

RAC DESIGN PACKAGE

DEEP ZONE BIO-SPARGE SYSTEM

**BUILDING 645
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA**

**NAVY CONTRACT NO. N62470-05-D-6200
DELIVERY ORDER NO. 0054
CATLIN PROJECT NO. 208-018**

AUGUST 14, 2009

PREPARED BY:

**CATLIN Engineers and Scientists
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CORPORATE LICENSURE NO. FOR ENGINEERING SERVICES C-0585

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BUILDING 645
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA
AUGUST 14, 2009

1.0 INTRODUCTION

The RAC Design Package (Draft Submittal) has been prepared in general accordance with the Corrective Action Plan (CAP) Supplement Report prepared by CATLIN Engineers and Scientists (CATLIN) dated September 8, 2008 and the guidelines set forth in the Professional Services Guide published by the Atlantic Division, Naval Facilities Engineering Command in July 2002. The purpose of this Deep Zone Bio-sparge System design is to address the presence of dissolved phase petroleum contamination within the deep zone (60' to 90') below land surface (BLS) at the former Building 645 project site. The design generally consists of the installation of five bio-sparge wells to a depth of 90 feet BLS and header piping for each well.

2.0 BASIS OF DESIGN

The Basis of Design is a supplemental document to the RAC Design Package, with the purpose of presenting all the assumptions and design criteria upon which the proposed Deep Zone Bio-sparge System design are based. The document is divided into three basic sub-sections, intended to address all engineering disciplines relevant to this design. The civil design basis includes all general construction and equipment design calculations, and the physical data upon which all assumptions are based. The environmental design basis addresses all relevant environmental considerations, such as environmental permitting and waste streams resulting from implementation of the design. Finally, the geotechnical design basis discusses site geological conditions and any considerations pertaining to groundwater flow and elevation.

Design calculations are presented within the Basis of Design. The Deep Zone Bio-sparge System will utilize equipment from the existing air sparge/soil vapor extraction (AS/SVE) system. Required air flow and header pipe design calculations are covered within the Civil Basis of Design. No calculations are applicable for the Environmental Basis of Design. All applicable geotechnical design calculations have been adequately covered in other sections; therefore, calculations were not necessary for the preparation of the Geotechnical Basis of Design. The Basis of Design for the Building 645 Deep Zone Bio-sparge System has been

included in Appendix A.

3.0 PROJECT SPECIFICATIONS

The Project Specifications for the Building 645 RAC Design Package are comprised of the General Requirements (Division 01), Site Construction (Division 02) and Concrete (Division 3). These divisions and their subdivisions are intended to encompass the entire scope of the project.

The Project Specifications have been included as Appendix B of this document.

4.0 PROJECT COST ESTIMATE

A project cost estimate has been prepared for the Deep Zone Bio-sparg System at Building 645. The estimate was prepared using the US Cost SUCCESS program recommended in the Professional Services Guide, dated July 2002 and the RS Means Environmental Cost Data-Unit Price Guide and the RS Means Heavy Construction Cost Data Guide. The cost estimate has been assembled using the required Work Breakdown Structure (WBS) format and has been broken down into individual specification sections under the Base Bid

The project cost estimate has been included as Appendix C.

5.0 CONSTRUCTION DRAWINGS

The construction drawings are intended to display to the extent possible, site conditions with regards to the proposed Deep Zone Bio-sparg System. The drawings consist of a site vicinity map, bio-sparg system layout, and bio-sparg system details.

Preliminary construction drawings have been included as Appendix D.

APPENDIX A

BASIS OF DESIGN

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DEEP ZONE BIO-SPARGE SYSTEM

BUILDING 645
MARINE CORPS BASE
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BASIS OF DESIGN
DEEP ZONE BIO-SPARGE SYSTEM
BUILDING 645
MAREINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA
AUGUST 14, 2009

1.0 DESIGN BASIS

For this project, the Basis of Design will focus on reducing the dissolved phase petroleum contamination within the deep zone (60' to 90' below land surface) (BLS) at the former Building 645 project site. Currently, an Air Sparge/Soil Vapor Extraction (AS/SVE) system is utilized onsite to reduce the shallow zone dissolved phase petroleum constituents and deep zone dissolved phase contamination in the source area. The system has been successful in remediating the shallow and deep zone source areas; however, the dissolved plume in the deep zone has migrated beyond the existing remedial system network to the northeast and southeast. To address the migrating dissolved phase petroleum contamination, five (5) bio-sparge wells will be installed and incorporated into the existing AS system.

Based on the Corrective Action Plan Supplement, the 2008 Annual Monitoring Report (prepared by Sovereign) and the most recent sampling event in October 2008, dissolved phase petroleum contamination in the shallow zone has been essentially remediated to below the 2L GWQS. One well, UST645-MW-02, in October 2008 had minor concentrations of carbon tetrachloride (0.5 ug/L), p-dichlorobenzene (1.7 ug/L), and tetrachloroethylene (2.9 ug/L). Therefore, it is recommended that the shallow zone sparging system be shut down. The existing deep zone sparge wells along with the existing SVE system should remain active. The shallow zone air sparge capacity should be utilized for the deep zone biosparging across Brewster Boulevard.

The Building 645 project site is located on Brewster Boulevard near its intersection with Holcomb Boulevard aboard the MCB Camp Lejeune, North Carolina. The site consists of the area surrounding former Building 645. This design is being prepared in general agreement with the recommendations presented in the Corrective Action Plan (CAP) Supplement prepared by CATLIN Engineers & Scientists (CATLIN) and dated September 8, 2008. The Basis of Design is a detailed presentation of the facts, organized by the disciplines identified by the Professional Services Guide Document, dated July 2002, published by the Atlantic Division, Naval Facilities Engineering Command, and serves as a reference for the Deep Zone Bio-sparge System. Additionally, Basis of Design is intended to be a portion of the Remedial Action Contractor (RAC) Package.

1.1 SYSTEM RECOMMENDATIONS

An AS/SVE system was installed by J.A. Jones and has been in operation since it was installed in 1998 except for short periods to accommodate groundwater gauging and sampling events and monitoring well installation. A review of groundwater monitoring data reveals that the remedial efforts have been successful in reducing the petroleum constituents in the shallow (<40') BLS and deep (60' to 90') BLS zones in the source area; however, the dissolved plume in the deep zone has migrated beyond the existing remedial system network to the northeast and southeast. In an effort to address the migrating dissolved phase petroleum contamination, the five bio-sparge wells are proposed to be installed within the core of the existing plume. The goal of bio-sparging is to provide just enough air/oxygen into the subsurface to enhance naturally occurring biodegradation. The fringe areas of the plume will be allowed to naturally attenuate.

The five bio-sparge wells should be installed to a depth of approximately 90 feet BLS and the system piping plumed into the existing AS system. The AS portion of the existing system utilizes a Rotary Vane Compressor (336 cfm), a coalescing filter, a 240 gallon compressed air receiver, and various regulators and flow meters. The proposed bio-sparge wells will need approximately 5-10 cfm per well at the existing design pressure of 100 pounds per square inch (psi). The maximum air flow needed for the five wells is 50 cfm. The shallow zone AS wells (utilizing 112 cfm) are intended to be taken off line since the shallow groundwater contamination is essentially below 2L GWQS. The air supply from these wells will provide the necessary air flow requirements to the proposed bio-sparge wells.

Section 2.2 of the Basis of Design provides a detailed description of the proposed components for the Deep Zone Bio-sparge System. However, a brief description system installation activities proposed as a part of the Basis of Design, are as follows in no particular order:

- Install five bio-sparge wells within the existing dissolved-phase petroleum hydrocarbon contaminant plume at the Building 645 project site.
- Install proposed header piping from the proposed bio-sparge wells and connect to existing piping at AS well DAS01.
- Install two soil vapor wells south west of the proposed bio-sparge wells.

