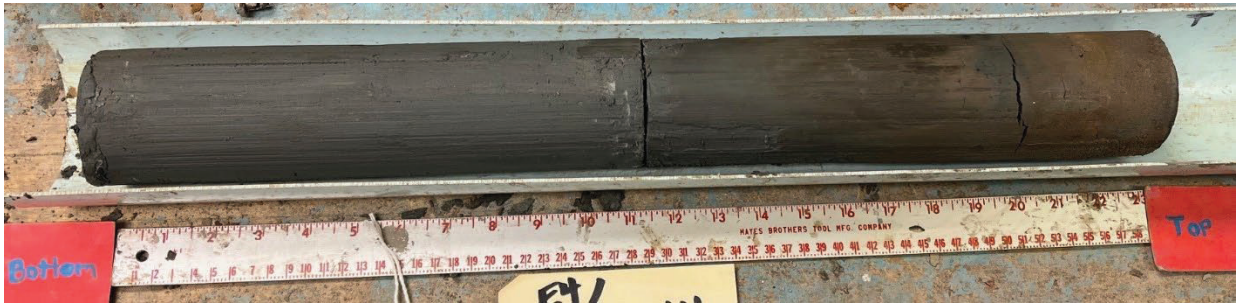
ASTM D2487

PROJECT: FEDMMA,
AREA: Norfolk District

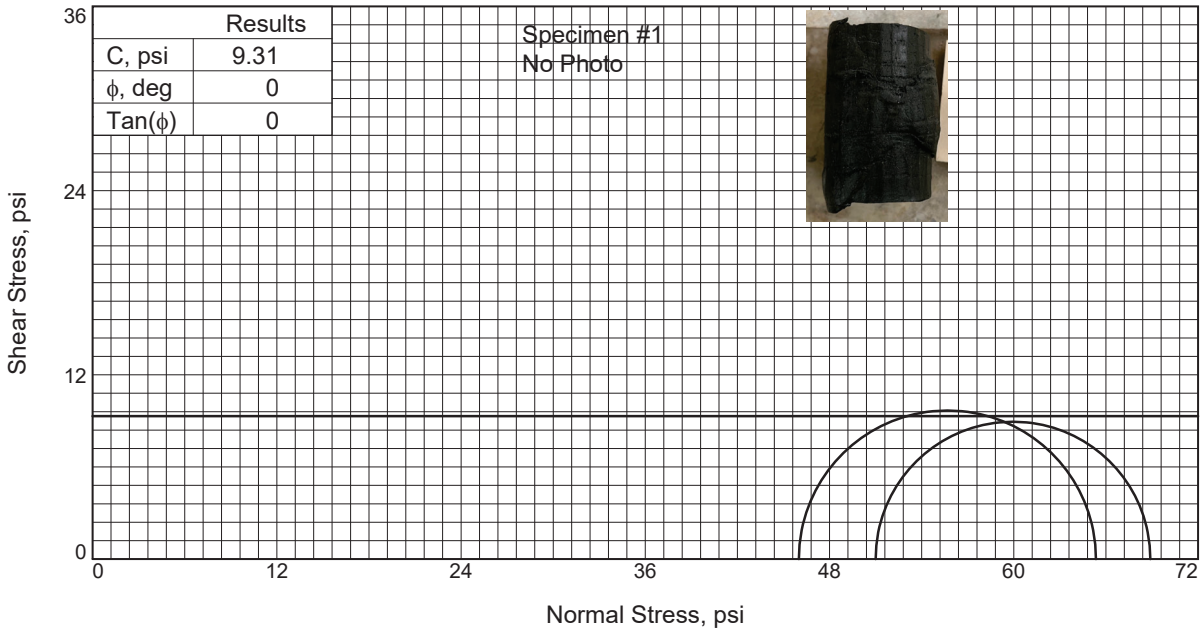
DATE: 15 July 2024

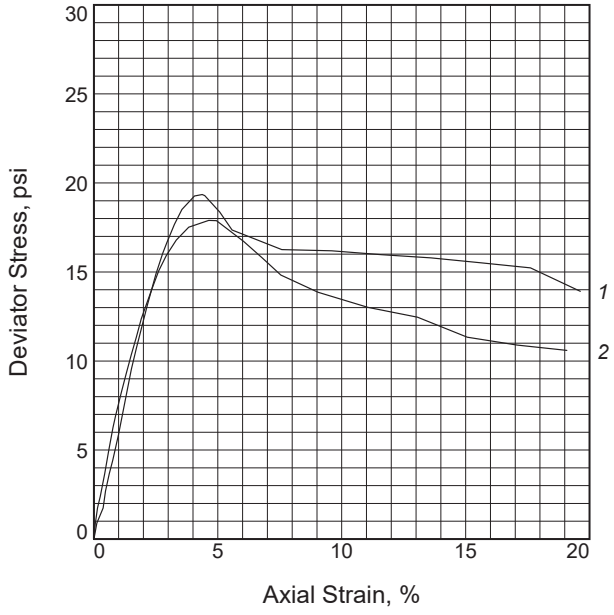


Remarks: Dark Gray, Gray & Red, Inorganic Silt High LL (MH), with a trace of sand.



Hole #/Sample #	Laboratory #	Depth (ft)
DH-1139-06, SH-1	E4/19144	65.0-67.0





Sample No.		1	2
Initial	Water Content, %	63.9	62.2
	Dry Density, pcf	60.5	61.3
	Saturation, %	97.5	96.9
	Void Ratio	1.7361	1.6998
	Diameter, in.	1.37	1.38
	Height, in.	2.80	2.80
At Test	Water Content, %	68.4	67.6
	Dry Density, pcf	60.5	61.3
	Saturation, %	104.3	105.4
	Void Ratio	1.7361	1.6998
	Diameter, in.	1.37	1.38
	Height, in.	2.80	2.80
Strain rate, in./min.		0.028	0.028
Back Pressure, psi		0.0	0.0
Cell Pressure, psi		46.0	51.0
Fail. Stress, psi		19.4	17.9
Ult. Stress, psi		15.5	11.3
σ_1 Failure, psi		65.4	68.9
σ_3 Failure, psi		46.0	51.0

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Dark Greenish Gray & Red, Inorganic Silt High LL (MH), with a trace of sand.

LL= 77 **PL=** 36 **PI=** 41

Assumed Specific Gravity= 2.65

Remarks: Other tests are done in general accordance with ASTM's: D422, D2216, D2487, D2950 & D4318.

Figure _____

Client: Norfolk District

Project: FEDMMA Project
Fort Eustis, VA

Location: DH-1139-01, SH-1, 60.0 - 62.0', E4/19139

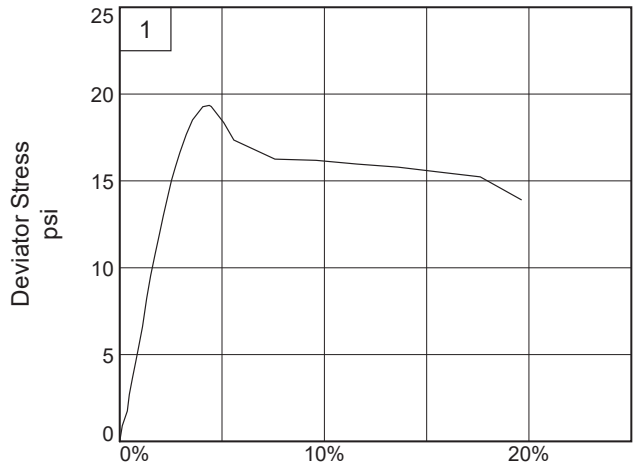
Sample Number: SH-1 **Depth:** 60.0 - 62.0'

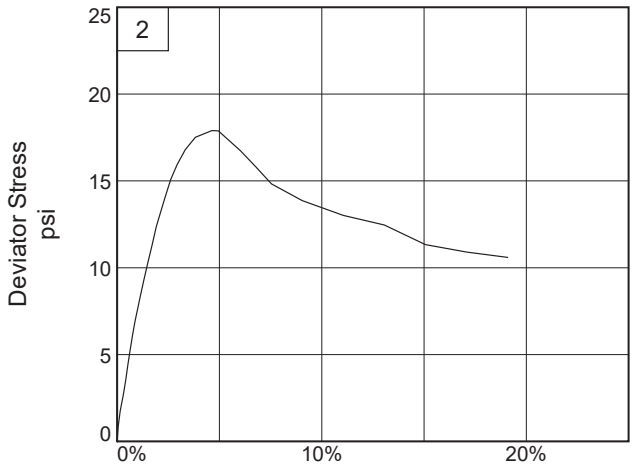
Proj. No.: W26GLG33625848, 44307J **Date Sampled:**

