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DEPARTMENT OF THE NAVY  
ATLANTIC DIVISION, NAVAL FACILITIES ENGINEERING COMMAND  
NORFOLK, VIRGINIA

LANTDIV RAC Contract No.  
N62470-93-D-3033

N62470-95-B-5806  
NAVFAC Specification No. 05955806  
Appropriation: DERA

INTERIM CORRECTIVE MEASURE  
AT SWMU 45  
NAVAL STATION ROOSEVELT ROADS  
CEIBA, PUERTO RICO

*Design by:*

BAKER ENVIRONMENTAL, INC.  
CORAOPOLIS, PENNSYLVANIA

*Specification Prepared by:*

**Environmental:**

**Civil:**

**Structural:**

Coreen Casadei, P.E.

Coreen Casadei, P.E.

**Electrical:**

**Mechanical:**

**Date: 12/11/95**

*Specification Approved by:*

**Specification Branch Head: M. D. Mutter, P.E.**

**Engineering and Design Division Director: W. H. Crone IV, P.E.**

**Environmental Quality Division Director: W.H. Russell, P.E.**

**Date:**

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## SECTION 01010

## GENERAL PARAGRAPHS

## PART 1 GENERAL

## 1.1 REFERENCES

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

## CORPS OF ENGINEERS (COE)

COE EM-385-1-1	1992 Safety and Health Requirements Manual
COE EP 1110-1-8	1993 Construction Equipment Ownership and Operating Expense Schedule

## NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 241	1989 Safeguarding Construction, Alteration, and Demolition Operations
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## 1.2 PRECONSTRUCTION SUBMITTALS

Submit the following in accordance with Section C, Part 7 of the Basic Contract.

## 1.2.1 SD-09, Reports

## a. Work Plan G

## 1.2.1.1 Work Plan

With 60 days of issuance of the delivery order, submit a work plan consisting of the following elements.

## a. Narrative

Provide a brief description of the project objectives, scheduling, sampling and analysis requirements, decontamination procedures, removal and excavation procedures, and storage, transportation, and treatment requirements; and a detailed sequence of events for the construction, extraction, and treatment methods.

## b. Technical Specifications

Provide, in an amendment format, any additions and modifications to the contract specifications required to accurately describe the materials and work procedures envisioned to satisfy the requirements of the delivery order. Contact Code 406, Specifications Branch, Engineering and Design Division,

LANTNAVFACENGCOM, (804) 322-4406, for availability of guide specification sections for those sections required, but not included in the contract documents. Do not provide a copy of this specification.

c. Shop Drawings

Shop drawings shall detail and describe all components of the project not currently indicated on the contract drawings such that the shop drawings and the contract drawings, when taken together, provide a complete representation of the project requirements. Shop drawings shall be prepared and sealed by a registered professional engineer. Shop drawings shall include, but not be limited to: 1) an Erosion Control Plan in accordance with Commonwealth and local regulations, consisting of site plans indicating locations of erosion control features during the various stages of construction, details of erosion control features, and applicable notes and, 2) Detail for sealing concrete walls at intake tunnel.

d. Environmental Protection Plan

Within 15 days of issuance of the delivery order, meet with the Navy's Technical Representative (NTR) to discuss environmental protection requirements for the project. After meeting with the NTR, prepare and submit an Environmental Protection Plan in Accordance with Section C, Part 4.0, of the Basic Contract.

e. Site Health and Safety Plan

Provide a site specific health and safety plan (HASP) in accordance with Section C, Part 3.0, of the Basic Contract The HASP will include but not be limited to the following:

1. Names of the Health and Safety officer and names of alternates responsible for Health and Safety.
2. Description of the levels of personal protection to be used for each task.
3. A description of the frequency and types of personal monitoring.
4. Employee training.
5. A description of environmental sampling techniques and instrumentation.
6. Site control measures.
7. Decontamination procedures.
8. Standard Health and Safety operating procedures.
9. Contingency plan.

10. NFPA 241

11. Material Safety Data Sheets for all hazardous materials brought on site.

f. QC Plan

Provide a QC Plan in accordance with Section C, Part 6.0, of the Basic Contract.

(1) Submittal Register

As part of the QC Plan, submit a completed Submittal Register to document quality control for materials, inspection, and testing in accordance with Section C, Part 7.0 of the Basic Contract. A copy of the Submittal Register is provided at the end of this section.

(2) Testing Laboratory Qualifications

As part of the QC Plan, submit qualifications for each laboratory which shall be used in accordance with Section C, Part 6.0, of the Basic Contract.

g. Sampling and Analysis Plan

Provide a Sampling and Analysis Plan describing all sampling and analyses requirements for the delivery order. The Plan shall contain a field sampling plan and a quality assurance plan.

1.2.2 Forwarding Preconstruction Submittals

Within 60 days of issuance of the delivery order, and before procurement, fabrication, or mobilization, submit to the Architect/Engineer, Baker Environmental, Inc., Airport Office Park, Building #3, 420 Rouser Road, Coraopolis, PA 15108, and to distribution as directed by the COTR, the preconstruction submittals required in this specification. The Architect/Engineer shall review the Work Plan for the COTR to determine compliance of the Contractor's Work Plan with the requirements of the contract documents for this delivery order.

1.2.3 Review Comments

The Contractor's Work Plan shall be reviewed. The COTR shall compile and coordinate all Government review comments, and forward consolidated review comments to the Contractor. Review comments on the Work Plan shall be resolved, and submittals modified as required. After the correction of the submittals, submit corrected final copy of the Work Plan to the Commander, LANTNAVFACENCOM, Code 183, 1510 Gilbert Street, Norfolk, Virginia 23511-2699 for final review. The Work Plan shall be approved prior to commencement of any other work associated with this delivery order.

### 1.3 SUBMITTALS

Submit the following in accordance with Section C, Part 7, of the Basic Contract.

#### 1.3.1 SD-18, Records

- a. As Built Records
- b. Environmental Conditions Report
- c. QC Meeting Minutes
- d. Test Results Summary Report
- e. Contractor Production Report
- f. QC Report
- g. Rework Items List
- h. Permits
- i. Contractor's Closeout Report

##### 1.3.1.1 As Built Records

Maintain two sets of full size contract drawings and two sets of full size approved shop drawings marked to show any deviations which have occurred, including buried or concealed construction and utility features revealed during the course of construction. Record horizontal and vertical locations of buried utilities that differ from the contract drawings. These drawings shall be available for review by the NTR at any time. At the completion of the work, deliver marked sets of the contract drawings to the NTR. The Contractor shall incorporate all shop drawing deviations, and deliver one complete set of the shop drawings to the NTR.

##### 1.3.1.2 Environmental Conditions Report

Prior to starting work, perform a preconstruction survey with the NTR. Take photographs showing existing environmental conditions on and adjacent to the site. Prior to starting work, submit the results of the survey in an Environmental Condition Report to the NTR.

##### 1.3.1.3 QC Meeting Minutes

The QC Representative shall document all QC meetings by delivering copies of the minutes to the NTR within 3 calendar days after each QC meeting. The submittals shall comply with Section C, Part 6.0 of the Basic Contract.

##### 1.3.1.4 Test Results Summary Report

A summary report of all field tests and laboratory analytical results shall be submitted to the NTR within 30 days after laboratory receipt of samples and in accordance with Section C, Part 6.0 of the Basic Contract.

#### 1.3.1.5 Contractor Production Report (CPR)

The CPR shall be prepared and submitted daily to the NTR in accordance with Section C, Part 6.0, of the Basic Contract.

#### 1.3.1.6 QC Report

The QC Report shall be submitted by the QC Representative to the NTR every day work is performed, material is delivered, direction is pending, or a labor force is present in accordance with Section C, Part 6.0, of the Basic Contract.

#### 1.3.1.7 Rework Items List

The QC Representative shall deliver a copy of the rework items list to the NTR on a monthly basis in accordance with Section C, Part 6.0, of the Basic Contract.

#### 1.3.1.8 Permits

Fifteen days prior to beginning onsite work, submit draft copies of the following permits required for onsite activities:

- a. Excavation Permit application; from the Public Works Officer, Utilities Division
- b. Confined Space Entry Permit

#### 1.3.1.9 Contractor's Closeout Report

Submit upon completion of the project. This report shall include: Introduction, Summary of Action, Final Health and Safety Report, Summary of Record Documents, Field Changes and Contract Modification, Final Documents, Complete Set of all Field Test and Laboratory Analytical Results, Complete Set of All Data Validation Results, Offsite Transportation and Treatment of Materials, and QC Summary Report.

#### 1.3.2 Forwarding Submittals

As soon as practicable after award of the contract, and before procurement or fabrication, submit, except as specified otherwise, to the Architect/Engineer, Baker Environmental, Inc., Airport Office Park, Building 3, 420 Rouser Road, Coraopolis, PA 15108. The Architect-Engineer for this project shall review and provide surveillance for the NTR to determine if Contractor-approved submittals comply with the contract requirements, and shall review and approve for the NTR those submittals not permitted to be Contractor approved to determine if submittals comply with the contract requirements. At each "Submittal" paragraph in the individual specification sections, a notation "G", following a submittal item, indicates the Architect-Engineer, acting as the agent for the NTR, is the approving authority for that submittal item. One copy of the transmittal form for submittals shall be forwarded to the Resident Officer in Charge of Construction (ROICC).

## 1.4 GENERAL INTENTION

It is the declared and acknowledged intention and meaning to provide and secure contractor services for UST and tunnel cleaning at SWMU 45, Naval Station Roosevelt Roads, Puerto Rico, complete and ready for use.

## 1.5 GENERAL DESCRIPTION

This work includes sealing two cooling water intake tunnels near Puerca Bay and at Building 38; sealing a cooling water outflow tunnel at Building 38 and near the boiler building; removing liquid and sludge from two 50,000 gallon USTs, the cooling water intake tunnels, and the cooling water outflow tunnel, treating the liquid on-site; disposing of treated liquid at the Forrestal Sewage Treatment Plant; disposal of contaminated sludge at a permitted facility; backfilling the USTs; sealing manway entrances; installing a water-tight lid on the pump pit; restoring the site; repairing a wooden walkway over the cooling water intake tunnel; and other related work.

## 1.6 DESCRIPTION OF CONTAMINANTS PRESENT

Identified contaminants that may exist in the USTs and tunnels include Bunker "C" fuel oil and waste transformer oil containing PCBs.

## 1.7 LOCATION

The work shall be located adjacent to Building 38 at the Naval Station Roosevelt Roads, Puerto Rico, approximately as shown.

## 1.8 PROJECT INFORMATION

## 1.8.1 Drawings, Maps and Specifications

Four sets of contract drawings, maps and specifications shall be furnished to the Contractor, except applicable publications incorporated into the technical provisions by reference. Additional sets shall be furnished on request at no additional charge. The work shall conform to the following contract drawings and maps, all of which form a part of these specifications and are available in the office of the NTR.

<u>EFD Drawing No.</u>	<u>NAVFAC Drawing No.</u>	<u>Title</u>	<u>Sheet No.</u>
425830	4325830	Title Sheet	T-1
425831	4325831	Tank and Tunnel Corrective Measure Plan	C-1
425832	4325832	Detail Sheet	C-2

## 1.8.2 Reference Report

The following reference reports are available for examination in the office of the NTR and are intended only to show the existing conditions. The reports and drawings are the property of the Government and shall not be used for any purpose other than that intended by the specification.

Reports

- A. "Draft Pre-Investigation Corrective Measures Screening Report", Baker Environmental, Inc., December 1993.
- B. "Final Engineering Report/Investigation, Characterization and Interim Corrective Measure of SWMU 45 (Site 16)", Baker Environmental, Inc., May 1995.
- C. "Initial Assessment Study of Naval Station Roosevelt Roads, Puerto Rico, Greeleaf/Telesca, September 1984.
- D. "Phase II RCRA Facility Assessment of the U.S. Naval Station Roosevelt Roads Facility, Puerto Rico", A.T. Kearney, Inc. and K.W. Brown and Associated, Inc. November 1988.
- E. "Remedial Action Alternatives for the Old Power Plant, Building 38, Site 16. Confirmation Study to Determine Possible Dispersion and Migration of Specific Chemicals", Environmental Science and Engineering, Inc., May 1988.
- F. "Remedial Investigation/Feasibility Study for Site 16", Versar, Inc., May 1988.

## 1.9 PROJECT SCHEDULE AND TIME CONSTRAINTS

The Contractor shall be required to (a) commence work under this contract within 10 calendar days after the date the Contractor receives the notice to proceed, (b) prosecute the work diligently, and (c) complete the entire work ready for use not later than 120 calendar days after receiving approval of the work plan. The time stated for completion shall include final cleanup of the premises and the restoration of the site.

## 1.10 SAFETY PROGRAM

In addition to safety requirements in the Basic Contract, the Contractor shall implement a safety program conforming to the requirements of Federal, Commonwealth, and local laws, rules and regulations as specifically related to excavation, liquid and sludge removal, and treatment operations. The program shall include, but is not limited to, the following:

- a. Occupational Safety and Health Standards
- b. COE EM-385-1-1
- c. NFPA 241

## PART 2 PRODUCTS

Not used.

## PART 3 EXECUTION

## 3.1 FACILITIES AND SERVICES

The Contractor shall provide all temporary facilities necessary for the proper completion of the work, as necessary and as specified.