This Basis of Design is based on the following:

1. A review of historical documents and as-built record drawings.
2. Various field evaluations of the condition of the current remedial system and surrounding area.

1.2 REGULATORY FRAMEWORK EVALUATION

The remedial goals for this site were based on the regulations current at the time and presented in the 1996 CAP. Current applicable remedial requirements for the contamination associated with Building 645 is based on the corrective action requirements per 15A NCAC 2L .0106, which became effective on January 2, 1998 and the requirements in the NCDENR 2000 Guidelines. Based on these regulations, the contaminant cleanup levels established in the 1996 CAP are still relevant. The goals for groundwater cleanup are the 2L GWQS.

2.0 CIVIL BASIS OF DESIGN

2.1 BACKGROUND INFORMATION

Building 645 previously housed water supply well HP645 and the associated wellhead and piping. Water supply well HP645 was reportedly 245 feet deep and screened from 90 to 100, 138 to 148, and 230 to 240 feet (ft.) below land surface (BLS). The well produced approximately 192 gallons per minute (gpm) (Geophex, 1991). The water supply well has been inactive since 1985, when water samples revealed the well to be impacted by petroleum constituents. A 110-gallon, steel above ground storage tank (AST) that supplied gasoline to a generator which powered the pump was located adjacent to the structure on a concrete pad. The AST is the assumed source of the petroleum contamination. Well HP645 was permanently abandoned in 1995 and the well house was demolished and removed.

Numerous previous assessments have confirmed the impact of petroleum constituents to the groundwater. Due to the vertical aspect of contaminant migration identified during the previous investigations, the subsurface was divided into three "zones" being the shallow zone (less than 40 ft. deep), intermediate zone (greater than or equal to 40 ft and less than 60 ft.), and deep zone (greater than or equal to 60 ft. and less than 90 ft.).

A remediation system was installed on the subject site in 1998 by J. A. Jones Environmental Services (J.A. Jones). The system consists of 14 vertical air sparge wells, four horizontal vapor extraction wells, and 21 soil vapor collection vent borings. Six of the 14 vertical sparge wells were installed in the deep zone to a depth of 80 ft. BLS, and the remaining eight in the intermediate zone, to 50 ft. BLS. The remediation system was installed to target the confirmed impact to the groundwater in the shallow, intermediate, and deep zones at the project site. The soil and groundwater treatment system has been operational since 1998. Review of groundwater monitoring data reveals that the remedial efforts have been successful in reducing the petroleum constituents in the target zones within the area of influence of the

treatment system as designed. However, deep zone dissolved phase contamination appeared to be migrating across Brewster Boulevard.

Sovereign Consulting Inc. (Sovereign) prepared a Soil and Groundwater Investigation Summary Report dated October 18, 2007. As part of the report, they installed two deep monitoring wells (80 feet BLS) and concluded that the dissolved contaminant plume in the deep zone had migrated beyond the monitoring well network to the northeast and southeast.

Subsequently, an Additional Site Assessment (ASA) was completed by CATLIN to provide data necessary to delineate and refine the boundaries of the deep zone dissolved phase contamination identified at the subject site. Two additional 80 ft. deep Type III and one additional 100 ft. deep Type III groundwater monitoring wells were installed during the ASA investigation. Groundwater samples were collected from the three newly installed monitoring wells and analyzed per EPA Methods 601 and 602. A groundwater gauging event and survey encompassing all intermediate and deep zone monitoring wells was completed by CATLIN and incorporated with data generated by Sovereign during quarterly groundwater sampling and gauging activities.

Groundwater sampling results were incorporated with data from the October 2007 and April 2008 groundwater sampling events conducted by Sovereign. This data was used in conjunction with recent groundwater sampling events to estimate the approximate horizontal and vertical extent of dissolved petroleum contamination. Review of this data indicates that the contaminant plume within the deep zone has essentially been delineated horizontally and vertically at the subject site. There are minor data gaps in the plume definition; however, the low levels of contaminants identified in these areas indicate that the plume has not migrated substantially beyond the limits of investigation.

The existing project site conditions to be encountered during the construction of the proposed Deep Zone Bio-spargers system are provided in Section 2.1.1 of this Basis of Design. Additionally, the disposal requirements and environmental permits associated with the construction of the proposed Deep Zone Bio-spargers system are provided in Sections 2.1.2, and 2.1.3 of this Basis of Design, respectively.

2.1.1 EXISTING SITE CONDITIONS

The topography at the Building 645 project site is relatively flat with relief near the drainage ditches. The majority of the surrounding land surface, with the exception of the school area, is covered with natural vegetation. Storm water is conveyed off site by means of drainage ditches. The groundwater flow at the subject site is generally to the southwest.

The site appears to be underlain by clay with interbedded sand lenses to approximately 20 ft. BLS. This clay exhibits medium to low permeability and appears to be an aquitard across the project site. Beneath the clay unit, a fine to medium grained sand was identified from 20 ft. to greater than 50 ft. BLS. Fine-grained sand with limestone fragments was identified beneath the limestone to approximately 100 ft. BLS. The discontinuous material appears to be the upper limits of the Castle Hayne Formation, which is part of the Castle Hayne aquifer (Winner and Coble, 1989), and consists of sandy limestone with interbedded, moderately well graded sands beginning at a depth of approximately 20 ft BLS.

Please note that a detailed utility locate was not performed as a part of this design. Therefore, all utilities must be field verified by the installation contractor prior to performing construction activities at the project site.

2.1.2 DEMOLITION

No Demolition activities are within the scope of this project. Drill cuttings from the installation of the five proposed bio-spargers, header piping, and two soil vapor wells will be containerized for proper disposal.

2.1.3 ENVIRONMENTAL PERMITS

A Sedimentation & Erosion Control Permit is not required for this project since the disturbed area is estimated to be less than one acre. However, Best Management Practices (BMP) are required to be incorporated throughout the duration of the construction process as referenced in the North Carolina Sedimentation & Erosion Control Planning Design Manual. In general, the purpose of incorporating BMP is to prevent any sediment from leaving the site during construction activities. Therefore, a Sedimentation & Erosion Control Plan should be prepared to address protection of storm drains and watercourse access from sediment and debris contamination. The construction contractor will be responsible for providing ground cover of denuded areas in accordance with Chapter 4 of Title 15A NCAC (T15A.04). Additionally, the construction contractor will be responsible for the removal of any temporary erosion/sedimentation control devices once stabilization has been accomplished.

2.2 SYSTEM DESIGN

The components of the proposed Building 645 Deep Zone Bio-sparger system to be designed are as follows:

- Bio-sparge Wells
- Air Supply header pipe
- Soil Vapor Sentinel Wells

The components of the proposed Building 645 Deep Zone Bio-sparge system were designed based on the horizontal and vertical geometry of the dissolved phase petroleum hydrocarbon contaminant plume, the performance of the existing air sparging system, air sparge pilot tests that have been conducted at the site, and previous design calculations. Bio-sparging was chosen over air sparging in an attempt to prevent potential vapor intrusion into nearby structures. Bio-sparging typically uses a smaller amount of injected air than air sparging. Bio-sparging uses just enough air/oxygen to enhance naturally occurring biodegradation, while air sparging uses air to volatilize petroleum hydrocarbons as the injected air rises up through the groundwater. The five proposed bio-sparge wells will need approximately 5 to 10 cfm per well at the existing design pressure of 100 psi. The maximum flow rate needed for all five bio-sparge wells is 50 cfm. The eight existing shallow AS wells utilize approximately a total of 112 cfm. Since the shallow contamination is essentially below 2L GWQS, CATLIN proposed to shutoff the existing shallow AS wells and use the air supplied to those wells to provide the five bio-sparge wells with the necessary air flow.