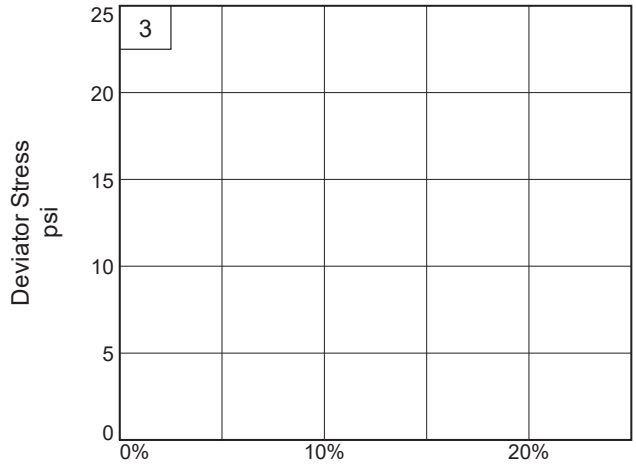
TRIAXIAL SHEAR TEST REPORT

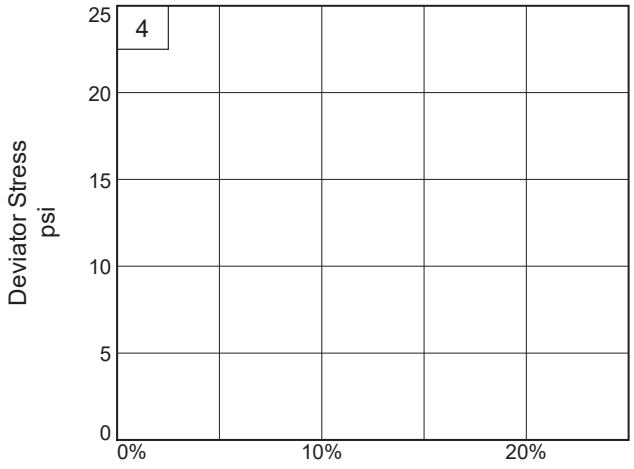
U.S. Army Corp of Engineers

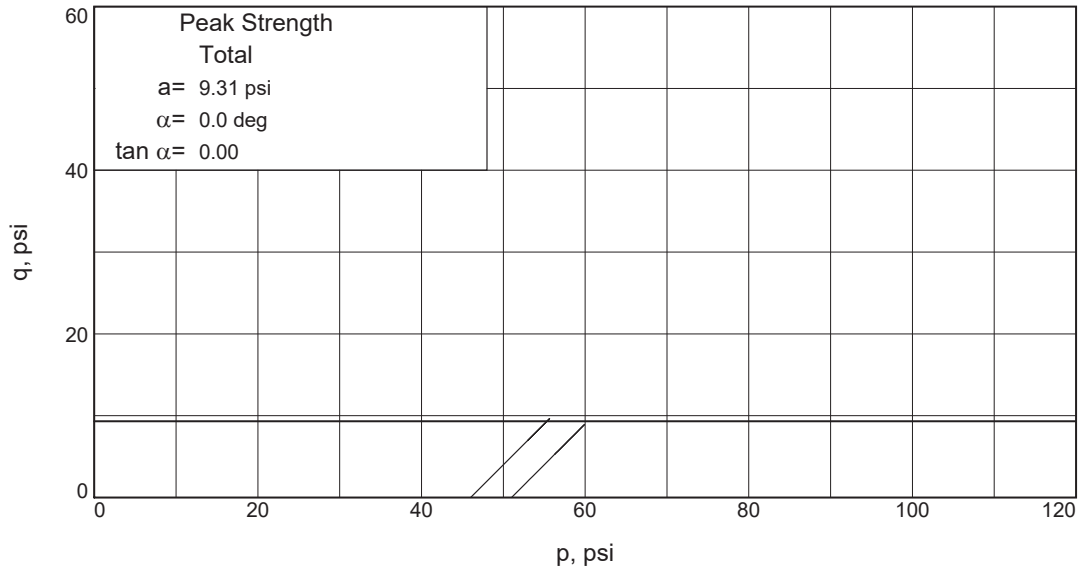
Tested By: JK **Checked By:** MW







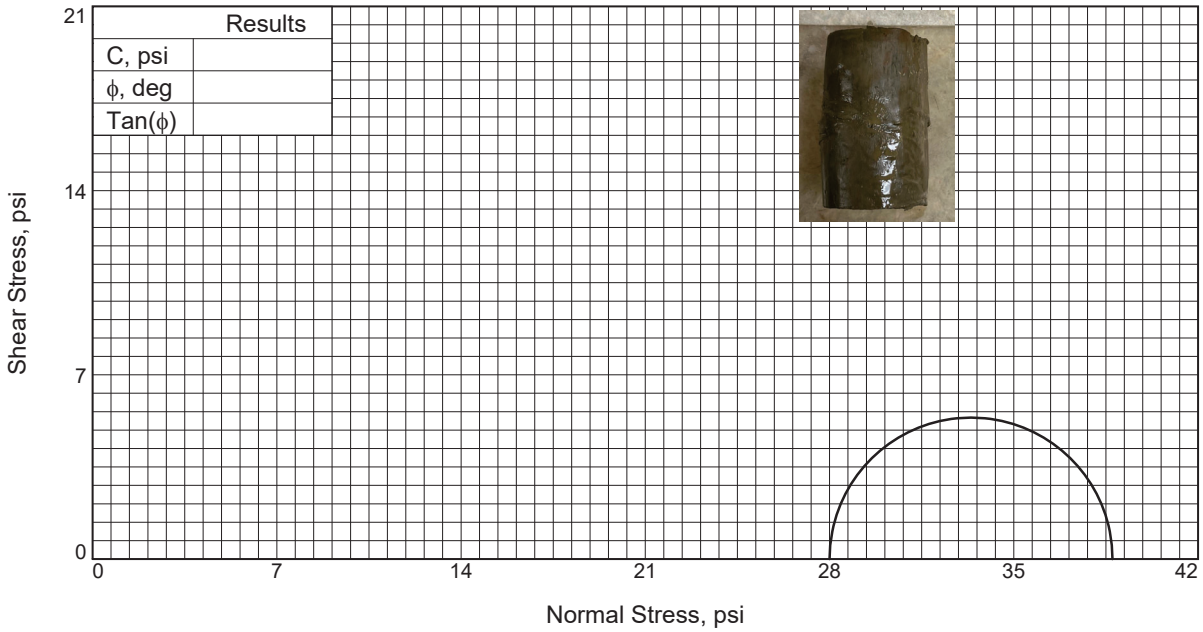


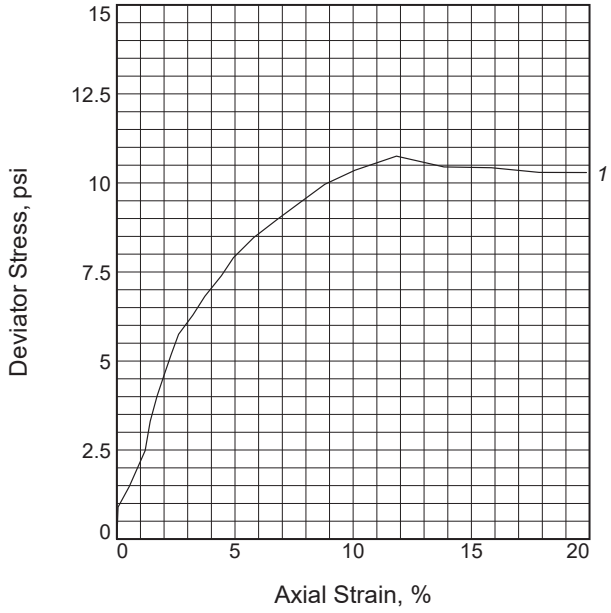


Client: Norfolk District
Project: FEDMMA Project
Location: DH-1139-01, SH-1, 60.0 - 62.0', E4/19139 **Depth:** 60.0 - 62.0' **Sample Number:** SH-1
Project No.: W26GLG33625848, 44307J **Figure** _____

U.S. Army Corp of Engineers

Tested By: JK **Checked By:** MW





Sample No.		1
Initial	Water Content, %	55.5
	Dry Density, pcf	67.7
	Saturation, %	99.8
	Void Ratio	1.5169
	Diameter, in.	1.38
	Height, in.	2.80
At Test	Water Content, %	58.1
	Dry Density, pcf	67.7
	Saturation, %	104.6
	Void Ratio	1.5169
	Diameter, in.	1.38
	Height, in.	2.80
Strain rate, in./min.		0.028
Back Pressure, psi		0.0
Cell Pressure, psi		28.0
Fail. Stress, psi		10.8
Ult. Stress, psi		10.4
σ_1 Failure, psi		38.8
σ_3 Failure, psi		28.0

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Brown & Red, Inorganic Silt High LL (MH), with a trace of sand.

LL= 92 **PL=** 44 **PI=** 48

Assumed Specific Gravity= 2.73

Remarks: Other tests are done in general accordance with ASTM's: D422, D2216, D2487, D2950 & D4318.

Figure _____

Client: Norfolk District

Project: FEDMMA Project
Fort Eustis, VA

Location: DH-1139-02, SH-1, 25.0 - 27.0', E4/19140

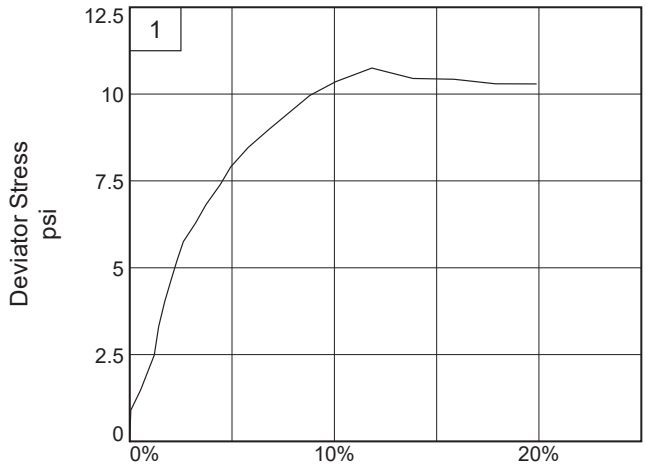
Sample Number: SH-1 **Depth:** 25.0 - 27.0'

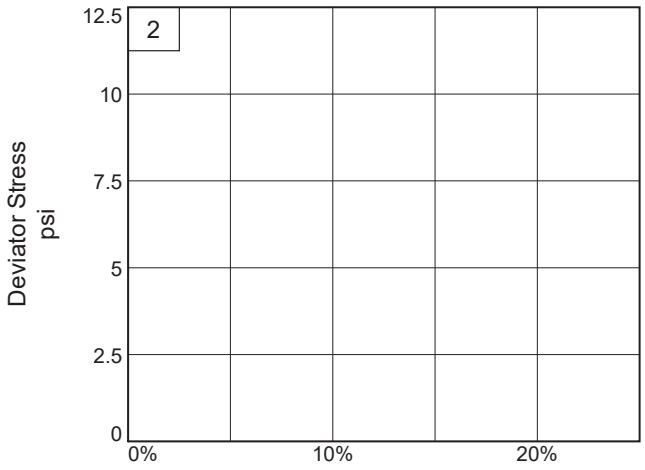
Proj. No.: W26GLG33625848, 44307J **Date Sampled:**

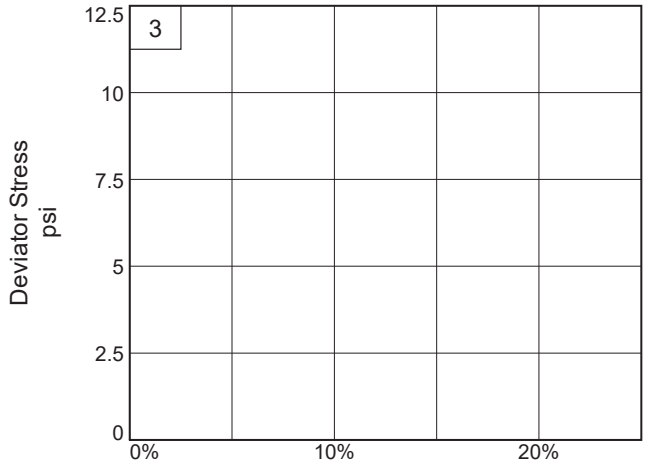
TRIAXIAL SHEAR TEST REPORT

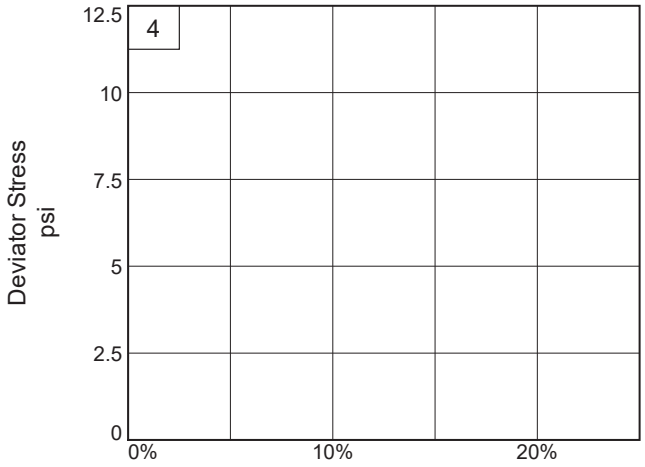
U.S. Army Corp of Engineers

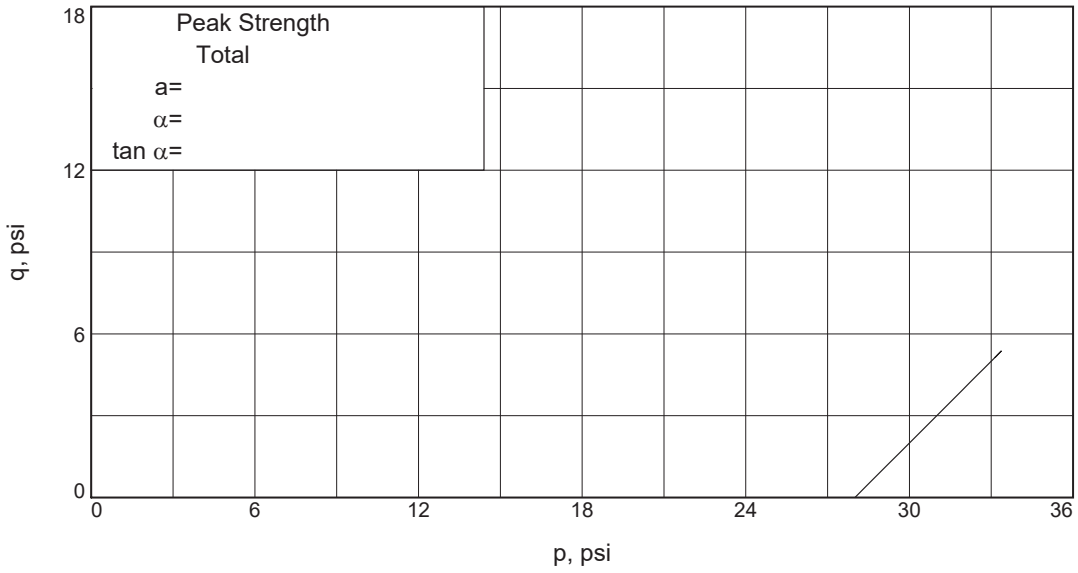
Tested By: JK **Checked By:** MW







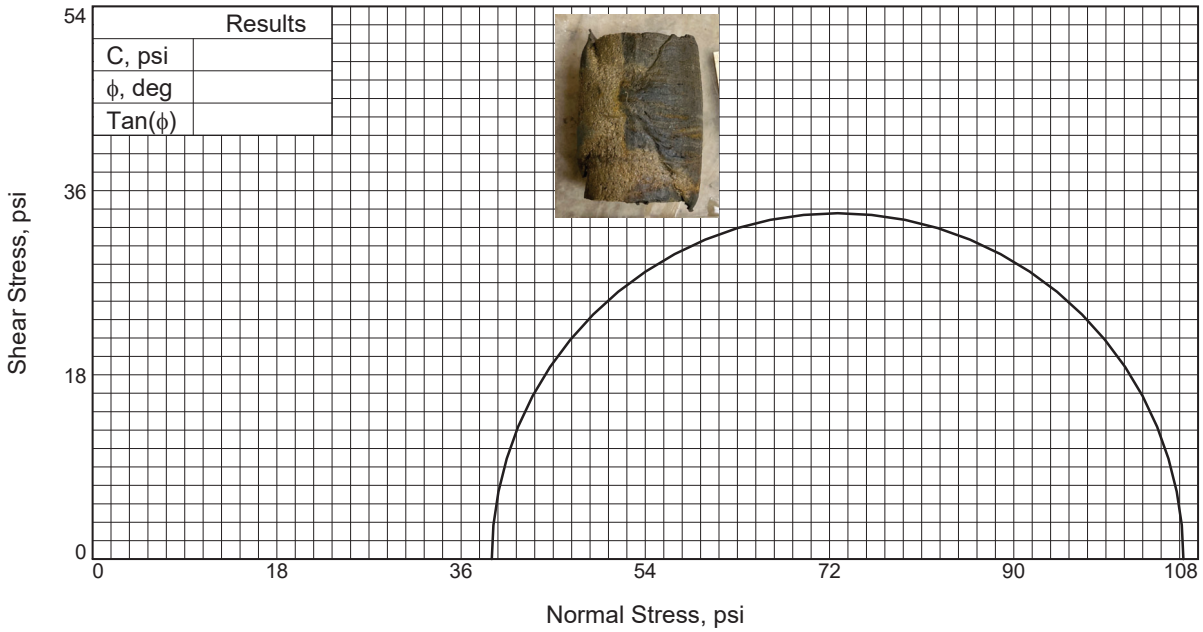


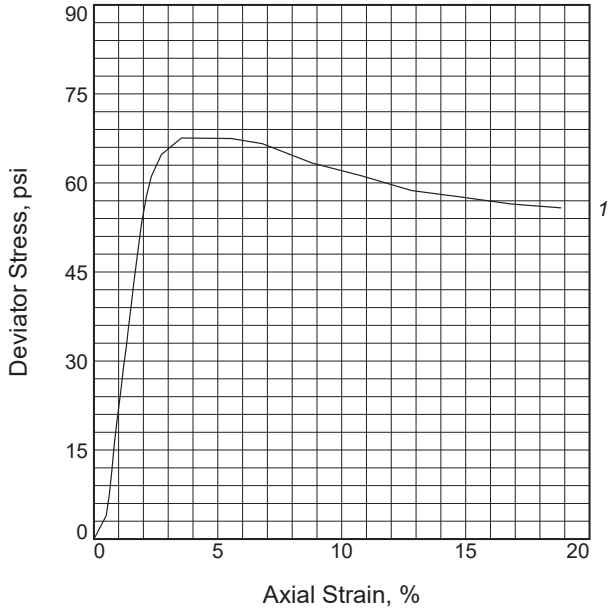


Client: Norfolk District
Project: FEDMMA Project
Location: DH-1139-02, SH-1, 25.0 - 27.0', E4/19140 **Depth:** 25.0 - 27.0' **Sample Number:** SH-1
Project No.: W26GLG33625848, 44307J **Figure** _____