## 3.1.1 Availability of Utilities Services

- a. The Government shall supply potable and non-potable water required to perform work to the Contractor. The water source location will be as directed by the NTR. Work shall be coordinated with the Base Civil Engineer. The Contractor shall provide all piping, hoses, pumps, and connections to transport water to the desired locations on site. The Contractor shall also provide a backflow-prevention device at the water source.
- b. The Contractor shall provide a watt-hour to the temporary facility in order for PWD to read the monthly consumption, and send one thousand dollars (\$1,000) check, payable to "The Treasurer of the United States" providing contract number and Contractor's name. This check will cover installation of the power to the temporary facility, about \$100.00 per site. The rest of the amount will be sent to comptroller to a Contractor's account for power consumption. If the Contractor spends more than the amount in the account, he will be required \$1,000 more. The request will be through Comptroller/ROICC. If the Contractor spends less than the amount in the account, the difference will be returned to the Contractor.
- c. The Contractor shall not operate nor disturb the setting of control devices in the station utilities system, including water, sewer, electrical, and steam services. The Government shall operate the control devices as required for normal conduct of the work. The Contractor shall notify the NTR, giving 15 days advance notice when such operation is required.
- d. The Contractor shall contact the Puerto Rico Telephone Company to obtain telephone service. The Contractor shall make arrangements for connections and disconnections and payments.

## 3.1.2 Storage in Existing Buildings

Storage in existing buildings shall not be allowed.

## 3.1.3 Open Site Storage Size and Location

The open site available for storage/laydown/decontamination shall be confined to the areas indicated by the NTR.

## 3.1.4 Trailers, Storage, and Temporary Buildings

Locate trailers, storage, and temporary buildings where directed and within the indicated operations area. Trailers or storage buildings shall be permitted where space is available subject to the approval of the NTR.

The trailers or storage buildings shall be suitably painted and kept in a good state of repair. Failure of the Contractor to maintain the trailers or storage buildings in good condition shall be considered sufficient reason to require their removal. Trailers shall be anchored to resist high winds and must meet applicable Commonwealth or local standards for anchoring mobile trailers.

#### 3.1.4.1 Storage and Office Trailers

Provide a trailer of sufficient size for an office trailer work area and floor area for the exclusive use of the Quality Control (QC) Representative. Also provide room in the same trailer for the QC Records. Provide the QC Representative with a 4-foot by 8-foot plan table, a standard size office desk and chair, and telephone service. QC Records shall be filed in the office and available at all times to the government.

Trailers must meet State law and station requirements and must be in good condition. Trailers shall be lockable and shall be locked when not in use. Trailers shall have a sign not smaller than 24 inches by 24 inches in the lower left hand corner of left door of trailer with the following information: company name, address, registration number of trailer or vehicle identification number, location on base, duration of contract or stay on-base, contract number, local on-base phone number, off base phone number of main office, and emergency recall person and phone number.

#### 3.1.5 Cleaning Up

During the progress of the remediation, the work area and adjacent areas shall be kept clean and free of all rubbish, surplus materials, and unneeded construction equipment.

No material or debris shall be allowed to flow or wash into watercourses, ditches, gutters, drains, or pipes.

The Contractor shall remove all temporary buildings and structures built under this contract on or before the completion of the work.

All materials and equipment installed by the Contractor or any subcontractors shall be thoroughly clean, and on completion of the work shall deliver it undamaged and in fresh and new-appearing condition.

The Contractor shall restore or replace, when and as directed by the NTR, any property damaged by the contract work and equipment or by employees. The property shall be restored in a condition at least equal to that existing prior to the beginning of construction operations. Suitable materials, equipment, and methods shall be used for such restoration. The restoration of property shall be done promptly and shall not be left until the end of the contract period.

### 3.2 RESTRICTIONS ON OPERATIONS

#### 3.2.1 Scheduling

The Naval Station Roosevelt Roads shall remain in operation during the entire construction period. The Contractor shall schedule the work as to

cause the least amount of interference with station operations. Work schedules shall be subject to the approval of the NTR. Permission to interrupt station roads shall be requested in writing a minimum of 15 calendar days prior to the desired date of interruption. Notify the NTR 48 hours prior to starting excavation.

### 3.2.2 Regular Work Hours

The regular work hours for the Naval Station Roosevelt Roads, Puerto Rico, are 0700 to 1600, Monday through Friday.

### 3.2.3 Work Outside Regular Hours

If the Contractor desires to carry on work outside regular hours or on Saturdays, Sundays, or holidays, the Contractor shall submit an application to the NTR, two regular working days prior to the scheduled working date. Provisions shall be preplaced with the ROICC PRA to avoid facility disruption. The Contractor shall allow ample time to enable satisfactory arrangements to be made by the Government for inspecting the work in progress. At night, the Contractor shall light the different parts of the work in an approved manner.

### 3.2.4 Security Requirements

The Contractor shall comply with the general security requirements as stipulated in Section C, Part 2.0, of the Basic Contract.

#### 3.2.4.1 Extra Security Requirements

Each employee of the Contractor shall be required to submit a good conduct certificate issued by the Commonwealth of Puerto Rico Police Department to obtain a temporary pass for the naval activity on which the work is to be performed. Contractors shall obtain the certificate from the Police Department in 2 to 3 weeks.

### 3.3 ACTIONS REQUIRED OF THE CONTRACTOR

The Contractor shall comply with all requirements stated in Section C, Part 2.0, of the Basic Contract.

#### 3.3.1 Station Permits

The Contractor shall obtain all necessary base permits. Permits are required for, but not necessarily limited to welding, digging, and hot work. Allow 14 calendar days for processing of the application. One copy of all applicable permits shall be posted at the job site.

### 3.4 PUBLIC RELEASE OF INFORMATION

The Contractor shall comply with all requirements stated in Section C, Part 2.0, of the Basic Contract.

### 3.5 ENVIRONMENTAL PROTECTION REQUIREMENTS

Provide and maintain, during the life of the contract, environmental protection as defined in Section C, Part 4.0, of the Basic Contract with additional requirements as follows:

- a. Provide 24 hour advance written notice to the NTR of Contractor's intention to dispose of off-Base.
- b. Disposal at non-permitted facilities is specifically prohibited. The prohibition also applies to sites where a permit may have been applied for but not yet obtained.
- c. Off-Station disposal of construction debris outside the parameters of this paragraph at sites without permits and/or not in accordance with all regulatory requirements shall require the Contractor at his own expense to remove, transport, and relocate the debris to an approved site. The Contractor shall also be required to pay any fines, penalties, or fee related to the illegal disposal of construction debris.

#### 3.5.1 Radio Transmitter Restrictions

Conform to the restrictions and procedures for the use of radio transmitting equipment, as directed by the NTR. Do not use transmitters without prior approval by the NTR.

### 3.6 PUBLIC SAFETY MEASURES

#### 3.6.1 Safety Fencing

Safety fencing shall be installed around the work areas as indicated.

### 3.7 REQUIRED INSURANCE

Insurance requirements from Section H of the Basic Contract are enforced in their entirety.

### 3.8 EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE

Whenever a contract or modification of contract price is negotiated, the Contractor's cost proposal for equipment ownership and operating expenses shall be determined in accordance with the following requirements. A copy of COE EP 1110-1-8 is available for review at:

OICC ROICC  
NAVFACENCOM Contracts  
PSC 1008 Box 3976  
FPO AA 34051-3976

- a. Allowable cost for construction, marine plant, and equipment in workable condition, owned or controlled, and furnished by a Contractor or subcontractor at any tier shall be based on actual cost data when the Government can determine both ownership and operating costs for equipment or equipment groups of similar serial

numbers 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 shall be based on the applicable provisions of COE EP 1110-1-8, Region XI (the schedule). Working conditions shall be considered to be average for determining equipment rates using the schedule unless otherwise specified 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 shall apply. For retrospective pricing, the schedule in effect at the time the work was performed shall apply.

- b. Equipment rental costs are allowable, subject to FAR 31.105(d)(2)(ii) and FAR 31.205-36, when substantiated by certified copies of paid invoices. Rates for equipment rented from an organization under common control, lease purchase, or sale-lease back arrangements will be determined using the schedule. However rental costs leased from an organization under common control that has an established practice of leasing the same or similar equipment to unaffiliated lessees shall not be allowed. Costs for major repairs and overhaul are not allowed.
- c. When actual equipment costs are proposed and the total amount of the pricing action is over \$25,000, submit cost or pricing data on Standard Form 1411, "Contract Pricing Proposal Cover Sheet." By submitting cost or pricing data, the Contractor grants to the Contracting Officer or an authorized 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 shall certify that the equipment costs or pricing data submitted are accurate, complete, and current.

-- End of Section --

Contract Number:

Project Title: Interim Corrective Measure at SWMU 45

SPEC SECTION NO.	SD NO, AND TYPE OF SUBMITTAL MATERIAL OR PRODUCT	SPEC PARA NO.	CLASSIF/ APPR BY CO *	GOVT OR A/E REVIEWER	TRANS CONTROL NO.	PLANNED SUBMITTAL DATE
(a)	(b)	(c)	(d)	(e)	(f)	(g)
1) 01010	SD-09, Reports	1.2.1				
2)	Work Plan	1.2.1.1	G			
3) 01010	SD-18, Records	1.3.1				
4)	As Built Records	1.3.1.1				
5)	Environmental Conditions Report	1.3.1.2				
6)	QC Meeting Minutes	1.3.1.3				
7)	Test Results Summary Report	1.3.1.4				
8)	Contractor Production Report	1.3.1.5				
9)	QC Report	1.3.1.6				
10)	Rework Items List	1.3.1.7				
11)	Permits	1.3.1.8				
12)	Contractor's Closeout Report	1.3.1.9				
13) 01430	SD-08, Statements	1.2.1				
14)	Sample Log	1.2.1.1				
15) 01430	SD-12, Field Test Reports	1.2.2				
16)	Waste Characterization Sample	1.2.2.1				
17)	Analyses Results					
18)	Wastewater Treatment System	1.2.2.2				
19)	Sample Analyses Results					
20)	Confirmation Sample Analyses	1.2.2.3				

\* Navy Notes:

Approved by:

G: NTR

Blank: CQC Manager

\* NASA Notes:

Approved by:

Blank: Contracting Officer

\* Army Notes:

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GA: Gov't Approval

FIO: For Information Only

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(a)	(b)	(c)	(d)	(e)	(f)	(g)
1)	Results					
2) 01561	SD-02, Manufacturer's Catalog Data	1.3.1				
3)	Silt Fence	2.1				
4)	Dust Suppressors	2.2.3				
5) 01561	SD-04, Drawings	1.3.2				
6)	Erosion Control Plan	1.3.2.1	G			
7) 02050	SD-08, Statements	1.3.1				
8)	Demolition plan					
9) 02220	SD-05, Design Data	1.3.1				
10)	Low Density Flowable Fill	2.2				
11)	Material					
12) 02223	SD-08, Statements	1.2.1				
13)	Waste Shipping Documentation	1.2.1.1				
14)	Waste Delivery Documentation	1.2.1.2				
15)	Waste Site Vehicle	1.2.1.3				
16)	Decontamination Verification					
17)	Treatment Site Vehicle	1.2.1.4				
18)	Decontamination Verification					
19) 02901	SD-08, Statements	1.2.1				
20)	Air Emissions Permit	1.4				

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(a)	(b)	(c)	(d)	(e)	(f)	(g)
1) 13219	SD-02, Manufacturer's Catalog Data	1.2.1				
2)	Cleaning agents	2.1.2	G			
3)	Gasoline-oil-resisting rubber	2.2	G			
4)	gloves and boots					
5)	Dermal protective equipment	2.2	G			
6)	Respiratory protective equipment	2.2	G			
7)	Disinfectant	2.2	G			
8)	Abrasive for blasting	2.1.2	G			
9) 13219	SD-06, Instructions	1.2.2				
10)	Cleaning agents	2.1.2				
11) 13219	SD-08, Statements	1.2.3				
12)	Qualifications of Certified	1.2.3.1	G			
13)	Industrial Hygienist (CIH)					
14)	Testing Laboratory	1.2.3.2	G			
15)	Safety Plan	1.2.3.3	G			
16)	Work Plan	1.2.3.4	G			
17)	Hazardous Waste Disposal Plan	1.2.3.5	G			
18)	Tank Certification of Safety	1.2.3.6	G			
19)	Training Certification	1.2.3.3	G			
20) 13219	SD-10, Test Reports	1.2.4				

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(a)	(b)	(c)	(d)	(e)	(f)	(g)
1)	Tank and tunnel contents	1.2.4.1	G			
2) 13219	SD-12, Field Test Reports	1.2.5				
3)	Monitoring Results	1.2.5.1	G			
4) 13219	SD-18, Records	1.2.6				
5)	Safety permits	1.4.3				

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GA: Gov't Approval

FIO: For Information Only

## SECTION 01430

## WASTE SAMPLING REQUIREMENTS

## 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.

## UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (USEPA)

EPA/540/P-91/008

Compendium of ERT Waste Sampling  
Procedures, 1991

EPA SW-846

Test Methods for Evaluating Solid Wastes  
(Nov. 1986)

## NAVAL ENERGY AND ENVIRONMENTAL SUPPORT ACTIVITY (NEESA)

NEESA 20.2-047B

Sampling and Chemical Analysis Quality  
Assurance Requirements for the Navy  
Installation Restoration Program (June 1988)

## 1.2 SUBMITTALS

Submit the following in accordance with Section C, Part 7.0, of the Basic Contract.

## 1.2.1 SD-08, Statements

## a. Sample Log

## 1.2.1.1 Sample Log

Provide a detailed summary of all of the confirmatory and waste characterization samples collected. The Sample Log should include the type of sample collected, date and time sample collected, person performing sampling, the location of the sample, the analyses performed, and the chain-of-custody record.

## 1.2.2 SD-12, Field Test Reports

## a. Waste Characterization Sample Analyses Results

## b. Wastewater Treatment System Sample Analyses Results

## c. Confirmation Sample Analyses Results

## 1.2.2.1 Waste Characterization Sample Analyses Results

Provide the results of all waste characterization sample analyses results in a neat and organized manner.

#### 1.2.2.2 Wastewater Treatment System Sample Analyses Results

Provide the analytical results of the wastewater treatment system sampling in a neat and organized manner.

#### 1.2.2.3 Confirmation Sample Analyses Results

Provide the analytical results of all confirmatory sample analyses results in a neat and organized manner.