The following sections describe the Building 645 Deep Zone Bio-sparge system layout and the design of individual system components.

2.2.1 SYSTEM LAYOUT

The proposed Deep Zone Bio-sparge system will consist of five deep (90' BLS) bio-sparge wells to be plumbed into the existing AS/SVE system. The header piping from the proposed bio-sparge wells will be tied into the existing AS/SVE system at AS well DAS01. In addition, two soil vapor wells will be installed south wet of the proposed bio-sparge wells to provide coverage for vapor monitoring. Please refer to sheet C1 of the Construction Drawings for the proposed system layout.

2.2.2 BIO-SPARGE WELL DESIGN

Five bio-sparge wells are proposed to be installed in order to treat the core or "hot spot" of the dissolved phase petroleum groundwater contamination. The locations of these bio-sparge wells are illustrated on Sheet C1 of the Construction Plans. The bio-sparge wells should be installed to a depth of 90' BLS with a five foot screened interval from 85' to 90' BLS. The wells should be spaced on 60 foot centers. The well spacing is based on previous pilot test data from the deep

aquifer zone performed as part of the original CAP. The bio-spargers should be constructed using 2-inch diameter schedule 80 PVC. The well screen should be constructed using 2-inch schedule 80, 0.02-inch slot width PVC.

A well vault will be installed around the bio-sparger well to protect the integrity of the well. The vault shall be an H-20 rated 24-inch by 24-inch by 24-inch reinforced concrete vault.

Please refer to Sheet C2 of the Construction Drawings for bio-sparger well details.

2.2.3 BIO-SPARGE HEADER PIPE DESIGN

Compressed air will be supplied to the bio-sparger wells through a 2-inch diameter, high density polyethylene (HDPE) compressed air pipe installed inside a trench at an approximate depth of two feet BLS. The header piping that will run under Brewster Boulevard will be installed using horizontal drilling techniques in order to minimize any stoppage of traffic. At each sparger well, a 1- ¼ inch diameter HDPE compressed air pipe will be used to supply the air from the 2-inch HDPE header pipe to the 2-inch bio-sparger wells. Please refer to Sheet C2 of the Construction Drawings for bio-sparger header pipe details.

2.2.4 SOIL VAPOR SENTINEL WELL DESIGN

Two soil vapor sentinel wells are proposed to be installed southwest of the proposed bio-sparger wells. The soil vapor wells are to act as sentinel wells to monitor vapor intrusion in order to protect building 40. The locations of these soil vapor wells are illustrated on Sheet C1 of the Construction Plans. The soil vapor wells should be installed to a depth of approximately 10 feet BLS. The soil vapor sentinel wells should have a five foot screened interval from approximately 5 to 10 feet BLS. The soil vapor sentinel wells should be constructed using 2-inch diameter schedule 40 PVC. The well screen should be constructed using 2-inch schedule 40, 0.02-inch slot width PVC.

Please refer to Sheet C2 of the Construction Drawings for soil vapor sentinel well details.

3.0 ENVIRONMENTAL BASIS OF DESIGN

The Environmental Basis of Design Section is intended to address environmental issues that will affect the project. Waste generated during construction activities will include well drill cuttings, well development fluids, and soil from carrier pipe installations. Drill cuttings and well developmental fluids are to be containerized for proper disposal. Required testing of these contaminated materials will be at the discretion of the disposal facility. The installation contractor will be required to submit a Site Specific Health and Safety Plan that addresses the potential risks for encountering unknown site conditions.

After the bio-spargers are installed, an environmental concern is the possibility of petroleum vapors impacting nearby buildings. In order to ensure vapors do not impact the buildings, a vapor monitoring program will be implemented, which included the installation of two soil vapor sentinel wells. During the vapor monitoring program, a hand held Photo Ionization Detector (PID) or Flame Ionization Detector (FID) will be used to sample vapors within the soil vapor sentinel wells and at various crawl space vents at the nearby buildings. Details of the vapor monitoring program are included in the specifications under section 02900 Remediation System Installation, paragraph 3.9 vapor Monitoring.

4.0 GEOTECHNICAL BASIS OF DESIGN

This section of the Basis of Design is intended to provide the current subsurface geotechnical conditions at the project site. These assumed current conditions are based on a review of the available historical reports.

4.1 SITE GEOLOGY

The topography at the Building 645 project site is relatively flat with relief near the drainage ditches. The majority of the surrounding land surface, with the exception of the school area, is covered with natural vegetation. Storm water is conveyed off site by means of drainage ditches. The site appears to be underlain by clay with interbedded sand lenses to approximately 20 ft. BLS. This clay exhibits medium to low permeability and appears to be an aquitard across the project site. Beneath the clay unit, a fine to medium grained sand was identified from 20 ft. to greater than 50 ft. BLS. Fine-grained sand with limestone fragments was identified beneath the limestone to approximately 100 ft. BLS.

4.2 GROUNDWATER ELEVATION AND FLOW DIRECTION

Groundwater flow direction has been observed to be predominantly toward the southwest in the shallow, intermediate, and deep aquifer zones. Depth to groundwater for the shallow zone determined from the March 13, 2008 and April 18, 2008 gauging events ranged from approximately 10.71 feet to 18

feet BLS, the intermediate zone had a range of 18.89 feet to 20.58 feet BLS, and the deep zone had a range of 14.28 feet to 23.81 feet BLS. Groundwater linear flow velocities for the three different aquifer zones at the project site have been previously calculated by CATLIN. The average linear flow velocity in the shallow zone was calculated to be 0.4885 ft/day (178.30 ft/yr) to the southwest. The intermediate zone has an average linear flow velocity of 0.0096 ft/day (3.50 ft/yr) to the west-southwest. Finally, the average linear flow velocity for the deep zone was calculated to be 0.0467 ft/day (17.05 ft/yr) to the southwest. The groundwater linear flow velocity calculations were based on an effective porosities of 0.43 (shallow), 0.39 (intermediate), and 0.37 (deep). The hydraulic conductivities obtained from slug tests reported in the 1995 CSA submitted by CATLIN and hydraulic gradients extrapolated from the groundwater elevations from the March 13, 2008 and April 18, 2008 gauging events were also used in calculating the groundwater linear flow velocities.

CATLIN has assumed that the groundwater velocities and the hydraulic conductivities remain applicable to this project site.

5.0 REFERENCES

- CATLIN Engineers and Scientists, *Additional Site Assessment (ASA), Building 645*, dated June 19, 2008.
- CATLIN Engineers and Scientists, *Remedial Action Optimization and Revised Corrective Action Plan, Building 645, Marine Corps Base Camp Lejeune, North Carolina*, August 9, 2006.
- (CATLIN) Richard Catlin & Associates, Inc. *Leaking Underground Storage Tank Comprehensive Site Assessment (CSA), 645*, dated April 28, 1995.
- Geophex, Ltd., *Wellhead Management Program Engineering Study 91-36*, Prepared for Officer in Charge of Construction Marine Corps Base Camp Lejeune, North Carolina, 1991.
- North Carolina Department of Environment and Natural Resources, *Guidelines for Assessment and Corrective Action, North Carolina Underground Storage Tank Section* (Effective July 1, 2001).
- Sovereign Consulting, Inc. *Annual Groundwater Monitoring Report 2006-2007 - Building 645*, dated June 15, 2007.
- Sovereign Consulting, Inc. *Final Annual Groundwater Monitoring Report 2007-2008 Building 645*, dated June 27, 2008.
- Sovereign Consulting, Inc. *Soil and Groundwater Investigation Summary Report*, dated October 18, 2007.
- Winner, M.D., Jr., and Coble, R.W., 1989, *Hydrogeologic Framework of the North Carolina Coastal Plain Aquifer System: U.S. Geological Survey Open-File Report 87-690*, 155p.