U.S. Army Corp of Engineers

Tested By: JK **Checked By:** MW





Sample No.		1
Initial	Water Content, %	22.5
	Dry Density, pcf	98.6
	Saturation, %	88.0
	Void Ratio	0.6778
	Diameter, in.	1.37
	Height, in.	2.80
At Test	Water Content, %	23.3
	Dry Density, pcf	98.6
	Saturation, %	91.1
	Void Ratio	0.6778
	Diameter, in.	1.37
	Height, in.	2.80
Strain rate, in./min.		0.028
Back Pressure, psi		0
Cell Pressure, psi		39
Fail. Stress, psi		68
Ult. Stress, psi		58
σ_1 Failure, psi		107
σ_3 Failure, psi		39

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Brown & Dark Gray, Sandy Inorganic Silt (ML).

LL= 43 **PL=** 31 **PI=** 12

Assumed Specific Gravity= 2.65

Remarks: Other tests are done in general accordance with ASTM's: D422, D2216, D2487, D2950 & D4318.

Figure _____

Client: Norfolk District

Project: FEDMMA Project
Fort Eustis, VA

Location: DH-1139-03, SH-1, 55.0 - 57.0', E4/19142

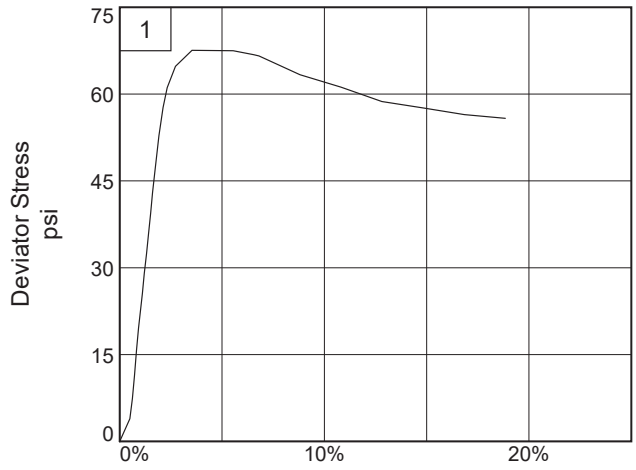
Sample Number: SH-1 **Depth:** 55.0 - 57.0'

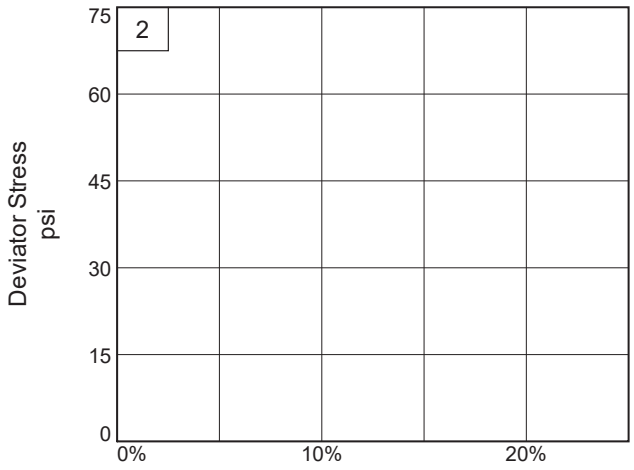
Proj. No.: W26GLG33625848, 44307J **Date Sampled:**

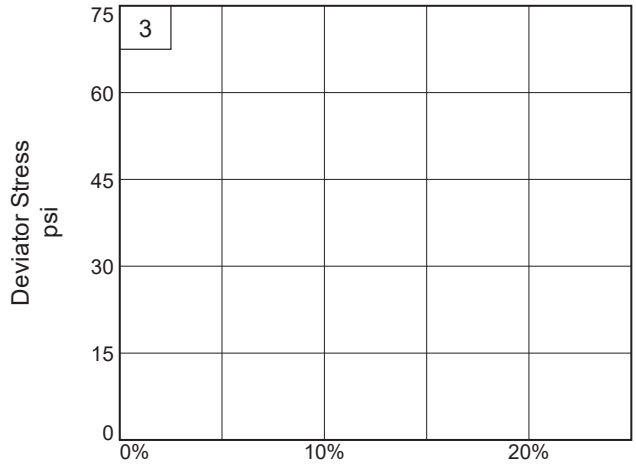
TRIAXIAL SHEAR TEST REPORT

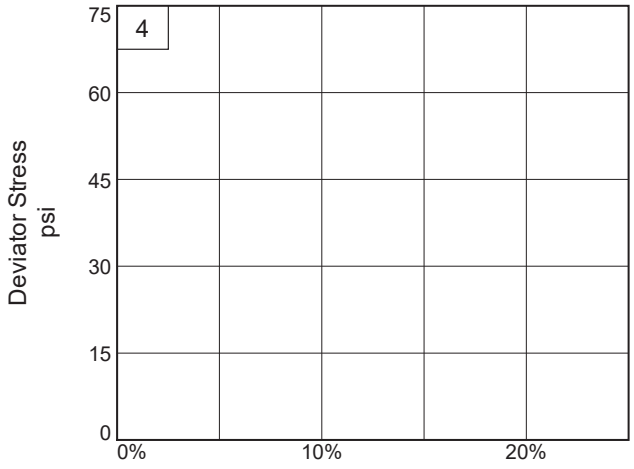
U.S. Army Corp of Engineers

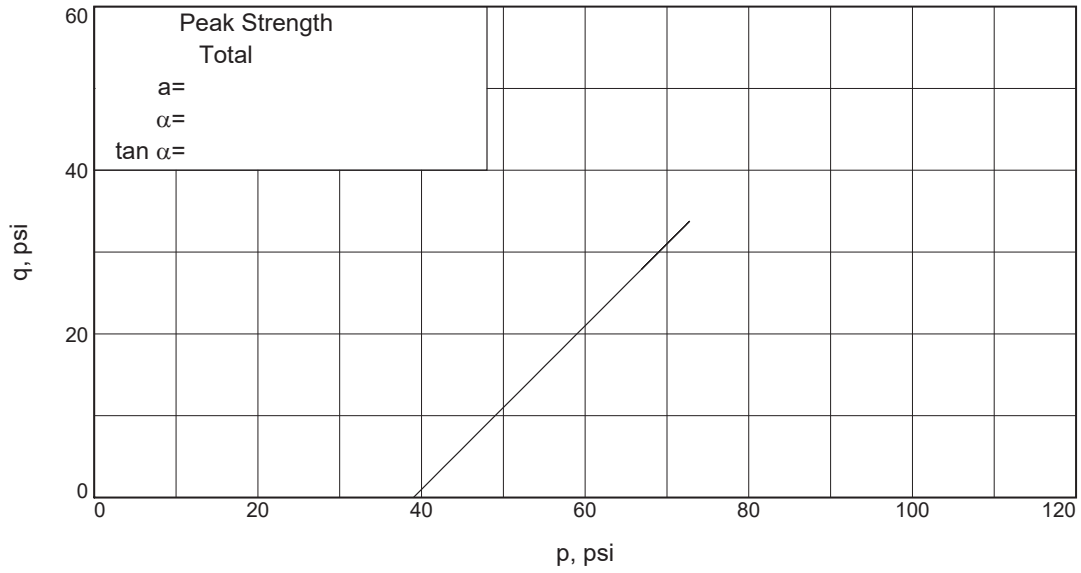
Tested By: JK **Checked By:** MW







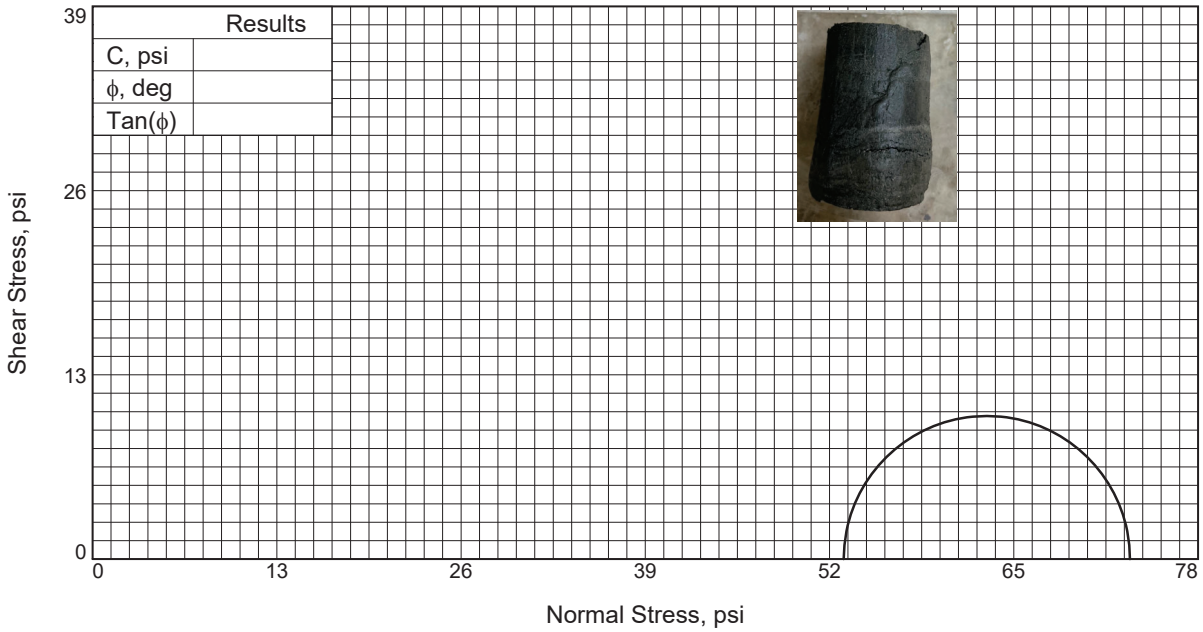


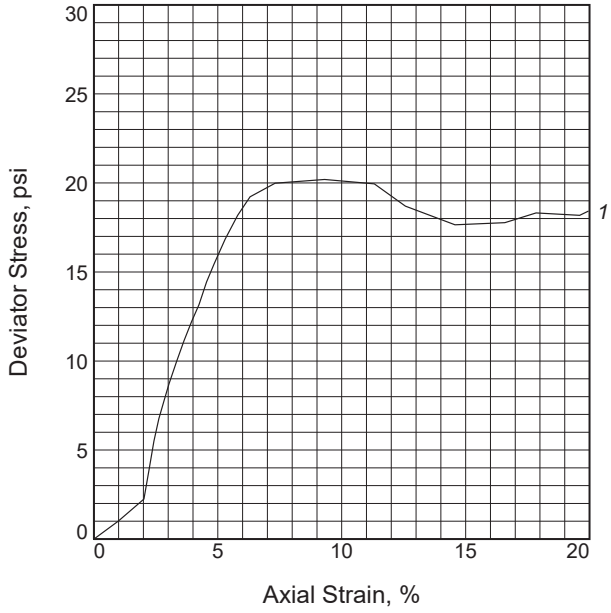


Client: Norfolk District
Project: FEDMMA Project
Location: DH-1139-03, SH-1, 55.0 - 57.0', E4/19142 **Depth:** 55.0 - 57.0' **Sample Number:** SH-1
Project No.: W26GLG33625848, 44307J **Figure** _____

U.S. Army Corp of Engineers

Tested By: JK **Checked By:** MW





Sample No.		1
Initial	Water Content, %	51.7
	Dry Density, pcf	68.2
	Saturation, %	96.1
	Void Ratio	1.4252
	Diameter, in.	1.37
	Height, in.	2.80
At Test	Water Content, %	55.6
	Dry Density, pcf	68.2
	Saturation, %	103.3
	Void Ratio	1.4252
	Diameter, in.	1.37
	Height, in.	2.80
Strain rate, in./min.		0.028
Back Pressure, psi		0.0
Cell Pressure, psi		53.0
Fail. Stress, psi		20.2
Ult. Stress, psi		17.7
σ_1 Failure, psi		73.2
σ_3 Failure, psi		53.0

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Fat Clay (CH), with a little sand.