### 1.3 DEFINITIONS

#### 1.3.1 Waste Characterization Sampling

Waste characterization sampling shall include sampling of sludge removed from the tanks and tunnels and from the treatment system to characterize it for disposal. Characterization sampling shall also include sampling of the treated groundwater to characterize it for discharge.

#### 1.3.2 Wastewater Treatment System Sampling

Wastewater Treatment System Sampling shall include sampling of the wastewater influent and treated effluent to evaluate the performance of the overall treatment system and individual components.

#### 1.3.3 Confirmatory Sampling

Confirmatory sampling shall include chip sampling of the tank and tunnel walls. These samples shall confirm that the tanks and tunnels are clean.

#### 1.3.4 Incidental Waste

Incidental waste shall include wastes generated by the Contractor during normal construction activities (except general refuse) excluding contaminated sludge removed from the tanks and tunnels. Incidental waste shall also include all water generated during the remedial action excluding contaminated liquids removed from the tanks and tunnels. Incidental waste water includes, but is not limited to, water from decontamination of personnel and equipment, rainfall and surface water runoff accumulated in the open excavations.

### 1.4 DESCRIPTION OF WORK

Collect and analyze environmental samples from:

- a. Sludge removed from the tanks and tunnels to characterize the waste for disposal.
- b. Sludge generated by the groundwater treatment system to characterize the waste for disposal.
- c. Influent and effluent from the groundwater treatment system to evaluate its performance.

- d. Treated groundwater to characterize it for discharge.
- e. Chip samples from the concrete walls of the tanks and tunnels to confirm the structures are clean.
- f. If excavated soil above the tunnel visually appears to be contaminated, the Contractor shall contact the NTR and halt excavation activities.

## 1.5 QUALITY ASSURANCE

### 1.5.1 Waste Sampling

Adhere to all sample acquisition, handling, custody documentation, decontamination, and quality assurance/quality control (QA/QC) requirements and procedures as described in the Sampling and Analysis Plan in accordance with Section 01010 and as required by Federal, Commonwealth and local regulations.

### 1.5.2 Analytical Laboratory

The Contractor shall be solely responsible for the execution and accuracy of the waste stream analyses. The Contractor shall use a NEESA-certified laboratory for all waste analyses. All analytical standard methods shall be included in the Sampling and Analysis Plan in accordance with Section 01010 and shall meet, at a minimum, NEESA 20.2-047B QA/QC Level C requirements for confirmation sampling and Level C requirements for waste characterization sampling and shall also be in accordance with Federal, local, and Commonwealth regulations.

## PART 2 PRODUCTS

Not Used.

## PART 3 EXECUTION

### 3.1 GENERAL

Supply all personnel, equipment, and facilities to collect and analyze the environmental samples required to characterize the wastes.

#### 3.1.1 Sample Acquisition

Sampling procedures shall be consistent with NEESA 20.2-047B Guidelines.

##### 3.1.1.1 Waste Characterization Samples

Waste characterization samples shall be collected for the purposes of determining handling, transportation, and disposal requirements and for determining personal and environmental protection and monitoring requirements.

Characterization samples shall be collected from sludge removed from the tanks and tunnels at a frequency required by the off-site soil treatment/disposal facility.

Except for samples that will receive volatile organic analyses, all sludge samples shall be thoroughly mixed composite samples. Composite samples shall consist of grab samples representative of the material being sampled. The grab samples shall be thoroughly mixed to obtain a relatively homogeneous mixture.

The characterization samples for all sludge shall be analyzed for the following minimum parameters:

- \* TCLP Volatile Organics - EPA Method 8240
- \* TCLP Semivolatile Organics - EPA Method 8270
- \* TCLP Pesticides/Polychlorinated Biphenyls - EPA Method 8080
- \* TCLP Metals - EPA Methods 6010
- \* RCRA Characteristics - Ignitability Method SW 1010 - Reactivity Method SW 9010/9030 - Corrosivity Method SW 9045 - Toxicity Method SW 6010
- \* Total Organic Halogens (TOX) - EPA Method 9020

If the results of the above analyses meet the facility's requirements, the containerized sludge will be disposed of at an on-island petroleum recycling facility. Otherwise, the containerized sludge will be disposed of at another appropriately permitted facility.

The characterization samples for all water shall be analyzed for the following minimum parameters:

- \* Volatile Organics - EPA Method 8240
- \* Semivolatile Organics - EPA Method 8270
- \* Total Petroleum Hydrocarbons (TPH) - EPA Method 418.1
- \* Pesticides/PCBs - EPA Method 8080
- \* Metals - EPA Method 6010
- \* TOX - EPA Method 9020
- \* Oil & Grease - EPA Method 9070
- \* Total Suspended Solids (TSS)
- \* Biochemical Oxygen Demand (BOD)
- \* Chemical Oxygen Demand (COD)

If the results of the above analyses meet the NPDES permit requirements, the treated water shall be discharged to the Forrestal Sewage Treatment Plant. Otherwise, the water shall be discharged to another approved facility or pumped through the temporary treatment system again.

#### 3.1.1.2 Wastewater Treatment System Samples

Collect wastewater samples from the influent to and composite samples of the effluent from the wastewater treatment system to evaluate the performance of the wastewater treatment system. Collect wastewater samples in accordance with the following schedule:

Collect one influent sample from the treatment system at start-up, and after every 10 hours of system operation.

Collect one composite effluent sample daily. This sample will be a composite of the stored, treated water collected during one day's

operation.

Analyze the wastewater samples for the following minimum parameters:

- \* Volatile Organic Compounds - EPA Method 8240
- \* Semivolatile Organic Compounds - EPA Method 8270
- \* TPH - EPA Method 418.1
- \* Pesticides/PCBs - EPA Method 8080
- \* Metals - EPA Method 6010
- \* TOX - EPA Method 9020
- \* Oil and Grease - EPA Method 9070
- \* Total Suspended Solids (TSS)
- \* Biochemical Oxygen Demand (BOD)
- \* Chemical Oxygen Demand (COD)

#### 3.1.1.3 Confirmation Samples

All concrete chip samples used as confirmation samples shall be analyzed for the following minimum parameters:

- \* PCBs - EPA Method 8080
- \* TPH - EPA Method 418.1

#### 3.1.2 Sample Handling

Sampling, sample handling, and sampling containers must be consistent with the chemicals expected, the matrix of the sample, and planned analytical procedures. Precleaned glass sample containers with teflon lids are required.

The Contractor shall describe in the Sampling and Analysis Plan all sampling procedures including strict chain-of-custody procedures to be used during collection, transport, and analysis of all samples.

#### 3.1.3 Confirmatory Samples

Collect confirmatory concrete chip samples on the surface of the USTs and tunnels as follows.

- One sample from each manhole in the USTs and tunnels
- Four samples from the floor of each UST
- Four samples from the roof of each UST
- Four samples from the perimeter wall of each UST
- One sample from each column in the USTs.

#### 3.1.4 Sampling Documentation

Maintain a sample log containing, at a minimum, the following information:

- a. Date and Time of Sampling
- b. Sample Locations
- c. Sample Matrix

- d. Sample Identification Number
  - e. QA/QC Sample Identification
  - f. Analyses to be Performed
  - g. Type and Number of Sample Containers
  - h. Signatures of Individuals Performing Sampling
- End of Section --

## SECTION 01561

## EROSION AND SEDIMENT CONTROL

## 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.

## FEDERAL SPECIFICATIONS (FS)

FS O-F-241 (Rev.D) Fertilizers; Mixed, Commercial

## U.S. ARMY CORPS OF ENGINEERS (CW) PUBLICATIONS

CW 02215 1977 Plastic Filter Fabric

## AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO M182 1960 (Rev. 1982) Burlap Cloth Made From Jute or Kenaf

## AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A185 1985 Steel Welded Wire, Fabric, for Concrete Reinforcement

ASTM C33 1990 Concrete Aggregate

ASTM D98 1987 Calcium Chloride

ASTM D1682 1964 (Rev.1985) Breaking Load and Elongation of Textile Fabrics

ASTM D3786 1987 Hydraulic Bursting Strength of Knitted Goods and Nonwoven Fabrics - Diaphragm Bursting Strength Tester Method

## 1.2 DESCRIPTION OF WORK

The work includes the provision of temporary erosion control measures to prevent the pollution of air, water, and land within the project limits and in areas outside the project limits where work is accomplished in conjunction with the project. Installation of temporary erosion control features shall be coordinated with the construction of permanent erosion control features to assure effective and continuous control of erosion and pollution.

## 1.3 SUBMITTALS

Submit the following in accordance with Section C, Part 7.0, of the Basic Contract.

## 1.3.1 SD-02, Manufacturer's Catalog Data

- a. Silt Fence
- b. Erosion Control Matting
- c. Dust Suppressors

## 1.3.2 SD-04, Drawings

- a. Erosion Control Plan G

## 1.3.2.1 Erosion Control Plan

Submit, for approval, four copies of a Contractor furnished erosion and sediment control plan to the Navy's Technical Representative (NTR) a minimum of 14 days prior to start of construction. The plans shall not be a reproduction of the contract documents. The erosion and sediment control plan shall indicate minimum erosion control requirements and shall be site adapted and modified to suit the sequence of construction operations. At a minimum, the Contractor furnished erosion and sediment control plan shall indicate the following:

- a. Clearing limits
- b. New construction and existing construction affected by new construction
- c. Grading sequence shown with installation sequence of temporary and permanent erosion control features
- d. Type, size, and location of temporary erosion control features.

## 1.3.2.2 General Guidance

Design to accommodate the runoff of a local 10 year storm. The following publications shall be used as a guide for developing the Contractor furnished plan:

- a. Guide for Sediment Control on Construction Sites - USDA Soil Conservation Service
- b. Processes, Procedures, and Methods To Control Pollution Resulting From All Construction Activity - EPA
- c. Guidelines for Erosion and Sediment Control Planning and Implementation - EPA.

PART 2 - PRODUCTS

2.1 Silt Fence

2.1.1 Posts

4 inch by 4 inch wood posts, minimum 3 inch diameter wood, or 1.33 pound per linear foot steel posts. Posts shall be minimum 6 feet long.

2.1.2 Wire Fabric

ASTM A185, 6 by 6, minimum 12-1/2 gage.

2.1.3 Filter Fabric

A woven or nonwoven polypropylene, nylon, or polyester containing stabilizers and/or inhibitors to make the fabric resistant to deterioration from ultraviolet, and with the following properties:

- |   |            |
|---|------------|
| a. Minimum grab tensile strength (ASTM D1682) | 100 pounds |
| b. Minimum grab elongation (ASTM D1682)       | 25 percent |
| c. Minimum mullen burst strength (ASTM D3786) | 210 psi    |
| d. E.O.S. (CW 02215)                          | 20-100     |

2.1.4 Standard Catalog Product

A manufacturer's standard catalog product for a preassembled silt fence may be provided in lieu of the indicated silt fence except that the filter fabric shall be as specified, and the height of the structure shall be as indicated.

2.2 TEMPORARY SEEDING

2.2.1 Seed

Commonwealth certified seed of the latest season's crop. Provide seed as specified in Part 3 - Execution.

2.2.2 Fertilizer

FS O-F-241, Type I, Class 2, with 10 percent nitrogen, 20 percent available phosphoric acid, and 10 percent potash.

2.2.3 Mulch

Hay or straw. Provide in an air dried condition for placement with commercial mulch blowing equipment.

2.3 DUST SUPPRESSORS

ASTM D98 calcium chloride, magnesium chloride, or other standard manufacturer's products designed for dust suppression.

### 2.3 WATER FOR DUST SUPPRESSION

Water used for dust suppression shall be free from oil, acids, alkalis, salts, or any substance that is toxic or otherwise harmful to surrounding vegetation.

## PART 3 - EXECUTION

### 3.1 SILT FENCE

Install posts a maximum of 6 feet on center, and at an angle between 2 degrees and 20 degrees towards the potential silt load area. The height of the silt fence shall not exceed 36 inches. Do not attach filter fabric to existing tree. Secure filter fabric to the post and wire fabric using staples, tie wire, or hog rings. Imbed the filter fabric into the ground as indicated. Splice filter fabric at support pole using a 6 inch overlap and securely seal. Top of the filter fabric shall have a 1 inch tuck or a reinforced top end section.

### 3.2 TEMPORARY SEEDING

Within 48 hours after attaining the grading increment specified herein, provide seed, fertilizer, and mulch on graded areas when any of the following conditions occur:

- a. Grading operations stop for an anticipated duration of 30 days or more.
- b. Provide on the slopes of cuts and fill slopes for every 5 foot increment of vertical height of the cut or fill.
- c. When it is impossible or impractical to bring an area to finish grade so that permanent seeding operations can be performed without serious disturbance from additional grading.
- d. When an immediate cover is required to minimize erosion, or when erosion has occurred.
- e. Provide on erosion control devices constructed using soil materials.

#### 3.2.1 General

Loosen subgrade to a minimum depth of 4 inches. Uniformly apply the seed, fertilizer, and mulch at the specified application rates. Roll the seeded area after applying seed and fertilizer. Do not seed or fertilize when the NTR determines conditions are unfavorable. Provide water to promote turf growth.

#### 3.2.2 Seed

Provide seed type and quantity (pounds per acre) as follows:

SEED TYPE	Nov 16 - Jan 31	Feb 1 - Apr 15	Oct 16 - Nov 15	Apr 16 - Oct 15
Bermuda	100		100	

### 3.2.3 Fertilizer

Apply at the rate of 1000 pounds per acre.

### 3.2.4 Mulch

Spread mulch at the rate of 1.5 tons per acre and anchor by crimping mulch with a disc.

### 3.3 GRAVEL CONSTRUCTION ENTRANCE

Provide a minimum 50 feet long, 20 feet wide entrance, a minimum of 6 inches thick, at points of vehicular ingress and egress on the construction site.