APPENDIX A-1

AIR FLOW
DESIGN CALCULATIONS



SKETCH AND COMPUTATION SHEET

CATLIN PROJECT:	Bld 645	DAY: 1/20/2009	DATE: 1/20/2009
CATLIN PROJECT #:	208-018	DRAWING BY: Sean O'Neil	REVIEWED BY:

Air flow requirements for biosparge wells

Assumptions:

- Five biosparge wells are to be installed
- All five wells will need air @ the same time
- Only 5-10 cfm air is needed per biosparge well
- Use existing air compressor for biosparge wells
- Shallow AS wells to be taken off line, 8 wells each use 14 cfm.

5 wells with 10 cfm each

$$5 \times 10 = \boxed{50 \text{ cfm needed}}$$

The shallow AS wells are going to be taken off line.

8 wells use 14 cfm each

$$8 \times 14 = \boxed{112 \text{ cfm}}$$

With the shallow AS wells going off line the available 112 cfm is more than enough air flow to cover the proposed biosparge wells.

∴ The current air compressor can be used for the five proposed biosparge wells.

APPENDIX A-2

**BIO-SPARGE HEADER PIPE
DESIGN CALCULATIONS**

**BUILDING 645
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA**

BIO-SPARGE WELL HEADER PIPE SIZING

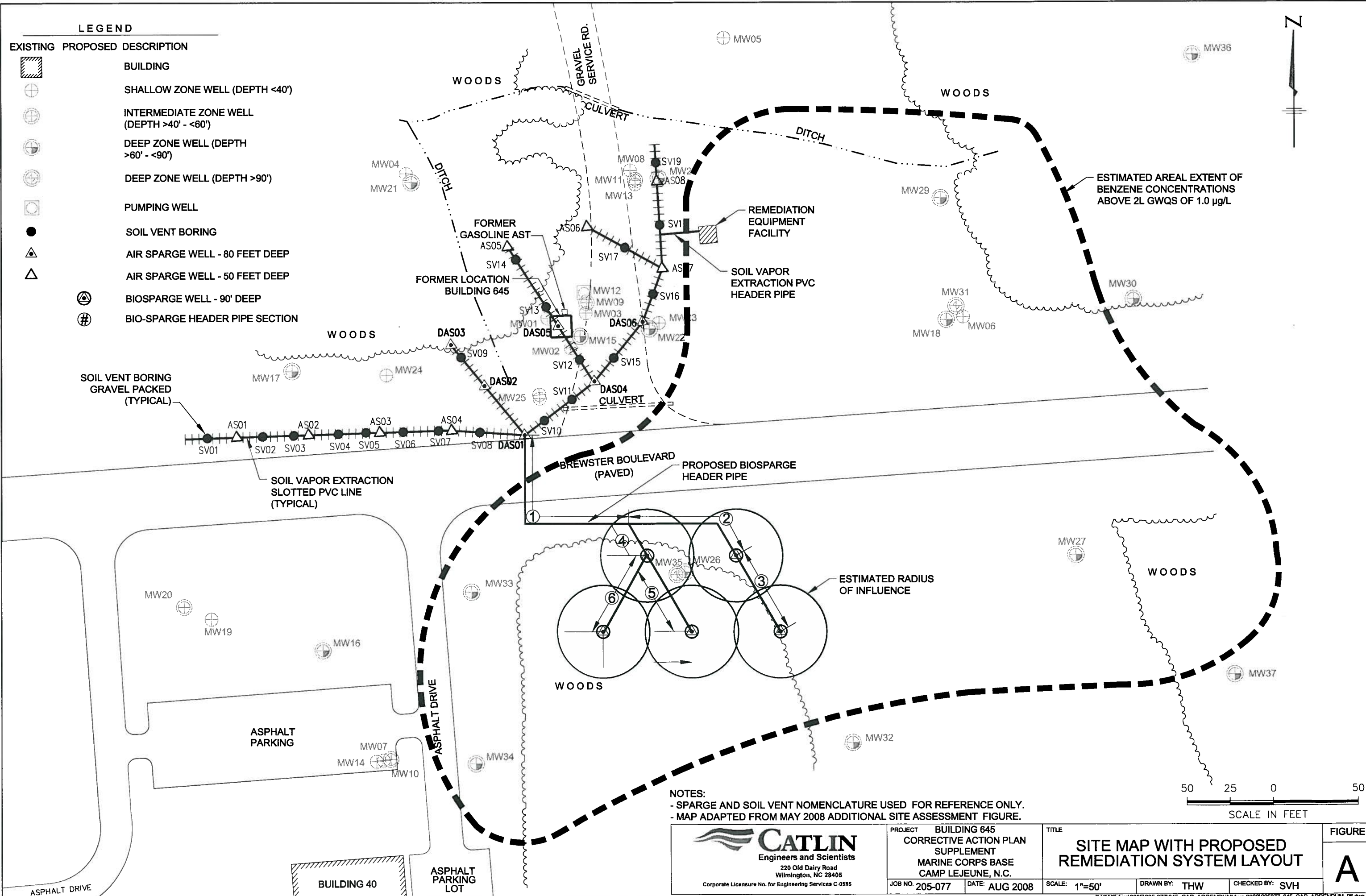
- Assumptions:
1. All 5 bio-sparge Wells will be running at the same time.
 2. Section 1 has air flow for all 5 bio-sparge wells
 3. Section 2 has air flow for 2 of the bio-sparge wells
 4. Section 3 has air flow for 1 of the bio-sparge wells
 5. Section 4 has air flow for 3 of the bio-sparge wells
 6. Section 5 has air flow for 2 of the bio-sparge wells
 7. Section 6 has air flow for 1 of the bio-sparge wells
 8. The bio-sparge header piping will be plumbed into existing AS well DAS01
 9. Bends in header piping added to the total length of pipe per section

Head Loss for a 2 inch Pipe (7 cfm per well)				
Section	Length of Pipe (ft)	Extraction Flow (cfm)	Head loss (in. H ₂ O per ft of tubing)	Total section head loss (in. H ₂ O)
1	120	35	0.021	2.52
2	75	14	0	0
3	51	7	0	0
4	22	21	0	0
5	52	14	0	0
6	52	7	0	0
				2.52

Head Loss for a 2 inch Pipe (10 cfm per well)				
Section	Length of Pipe (ft)	Extraction Flow (cfm)	Head loss (in. H ₂ O per ft of tubing)	Total section head loss (in. H ₂ O)
1	120	50	0.0475	5.7
2	75	20	0	0
3	51	10	0	0
4	22	30	0.017	0.374
5	52	20	0	0
6	52	10	0	0
				6.074

Head Loss for a 3 inch Pipe (10 cfm per well)				
Section	Length of Pipe (ft)	Extraction Flow (cfm)	Head loss (in. H ₂ O per ft of tubing)	Total section head loss (in. H ₂ O)
1	120	50	0	0
2	75	20	0	0
3	51	10	0	0
4	22	30	0	0
5	52	20	0	0
6	52	10	0	0
				0

Based on the calculations, there is minimal head loss in a 2 inch pipe and no head loss for a 3 inch pipe with 10 cfm.