LL= 56 **PL=** 28 **PI=** 28

Specific Gravity= 2.65

Remarks: Other tests are done in general accordance with ASTM's: D422, D2216, D2487, D2950 & D4318.

Figure _____

Client: Norfolk District

Project: FEDMMA Project
Fort Eustis, VA

Location: DH-1139-05, SH-1, 65.0 - 67.0', E4/19143

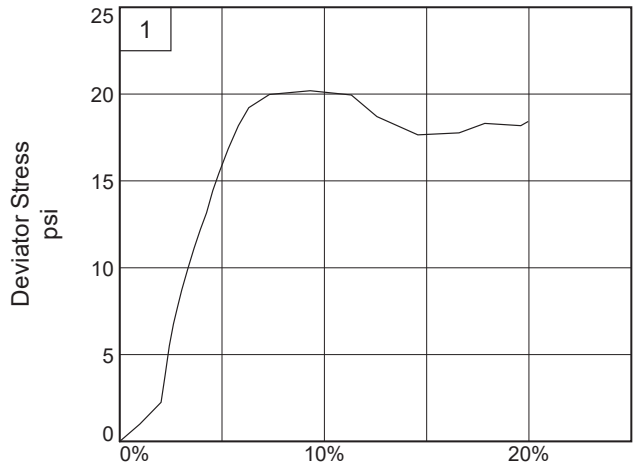
Sample Number: SH-1 **Depth:** 65.0 - 67.0'

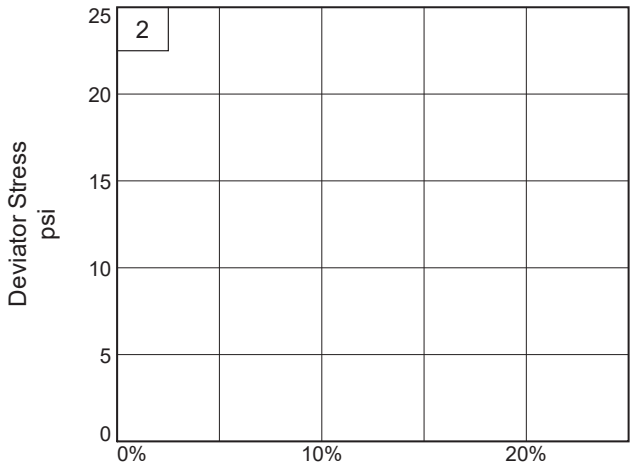
Proj. No.: W26GLG33625848, 44307J **Date Sampled:**

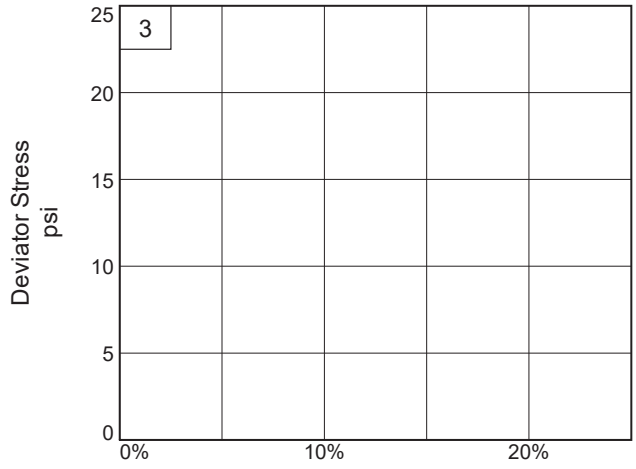
TRIAXIAL SHEAR TEST REPORT

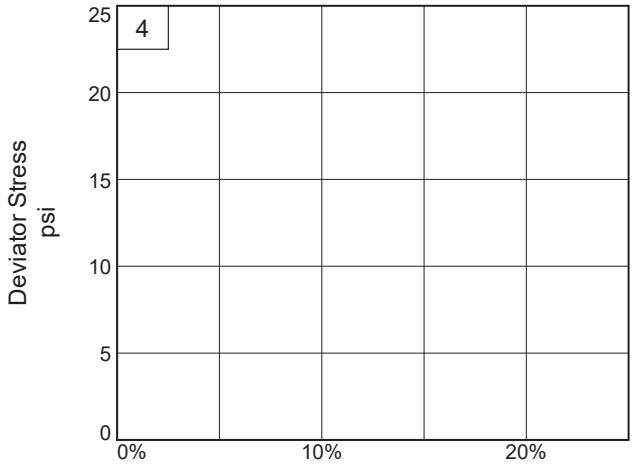
U.S. Army Corp of Engineers

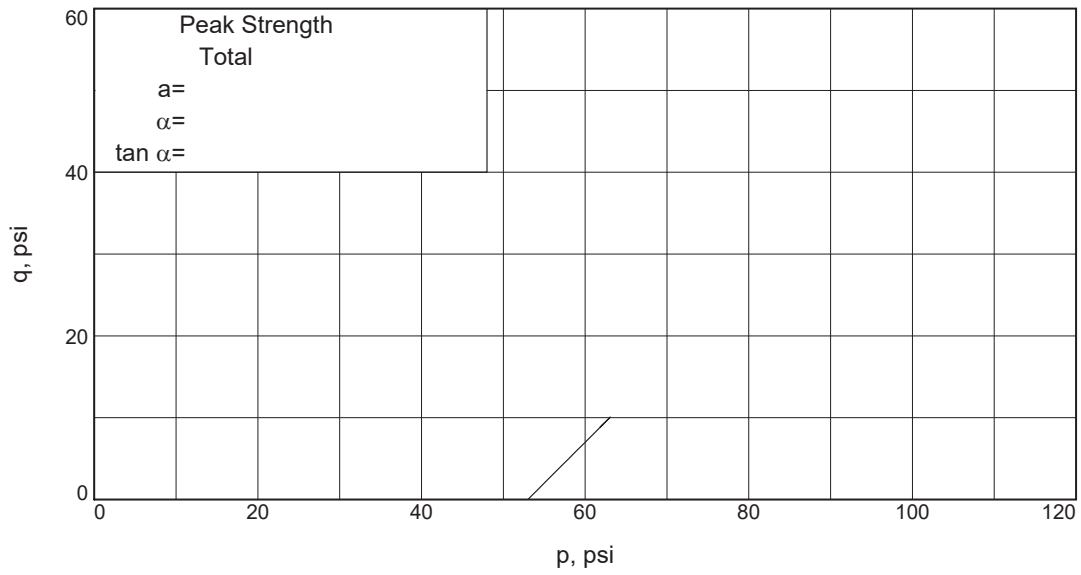
Tested By: JK **Checked By:** MW









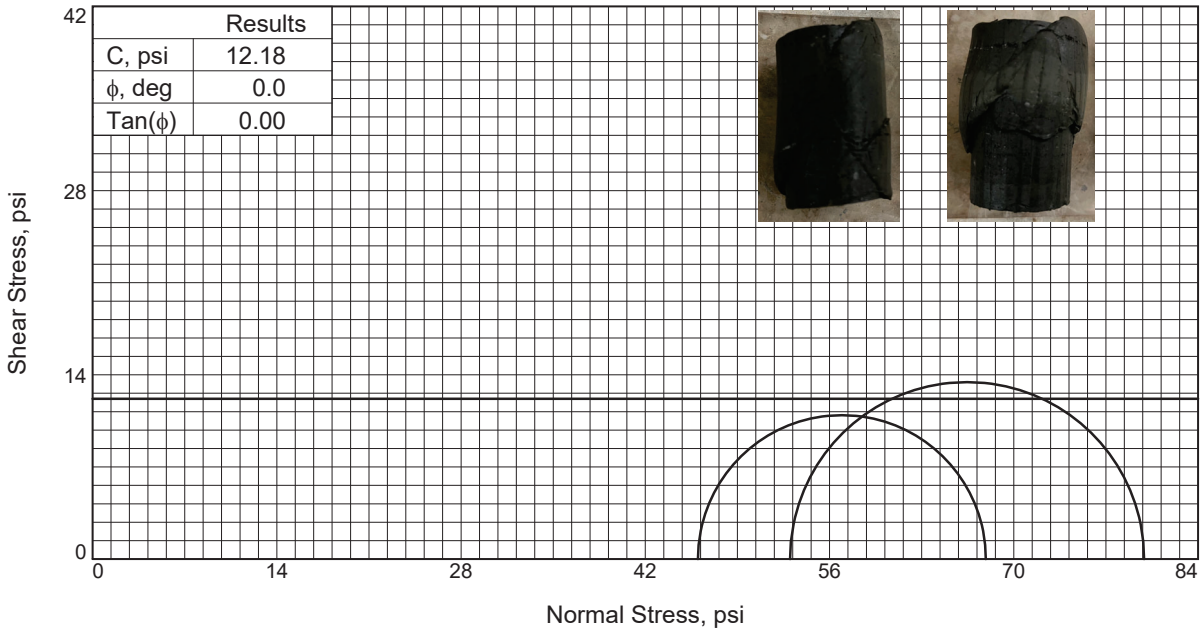


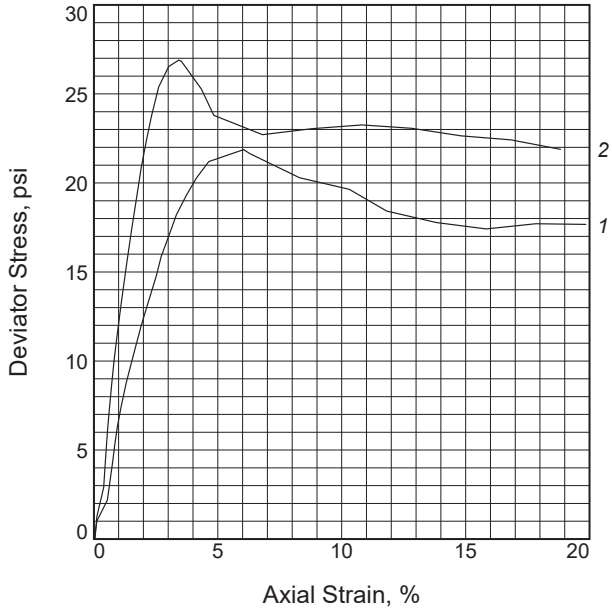
Client: Norfolk District
Project: FEDMMA Project
Location: DH-1139-05, SH-1, 65.0 - 67.0', E4/19143 **Depth:** 65.0 - 67.0' **Sample Number:** SH-1
Project No.: W26GLG33625848, 44307J **Figure** _____

U.S. Army Corp of Engineers

Tested By: JK **Checked By:** MW

	Results
C, psi	12.18
ϕ, deg	0.0
Tan(ϕ)	0.00





Sample No.		1	2
Initial	Water Content, %	73.4	71.7
	Dry Density, pcf	55.8	56.4
	Saturation, %	99.1	98.4
	Void Ratio	1.9622	1.9308
	Diameter, in.	1.39	1.38
	Height, in.	2.80	2.80
At Test	Water Content, %	74.6	72.0
	Dry Density, pcf	55.8	56.4
	Saturation, %	100.8	98.8
	Void Ratio	1.9622	1.9308
	Diameter, in.	1.39	1.38
	Height, in.	2.80	2.80
Strain rate, in./min.		0.028	0.028
Back Pressure, psi		0.0	0.0
Cell Pressure, psi		46.0	53.0
Fail. Stress, psi		21.9	26.9
Ult. Stress, psi		17.4	22.6
σ_1 Failure, psi		67.9	79.9
σ_3 Failure, psi		46.0	53.0

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Dark Gray, Gray & Red, Inorganic Silt High LL (MH), with a trace of sand.

LL= 93 **PL=** 57 **PI=** 36

Specific Gravity= 2.65

Remarks: Other tests are done in general accordance with ASTM's: D422, D2216, D2487, D2950 & D4318.