### 3.4 DUST SUPPRESSORS

Immediately dampen the surface before calcium chloride application. Apply dust suppressors on unsurfaced base, subbase and other unsurfaced travel ways at the rate between 1.0 and 1.25 pounds per square yard of surface for pellets for the initial application. For subsequent applications of dust suppressors, application rates may be approximately 75 percent of initial application rates. Do not apply when raining or the moisture conditions exceed that required for proper application. Apply other dust suppressors in accordance with manufacturers instructions. Protect treated surfaces from traffic for a minimum of 2 hours after treatment. Repeat application of dust suppressors as required to control dust emissions.

### 3.5 MAINTENANCE AND INSPECTION

Inspect erosion control devices after each rainfall and daily during prolonged rainfall. Remove sediment deposits after each rainfall or when sediment reaches approximately one-half the barrier height. Immediately repair damaged erosion control devices and damaged areas around and underneath the devices. Maintain erosion control devices to assure continued performance of their intended function. Modify the Contractor furnished erosion control plan as required to control problem areas noticed after each inspection.

### 3.6 CLEAN UP

At the completion of the job, or when directed or approved by the NTR, erosion control devices shall be removed. Erosion control devices and areas immediately adjacent to the device shall be filled (where applicable), and shaped to drain and to blend into the surrounding contours. Erosion control devices may remain in place when approved by the NTR.

--End of Section--

SECTION 02050

DEMOLITION AND REMOVAL

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI A10.6 (1990) Demolition Operations

1.2 GENERAL REQUIREMENTS

Do not begin demolition until authorization is received from the NTR. Remove rubbish and debris from the project site; do not allow accumulations inside or outside the buildings. Store materials that cannot be removed daily in areas specified by the NTR.

1.3 SUBMITTALS

Submit the following in accordance with Section C, Part 7.0, of the Basic Contract.

1.3.1 SD-08, Statements

a. Demolition plan

Submit proposed demolition and removal procedures to the NTR for approval before work is started. Demolition plan shall include procedures for coordination with other work in progress, a detailed description of methods and equipment to be used for each operation, and the sequence of operations.

1.4 REGULATORY AND SAFETY REQUIREMENTS

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

1.5 DUST AND DEBRIS CONTROL

Prevent the spread of dust and debris and avoid the creation of a nuisance or hazard in the surrounding area. Do not use water if it results in hazardous or objectionable conditions such as, but not limited to flooding, or pollution.

1.6 PROTECTION

### 1.6.1 Traffic Control Signs

Where pedestrian and driver safety is endangered in the area of removal work, use traffic barricades with flashing lights. Notify the Navy's Technical Representative (NTR) prior to beginning such work.

### 1.6.2 Existing Work

Protect existing work which is to remain in place, be reused, or remain the property of the Government. Repair items which are to remain and which are damaged during performance of the work to their original condition, or replace with new. Repairs, reinforcement, or structural replacement must have NTR approval.

### 1.6.3 Facilities

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

## 1.7 BURNING

Burning will not be permitted.

## PART 2 PRODUCTS

Not used.

## PART 3 EXECUTION

### 3.1 EXISTING FACILITIES TO BE REMOVED

#### 3.1.1 Concrete

Saw concrete of the cooling water intake and outflow tunnels along straight lines to a depth of not less than 2 inches. Make each cut in walls perpendicular to the face and in alignment with the cut in the opposite face. Break out the remainder of the concrete provided the remaining concrete is sound. At locations where the broken face cannot be concealed, grind smooth or saw cut entirely through the concrete.

### 3.2 DISPOSITION OF MATERIAL

#### 3.2.1 Reuse of Materials and Equipment

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

3.3 CLEANUP

3.3.1 Debris and Rubbish

Remove and transport debris and rubbish in a manner that will prevent spillage on roadways or adjacent areas. Clean up spillage from roadways, streets, and adjacent areas.

-- End of Section --

## SECTION 02220

## EXCAVATION, FILLING, AND BACKFILLING

## PART 1 GENERAL

## 1.1 REFERENCES

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

## AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 33	(1993) Concrete Aggregates
ASTM C 136	(1993) Sieve Analysis of Fine and Coarse Aggregates
ASTM D 698	(1991) Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft (600 kN-m/m))
ASTM D 1140	(1992) Amount of Material in Soils Finer Than the No. 200 (75-Micrometer) Sieve
ASTM D 1556	(1990) Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D 1557	(1991) Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft (2,700 kN-m/m))
ASTM D 2487	(1993) Classification of Soils for Engineering Purposes
ASTM D 2922	(1991) Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
ASTM D 3017	(1988; R 1993) Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)
ASTM D 4318	(1993) Liquid Limit, Plastic Limit, and Plasticity Index of Soils

## AMERICAN WATER WORKS ASSOCIATION (AWWA)

AWWA C600	(1993) Installation of Ductile-Iron Water Mains and Their Appurtenances
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## COMMERCIAL ITEM DESCRIPTIONS (CID)

CID A-A-1909	Fertilizer
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## CORPS OF ENGINEERS (COE)

COE EM-385-1-1

(1992) Safety and Health Requirements  
Manual

## 1.2 DEFINITIONS

## 1.2.1 Hard Materials

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

## 1.2.2 Rock

Solid homogeneous interlocking crystalline material with firmly cemented, laminated, or foliated masses or conglomerate deposits, neither of which can be removed without systematic drilling and blasting, drilling and the use of expansion jacks or feather wedges, or the use of backhoe-mounted pneumatic hole punchers or rock breakers; also large boulders, buried masonry, or concrete other than pavement exceeding 1/2 cubic yard in volume. Removal of hard material will not be considered rock excavation because of intermittent drilling and blasting that is performed merely to increase production.

## 1.2.3 Cohesive Materials

Materials ASTM D 2487 classified as GC, SC, ML, CL, MH, and CH. Materials classified as GM and SM will be identified as cohesive only when the fines have a plasticity index greater than zero.

## 1.2.4 Cohesionless Materials

Materials ASTM D 2487 classified as GW, GP, SW, and SP. Materials classified as GM and SM will be identified as cohesionless only when the fines have a plasticity index of zero.

## 1.3 SUBMITTALS

## 1.3.1 SD-05, Design Data

- a. Low Density Flowable Fill Material

## 1.4 DELIVERY, STORAGE, AND HANDLING

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

## 1.5 CRITERIA FOR BIDDING

Base bids on the following criteria:

- a. Surface elevations are as indicated.
- b. Hard materials and rock will be encountered at approximately 2 feet

below existing surface elevations.

- c. Blasting will not be permitted. Remove material in an approved manner.

## PART 2 PRODUCTS

### 2.1 SOIL MATERIALS

Free of debris, roots, wood, scrap material, vegetation, refuse, soft unsound particles, and deleterious, or objectionable materials.

#### 2.1.1 Common Fill

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

### 2.2 LOW DENSITY FLOWABLE FILL MATERIAL

Inert, low density material that can be poured into the underground storage tanks. The fill material shall have a low density so that future tank entry or removal will be possible. When set, the fill material shall be insoluble; it shall not bleed when immersed in water. An example of a suitable material is low density cellular concrete which is a mixture of cement, water slurry, and a high stability foam. The material shall not be fly ash based.

If concrete or cement is used as a component of the fill material, it shall comply with all applicable specifications included in Section 03302. Mixing water shall be potable and free from deleterious amounts of acids, alkali, salts, oils, and organic materials which would adversely affect the setting or strength of the fill material. All admixtures, such as admixtures for reducing water or accelerating the setting time, shall be approved by the NTR. The admixtures shall comply with all applicable specifications included in Section 03302.

### 2.3 METAL PUMP PIT COVER

Metal cover machined to provide the pump pit with a water-tight seal. The cover shall have a dome-like shape to encourage water run-off and shall extend slightly beyond the pump pit opening. The cover shall also include a gasket and a locking mechanism that forces a tight seal.

### 2.4 BURIED WARNING AND IDENTIFICATION TAPE

Polyethylene plastic warning tape manufactured specifically for warning and identification of buried utility lines. Provide tape on rolls, 3 inch minimum width, color coded as specified below for the intended utility with warning and identification imprinted in bold black letters continuously over the entire tape length. Warning and identification to read, "CAUTION, BURIED (intended service) LINE BELOW" or similar wording. Color and printing shall be permanent, unaffected by moisture or soil.

## Warning Tape Color Codes

Yellow:	Electric
Yellow:	Gas, Oil; Dangerous Materials
Orange:	Telephone and Other Communications
Blue:	Water Systems
Green:	Sewer Systems
White:	Steam Systems
Gray:	Compressed Air

## 2.4.1 Detectable Warning Tape for Non-Metallic Piping

Polyethylene plastic tape conforming to the width, color, and printing requirements specified above. Minimum thickness of the tape shall be 0.004 inch. Tape shall have a minimum strength of 1500 psi lengthwise and 1250 psi crosswise. Tape shall be manufactured 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.

## 2.5 DETECTION WIRE FOR NON-METALLIC PIPING

Detection wire shall be insulated single strand, solid copper with a minimum of 12 AWG.

## PART 3 EXECUTION

## 3.1 SURFACE PREPARATION

## 3.1.1 Clearing and Grubbing

Unless indicated otherwise, remove trees, stumps, logs, shrubs, and brush within the clearing limits. Remove stumps entirely. Grub out matted roots and roots over 2 inches in diameter to at least 18 inches below existing surface.

## 3.1.2 Stripping

Strip existing topsoil to a depth of 4 inches without contamination by subsoil material. Stockpile topsoil separately from other excavated material and locate convenient to finish grading area.

## 3.1.3 Unsuitable Material

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

## 3.2 PROTECTION

## 3.2.1 Drainage

Provide for the collection and disposal of surface and subsurface water encountered during construction. So that construction operations progress successfully, completely drain construction site during periods of

construction to keep soil materials sufficiently dry. Provide temporary ditches, swales, and other drainage features and equipment as required to maintain dry soils. When unsuitable working platforms for equipment operation and unsuitable soil support for subsequent construction features develop, remove unsuitable material and provide new soil material as specified herein.

### 3.2.2 Underground Utilities

Location of the existing utilities indicated is approximate. The Contractor shall physically verify the location and elevation of the existing utilities indicated prior to starting construction. The Contractor shall contact the Public Works Department for assistance in locating existing utilities. The Contractor shall scan the construction site with electromagnetic and sonic equipment and mark the surface of the ground where existing underground utilities are discovered. An excavation permit issued by the Public Works Department is required prior to performing any excavation. Allow two weeks for processing of permit.

### 3.2.3 Machinery and Equipment

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

## 3.3 EXCAVATION

Excavate to contours, elevation, and dimensions indicated. Reuse excavated materials that meet the specified requirements for the material type required at the intended location. Keep excavations free from water. Excavate soil disturbed or weakened by Contractor's operations, soils softened or made unsuitable for subsequent construction due to exposure to weather. Refill with backfill and fill material and compact to 95 percent of ASTM D 698 maximum density. Unless specified otherwise, refill excavations cut below indicated depth with backfill and fill material and compact to 95 percent of ASTM D 698 maximum density.

### 3.3.1 Hard Material and Rock Excavation

Remove hard material and rock to elevations indicated in a manner that will leave foundation material in an unshattered and solid condition. Roughen level surfaces and cut sloped surfaces into benches for bond with concrete. Protect shale from conditions causing decomposition along joints or cleavage planes and other types of erosion. Removal of hard material and rock beyond lines and grades indicated unless previously authorized by the NTR will not be grounds for a claim for additional payment.

## 3.4 FILLING AND BACKFILLING

Fill and backfill to contours, elevations, and dimensions indicated.

### 3.4.1 Common Fill Placement

Provide for site excavation areas. Place in 12 inch lifts. Compact areas not accessible to rollers or compactors with mechanical hand tampers. Aerate material excessively moistened by rain to a satisfactory moisture content. Finish to a smooth surface by blading, rolling with a smooth roller, or both.

### 3.4.2 Placement of Low Density Flowable Fill Material

The fill material shall be placed in a flowable, completely mixed state to eliminate voids of unfilled space. The material shall be mixed so that a water layer does not form above the solid material once it is set. Site conditions shall be adjusted so that adequate setting of the fill material is possible.

### 3.5 BURIED WARNING AND IDENTIFICATION TAPE

Provide buried utility lines with utility identification tape. Bury tape 12 inches below finished grade; under pavements and slabs, bury tape 6 inches below top of subgrade.

### 3.6 BURIED DETECTION WIRE

Bury detection wire directly above non-metallic piping at a distance not to exceed 12 inches above the top of pipe. The wire shall extend along the length of the outflow tunnel exposed during cleaning and sealing operations.

### 3.7 COMPACTION

Expressed as a percentage of maximum density. Determine in-place density of existing subgrade; if required density exists, no compaction of existing subgrade will be required. Density requirements specified herein are for cohesionless materials. When cohesive materials are encountered or used, density requirements may be reduced by 5 percent.

#### 3.7.1 General Site

Compact underneath areas designated for vegetation and areas outside the 5 foot line of the structure to 85 percent of ASTM D 698 ASTM D 1557.

#### 3.7.2 Adjacent Area

Compact areas within 5 feet of structures to 90 percent of ASTM D 698.

#### 3.7.3 Paved Areas

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

### 3.8 FINISH OPERATIONS

### 3.8.1 Grading

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

### 3.8.2 Seed

Scarify existing subgrade. Provide 4 inches of topsoil for newly graded finish earth surfaces and areas disturbed by the Contractor. Additional topsoil will not be required if work is performed in compliance with stripping and stockpiling requirements. If there is insufficient on-site topsoil meeting specified requirements for topsoil, provide topsoil required in excess of that available. Seed shall match existing vegetation. Provide seed at 5 pounds per 1000 square feet. Provide CID A-A-1909, Type I, Class 2, 10-10-10 analysis fertilizer at 25 pounds per 1000 square feet. Provide commercial agricultural limestone of 94-80-14 analysis at 70 pounds per 1000 square feet. Provide mulch and water to establish an acceptable stand of grass.