LEGEND

- | EXISTING | PROPOSED | DESCRIPTION |
|----------|----------|--|
| | | BUILDING |
| | | SHALLOW ZONE WELL (DEPTH <40') |
| | | INTERMEDIATE ZONE WELL (DEPTH >40' - <60') |
| | | DEEP ZONE WELL (DEPTH >60' - <90') |
| | | DEEP ZONE WELL (DEPTH >90') |
| | | PUMPING WELL |
| | | SOIL VENT BORING |
| | | AIR SPARGE WELL - 80 FEET DEEP |
| | | AIR SPARGE WELL - 50 FEET DEEP |
| | | BIO-SPARGE WELL - 90' DEEP |
| | | BIO-SPARGE HEADER PIPE SECTION |

NOTES:
- SPARGE AND SOIL VENT NOMENCLATURE USED FOR REFERENCE ONLY.
- MAP ADAPTED FROM MAY 2008 ADDITIONAL SITE ASSESSMENT FIGURE.

 CATLIN Engineers and Scientists 220 Old Dairy Road Wilmington, NC 28405 Corporate Licensure No. for Engineering Services C-9585	PROJECT	BUILDING 645 CORRECTIVE ACTION PLAN SUPPLEMENT MARINE CORPS BASE CAMP LEJEUNE, N.C.				
	JOB NO.	205-077	DATE	AUG 2008		
	TITLE		SITE MAP WITH PROPOSED REMEDATION SYSTEM LAYOUT			
SCALE:		1"=50'	DRAWN BY:	THW	CHECKED BY:	SVH
FIGURE		A		S:\CAD\dwg\2005\205-077\645_CAP_ADDENDUMAug 2008\205077_645_CAP_ADDENDUM_06.dwg		

APPENDIX B

PROJECT SPECIFICATIONS

DEPARTMENT OF THE NAVY
SPECIFICATION NO:

NAVAL FACILITIES ENGINEERING COMMAND

CONTRACT NO:
N62470-05-D-6200
Delivery Order No. 0054
CATLIN Project No.:
208-018

BUILDING 645 DEEP ZONE BIO-SPARGE SYSTEM
at the

MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

DESIGN BY:

CATLIN ENGINEERS AND SCIENTISTS

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WILMINGTON, NORTH CAROLINA 28404-0279
CORPORATE LICENSURE NO. FOR ENGINEERING SERVICES C-0585



SPECIFICATION PREPARED BY:

Architectural:

Civil:

Structural:

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Electrical:

Mechanical:

Other:

SPECIFICATION SUBMITTED BY: Michael E. Mason, PE DATE: August 14, 2009

SPECIFICATION APPROVED BY: _____ DATE: _____

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SECTION 00 01 15

LIST OF DRAWINGS

01/07

PART 1 GENERAL

1.1 SUMMARY

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

1.2 CONTRACT DRAWINGS

Contract drawings are as follows:

DRAWING NO.	TITLE
T1	COVER SHEET
C1	LAYOUT OF BIO-SPARGE SYSTEM
C2	SYSTEM DETAILS

1.3 SUPPLEMENTARY DRAWINGS

These supplementary drawings may not be a part of the contract but are included with the drawings for information.

1.3.1 Boring Logs

The Government does not guarantee that borings indicate actual conditions, except for the exact locations and the time that they were made.

[Subsurface data, not specified or indicated, have been obtained by the Government at this station. The data are available for examination by prospective bidders.

1.3.2 Subsurface Data

Subsurface data, not specified or indicated, have been obtained by the Government at the station. The data are available for examination by prospective bidders.

-- End of Document --

SECTION 01 11 00

SUMMARY OF WORK

01/08

PART 1 GENERAL

1.1 DEFINITIONS

Definitions pertaining to sustainable development are as defined in ASTM E 2114 and as specified.

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

b. "Sustainability" is the balance of environmental, economic, and societal considerations.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

1.2.1 Project Description

The work includes the installation of five bio-sparge wells and required header piping, valves, and controls necessary to expand the existing sparge system at the Building 645 project site.

1.2.2 Location

The work shall be located at the MCB Camp Lejeune, North Carolina, Building 645 project site, as indicated on the plan sheets.

1.3 CONTRACT DRAWINGS

The following drawings accompany this specification and are a part thereof.

Cover Sheet, Layout of Bio-Sparge System, and System Details
Sheets T1, C1, and C2

One set of full size contract drawings, maps, and specifications will be furnished to the Contractor without charge. Reference publications will not be furnished.

Contractor shall immediately check furnished drawings and notify the Government of any discrepancies.

1.4 EXISTING WORK

In addition to "FAR 52.236-9, Protection of Existing Vegetation, Structures, Equipment, Utilities, and Improvements":

- a. Remove or alter existing work in such a manner as to prevent injury or damage to any portions of the existing work which remain.
- b. Repair or replace portions of existing work which have been altered during construction operations to match existing or

adjoining work, as approved by the Contracting Officer. At the completion of operations, existing work shall be in a condition equal to or better than that which existed before new work started.

1.5 LOCATION OF UNDERGROUND FACILITIES

Obtain digging permits prior to start of excavation. The Contractor is to scan the construction site with electromagnetic or sonic equipment, and mark the surface of the ground where existing underground utilities are discovered. Verify the elevations of existing piping, utilities, and any type of underground obstruction not indicated to be specified or removed but indicated or discovered during scanning in locations to be traversed by piping, ducts, and other work to be conducted or installed.

1.5.1 Notification Prior to Excavation

Notify the Contracting Officer at least prior to starting excavation work. Contractor is responsible for marking all utilities.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 14 00

WORK RESTRICTIONS

07/07

PART 1 GENERAL

1.1 DEFINITIONS

1.1.1 State

"State" when used in reference to states of the United States shall also include the Territory of Guam.

1.2 SPECIAL SCHEDULING REQUIREMENTS

- a. The MCB Camp Lejeune will remain in operation during the entire construction period. The Contractor shall conduct his operations so as to cause the least possible interference with normal operations of the activity.
- b. Permission to interrupt any Activity roads, railroads, and/or utility service shall be requested in writing a minimum of 15 calendar days prior to the desired date of interruption.
- c. It is the intent that the contractor not interrupt traffic on Brewster Boulevard for installation of the air sparge header piping. The contractor shall use directional drilling techniques or other approved methods for installation of the header piping under Brewster Boulevard..

1.3 CONTRACTOR ACCESS AND USE OF PREMISES

1.3.1 Activity Regulations

Ensure that Contractor personnel employed on the Activity become familiar with and obey Activity regulations including safety, fire, traffic and security regulations. Keep within the limits of the work and avenues of ingress and egress. [To minimize traffic congestion, delivery of materials shall be outside of peak traffic hours unless otherwise approved by the Contracting Officer. Wear hard hats in designated areas. Do not enter any restricted areas unless required to do so and until cleared for such entry. The Contractor's equipment shall be conspicuously marked for identification.

1.3.1.1 Subcontractors and Personnel Contacts

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

1.3.1.2 Identification Badges

Identification badges, if required, will be furnished without charge. Application for and use of badges will be as directed. Immediately report instances of lost or stolen badges to the Contracting Officer.

1.3.1.3 Employee List

The Contractor shall provide to the Contracting officer, in writing, the names of two designated representatives authorized to request personnel and vehicle passes for employees and subcontractor's employees prior to commencement of work under this contract. The Contractor shall adhere to the most current requirements of "Important Clarifications - Contractors - How to Gain Access," , in obtaining access to the Marine Corps Base for the life of the contract. A copy of these requirements will be provided. .