Figure _____

Client: Norfolk District

Project: FEDMMA Project
Fort Eustis, VA

Location: DH-1139-06, SH-1, 65.0 - 67.0', E4/19144

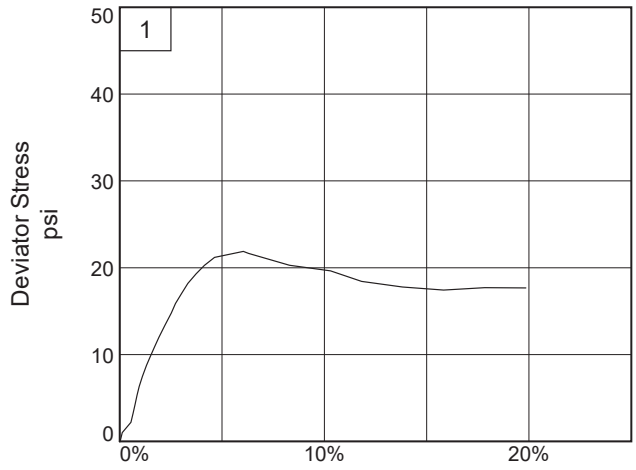
Sample Number: SH-1 **Depth:** 65.0 - 67.0'

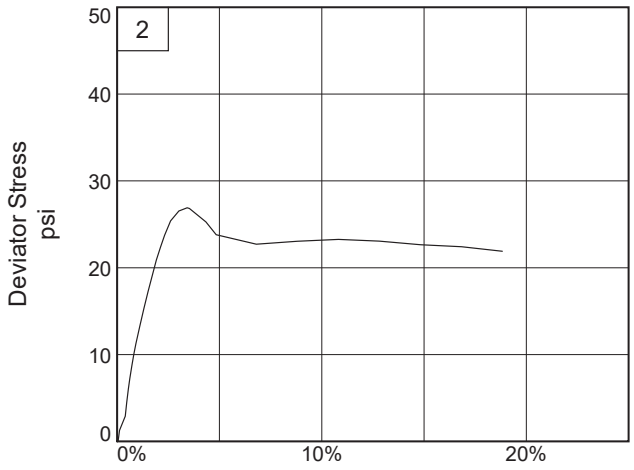
Proj. No.: W26GLG33625848, 44307J **Date Sampled:**

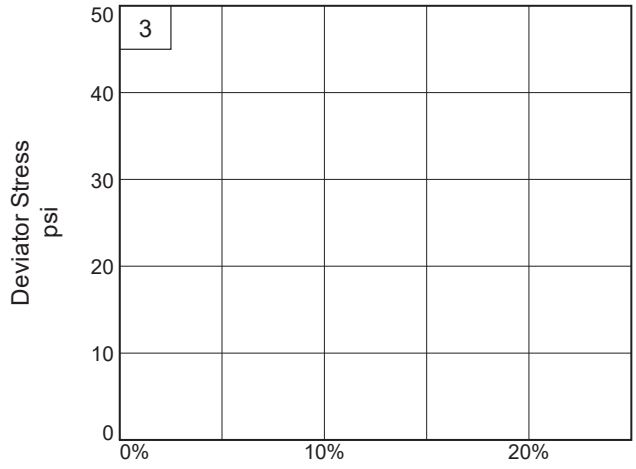
TRIAXIAL SHEAR TEST REPORT

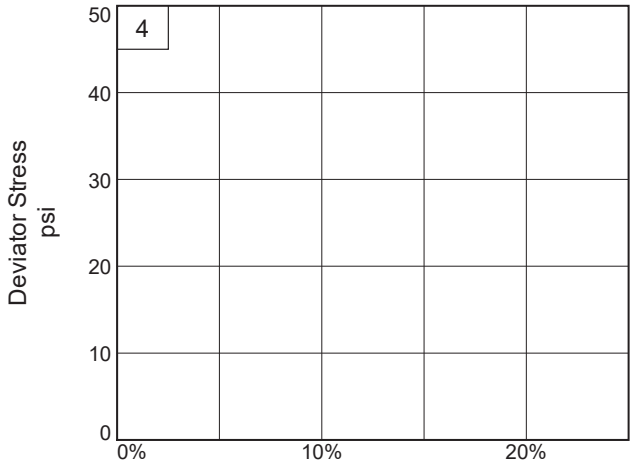
U.S. Army Corp of Engineers

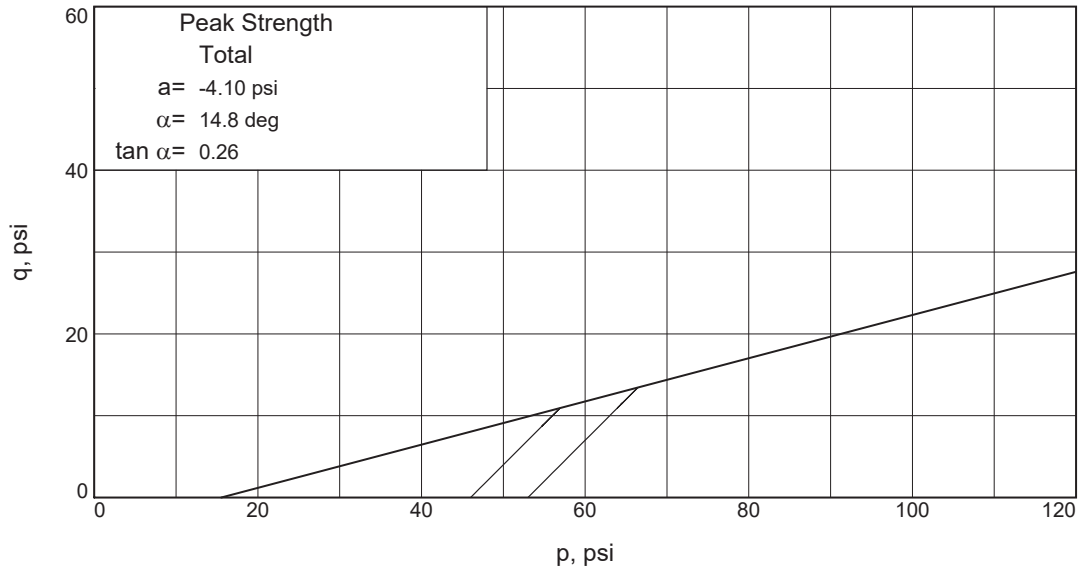
Tested By: JK **Checked By:** MW









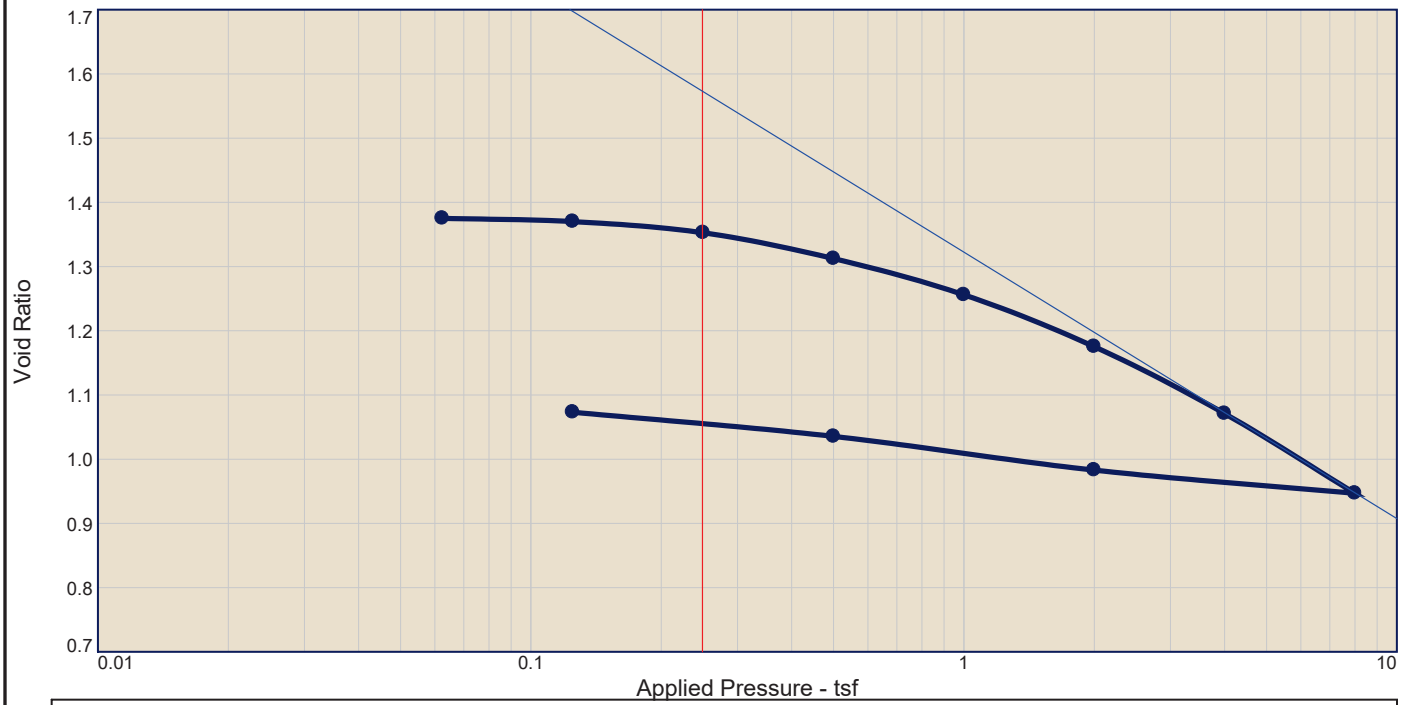


Client: Norfolk District
Project: FEDMMA Project
Location: DH-1139-06, SH-1, 65.0 - 67.0', E4/19144 **Depth:** 65.0 - 67.0' **Sample Number:** SH-1
Project No.: W26GLG33625848, 44307J **Figure** _____

U.S. Army Corp of Engineers

Tested By: JK **Checked By:** MW

CONSOLIDATION TEST REPORT ASTM D2435



Coefficients of Consolidation and Secondary Consolidation

No.	Load (tsf)	C_v (ft.2/day)	C_α	No.	Load (tsf)	C_v (ft.2/day)	C_α	No.	Load (tsf)	C_v (ft.2/day)	C_α
3	0.25	0.103	0.004								
4	0.50	0.015	0.007								
5	1.00	0.033	0.008								
6	2.00	0.026	0.007								
7	4.00	0.023	0.004								
8	8.00	0.024	0.005								

MATERIAL DESCRIPTION	USCS	AASHTO
Brown & Red, Inorganic Silt High LL (MH), with a trace of sand.	MH	

LL	PI	Sp. Gr.	Overburden (tsf)	Dry Dens. (pcf)		Moisture		Saturation		Void Ratio		P_c (tsf)	C_c
				Init.	Final	Init.	Final	Init.	Final	Init.	Final		
92	48	2.65		69.4		50.6 %	43.1 %	97.5 %	100.0 %	1.376	1.073	1.0	0.41

Preparation Process: Undisturbed

Condition of Test: Unindated

D2435 Method	C_r	Swell Press. (tsf)	Swell %
Method A	0.07		

Project No. W26GLG33625848, **Client:** Norfolk District

Project: FEDMMA Project
Fort Eustis, VA

Loc.: DH-1139-02, SH-1, 25.0 - 27.0', E4/19140 **Sample No.:** SH-1

Remarks:
Other tests are done in general accordance with ASTM's: D422, D2216, D2435, D2487 &

Checked By: MW

Title:

Figure

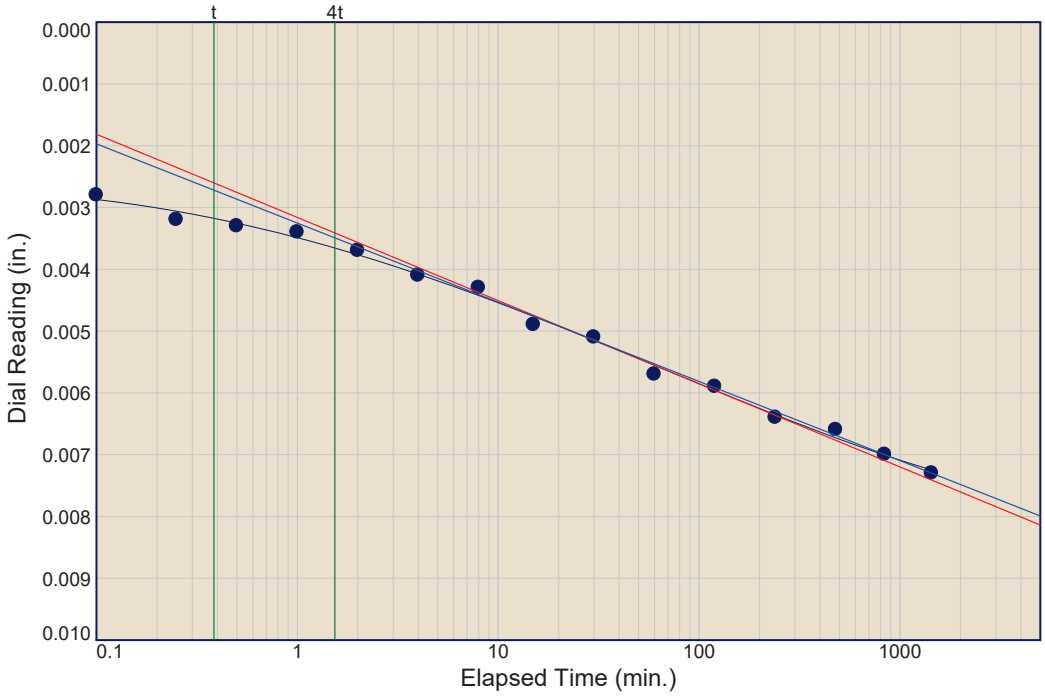
U.S. Army Corp of Engineers

Tested By: JK

Dial Reading vs. Time

Project No.: W26GLG33625848, 44307J
Project: FEDMMA Project

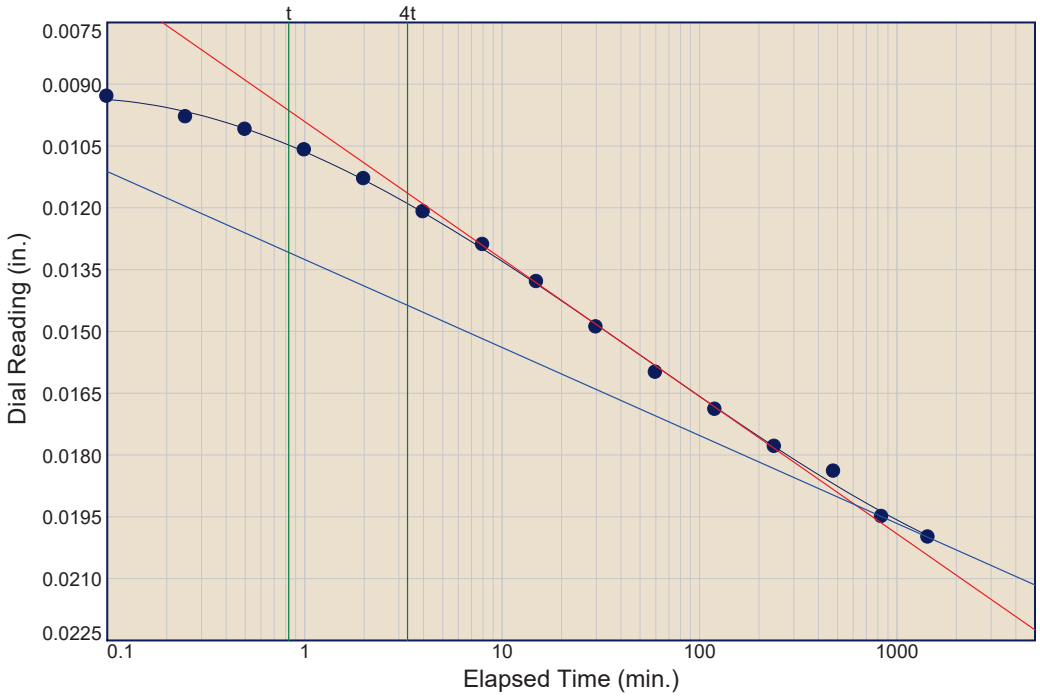
Location: DH-1139-02, SH-1, 25.0 - 27.0', E4/19140 Depth: 25.0 - 27.0' Sample Number: SH-1



Load No.= 3
Load= 0.25 tsf
D_0 = 0.0027
D_{50} = 0.0039
D_{100} = 0.0051
T_{50} = 2.66 min.

C_v @ T_{50}
0.103 ft.^{2}/day

C_α = 0.004



Load No.= 4
Load= 0.50 tsf
D_0 = 0.0091
D_{50} = 0.0141
D_{100} = 0.0192
T_{50} = 18.36 min.

C_v @ T_{50}
0.015 ft.^{2}/day

C_α = 0.007

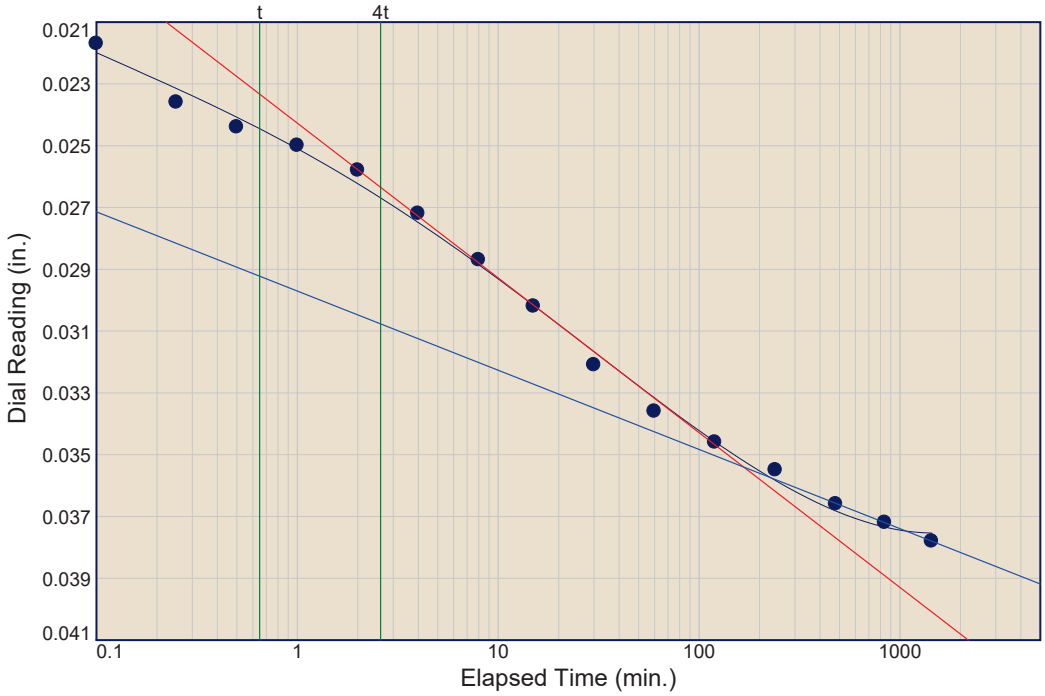
Figure

U.S. Army Corp of Engineers

Dial Reading vs. Time

Project No.: W26GLG33625848, 44307J
Project: FEDMMA Project

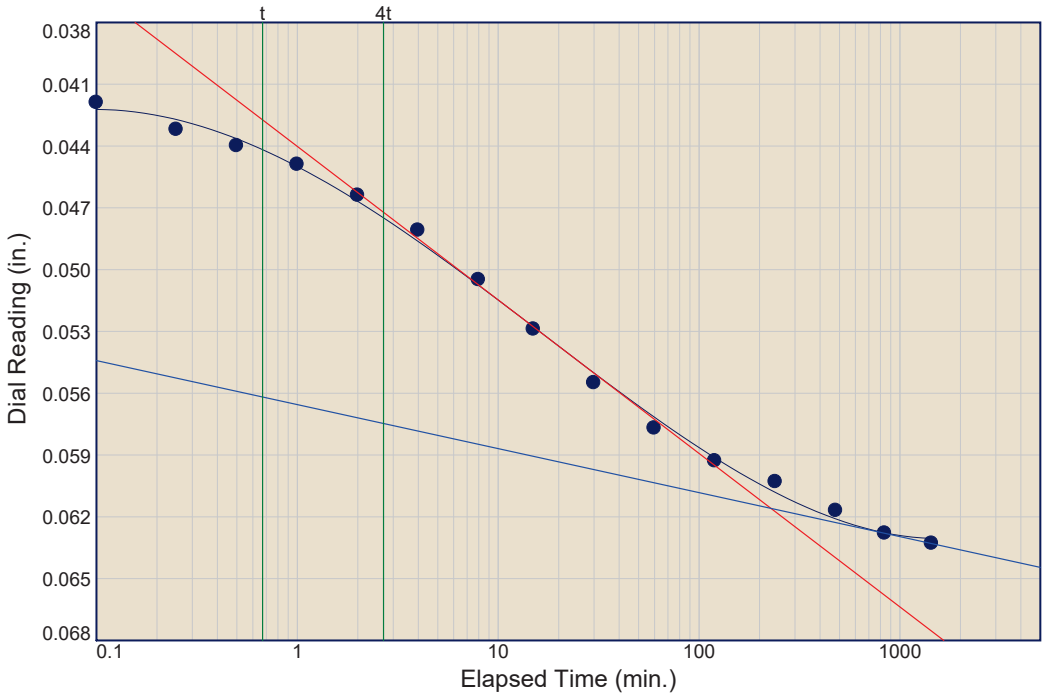
Location: DH-1139-02, SH-1, 25.0 - 27.0', E4/19140 Depth: 25.0 - 27.0' Sample Number: SH-1



Load No.= 5
Load= 1.00 tsf
D_0 = 0.0222
D_{50} = 0.0288
D_{100} = 0.0354
T_{50} = 7.83 min.

C_v @ T_{50}
0.033 ft.^{2}/day

C_α = 0.008



Load No.= 6
Load= 2.00 tsf
D_0 = 0.0409
D_{50} = 0.0512
D_{100} = 0.0616
T_{50} = 9.26 min.

C_v @ T_{50}
0.026 ft.^{2}/day

C_α = 0.007

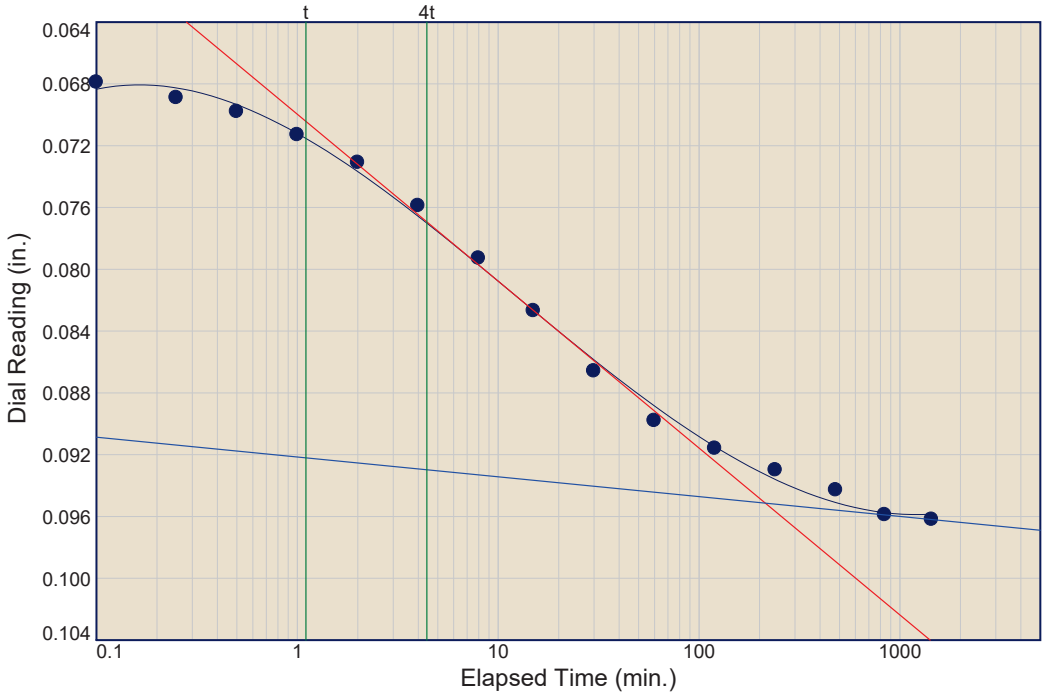
Figure

U.S. Army Corp of Engineers

Dial Reading vs. Time

Project No.: W26GLG33625848, 44307J
Project: FEDMMA Project

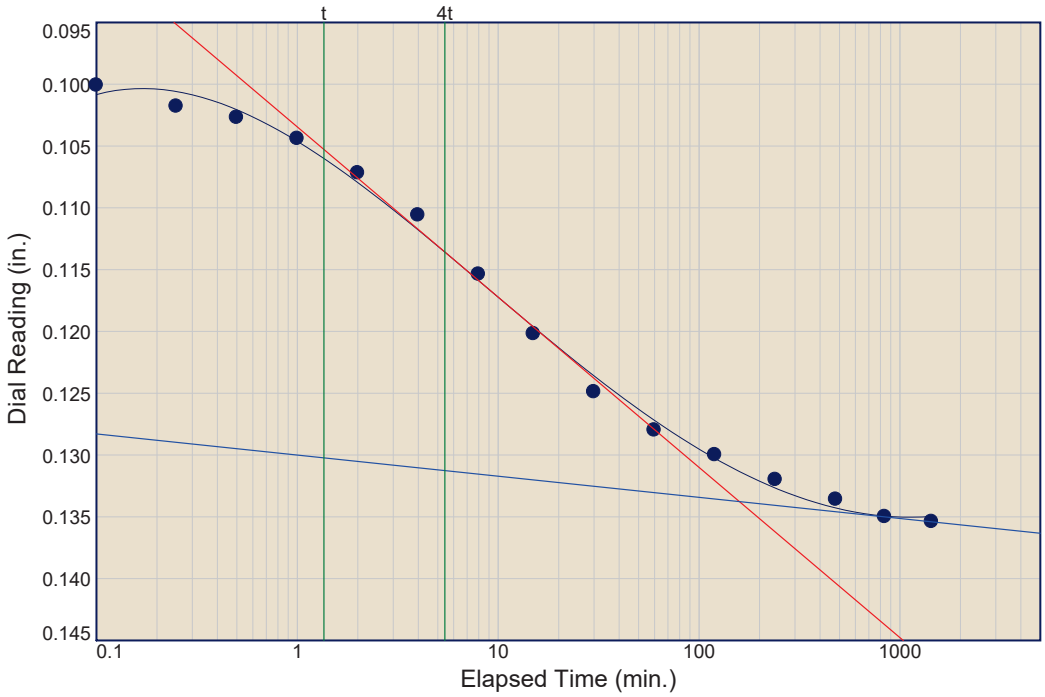
Location: DH-1139-02, SH-1, 25.0 - 27.0', E4/19140 Depth: 25.0 - 27.0' Sample Number: SH-1



Load No.= 7
Load= 4.00 tsf
D_0 = 0.0660
D_{50} = 0.0806
D_{100} = 0.0951
T_{50} = 9.62 min.