### 3.8.3 Protection of Surfaces

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

### 3.9 DISPOSITION OF SURPLUS MATERIAL

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

-- End of Section --

## SECTION 02223

## TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL

## 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.

## CODE OF FEDERAL REGULATIONS

40 CFR Part 261	Identification and Listing of Hazardous Waste
40 CFR Part 262	Standards Applicable to Generators of Hazardous Waste
40 CFR Part 761	Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions
49 CFR Parts 100 to 180	Transportation

## UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (USEPA)

SW-846	(1986) Test Methods for Evaluating Solid Waste (Physical/Chemical Methods)
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## 1.2 SUBMITTALS

Submit the following in accordance with Section C, Part 7.0, of the Basic Contract.

## 1.2.1 SD-08, Statements

The Contractor shall provide the NTR with the following decontamination, transportation and soil treatment documentation:

- a. Waste Shipping Documentation
- b. Waste Delivery Documentation
- c. Waste Site Vehicle Decontamination Verification
- d. Treatment Site Vehicle Decontamination Verification

## 1.2.1.1 Waste Shipping Documentation

Copies of manifests and other documentation required for shipment of waste materials shall be submitted to the NTR within 24 hours after removal of waste from the site. All manifest documentation shall conform with 40 CFR 261 and 40 CFR 262. Manifest documentation shall be signed by the

Hazardous Waste Manager of the Naval Station. The name of the disposal company, as well as a copy of their permit to accept the waste, shall be provided in the waste shipping documentation. A copy of the transporters permits (i.e., EPA ID NO.) should also be included in the package.

Manifesting is not required if the contaminated material does not meet the characteristics of a Resource Conservation and Recovery Act (RCRA) waste, as defined in 40 CFR 261, or a Toxic Substances Control Act (TSCA) waste as defined in 40 CFR 761.6 - 761.79.

#### 1.2.1.2 Waste Delivery Documentation

Written verification that the wastes were actually delivered to the proposed treatment site, within 21 days of waste removal from the station.

#### 1.2.1.3 Waste Site Vehicle Decontamination Verification

Written verification that all vehicles and containers were decontaminated prior to leaving the work site, were properly operating, and were covered, within 24 hours after removal of waste from the site.

#### 1.2.1.4 Treatment Site Vehicle Decontamination Verification

Written verification that all vehicles and containers were decontaminated prior to leaving the treatment site, within 7 days of the date of service.

### 1.3 DEFINITIONS

The following definitions shall apply, in addition to the definitions for the various waste types described in the Basic Contract.

#### 1.3.1 Incidental Waste

Incidental waste shall include all materials which become contaminated with wastes as defined in the Basic Contract as a result of Contractor activity at the site after the commencement of contract work.

#### 1.3.2 Sludge

Sludge shall include all solids removed from the underground storage tanks, cooling water tunnels, and temporary treatment plant.

#### 1.3.3 Wastewater

Wastewater shall include all water removed from the USTs and cooling water tunnels, all water used in cleaning the USTs and cooling water tunnels, and all water derived from decontamination activities.

## PART 2 PRODUCTS

Not used.

**PART 3 EXECUTION****3.1 GENERAL****3.1.1 Materials and Equipment**

The Contractor shall furnish all labor, materials, and equipment necessary to transport contaminated soils in accordance with applicable Federal, Commonwealth, and local requirements.

**3.1.2 Records**

The Contractor shall originate, use, and maintain the waste shipment records/manifests required by the RCRA and the U.S. Department of Transportation, as necessary.

**3.1.3 Temporary Storage of Contaminated Materials**

The Contractor shall schedule and control the work such as to minimize the quantity and duration of on-site contaminated material storage. All contaminated materials stored on-site shall be stored in covered containers or vehicles designed to contain such materials without spillage. Any damage or contamination caused by contaminated materials storage shall be repaired or removed to the satisfaction of the NTR.

**3.1.4 Transportation**

The Contractor shall be solely responsible for complying with all Federal, Commonwealth, and local requirements for transporting hazardous materials through the applicable jurisdictions and shall bear all responsibility and cost for any noncompliance. In addition to those requirements, the Contractor shall do the following:

- a. Inspect and document all vehicles and containers for proper operation and covering.
- b. Inspect all vehicles and containers for proper markings, manifest documents, and other requirements for waste shipment.
- c. Perform and document decontamination procedures prior to leaving the worksite and again before leaving the treatment site.

**3.1.5 Treatment - Incidental Wastes**

All incidental waste materials classified as hazardous under RCRA (40CFR Part 261) that are removed from the site shall be disposed of in a RCRA hazardous waste treatment/disposal facility permitted to accept such materials.

**3.1.6 Treatment - Sludge**

If it meets a permitted facility's requirements, sludge removed from the site shall be transported to an off-site petroleum recycling facility. Otherwise, contaminated sludge shall be transported to an approved disposal facility. Sludge shall not be disposed in the Station landfill.

3.1.7 Treatment - Wastewater

All wastewater shall be treated onsite and discharged via tanker truck to the Forrestal Sewage Treatment Plant. The Contractor shall coordinate with the Environmental Engineering Division of the Public Works Department for the discharge of treated wastewater into the Forrestal STP.

3.1.8 Sampling and Analysis Requirements for Disposal

The Contractor shall conduct sampling and analysis in accordance with Section 01430, "Waste Sampling Requirements".

-- End of Section --

SECTION 02901

WASTEWATER TREATMENT SYSTEM

PART 1 - GENERAL

1.1 REFERENCES

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

CODE OF FEDERAL REGULATIONS (CFR)

40 CFR 136

40 CFR 136 Guidelines Establishing Test Procedures for the Analysis of Pollutants

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70

National Electric Code

1.2 SUBMITTALS

Submit the following in accordance with Section C, Part 7.0, of the Basic Contract.

1.2.1 SD-08, Statements

a. Temporary Air Emissions Permit

1.3 DESCRIPTION OF WORK

The work includes the design and installation of a temporary wastewater treatment system as specified herein and indicated on the Contract drawings. The system shall include all treatment equipment, and all associated pumps, piping, panelboard and enclosures for starters and controls, complete and ready for use. The treatment equipment shall be designed to remove Bunker "C" fuel oil, PCBs, and low level organics and metal contaminants from the wastewater to meet the specified effluent requirements, and shall be capable of treating a minimum of 10 gallons per minute of wastewater. The Contractor shall provide technical and operational data on the wastewater treatment system to the Water Pollution Branch.

1.4 NOTIFICATIONS

An air emissions permit must be applied for and approved by the Puerto Rico Environmental Quality Board (EQB) before work begins. The permit must cover emission from dust and volatile organic compounds.

## PART 2 - PRODUCTS

## 2.1 WASTEWATER TREATMENT EQUIPMENT

Provide wastewater treatment equipment, complete and ready for use, including all associated tanks, pumps, piping, controls, and appurtenances.

## 2.2 WASTEWATER TREATMENT SYSTEM PERFORMANCE

The wastewater treatment system shall be capable of treating a minimum of 10 gallons per minute of wastewater, at an influent temperature of approximately 60 degrees F. The wastewater treatment system shall be capable of removing the specified contaminants to the required levels. The following factors should not inhibit system operation or quality of the treated effluent:

1. High levels of suspended solids
2. High levels of iron
3. Build up of calcium carbonate deposits
4. High levels of water hardness
5. High levels of dissolved solids

## 2.2.1 Influent Characteristics

Influent contaminant characteristics are as identified in the Final Engineering Report Investigation, Characterization, and Interim Corrective Measure of SWMU 45 (Site 16), May 23, 1995 by Baker Environmental, Inc. A summary of the anticipated influent characteristics is as follows:

Wastewater

Aroclor-1260	0.41J	ug/l
Methylene Chloride	3JB	ug/l
Chlorobenzene	16	ug/l
1,3-Dichlorobenzene	3J	ug/l
1,4-Dichlorobenzene	4J	ug/l
Barium	19.3	ug/l
Lead	11.8	ug/l
Mercury	0.38	ug/l
Silver	6.4B	ug/l
Vanadium	22	ug/l
TPH	2000	ug/l

Sludge

Chlorobenzene	20J	ug/l
Aroclor-1260	1,800J	ug/l
Arsenic	47.0	ug/l
Barium	250	ug/l
Lead	527	ug/l
Silver	8.7B	ug/l

## 2.2.2 Effluent Requirements

Wastewater contaminants shall be removed to below the following limits, as analyzed by EPA SW-846 Methods.

Aroclor-1260	non-detect	
Chlorobenzene	5.0	ug/l
1,4-Dichlorobenzene	75	ug/l
Barium	1000	ug/l
Lead	15	ug/l
Mercury	1	ug/l
Silver	2	ug/l
Oil & Grease	8	mg/l
Total Suspended Solids (TSS)	30	mg/l
pH	7.5 -8.0	s.u.
Biochemical Oxygen Demand (BOD)	30	mg/l
Chemical Oxygen Demand (COD)	50	mg/l
Dissolved Oxygen	>4.0	mg/l

### PART 3 - EXECUTION

#### 3.1 GENERAL

Design and install the wastewater treatment system and controls in accordance with the applicable codes and requirements as required for a complete and operable system.

All electrical work shall be in accordance with NFPA 70 and as specified.

#### 3.2 PIPING AND VALVES

The Contractor shall design and install all piping in accordance with the applicable sections of these specifications as required for a complete and operable system.

#### 3.3 INSTRUMENTATION AND CONTROL SYSTEM

The Contractor shall design the instrumentation and control system for the wastewater treatment system to provide for a system that continuously processes contaminated wastewater with a minimal amount of operator input.

#### 3.4 STARTUP AND INITIAL TESTING

Provide valves and fittings as required to obtain water samples for testing. Samples shall be obtained via fittings from the effluent piping of the equipment being tested. Samples shall not be obtained from temporary drain hoses or pipes.

Maintain an accurate log of all test procedures and results. Submit a report of procedures and results to the NTR for approval.

##### 3.4.1 Water Quality Analyses

Water quality analysis of the wastewater treatment system influent and effluent shall be for volatile organic compounds, semivolatile organic compounds, total petroleum hydrocarbons, pesticides/PCBs, metals, total organic halogens, oil and grease, total suspended solids, biochemical oxygen demand and chemical oxygen demand as required to evaluate treatment

system performance. The Contractor is responsible for conducting all required tests, and shall submit a Sampling and Analysis Plan, as required by Section 01010, "General Paragraphs", outlining all sampling and analysis methods, procedures and frequencies, as outlined by Section 01430, "Waste Sampling Requirements".

-- End of Section --

## SECTION 03302

## CAST-IN-PLACE CONCRETE (MINOR CONSTRUCTION)

## PART 1 GENERAL

## 1.1 REFERENCES

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

## AMERICAN CONCRETE INSTITUTE (ACI)

- ACI 304R (1989) Measuring, Mixing, Transporting,  
and Placing Concrete
- ACI 305R (1991) Hot Weather Concreting

## AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- ASTM A 615/A 615M (1993) Deformed and Plain Billet-Steel  
Bars for Concrete Reinforcement
- ASTM C 33 (1993) Concrete Aggregates
- ASTM C 94 (1994) Ready-Mixed Concrete
- ASTM C 143 (1990; Rev. A) Slump of Hydraulic Cement  
Concrete
- ASTM C 150 (1994) Portland Cement
- ASTM C 171 (1992) Sheet Materials for Curing  
Concrete
- ASTM C 172 (1990) Sampling Freshly Mixed Concrete
- ASTM C 309 (1993) Liquid Membrane-Forming Compounds  
for Curing Concrete
- ASTM C 494 (1992) Chemical Admixtures for Concrete
- ASTM C 595 (1994) Blended Hydraulic Cements
- ASTM C 618 (1994) Coal Fly Ash and Raw or Calcined  
Natural Pozzolan for Use as a Mineral  
Admixture in Portland Cement Concrete
- ASTM D 4397 (1991) Polyethylene Sheeting for  
Construction, Industrial, and Agricultural  
Applications

## CORPS OF ENGINEERS (COE)

COE CRD-C-572

(1974) Polyvinylchloride Waterstop

## PUERTO RICO DEPARTMENT OF TRANSPORTATION (PRDOT)

PRDOT RBS

(1984) Standard Specifications for Road  
and Bridge Construction

## 1.2 MODIFICATION OF REFERENCES

Accomplish work in accordance with ACI publications, except as modified by this section. Consider the advisory or recommended provisions to be mandatory, as though the word "shall" had been substituted for the words "should" or "could" or "may," wherever they appear. Interpret reference to the "Building Official," the "Structural Engineer," and the "Architect/Engineer" to mean the NTR.

## 1.3 DELIVERY, STORAGE, AND HANDLING

Do not deliver concrete until ready for concrete placement. Store concrete aggregates to prevent contamination or segregation. Store reinforcement of different sizes and shapes in separate piles or racks raised above the ground to avoid excessive rusting. Protect from contaminants such as grease, oil, and dirt. Provide for accurate identification after bundles are broken and tags removed.

## PART 2 PRODUCTS

## 2.1 CONCRETE

## 2.1.1 Contractor Mix Design

ACI 301, except as modified herein. Unless indicated otherwise, concrete shall have a 28-day compressive strength of 3000 psi. Slump shall be between 2 and 4 inches in accordance with ASTM C 143. Provide ASTM C 33 aggregate Size No. 57.

## 2.1.2 Ready-Mixed Concrete

ASTM C 94, except as modified herein. Ready-mixed concrete is defined in this specification as concrete produced regularly by a commercial establishment and delivered to the purchaser in the plastic state.

## 2.2 MATERIALS

## 2.2.1 Cement

ASTM C 150, Type I or II or ASTM C 595, Type IP(MS) or IS(MS) blended cement, except as modified herein. The blended cement shall consist of a mixture of ASTM C 150 cement and one of the following materials: ASTM C 618 pozzolan or fly ash. The pozzolan/fly ash content shall not exceed 25 percent by weight of the total cementitious material. For exposed concrete, use one manufacturer for each type of cement, fly ash, and pozzolan.