1.3.1.4 Personnel Entry Approval

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

1.3.2 Emergency Response Requirement

The most appropriate protective action for certain emergencies is to take shelter. Personnel shall immediately seek shelter while an assessment is made of the threat and determinations are being made regarding subsequent actions such as "all clear" or selected building evacuations. The following procedures have been put in place in the event of an emergent condition.

1. NOTIFICATION: The primary means of alerting personnel shall be emergency alert signals. The alerting signal to seek shelter shall be three steady tones that last for thirty seconds separated by ten seconds of silence. The notification for "all clear" shall be three short tones repeated three times.

2. SHELTERING: When personnel hear the alert signal, the area of work must be secured in a manner that will leave the site in safe condition. Personnel shall seek shelter in the nearest occupied building in calm and orderly manner. If possible, secure all windows and doors and shut off ventilation. If in a vehicle, park the vehicle so that it does not block the normally traveled portion of the road and proceed into the nearest occupied building.

3. EVACUATION: In the event of an evacuation, personnel shall receive directions from team members of the Crowd Control Center (CCC) or the building custodian acting on the directions from the CCC. Contract personnel shall comply with instructions given at all times.

1.3.3 Working Hours

Regular working hours shall consist of times established by the Contracting Officer between Monday through Friday, excluding Government holidays.

1.3.4 Work Outside Regular Hours

Work outside regular working hours requires Contracting Officer approval. Make application 15 calendar days prior to such work to allow arrangements to be made by the Government for inspecting the work in progress, giving the specific dates, hours, location, type of work to be performed, contract number and project title. Based on the justification provided, the Contracting Officer may approve work outside regular hours. During periods of darkness, the different parts of the work shall be lighted in a manner approved by the Contracting Officer.

1.3.5 Utility Cutovers and Interruptions

- a. Make utility cutovers and interruptions after normal working hours or on Saturdays, Sundays, and Government holidays. Conform to procedures required in the paragraph "Work Outside Regular Hours."
- b. Ensure that new utility lines are complete, except for the connection, before interrupting existing service.
- c. Operation of Station Utilities: The Contractor shall not operate nor disturb the setting of control devices in the station utilities system, including water, sewer, electrical, and steam services. The Government will operate the control devices as required for normal conduct of the work. The Contractor shall notify the Contracting Officer giving reasonable advance notice when such operation is required.

1.4 SECURITY REQUIREMENTS

The Contractor shall be working around active Marine Corps Base operations. The Contractor shall observe MCB security regulations. All Contractor employees will be required to obtain identification badges. Specific requirements should be coordinated through the Contracting Officer.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 30 00

ADMINISTRATIVE REQUIREMENTS

08/08

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

List of contact personnel; G,

Personnel list; G,

Vehicle list; G,

1.2 MINIMUM INSURANCE REQUIREMENTS

Procure and maintain during the entire period of performance under this contract the following minimum insurance coverage:

- a. Comprehensive general liability: \$500,000 per occurrence
- b. Automobile liability: \$200,000 per person, \$500,000 per occurrence for bodily injury, \$20,000 per occurrence for property damage
- c. Workmen's compensation as required by Federal and State workers' compensation and occupational disease laws.
- d. Employer's liability coverage of \$100,000, except in States where workers compensation may not be written by private carriers,
- e. Others as required by the state of North Carolina.

1.3 CONTRACTOR PERSONNEL REQUIREMENTS

1.3.1 Subcontractors and Personnel

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

1.3.2 Identification Badges

Identification badges will be furnished without charge. Application for and use of badges will be as directed. Immediately report instances of lost or stolen badges to the Contracting Officer.

1.3.3 Vehicles

Provide a vehicle list of the Contractor and subcontractors requiring access to the project site. Vehicle decals, if required, will be furnished without charge. Application for and use of vehicle decals will be as directed. Immediately report instances of lost or stolen badges to the Contracting Officer.

1.3.4 Contractor Personnel Requirements

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

1.4 SUPERVISION

Have at least one qualified supervisor capable of reading, writing, and conversing fluently in the English language on the job site during working hours. In addition, if a Quality Control (QC) representative is required on the contract, then that individual shall also have fluent English communication skills.

1.5 PRECONSTRUCTION CONFERENCE

After award of the contract but prior to commencement of any work at the site, meet with the Contracting Officer to discuss and develop a mutual understanding relative to the administration of the value engineering and safety program, preparation of the schedule prices, shop drawings, and other submittals, scheduling programming, and prosecution of the work. Major subcontractors who will engage in the work shall also attend.

1.6 PARTNERING

LEVEL C PARTNERING: To most effectively accomplish this contract, the Government requires the formation of a cohesive partnership with the Contractor and its subcontractors. The partnership will draw on the strength of each organization in an effort to achieve a quality project done right the first time, within budget, on schedule, and without any safety mishaps. This level of partnering discusses partnering concepts and benefits and should become a part of the preconstruction conference. The senior Government representative and senior Contractor representative present will jointly host the partnering sessions. The partners will determine the frequency of the follow-on sessions. Partnering sessions should be held at or near the location of the activity contracting office. The participants shall bear their own costs for meals, lodging, and transportation associated with partnering.

1.7 AVAILABILITY OF CADD DRAWING FILES

After award and upon request, the electronic "Computer-Aided Drafting and Design (CADD)" drawing files will only be made available to the Contractor for use in preparation of construction drawings and data related to the referenced contract subject to the following terms and conditions.

Data contained on these electronic files shall not be used for any purpose other than as a convenience in the preparation of construction drawings and data for the referenced project. Any other use or reuse shall be at the sole risk of the Contractor and without liability or legal exposure to the Government. The Contractor shall make no claim and waives to the fullest extent permitted by law, any claim or cause of action of any nature against

the Government, its agents or sub consultants that may arise out of or in connection with the use of these electronic files. The Contractor shall, to the fullest extent permitted by law, indemnify and hold the Government harmless against all damages, liabilities or costs, including reasonable attorney's fees and defense costs, arising out of or resulting from the use of these electronic files.

These electronic CADD drawing files are not construction documents. Differences may exist between the CADD files and the corresponding construction documents. The Government makes no representation regarding the accuracy or completeness of the electronic CADD files, nor does it make representation to the compatibility of these files with the Contractors hardware or software. In the event that a conflict arises between the signed and sealed construction documents prepared by the Government and the furnished CADD files, the signed and sealed construction documents shall govern. The Contractor is responsible for determining if any conflict exists. Use of these CADD files does not relieve the Contractor of duty to fully comply with the contract documents, including and without limitation, the need to check, confirm and coordinate the work of all contractors for the project.

If the Contractor uses, duplicates and/or modifies these electronic CADD files for use in producing construction drawings and data related to this contract, all previous indicia of ownership (seals, logos, signatures, initials and dates) shall be removed.

1.8 ELECTRONIC MAIL (E-MAIL) ADDRESS

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

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

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 32 01.00 10

PROJECT SCHEDULE
08/08

PART 1 GENERAL

1.1 SUBMITTALS

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

SD-01 Preconstruction Submittals

Project Schedule; G

1.2 QUALITY ASSURANCE

Designate an authorized representative to be responsible for the preparation of the schedule and all required updating (activity status) and preparation of reports. The authorized representative shall be experienced in scheduling projects similar in nature to this project and shall be experienced in the use of the scheduling software that meets the requirements of this specification.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

Prepare for approval a Project Schedule, as specified herein, pursuant to the Contract Clause, SCHEDULE FOR CONSTRUCTION CONTRACTS. Show in the schedule the sequence in which the Contractor proposes to perform the work and dates on which the Contractor contemplates starting and completing all schedule activities. The scheduling of the entire project, including the design and construction sequences, is required. The scheduling of construction is the responsibility of the Contractor. Contractor management personnel shall actively participate in its development. Subcontractors and suppliers working on the project shall also contribute in developing and maintaining an accurate Project Schedule. Provide a schedule that is a forward planning as well as a project monitoring tool.