C_v @ T_{50}
0.023 ft.^{2}/day

C_α = 0.004



Load No.= 8
Load= 8.00 tsf
D_0 = 0.0984
D_{50} = 0.1161
D_{100} = 0.1338
T_{50} = 8.27 min.

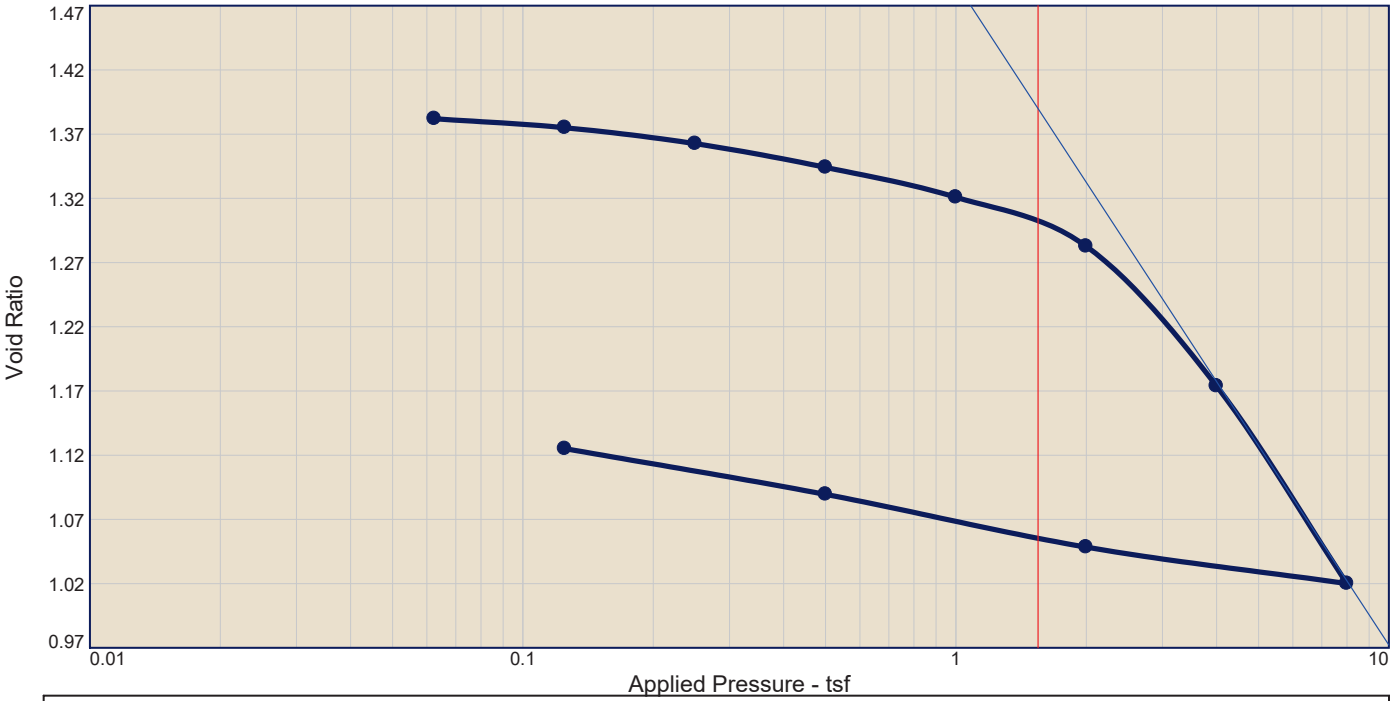
C_v @ T_{50}
0.024 ft.^{2}/day

C_α = 0.005

U.S. Army Corp of Engineers

Figure

CONSOLIDATION TEST REPORT ASTM D2435



Coefficients of Consolidation and Secondary Consolidation

No.	Load (tsf)	C_v (ft.2/day)	C_α	No.	Load (tsf)	C_v (ft.2/day)	C_α	No.	Load (tsf)	C_v (ft.2/day)	C_α
2	0.13	0.001	0.001								
3	0.25	0.345	0.001								
4	0.50	0.704	0.002								
5	1.00	0.075	0.002								
6	2.00	0.740	0.005								
7	4.00	1.719	0.018								
8	8.00	1.015	0.021								

MATERIAL DESCRIPTION	USCS	AASHTO
Dark Gray, Gray & Red, Fat Clay (CH), with a little sand.	CH	

LL	PI	Sp. Gr.	Overburden (tsf)	Dry Dens. (pcf)		Moisture		Saturation		Void Ratio		P_c (tsf)	C_c
				Init.	Final	Init.	Final	Init.	Final	Init.	Final		
56	28	2.65		67.6		54.6 %	45.1 %	104.2 %	100.0 %	1.387	1.125	2.4	0.52

Preparation Process: Undisturbed

Condition of Test: Unindated

D2435 Method	C_r	Swell Press. (tsf)	Swell %
Method A	0.06		

Project No. W26GLG33625848, **Client:** Norfolk District

Project: FEDMMA Project
Fort Eustis, VA

Loc.: DH-1139-05, SH-1, 65.0 - 67.0', E4/19143 **Sample No.:** SH-1

Remarks:
Other tests are done in general accordance with ASTM's: D422, D2216, D2435, D2487 &

Checked By: MW

Title:

Figure

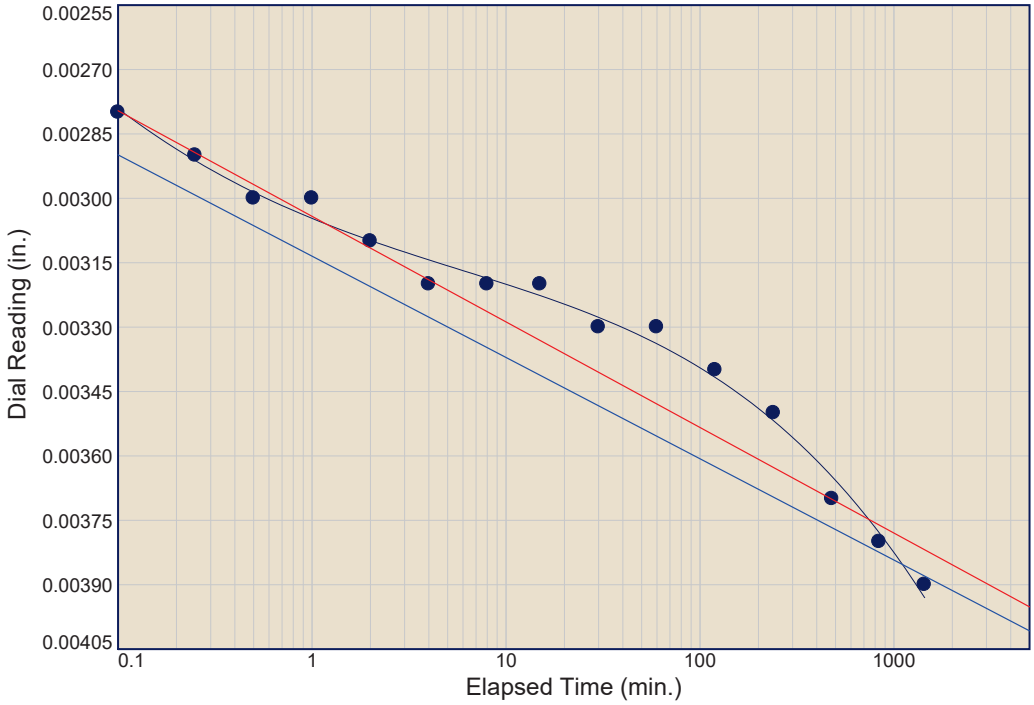
U.S. Army Corp of Engineers

Tested By: JK

Dial Reading vs. Time

Project No.: W26GLG33625848, 44307J
Project: FEDMMA Project

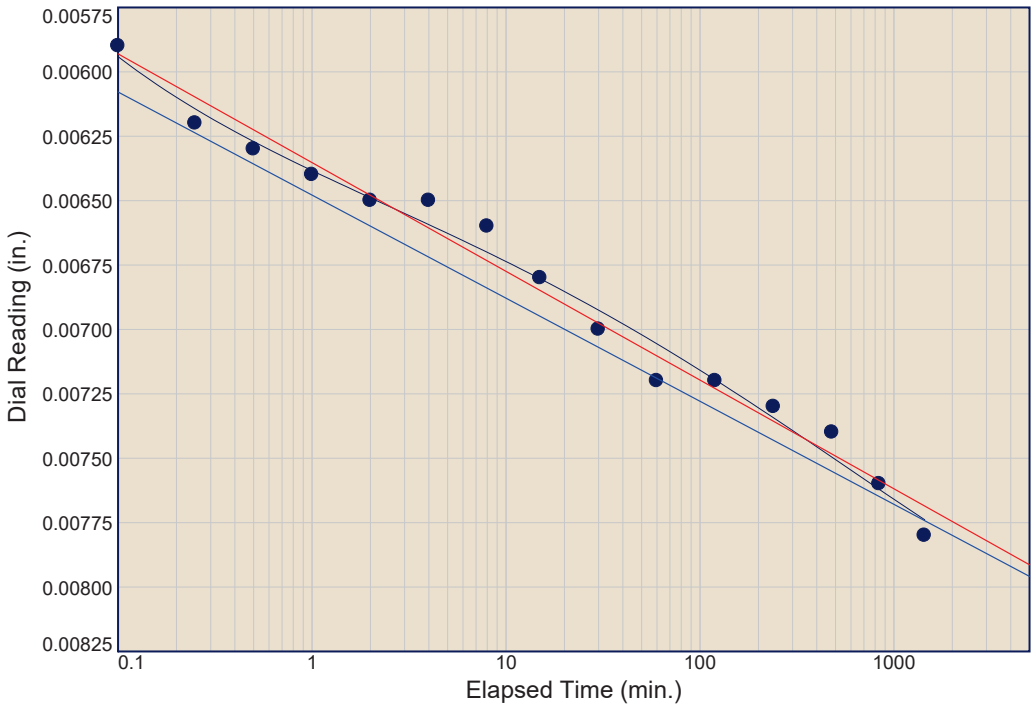
Location: DH-1139-05, SH-1, 65.0 - 67.0', E4/19143 Depth: 65.0 - 67.0' Sample Number: SH-1



Load No.= 2
Load= 0.13 tsf
D_0 = 0.0017
D_{50} = 0.0035
D_{100} = 0.0053
T_{50} = 242.22 min.

C_v @ T_{50}
0.001 ft.^{2}/day

C_α = 0.001



Load No.= 3
Load= 0.25 tsf
D_0 = 0.0039
D_{50} = 0.0063
D_{100} = 0.0088
T_{50} = 0.79 min.