2.2.2 Water

Water shall be potable.

2.2.3 Aggregates

ASTM C 33. Obtain aggregates for exposed concrete surfaces from one source. Aggregates shall not contain any substance which may be deleteriously reactive with the alkalis in the cement.

2.2.4 Reinforcement

2.2.4.1 Reinforcing Bars

ASTM A 706/A 706M, Grade 60; ASTM A 615/A 615M and ASTM A 617/A 617M, Grade 40; or ASTM A 616/A 616M, Grade 50.

2.2.5 Materials for Curing Concrete

2.2.5.1 Impervious Sheeting

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

2.2.5.2 Liquid Membrane-Forming Compound

ASTM C 309, white-pigmented, Type 2, Class B. Do not use where finished appearance is important. Only use where approved.

2.2.6 Vapor Barrier

ASTM D 4397 polyethylene sheeting, minimum 6 mil thickness.

2.2.7 Polyvinylchloride Waterstops

COE CRD-C-572.

PART 3 EXECUTION

3.1 FORMS

ACI 301. Set forms true to line and grade and make mortar-tight. Chamfer above grade exposed joints, edges, and external corners of concrete 3/4 inch, unless otherwise indicated. Before concrete placement, coat the contact surfaces of forms with a nonstaining form coating compound. Do not use mineral oil on formed surfaces to be painted. Prevent concrete damage during form removal.

3.2 PLACING REINFORCEMENT AND MISCELLANEOUS MATERIALS

ACI 301. Provide bars and other reinforcing materials, including wire ties, supports, and other devices necessary to install and secure the reinforcement.

### 3.2.1 Cover and Splicing

ACI 301, unless otherwise indicated.

### 3.2.2 Setting Miscellaneous Material

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

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

ACI 304R, except as modified herein. ASTM C 94; machine mix concrete and provide mandatory batch ticket information for each load of ready mix concrete. Begin mixing within 30 minutes after the cement has been added to the aggregates. Place concrete within 90 minutes of either addition of mixing water to cement and aggregates or addition of cement to aggregates if the air temperature is less than 85 degrees F. Reduce mixing time to 60 minutes if the air temperature is greater than 85 degrees F. Additional water may be added, provided that both the specified maximum slump and water-cement ratio are not exceeded. Do not place concrete when weather conditions prevent proper placement and consolidation; in uncovered areas during periods of precipitation; or in standing water. Prior to placing concrete, remove dirt, construction debris, and water from within the forms. Consolidate concrete slabs greater than 4 inches depth with high frequency, internal, mechanical vibrating equipment supplemented by hand spading and tamping. Consolidate concrete slabs 4 inches or less in depth by tamping, spading, and settling with a heavy leveling straight edge.

### 3.3.1 Hot Weather

ACI 305R. Concrete temperature from initial mixing through final cure shall not exceed 90 degrees F. Cool ingredients before mixing, or substitute chip ice for part of required mixing water or use other suitable means to control concrete temperature to prevent rapid drying of newly placed concrete. Shade the fresh concrete and start curing as soon as the surface of the fresh concrete is sufficiently hard to permit curing without damage.

## 3.4 SURFACE FINISHES

ACI 301 for repair and finish, unless otherwise specified.

### 3.4.1 Defects

Repair formed surfaces by removing minor honeycombs, pits greater than 1 square inch surface area or 0.25 inch maximum depth, or otherwise defective areas. Provide edges perpendicular to the surface and patch with nonshrink grout. Patch tie holes and defects when the forms are removed. Concrete with extensive honeycomb (including exposed steel reinforcement, cold joints, entrapped debris, separated aggregate, or other defects) which affect the serviceability or structural strength will be rejected, unless correction of defects is approved. Obtain approval

of corrective action prior to repair. The surface of the concrete shall not vary more than the allowable tolerances of ACI 301. Exposed surfaces shall be uniform in appearance and finished to a smooth form finish, unless otherwise specified.

### 3.5 MISCELLANEOUS CONSTRUCTION

#### 3.5.1 Pits and Trenches

Place bottoms and walls monolithically or provide waterstops and keys.

### 3.6 CURING AND PROTECTION

ACI 301. Protect concrete from injurious action by sun, rain, wind, flowing water, mechanical injury, tire marks, and oil stains. Do not allow concrete to dry out from time of placement until the expiration of the curing period. Forms may be removed 48 hours after concrete placement.

#### 3.6.1 Moist Curing

Provide for the removal of water without erosion or damage to the structure.

##### 3.6.1.1 Ponding or Immersion

Continually immerse the concrete throughout the curing period.

##### 3.6.1.2 Fog Spraying or Sprinkling

Provide uniform and continuous application of water throughout the curing period. For temperatures between 40 and 50 degrees F, increase the curing period by 50 percent.

#### 3.6.2 Impervious-Sheeting Curing

Wet the entire exposed surface thoroughly with a fine spray of water and cover with impervious sheeting throughout the curing period. Lay sheeting directly on the concrete surface and overlap edges 12 inches minimum. Provide sheeting not less than 18 inches wider than the concrete surface to be cured. Secure edges and transverse laps to form closed joints. Repair torn or damaged sheeting or provide new sheeting.

#### 3.6.3 Protection of Treated Surfaces

Prohibit foot and vehicular traffic and other sources of abrasion for not less than 72 hours after compound application. Maintain continuity of the coating for the entire curing period and immediately repair any damage.

#### 3.6.4 Curing Periods

Allow 7 days.

3.7 SAMPLING AND TESTING

3.7.1 Sampling

ASTM C 172. Collect samples of fresh concrete to perform tests specified.

3.7.2 Testing

3.7.2.1 Slump Tests

ASTM C 143. Take samples during concrete placement. The maximum slump may be increased as specified with the addition of an approved admixture provided that the water-cement ratio is not exceeded. Perform tests at commencement of concrete placement and for each batch (minimum) or every 10 cubic yards (maximum) of concrete.

-- End of Section --



40 CFR 263	Transporters of Hazardous Waste
40 CFR 264	Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 265	Interim Status Standard for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 266	Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities
40 CFR 280	Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks (USTs)
40 CFR 761	Polychlorinated Biphenols (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions.

## CORPS OF ENGINEERS (COE)

COE EM-385-1-1	1992 Safety and Health Requirements Manual
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## FEDERAL SPECIFICATIONS (FS)

FS TT-T-291	(Rev. F) (Am. 2) Thinner, Paint, Mineral Spirits, Regular and Odorless
FS O-D-1276	(Rev. B) Disinfectant-Detergent, General Purpose (Pine Oil)

## NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	1993 National Electrical Code
NFPA 306	1993 Control of Gas Hazards in Vessels

## NATIONAL INSTITUTE OF OCCUPATIONAL SAFETY AND HEALTH (NIOSH)

NIOSH 85-101	1990 NIOSH Certified Personnel Protective Equipment List
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## UNDERWRITERS LABORATORIES INC. (UL)

UL 844	1990 (R 1990) Electric Lighting Fixtures for Use in Hazardous (Classified) Locations
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## 1.2 SUBMITTALS

Submit the following in accordance with Section C, Part 7.0, of the Basic Contract.

1.2.1 SD-02, Manufacturer's Catalog Data

- a. Cleaning agents G
- b. Gasoline-oil-resisting rubber gloves and boots G
- c. Dermal protective equipment G
- d. Respiratory protective equipment G
- e. Disinfectant G
- f. Abrasive for blasting if it will be used G

Submit identification for the items by designated name, specification number, project contracting number, and intended use.

1.2.2 SD-06, Instructions

- a. Cleaning agents

Submit material safety data sheets for materials to be used at the job site, in accordance with 29 CFR 1910.1200.

1.2.3 SD-08, Statements

- a. Qualifications of Certified Industrial Hygienist (CIH) G
- b. Testing Laboratory G
- c. Safety Plan G
- d. Work Plan G
- e. Hazardous Waste Disposal Plan G
- f. Tank Certification of Safety G
- g. Training Certification G

1.2.3.1 Qualifications of Certified Industrial Hygienist (CIH)

Submit name, address, and telephone number of the CIH selected to perform responsibilities in paragraph entitled "CIH Responsibilities." Provide previous experience of the CIH. Submit proper documentation that the Industrial Hygienist is certified by the American Board of Industrial Hygiene in comprehensive practice, including certification number and date of certification/recertification. The CIH shall be familiar with the hazards involved in fuel systems work.

1.2.3.2 Testing Laboratory

Submit the name, address, and telephone number of the testing laboratory selected to perform the monitoring, testing, and reporting of airborne

concentrations of lead and other contaminants. Provide proper documentation that persons performing the analysis have been judged proficient by successful participation within the last year in the National Institute for Occupational Safety and Health (NIOSH) Proficiency Analytical Testing (PAT) Program. The laboratory shall be accredited by the American Industrial Hygiene Association (AIHA). Provide AIHA documentation along with date of accreditation/reaccreditation.

#### 1.2.3.3 Safety Plan

Submit a safety plan within 60 calendar days after contract award and 30 days prior to commencing work. The safety program shall be reviewed and approved by the NTR and the safety/health officer of the facility. The safety plan shall meet OSHA requirements and address the following:

- a. Identification and evaluation of the hazards and risks associated with each site being studied, including reproductive hazards and precautionary measures to be followed by workers for all hazards.
- b. Names and qualifications of each Contractor's representative in charge of the work and present at the job site when tank/tunnel cleaning and repair work will be performed.
- c. Identification of supervisory personnel and alternates responsible for site safety/response operations.
- d. Determination of levels of personal protection to be worn for various site operations.
- e. List of equipment with adequate nomenclature by item, that will be used at the job site and the date and location where this equipment can be inspected by the NTR.
- f. Establishment of work zones (exclusion area, contamination area, and support area).
- g. Establishment of a tank entry and work permit program in accordance with 29 CFR 1910.146 and COE EM-385-1-1.
- h. Establishment of decontamination methods and procedures.
- i. Determination of the number of people required to enter the contamination zones during the initial entries and subsequent operations.
- j. Establishment of emergency procedures, such as: escape routes, fire protection, signals for withdrawing work parties from site, emergency communications, wind indicators, including Navy notification.
- k. Identification and arrangements with nearest medical facility for emergency medical care for both routine-type injuries and toxicological problems. Submit name, location, and telephone number of this medical facility.

- l. Establishment of continual air and personnel monitoring procedures.
- m. Establishment of procedures for obtaining and handling potentially contaminated samples.
- n. Identification of medical monitoring program, including respirator medical qualification examination for each individual at the work site.
- o. Identification of training plan to be instituted, including contents of 29 CFR 1910.1200 and 29 CFR 1910.134; its training contents; and instructor with appropriate training certification. Training plan shall also include counseling to each employee on reproductive hazards.
- p. Establishment of a respiratory protection program conforming to 29 CFR 1910.134 and ANSI Z88.2.
- q. Establishment of a hazard communication program (29 CFR 1910.1200).

#### 1.2.3.4 Work Plan

The shut down or interruption to normal operations or traffic shall be listed on the progress schedule and submitted to the NTR.

#### 1.2.3.5 Hazardous Waste Disposal Plan

Prepare a Hazardous Waste Disposal Plan and submit within 45 calendar days after contract award for approval by the NTR, or if there are no hazardous wastes indicated by Government tests, submit the plan 21 days after the Contractor's tests indicate hazardous wastes. The Hazardous Waste Disposal Plan shall comply with applicable requirements of Federal, State, and local hazardous waste regulations and shall address the following:

- a. Identification of hazardous wastes associated with the work, including a sampling and testing plan, the purpose of each test, and the rationale for evaluating the test results. Indicate the representative sampling and specific testing methods, number of samples, and the names and qualifications of the testing laboratory.
- b. Estimated quantities of waste to be disposed in the cleaning of each tank and tunnel and a description of arrangements made for storage and disposal.
- c. Names and qualifications of each Contractor that will be transporting, storing, treating, and disposing of the wastes. Include the facility location and a 24-hour point of contact. Furnish two copies of EPA Identification numbers.
- d. Names and qualifications (experience and training) of personnel who will be working on-site with hazardous wastes.

- e. List of waste handling equipment to be used in performing the work, to include cleaning, treatment, volume reduction, and transport equipment.
- f. Spill prevention, containment, and cleanup contingency measures to be implemented.
- g. Work plan and schedule for waste removal and disposal.
- h. Cost for hazardous waste disposal according to this plan.

1.2.3.6 Tank Certification of Safety

Submit certification, from an NFPA certified CIH stating that the underground storage tanks are safe for hot work and that special precautionary measures have been taken for workers to enter the tanks to perform the work.

1.2.3.7 Training Certification

Submit certifications signed and dated by the CIH specified in the testing plan and by each employee stating that the employee has received training on work practices and received counseling on and fully understands the reproductive hazards involved with lead exposure and the work.

1.2.4 SD-10, Test Reports

- a. Tank and tunnel contents tests G

1.2.4.1 Required Test Reports

Submit contractor's independent tests of tank and tunnel contents (water and sludge).

1.2.5 SD-12, Field Test Reports

- a. Monitoring Results G

1.2.5.1 Air Monitoring

Submit monitoring results to the NTR within 2 working days after the samples are taken, signed by the testing laboratory employee performing the air monitoring, the employee that analyzed the sample, and the CIH.

1.2.6 SD-18, Records

- a. Safety permits

Submit copies of permits required to comply with local, Commonwealth, and Federal regulations.

1.2.6.1 Hazardous Waste Permits

Submit copies of EPA, Commonwealth and local hazardous waste permits and EPA Identification numbers of the transporter, treatment, storage and

disposal facility that will be accepting hazardous waste. Include the facility location and a 24-hour point of contact.

#### 1.2.6.2 Non-Hazardous Waste Permits

Submit EPA state local permits for disposal site for non-hazardous residues and wastes.