3.1.1 Approved Project Schedule

Use the approved Project Schedule to measure the progress of the work and to aid in evaluating time extensions. Make the schedule cost loaded and activity coded. The schedule will provide the basis for all progress payments. If the Contractor fails to submit any schedule within the time prescribed, the Contracting Officer may withhold approval of progress payments until the Contractor submits the required schedule.

3.1.2 Schedule Status Reports

Provide a Schedule Status Report on at least a monthly basis. If, in the opinion of the Contracting Officer, the Contractor falls behind the approved schedule, the Contractor shall take steps necessary to improve its progress including those that may be required by the Contracting Officer, without additional cost to the Government. In this circumstance, the Contracting Officer may require the Contractor to increase the number of shifts, overtime operations, days of work, and/or the amount of construction plant, and to submit for approval any supplementary schedule or schedules as the Contracting Officer deems necessary to demonstrate how the approved rate of progress will be regained.

3.1.3 Default Terms

Failure of the Contractor to comply with the requirements of the Contracting Officer shall be grounds for a determination, by the Contracting Officer, that the Contractor is not prosecuting the work with sufficient diligence to ensure completion within the time specified in the contract. Upon making this determination, the Contracting Officer may terminate the Contractor's right to proceed with the work, or any separable part of it, in accordance with the default terms of the contract.

3.2 BASIS FOR PAYMENT AND COST LOADING

Use the schedule as the basis for determining contract earnings during each update period and therefore the amount of each progress payment. Lack of an approved schedule update, or qualified scheduling personnel, will result in the inability of the Contracting Officer to evaluate contract earned value for the purposes of payment. Failure of the Contractor to provide all required information will result in the disapproval of the preliminary, initial and subsequent schedule updates. In the event schedule revisions are directed by the Contracting Officer and those revisions have not been included in subsequent revisions or updates, the Contracting Officer may hold retainage up to the maximum allowed by contract, each payment period, until such revisions to the Project Schedule have been made. Activity cost loading shall be reasonable, as determined by the Contracting Officer. The aggregate value of all activities coded to a contract CLIN shall equal the value of the CLIN on the Schedule.

3.3 PROJECT SCHEDULE DETAILED REQUIREMENTS

The computer software system utilized to produce and update the Project Schedule shall be capable of meeting all requirements of this specification. Failure of the Contractor to meet the requirements of this specification will result in the disapproval of the schedule.

3.3.1 Critical Path Method

Use the Critical Path Method (CPM) of network calculation to generate the Project Schedule. Prepare the Project Schedule using the Precedence Diagram Method (PDM).

3.3.2 Level of Detail Required

Develop the Project Schedule to an appropriate level of detail. Failure to develop the Project Schedule to an appropriate level of detail, as determined by the Contracting Officer, will result in its disapproval.

3.3.3 Scheduled Project Completion and Activity Calendars

The schedule interval shall extend from NTP date to the required contract completion date. The contract completion activity (End Project) shall finish based on the required contract duration in the accepted contract proposal, as adjusted for any approved contract time extensions. The first scheduled work period shall be the day after NTP is acknowledged by the Contractor.

3.3.3.1 Project Start Date

The schedule shall start no earlier than the date on which the NTP was acknowledged. Include as the first activity in the project schedule an activity called "Start Project"(or NTP). The "Start Project" activity shall have an "ES" constraint date equal to the date that the NTP was acknowledged, and a zero day duration.

3.3.4 Milestones

The schedule must include milestone activities for each significant project event including but not limited to: milestone activities for each fast track design package released for construction; design complete; foundation/substructure construction complete; superstructure construction complete; building dry-in or enclosure complete to allow the initiation of finish activities; permanent power complete; and building systems commissioning complete.

3.4 PROJECT SCHEDULE SUBMISSIONS

Provide the submissions as described below. The data CD, reports, and network diagrams required for each submission are contained in paragraph SUBMISSION REQUIREMENTS.

3.4.1 Periodic Schedule Updates

Based on the result of the meeting, specified in PERIODIC SCHEDULE UPDATE MEETINGS, submit periodic schedule updates. These submissions will enable the Contracting Officer to assess Contractor's progress. If the Contractor fails or refuses to furnish the information and project schedule data, which in the judgement of the Contracting Officer or authorized representative is necessary for verifying the Contractor's progress, the Contractor shall be deemed not to have provided an estimate upon which progress payment may be made.

3.5 SUBMISSION REQUIREMENTS

Submit the following items for the Periodic Schedule Update throughout the life of the project:

3.5.1 Narrative Report

Provide a Narrative Report with each Periodic Update of the project schedule, as the basis of the progress payment request. The narrative report is expected to communicate to the Government, the Contractor's thorough analysis of the schedule output and its plans to compensate for any problems, either current or potential, which are revealed through that analysis. Identify and explain why any activities that, based their calculated late dates, should have either started or finished during the update period but did not.

3.5.2 Approved Changes Verification

Include only those project schedule changes in the schedule submission that have been previously approved by the Contracting Officer. The Narrative Report shall specifically reference, on an activity by activity basis, all changes made since the previous period and relate each change to documented, approved schedule changes.

3.6 PERIODIC SCHEDULE UPDATE MEETINGS

Conduct periodic schedule update meetings for the purposes of reviewing the Contractor's proposed out of sequence corrections, determining causes for delay, correcting logic, maintaining schedule accuracy and determining earned value. Meetings shall occur at least monthly within five days of the proposed schedule data date and after the Contractor has updated the schedule with Government concurrence respecting actual start dates, actual finish dates, remaining durations and percent complete for each activity it intend to status. The meeting will be a working interactive exchange which will allow the Government and the Contractor the opportunity to review the updated schedule on a real time and interactive basis. The Contractor's authorized scheduling representative will organize, sort, filter and schedule the update as requested by the Government. A rough draft of the proposed activity logic corrections and narrative report shall be provided to the Government 48 hours in advance of the meeting. The Contractor's Project Manager and Authorized Scheduler shall attend the meeting with the Authorized Representative of the Contracting Officer.

3.6.1 Update Submission Following Progress Meeting

Submit a complete update of the project schedule containing all approved progress, revisions, and adjustments, pursuant to paragraph SUBMISSION REQUIREMENTS not later than 4 working days after the periodic schedule update meeting, reflecting only those changes made during the previous update meeting.

3.6.2 Status of Activities

Update information, including Actual Start Dates (AS), Actual Finish Dates (AF), Remaining Durations (RD), and Percent Complete shall be subject to the approval of the Government prior to the meeting. As a minimum, address the following items on an activity by activity basis during each progress meeting.

3.7 REQUESTS FOR TIME EXTENSIONS

In the event the Contractor believes it is entitled to an extension of the contract performance period, completion date, or any interim milestone date, furnish the following for a determination by the Contracting Officer: justification, project schedule data, and supporting evidence as the Contracting Officer may deem necessary. Submission of proof of excusable delay, based on revised activity logic, duration, and costs (updated to the specific date that the delay occurred) is a condition precedent to any approvals by the Government. In response to each Request For Proposal issued by the Government, the Contractor shall submit a schedule impact analysis demonstrating whether or not the change contemplated by the Government impacts the critical path.

3.7.1 Justification of Delay

The project schedule shall clearly display that the Contractor has used, in full, all the float time available for the work involved with this request. The Contracting Officer's determination as to the number of allowable days of contract extension shall be based upon the project schedule updates in effect for the time period in question, and other factual information. Actual delays that are found to be caused by the Contractor's own actions, which result in a calculated schedule delay, will not be a cause for an extension to the performance period, completion date, or any interim milestone date.