C_v @ T_{50}
0.345 ft.^{2}/day

C_α = 0.001

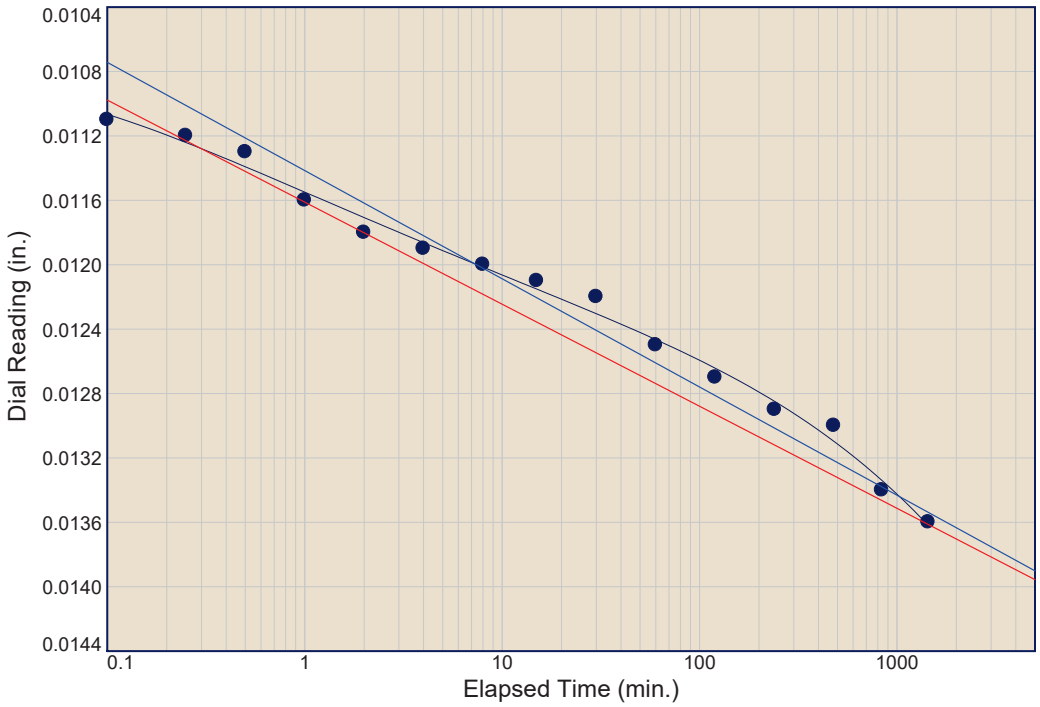
Figure

U.S. Army Corp of Engineers

Dial Reading vs. Time

Project No.: W26GLG33625848, 44307J
Project: FEDMMA Project

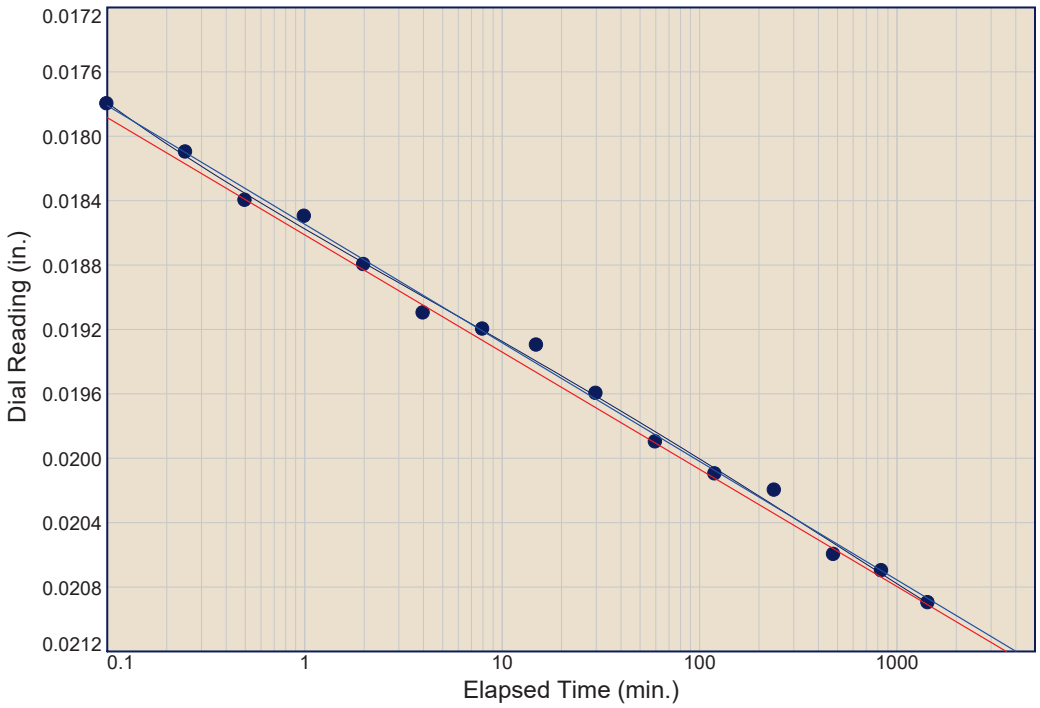
Location: DH-1139-05, SH-1, 65.0 - 67.0', E4/19143 Depth: 65.0 - 67.0' Sample Number: SH-1



Load No.= 4
Load= 0.50 tsf
D_0 = 0.0078
D_{50} = 0.0113
D_{100} = 0.0149
T_{50} = 0.38 min.

C_v @ T_{50}
0.704 ft.^{2}/day

C_α = 0.002



Load No.= 5
Load= 1.00 tsf
D_0 = 0.0136
D_{50} = 0.0190
D_{100} = 0.0243
T_{50} = 3.54 min.

C_v @ T_{50}
0.075 ft.^{2}/day

C_α = 0.002

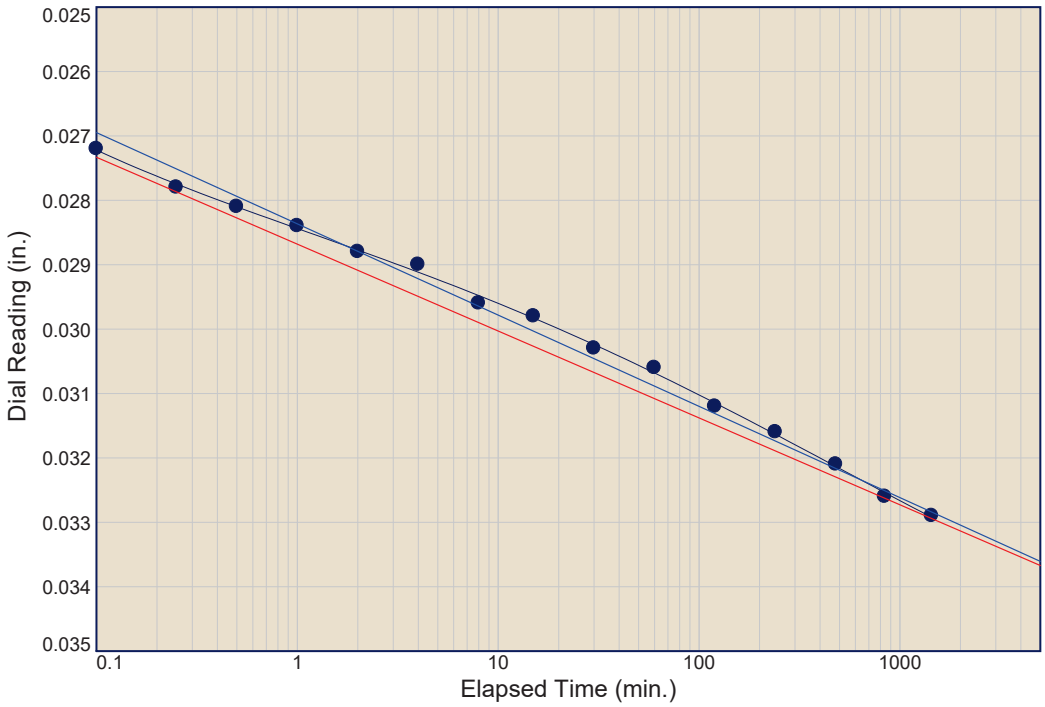
Figure

U.S. Army Corp of Engineers

Dial Reading vs. Time

Project No.: W26GLG33625848, 44307J
Project: FEDMMA Project

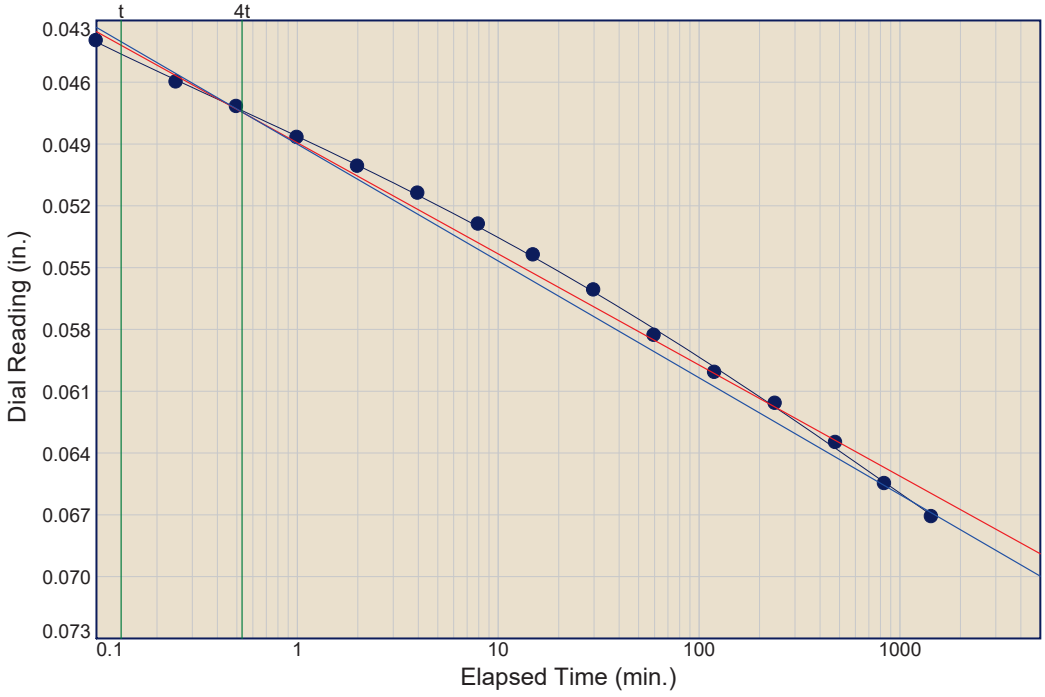
Location: DH-1139-05, SH-1, 65.0 - 67.0', E4/19143 Depth: 65.0 - 67.0' Sample Number: SH-1



Load No.= 6
Load= 2.00 tsf
D_0 = 0.0209
D_{50} = 0.0279
D_{100} = 0.0349
T_{50} = 0.35 min.

C_v @ T_{50}
0.740 ft.^{2}/day

C_α = 0.005



Load No.= 7
Load= 4.00 tsf
D_0 = 0.0419
D_{50} = 0.0447
D_{100} = 0.0476
T_{50} = 0.14 min.

C_v @ T_{50}
1.719 ft.^{2}/day

C_α = 0.018

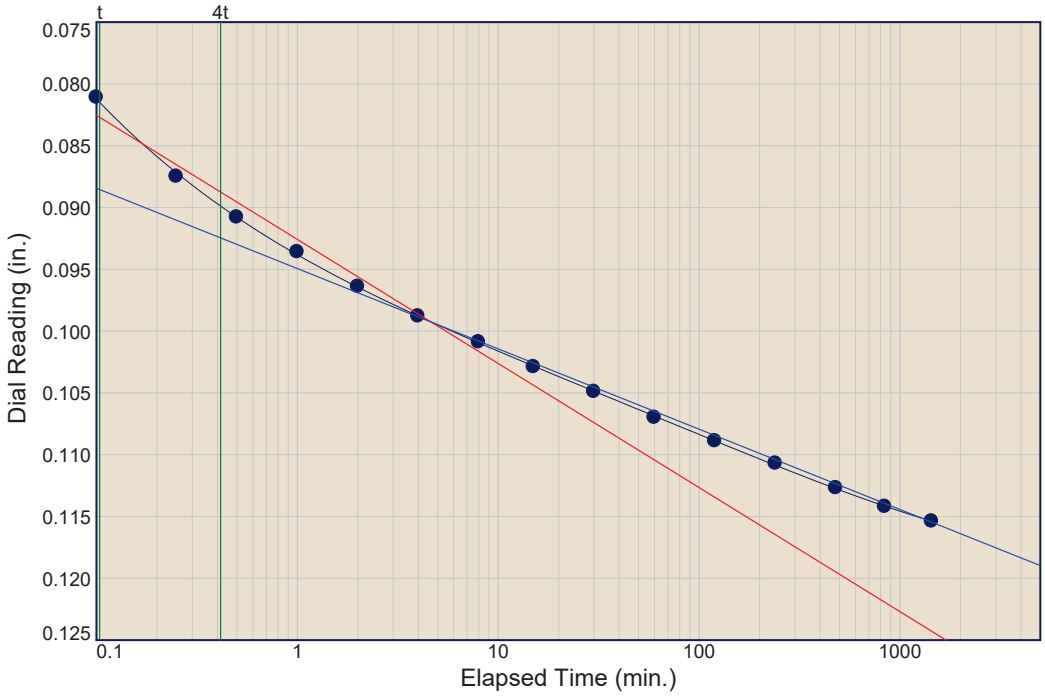
Figure

U.S. Army Corp of Engineers

Dial Reading vs. Time

Project No.: W26GLG33625848, 44307J
Project: FEDMMA Project

Location: DH-1139-05, SH-1, 65.0 - 67.0', E4/19143 Depth: 65.0 - 67.0' Sample Number: SH-1



Load No.= 8
Load= 8.00 tsf
D_0 = 0.0731
D_{50} = 0.0862
D_{100} = 0.0993
T_{50} = 0.21 min.

C_v @ T_{50}
1.015 $ft.^2/day$

C_α = 0.021

Figure

U.S. Army Corp of Engineers