### 1.3 DEFINITIONS

#### 1.3.1 Certified Industrial Hygienist (CIH)

As used in this section, refers to an Industrial Hygienist employed by the Contractor and certified by the American Board of Industrial Hygiene in comprehensive practice.

#### 1.3.2 Hazardous Areas

Hazardous areas shall be defined as any area within the underground storage tanks.

#### 1.3.3 Hot Work Operations

Hot work, for work covered by this section, includes: flame heating, welding, torch cutting, brazing, carbon arc gouging, or any work which produces heat, by any means, of 400 degrees F or more; or in the presence of flammables or flammable atmospheres, other ignition sources such as spark or arc producing tools (except steel hand tools) or equipment, static discharges, friction, impact, open flames or embers, nonexplosion-proof lights, fixtures, motors or equipment.

#### 1.3.4 Personal Monitoring

Sampling of lead concentrations within the breathing zone of an employee to determine the 8-hour time weighted average concentration in accordance with 29 CFR 1910.1025. Samples shall be representative of the employee's work tasks. Breathing zone shall be considered an area within a hemisphere, forward of the shoulders, with a radius of 6 to 9 inches and the center at the nose or mouth of an employee.

#### 1.3.5 Reproductive Hazard

A reproductive hazard is defined as any occupational stressor (biological, chemical, or physical) that has the potential to adversely affect the human reproductive process. For example, it is well known that central nervous system problems often occur in the offspring of mothers exposed to organic mercury during pregnancy. Therefore, based on the example cited, organic mercury can be classified as a reproductive stressor. Many reproductive hazards also cause other adverse health effects; for example, ethylene oxide is also known to be a carcinogen (i.e., produces cancer). Certain reproductive stressors can also have adverse effects on the male reproductive system. (If requested by the Contractor, the Contracting Officer will make available the Navy's standard on reproductive hazards.)

#### 1.4 QUALITY ASSURANCE

##### 1.4.1 Modification of References

Except as modified herein, the work shall conform with the recommendations of API RP 500, API RP 2003, and API PUBL 2015. Where the word "should" appears in these publications, substitute "shall."

##### 1.4.2 Copies of Standards

Furnish four copies of API RP 500 , API RP 2003, and API PUBL 2015.

##### 1.4.3 Safety Permits and Equipment

Acquire safety permits (specified by the facility safety authorities) and necessary safety equipment.

##### 1.4.4 Regulatory Requirements

- a. Obtain permits required to comply with local, Commonwealth, and Federal regulations.
- b. Hazardous wastes, such as sludge, shall be packaged, labeled, stored, transported, treated and disposed of in accordance with 40 CFR 260 through 40 CFR 266 and Commonwealth and local regulations. Transporters, sorters, treaters and disposers must be certified and have EPA ID numbers. Payment for disposal of hazardous waste will not be made until a completed hazardous waste manifest from the treatment or disposal facility is returned, and a copy furnished to the Government.

##### 1.4.5 CIH Responsibilities

- a. Certify training.
- b. Review and approve safety plans and work plan for conformance to the applicable referenced standards.
- c. Inspect tank and tunnel cleaning work for conformance with the approved safety and work plans.
- d. Direct monitoring.
- e. Ensure work is performed in strict accordance with specifications at all times.
- f. Ensure hazardous exposure to personnel and to the environment are adequately controlled at all times.

##### 1.4.6 Training

Train each employee performing tank cleaning, waste disposal, and air sampling operations prior to the time of initial job assignment, in accordance with API PUBL 2015, 29 CFR 1910.120, 29 CFR

1910.134, 29 CFR 1910.1025, and 29 CFR 1910.1200. The training shall also include counseling of each employee on reproductive hazards involved in the work.

#### 1.4.7 Respiratory Protection Program

- a. Furnish each employee required to wear a negative pressure respirator or other appropriate type with a respirator fit test at the time of initial fitting and at least every 6 months thereafter as required by 29 CFR 1910.1025 where lead exposure is involved. Fit testing is not required for positive pressure respirators.
- b. Establish and implement a respiratory protection program as required by ANSI Z88.2, 29 CFR 1910.134, and 29 CFR 1926.55. Also comply with 29 CFR 1910.1025 when exposure to lead is involved.

#### 1.4.8 Pre-Construction Conference

Along with the CIH or gas-free engineer, meet with the NTR to discuss in detail the tank and tunnel cleaning work plan, including work procedures and precautions for the work plan.

#### 1.5 DELIVERY AND STORAGE

Deliver equipment and materials to the site in an undamaged condition bearing the manufacturer's name and brand designation. Store equipment and materials off the ground to provide proper ventilation, drainage, and protection against dampness. Replace defective and damaged equipment and materials.

#### 1.6 JOB CONDITIONS

##### 1.6.1 Ventilation

Maintain a vapor-free condition throughout the course of the work inside the tanks. The air movers shall be non-sparking, explosion-proof, electrically operated or air-driven exhaust type. A rate of one air change per hour shall be the lowest acceptable rate, for tanks under 30,000 BBL. For tanks greater than 30,000 BBL, use 10,000 cfm. Air movers shall be kept in operation whenever workers are in the tanks; except the air movers shall be shut down 15 minutes before taking tests.

#### 1.7 SCHEDULING AND SEQUENCING

##### 1.7.1 Sequence of Primary Phases of the Cleaning Procedure

- a. Planning the operations
- b. Preparation for cleaning
- c. Vapor-freeing of the underground storage tanks

- d. Cleaning the tanks and tunnels
- e. Clean-up, residue disposal, inspection, and acceptance.

#### 1.7.2 General Scheduling

Complete the work specified in this section before any other work in the tanks or tunnels is started. The work includes the complete interior cleaning of the tanks and tunnels.

### PART 2 PRODUCTS

#### 2.1 MATERIALS

##### 2.1.1 Cleaning Devices

- a. For the tanks, approved commercial devices
- b. For the tunnels, an approved commercial device capable of remote cleaning

##### 2.1.2 Cleaning Agents

The cleaning agents shall be capable of removing the contaminated materials from the concrete surfaces of the tanks and tunnels. If any of the following agents are used, the specifications listed shall be met.

- a. Detergent: FS O-D-1276.
- b. Solvent: FS TT-T-219, Type II, minimum flashpoint of 60 degrees C.
- c. Approved commercial cleaning agent.
- d. Abrasive for blasting: Provide sharp, washed, salt-free, angular abrasive material, free from feldspar and other constituents that tend to break down and remain on the surface. Abrasive shall not contain magnetic materials and shall conform to MIL-A-22262.

#### 2.2 EQUIPMENT

Furnish necessary clothing and equipment for the work and protection of people cleaning the tanks and tunnels. Electrical equipment and wiring shall be in accordance with NFPA 70, Class 1, Group D, Division 1. Provide any item or items for the protection of these people including but not limited to the following:

- a. Gasoline-Oil-Resisting Rubber Gloves and Boots: Gauntlet type and conductive type respectively (acid-proof rubber is an acceptable material); furnished for each person entering or working inside the tank or handling materials on the exterior of the tank, plus one extra pair each for emergency use.
- b. Dermal Protective Equipment: Light colored; two changes per person per day, capable of protecting personnel from dermal

exposure to tank contents.

- c. **Respiratory Protection:** For personnel working outside the tanks and tunnels, the CIH shall specify respiratory protection that is required. For each person working inside the tanks provide one of the following types of NIOSH-approved respiratory protective equipment for each person, plus one extra for emergency use. NIOSH 85-101 listing constitutes NIOSH approval.
- (1) Self-contained breathing apparatus with a full facepiece operated in a positive pressure mode.
  - (2) A combination respirator which includes a Type C supplied-air respirator which a full facepiece operated in a positive pressure mode and an auxiliary positive pressure self-contained breathing apparatus. Provide and use two-way communication equipment when cleaning underground tanks.
  - (3) The CIH may specify airline (Type C) respirator in place of those specified above; however, the decision shall be based on the results of personal monitoring.
  - (4) Use Type CE respirator for abrasive blasting inside the tank.
- d. **Safety Harness:** For each person working inside tanks, plus one extra for outside the tanks.
- e. **One half Inch Diameter Life Rope of Required Length:** For each person working inside the tanks.
- f. **Breathing-Air Supply Source:** 29 CFR 1910.134.
- g. **Combustible Gas Indicator ,Lead-in-Air Analyzer , Hydrogen-Sulfide (H<sub>2</sub>S) Indicator , Benzene Indicator and Oxygen Meter.** Recommend a portable gas chromatograph or other more accurate instrument for the benzene indicator.
- h. **Shovels, Buckets, Brooms, Wrenches, Scrapers, Squeegees, Wire Brushes, Scrub-Brushes, Ladders, Staging, and Other Tools:** Do not use brooms or brushes that have plastic or synthetic bristles.
- i. **Lighting for Tank Interiors:** UL 844, explosion-proof, minimum 50 footcandle, floodlight type, or Mining Enforcement and Safety Administration (MESA) approved, explosion-proof, portable battery-powered light.
- j. **Air Movers for Tank Ventilation:** Explosion proof electrically operated or air driven. Nonferrous fan blades. Use velometers for measuring velocity.
- k. **Disinfectant for Cleaning Face Masks:** Cleaner-sanitizer for cleaning and disinfecting respirator facepieces as specified in ANSI Z88.2.
- l. **Soap for Personnel Washing:** Non-phosphate type.

- m. A.B.C. Fire Extinguishers: UL listed 2A: 40B: C, 2A: 20B: C, or 4A: 30B: C; minimum 15 pound capacity.
- n. First Aid Kit: One 16-unit kit for each 25 persons.

### PART 3 EXECUTION

#### 3.1 PROJECT CONDITIONS

##### 3.1.1 Permission for Each Entry Into a Tank

Obtain written permission from the NTR prior to each entry into a tank. Permission will be granted only under the following conditions:

- a. The Contractor's qualified supervisor is present.
- b. The Contractor's personnel have been briefed by the supervisor on the procedure and role of each employee in the event of an emergency.
- c. Required equipment is approved and properly located.
- d. Personnel are properly equipped with properly fitted protective equipment and have received adequate training from a qualified instructor.
- e. The entire area adjacent to the tank is secured.
- f. A minimum of two persons outside and two or more persons inside of each tank are provided at all times during cleaning operations.
- g. Tank air is monitored and corrective action is taken to ensure that the vapor concentration is less than 10 percent of the lower flammable limit (LFL) , lead-in-air is less than 0.050 milligrams per cubic meter , hydrogen sulfide is less than 10 ppm permissible exposure level (PEL) , benzene is less than one ppm PEL and oxygen content is a minimum of 19.5 percent.
- h. An NFPA certified "Marine Chemist" or CIH has certified that the tank is safe for hot work, and that the required special precautionary measures have been taken due to the potential health hazard to the worker that still exists, even when the vapor concentration is well below the LFL. The Contractor shall be responsible for reviewing the record drawing(s) of the tank to be cleaned.
- i. People entering the area leave smoking materials such as cigarettes and flame-producing devices at a previously determined location.
- j. When work involves handling and disposal of hazardous waste, the Contractor has a copy of 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, 40 CFR 265, and 40 CFR 266 in his possession.

- k. Permit only personnel authorized in the safety plan within 100 feet of the tank perimeter.

### 3.1.2 Traffic Control

Direct traffic a minimum of 200 feet away from the tank and tunnel cleaning areas. Set up road blocks and warning signs. Do not operate vehicles in hazardous areas.

### 3.1.3 Miscellaneous

Ensure that the manufacturers have labelled containers holding products involving hazards in use or storage, in accordance with 29 CFR 1910.1200. Label containers used to store, transport, or dispose of hazardous waste in accordance with 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, 40 CFR 265, 40 CFR 266, 40 CFR 761 and Commonwealth regulations. Remove small objects of ferrous metal within the working areas to prevent the accidental striking of a spark. Place equipment upwind of tank and tunnel openings at highest elevation possible; do not place in a spot lower than the surrounding terrain. Review drawings of the tanks and tunnels to be cleaned and brief workers on the location of pits, sumps, piping, or other appurtenances which could be hazardous to personnel. Provide floodlights to illuminate the work area without the need for battery operated handlights. Provide scaffolding, platforms, and ladders for secure, safe accessibility to tank surfaces. Install electrical equipment in accordance with API RP 500. Provide floodlights to illuminate the work area without the need for battery operated handlights. Do not use artificial lights inside tank until the tank is vapor-free.

#### 3.1.3.1 Grounding and Bonding for Equipment

Provide grounding and bonding for equipment which may generate static electricity, including air hose to sandblast nozzle. Do not pass the air hose through an area where flammable vapors may exist.

#### 3.1.3.2 Fire Extinguishers

Furnish two carbon-dioxide fire extinguishers of minimum 15 pounds capacity each, in the immediate vicinity of the work. Provide a continuous fire watch. CAUTION: Do not discharge high pressure carbon dioxide extinguishers where explosive vapors exist since the discharge can cause a spark which will ignite the vapors.

#### 3.1.3.3 Disconnection Pipelines

Disconnect pipelines connected to the tank. Insert a solid-plate blind flange between two flanges near the tank, or remove a valve or piece of pipe and install a blind flange to prevent flammable material from entering the tank. For underground tanks where connected pipelines are buried, blind off the pipelines at the nearest valve box. Blind flanges shall be of sufficient strength to withstand pressure which might be exerted by the material being blanked off, and shall be gasketed on both sides if blind flange is inserted between two flanges. CAUTION: Do not disconnect piping or valves until it is certain the line has been emptied of fuel.

### 3.1.3.4 Removal of Ignition Sources

Remove sources of ignition from the cleaning area. Do not permit ignition producing devices, including matches, lighters or cigarettes, within 100 feet upwind and 200 feet downwind of a tank or tunnel opening, or inside the tank farm, or within the tank firewall, whichever is farther.

### 3.1.3.5 Survey of Hazardous Areas

Carefully survey the entire area around the tanks and tunnels to be cleaned to ensure that there are no vapors present in the pit, low places, or hazardous areas and that all unauthorized personnel are cleared from the area. Ensure that there is no possibility of anyone smoking in the immediate vicinity. Hazardous areas are defined as follows:

- a. Interior of tanks and tunnels
- b. Areas within 100 feet from points having flammable vapor emissions which, for example, are from the exhaust manholes of tanks and tunnels under repair, open vents or pressure vacuum vents (breather valves) of active tanks or tunnels in the vicinity of tanks or tunnels under repairs or cleaning. CAUTION: Allowance shall be made for 4 or more miles per hour winds by increasing the size of the hazardous area to a minimum of 200 feet on the downward side.

### 3.1.3.6 Exit from a Tank During Emergencies

To permit quick, free exit from a tank during emergencies, keep the area around the tank openings and emergency routes clear of obstructions.

## 3.2 INSPECTION

### 3.2.1 Inspection of Equipment

#### 3.2.1.1 Respirators

Respirator users shall inspect their respirators in strict accordance with the instructions provided by the manufacturer.

#### 3.2.1.2 Air Hose from Breathing-Air Supply

If air line respirators are used, ensure that:

- a. There are no breaks in outside covering;
- b. Condition of gaskets is good;
- c. Connections are tight; and
- d. There are no restrictions in the hose.

3.2.1.3 Safety Harness and Life Line

Ensure that:

- a. There is no frayed or weak material; and
- b. Condition of harness is good.

3.2.1.4 Breathing-Air Supply Source

Ensure:

- a. Good working condition; and
- b. Location in vapor-free area.
- c. Compliance with 29 CFR 1910.134 for breathing air quality, frequency of air analysis, and presence of safety devices.
- d. Backup air supply source.

3.2.1.5 Monitoring Equipment

Calibrate each day before use:

- a. Combustible gas indicator
- b. Oxygen meter
- c. H<sub>2</sub>S Indicator
- d. Lead-in-Air Analyzer

3.2.1.6 Other Equipment

Ensure:

- a. Proper grounding and bonding;
- b. Explosion-proof motors; and
- c. Explosion-proof lighting.

3.2.2 Personnel Inspection

3.2.2.1 Clothing

Personnel for Proper Attire Commensurate with Hazards Involved: Check for:

- a. Clean clothing in good condition (wear freshly laundered clothing at the beginning of the job and at the start of each workday thereafter).
- b. Boots and gloves of approved type and in good condition.

## 3.2.2.2 Breathing-Air Supply

If air line respirators are used, ensure that air is supplied to the facepiece at a rate of 4 to 15 cfm. If self-contained breathing apparatus are use, ensure sufficient number of full replacement cylinders are available to last the duration of the job.

## 3.2.2.3 Harness and Lifeline

Harness and lifeline shall be in good condition and properly attached.

## 3.2.2.4 Gum or Tobacco Chewing

Ensure that gum or tobacco chewing is prohibited.

## 3.2.2.5 Physical Defects or Injuries

Ensure that people have no physical defects or injuries which may prevent their wearing respirators or which may cause rescue to be difficult. No beards, sideburns, or large mustaches shall be allowed on people who must wear respirators.

## 3.2.2.6 Alcoholic Beverages and Drugs

Ensure that people entering the tank are not under influence of alcoholic beverages and drugs.

## 3.2.2.7 Counseling on Reproductive Hazards

Ensure that all employees have been counseled on and fully understand the reproductive hazards related to work in contaminated areas or in leaded gasoline or chemically contaminated tanks since they may be seriously affected by organic lead compounds or other chemical contaminants.

## 3.2.2.8 Hazardous Areas

Check hazardous areas as defined in paragraph entitled "Survey of Hazardous Areas."

## 3.3 TABLE OF TANK HISTORY

Tank Number	Tank Location	Tank Capacity	Date Constructed	Type of Lining (If Applicable)	Type of Fuel	Remarks from the Last Inspection
1	East Side of Building 38	50,000	early 1940s	unknown	Bunker C	Completely filled with water. Thick petroleum sludge

Tank Number	Tank Location	Tank Capacity	Date Constructed	Type of Lining (If Applicable)	Type of Fuel	Remarks from the Last Inspection
2	East Side of Building 38	50,000	early 1940s	unknown	Bunker C	Completely filled with water. Thick petroleum sludge

### 3.4 FUEL REMOVAL

All possible Bunker C fuel will be pumped or otherwise removed from the tanks and tunnels by the Contractor. Treat and/or dispose of remaining fuel emulsions in accordance with applicable local, Commonwealth, and Federal regulations. Drums or tanks used for containerizing waste fuel will be furnished by the Contractor. Treatment unit for fuel separation will be furnished by the Contractor.

### 3.5 IDENTIFICATION OF TANKS WITH HAZARDOUS WASTE SLUDGES AND RESIDUES

The following tanks are known or suspected to contain hazardous wastes:

Tank No.	Product	Hazardous Waste, Status, Type and Basis-known or suspect
1	Bunker C	PCB laden transformer oil
2	Bunker C	PCB laden transformer oil

### 3.6 TANK AND TUNNEL CLEANING

For the interior of the tanks, the shell, bottom, columns, roof, roof beams, and interior accessory equipment such as pumps, piping, and ladders, shall be cleaned to the sound surface of the lining or coating, free of rust, dirt, scale, loose materials, fuel, oil, grease, sludge, and other deleterious materials. Do not damage sound existing lining material. Remove unsound or loose lining or coating and clean the surfaces exposed thereby to bare metal or concrete as applicable. Immediately notify the NTR if the lining or coating is deteriorated or loose.

For the tunnels, the entire interior shall be cleaned free of rust, dirt, scale, loose materials, fuel, oil, grease, sludge, and other deleterious materials.

#### 3.6.1 Monitoring

Monitoring of airborne concentrations of lead shall be in accordance with 29 CFR 1910.1025 of benzene in accordance with 29 CFR 1910.1028, and as specified herein. Air monitoring, testing, and reporting shall be performed by a CIH or an Industrial Hygiene (IH) Technician who is under

the direction of the CIH.

- a. The CIH or the IH Technician under the direction of the CIH shall be on the jobsite directing the monitoring, and inspecting the work to ensure that the requirements of the Contract have been satisfied during the entire operation.
- b. Take personal air monitoring samples on employees who are anticipated to have the greatest risk of exposure as determined by the CIH. In addition, take air monitoring samples on at least 25 percent of the work crew or a minimum of two employees, whichever is greater, during each work shift.
- c. Submit results of air monitoring samples, signed by the CIH, within 2 working days after the air samples are taken. Notify the NTR immediately of exposure to lead at or in excess of the action level of 30 micrograms per cubic meter of air outside of the lead control area, and 0.5 ppm for benzene.

#### 3.6.1.1 Monitoring During Tank and Tunnel Cleaning Work

Perform personal and area monitoring during the entire tank and tunnel cleaning operation. Sufficient area monitoring shall be conducted at the physical boundary to ensure unprotected personnel are not exposed above 30 micrograms per cubic meter of air for lead and 0.5 ppm for benzene at all times. If the outside boundary lead levels are at or exceed 30 micrograms per cubic meter of air or the benzene levels are at or exceed 0.5 ppm, work shall be stopped and the CIH shall immediately correct the condition(s) causing the increased levels and notify the NTR immediately. The CIH shall review the sampling data collected on that day to determine if the condition(s) requires any further change in work methods. Tank cleaning work shall resume when approval is given by the CIH. The Contractor shall control the lead level outside of the work boundary to less than 30 micrograms per cubic meter of air and the benzene levels to less than 0.5 ppm at all times. As a minimum, conduct area monitoring daily on each shift in which tank cleaning operations are performed in areas immediately adjacent to the control area. For outdoor operations, at least one sample on each shift shall be taken on the downwind side of the control area. If adjacent areas are contaminated, clean and visually inspect contaminated areas. The CIH shall certify that the area has been cleaned of contamination.

#### 3.6.2 Lead Hazard Personnel Safety

Due to the potential lead hazard (inorganic and organic (TEL)) associated with the tanks and tunnels, comply with API PUBL 2015, and the applicable rules and regulations of the Commonwealth of Puerto Rico and Federal Occupational Safety and Health Standards. If there is conflict among the API Publications, Commonwealth, and Federal regulations; the most stringent criteria shall apply. Ensure that the requirements for protective clothing and equipment, monitoring to determine exposure levels, and all other relevant controls are complied with. Ensure that employees are counseled on the reproductive hazards associated with lead.

### 3.6.3 Precautions for Airborne Lead

The Contractor shall, in accordance with API PUBL 2015, ensure that the workers inside the tank wear the appropriate protective clothing and respiratory equipment as prescribed by API PUBL 2015 for the duration of the tank cleaning. Use only the types of respirators specified for "Respiratory Protection" under the paragraph titled "Equipment." After completion of the cleaning operation, the Contractor has the option of allowing people to enter the tank without respiratory protective equipment, only after a lead-in-air analysis has been obtained in accordance with API PUBL 2015.

### 3.6.4 PCB Hazard Personnel Safety

Mobilization of PCBs to air, soil, or water from disposal sites is a source of potential exposure. Skin irritations and liver effects have been reported with high levels of exposure to PCBs in workers. But there is insufficient evidence in humans that exposure to PCBs increased the incidence of cancer. OSHA does not regulate PCBs as a carcinogen, but has set workplace exposure limits to protect workers from harmful health effects.

### 3.6.5 Liquids Removal and Disposal

Pump or otherwise remove liquids from the tanks and tunnels. Ensure that sludge is not pumped out or mixed with the liquids. Hazardous water and cleaning and rinse waters shall be transported, treated, and disposed of in accordance with 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, 40 CFR 265, and 40 CFR 266.

### 3.6.6 Sludge Removal and Disposal

Squeegee or brush any sludge, sediment, or other loose material into piles, shovel into buckets or other suitable containers, and remove from the tank.

#### 3.6.6.1 Sludge Disposal

Hazardous sludge in the tank shall be disposed of by the Contractor. Package, label, store, transport, treat, and dispose of hazardous sludge and sediment in accordance with 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, 40 CFR 265, and 40 CFR 266.

### 3.6.7 Washing

After water, fuel, and sludge have been removed, thoroughly wash the tank and tunnel interiors. Minimize the use of water; substitute brush blasting when practical. Start washing at the top of the walls and columns and work down to the floor. Wash the floor last starting from the sides and working towards sumps. In the tunnels, start washing at the highest elevation and move down the tunnel slope. Wash to remove oil, sludge, wax, tar, and other fuel residue adhering to the surface. Wash by any one or a combination of the following methods:

- a. Apply a detergent conforming to FS O-D-1276 by spray or brush.

- b. Apply a detergent cleaning solution by spray or brush and allow to soak approximately 30 minutes. The cleaning solution shall be either a one-to-one ratio of detergent conforming to FS O-D-1276 and solvent conforming to FS TT-T-291 or an equivalent commercial cleaning agent as approved by the Contracting Officer.
- c. Scrub the surfaces vigorously with long-handled stiff-bristle brushes. Wet the brushes intermittently with fresh cleaning agent during scrubbing process. For heavily oil-soaked areas which still appear to retain some residue after first scrubbing, give a second application of cleaning agent and repeat the scrub process a second time. Scrub until clean.
- d. Rinse the surfaces thoroughly with fresh water.
- e. Brush-off blast clean.

#### 3.6.8 Wash Water, Detergent Solution, and Sludge Removal

During the washing process, operate a portable pump continuously with suction hose extended to the tank bottom to remove water, detergent, dirt, oil, or other loose materials washed off. Following the final tank rinsing, pump, squeegee, and mop the tanks dry.

- a. The wash fluids shall be transported for treatment to the on-site treatment plant.
- b. For bidding purposes, assume that the sludge is hazardous and must be disposed of off-island at an approved facility. The hazardous sludge must be handled in accordance with the paragraph entitled "Sludge Removal and Disposal."

#### 3.6.9 Removal of Scale and Other Tenaciously Adhering Materials

After sandblasting, clean the entire tanks and tunnel interior surfaces. Remove loose materials from the tank and tunnel interiors.

#### 3.6.10 Disposal of Used Blasting Abrasive

If applicable, test used abrasive in accordance with 40 CFR 261 to determine if it is a hazardous waste using the EP toxicity test for metals. Handle and dispose of abrasive determined to be hazardous waste in accordance with 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, 40 CFR 265, and 40 CFR 266. Dispose of abrasive which is not hazardous waste at a landfill off Government property in accordance with applicable regulations. The contract price will be adjusted if the used abrasive is determined to be hazardous waste. However, payment for disposal of hazardous waste will not be made until a completed manifest from the treatment or disposal facility is returned, and a copy furnished to the Government.

3.6.11 Visual Inspection

After cleaning the tanks and tunnels, visually inspect the cleaned surfaces. Log the appearance of the surfaces and the locations of cracks or holes that are encountered.

3.6.12 Sealing Cracks

With an approved sealing material, seal cracks and holes that have been visually identified.

3.6.13 Lead-Hazard-Free Tests

In accordance with API PUBL 2015, use lead-in-air tests to make sure that the tanks are lead-hazard-free (CAUTION: Never take lead-hazard-free tests before or during cleaning, only after).

3.7 FINAL CLEAN-UP

After the NTR has inspected and accepted the tank and tunnel cleaning and before final inspection, accomplish the following work:

3.7.1 Stenciling Tanks

Stencil on the tanks in 3/4 inch letters adjacent to the manhole openings the following data:

Date Cleaned - \_\_\_\_\_  
Contractor Name - \_\_\_\_\_  
Address - \_\_\_\_\_

3.7.2 Restoration of Site to Original Condition

Backfill tanks and manholes, and install cover on pump pit as indicated in Section 03302. Remove from the site debris, equipment and materials used for the cleaning operations. Restore the site to its original condition.

-- End of Section --