3.7.2 Submission Requirements

Submit a justification for each request for a change in the contract completion date of less than 2 weeks based upon the most recent schedule update at the time of the NTP or constructive direction issued for the change. Such a request shall be in accordance with the requirements of other appropriate Contract Clauses and shall include, as a minimum:

- a. A list of affected activities, with their associated project schedule activity number.
- b. A brief explanation of the causes of the change.
- c. An analysis of the overall impact of the changes proposed.
- d. A sub-network of the affected area.

Identify activities impacted in each justification for change by a unique activity code contained in the required data file.

3.8 DIRECTED CHANGES

If the NTP is issued for changes prior to settlement of price and/or time, submit proposed schedule revisions to the Contracting Officer within 2 weeks of the NTP being issued. The Contracting Officer will approve proposed revisions to the schedule prior to inclusion of those changes within the project schedule. If the Contractor fails to submit the proposed revisions, the Contracting Officer may furnish the Contractor with suggested revisions to the project schedule. The Contractor shall include these revisions in the project schedule until revisions are submitted, and final changes and impacts have been negotiated. If the Contractor has any objections to the revisions furnished by the Contracting Officer, advise the Contracting Officer within 2 weeks of receipt of the revisions. Regardless of the objections, the Contractor shall continue to update the schedule with the Contracting Officer's revisions until a mutual agreement in the revisions is reached. If the Contractor fails to submit alternative revisions within 2 weeks of receipt of the Contracting Officer's proposed revisions, the Contractor will be deemed to have concurred with the Contracting Officer's proposed revisions. The proposed revisions will then be the basis for an equitable adjustment for performance of the work.

3.9 WEEKLY PROGRESS MEETINGS

- a. The Government and the Contractor shall meet weekly (or as otherwise mutually agreed to) between the meetings described in paragraph PERIODIC SCHEDULE UPDATE MEETINGS for the purpose of jointly reviewing the actual progress of the project as compared to the as

planned progress and to review planned activities for the upcoming two weeks. The then current and approved schedule update shall be used for the purposes of this meeting and for the production and review of reports. The Contractor's Project Manager and the Authorized Representative of the Contracting Officer shall attend. The weekly progress meeting will address the status of RFI's, RFP's and Submittals.

-- End of Section --

SECTION 01 33 00

SUBMITTAL PROCEDURES

11/08

PART 1 GENERAL

The Contracting Officer may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective sections.

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

Each submittal is to be complete and in sufficient detail to allow ready determination of compliance with contract requirements.

Contractor's Quality Control (CQC) System Manager and the Designer of Record, if applicable, to check and approve all items prior to submittal and stamp, sign, and date indicating action taken. Proposed deviations from the contract requirements are to be clearly identified. Include within submittals items such as: Contractor's, manufacturer's, or fabricator's drawings; descriptive literature including (but not limited to) catalog cuts, diagrams, operating charts or curves; test reports; test cylinders; samples; O&M manuals (including parts list); certifications; warranties; and other such required submittals.

Submittals requiring Government approval are to be scheduled and made prior to the acquisition of the material or equipment covered thereby. Picked up and disposed of in accordance with manufacturer's Material Safety Data Sheets (MSDS) and in compliance with existing laws and regulations samples remaining upon completion of the work.

1.1 DEFINITIONS

1.1.1 Submittal Descriptions (SD)

Submittals requirements are specified in the technical sections. Submittals are identified by Submittal Description (SD) numbers and titles as follows:

SD-01 Preconstruction Submittals

Submittals which are required prior to a notice to proceed commencing work on site. Submittals required prior to the start of the next major phase of the construction on a multi-phase contract. Schedules or tabular list of data or tabular list including location, features, or other pertinent information regarding products, materials, equipment, or components to be used in the work, submitted prior to contract notice to proceed or next major phase of construction.

Certificates of insurance
Surety bonds
List of proposed subcontractors
Construction Progress Schedule
Submittal register
Schedule of prices
Health and safety plan

Work plan
Quality control(QC) plan
Environmental protection plan

SD-03 Product Data

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

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

SD-10 Operation and Maintenance Data

Data that is furnished by the manufacturer, or the system provider, to the equipment operating and maintenance personnel, including manufacturer's help and product line documentation necessary to maintain and install equipment. This data is needed by operating and maintenance personnel for the safe and efficient operation, maintenance and repair of the item.

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

SD-11 Closeout Submittals

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

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

1.1.2 Approving Authority

Office or designated person authorized to approve submittal.

1.1.3 Work

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

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor QC approval.. Submit the following in accordance with this section.

SD-01 Preconstruction Submittals

Submittal register G

1.3 SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

1.3.1 Government Approved

Government approval is required for extensions of design, critical materials, deviations, equipment whose compatibility with the entire system must be checked, and other items as designated by the Contracting Officer. Government approval is required for any deviations from the Solicitation or Accepted Proposal and other items as designated by the Contracting Officer.

1.3.2 Government Conformance Review of Design (CR)

The Government will review all intermediate and final design submittals for conformance with the technical requirements of the solicitation. Review will be only for conformance with the applicable codes, standards and contract requirements. Generally, design submittals should be identified as SD-05 Design Data submittals.

1.3.3 Information Only

Submittals not requiring Government approval will be for information only. For Design-build construction all submittals not requiring Designer of Record or Government approval will be for information only. They are not considered to be "shop drawings" within the terms of the Contract Clause referred to above.

1.4 PREPARATION

1.4.1 Transmittal Form

Transmit each submittal, except sample installations and sample panels to the office of the approving authority. Transmit submittals with transmittal form prescribed by Contracting Officer and standard for project. On the transmittal form identify Contractor, indicate date of submittal, and include information prescribed by transmittal form and required in paragraph entitled "Identifying Submittals."

1.4.2 Identifying Submittals

When submittals are provided by a lower tier contractor the Prime Contractor is to prepare, review and stamp with Contractor's approval all specified submittals prior to submitting for Government approval.

Identify submittals, except sample installations and sample panels, with the following information permanently adhered to or noted on each separate component of each submittal and noted on transmittal form. Mark each copy of each submittal identically, with the following:

- a. Project title and location.
- b. Construction contract number.
- c. Date of the drawings and revisions.
- d. Name, address, and telephone number of subcontractor, supplier, manufacturer and any other second tier Contractor associated with submittal.

- e. Section number of the specification section by which submittal is required.
- f. Submittal description (SD) number of each component of submittal.
- g. When a resubmission, add alphabetic suffix on submittal description, for example, submittal 18 would become 18A, to indicate resubmission.
- h. Product identification and location in project.

1.4.3 Format for SD-02 Shop Drawings

- a. Shop drawings are not to be less than 8 1/2 by 11 inches nor more than 30 by 42 inches, except for full size patterns or templates. Prepare drawings to accurate size, with scale indicated, unless other form is required. Drawings are to be suitable for reproduction and be of a quality to produce clear, distinct lines and letters with dark lines on a white background.
- b. Present an 8 1/2 by 11 inches sized shop drawings as part of the bound volume for submittals required by section. Present larger drawings in sets.
- c. Include on each drawing the drawing title, number, date, and revision numbers and dates, in addition to information required in paragraph entitled "Identifying Submittals."
- d. Number drawings in a logical sequence. Each drawing is to bear the number of the submittal in a uniform location adjacent to the title block. Place the Government contract number in the margin.
- e. Dimension drawings, except diagrams and schematic drawings; prepare drawings demonstrating interface with other trades to scale. Use the same unit of measure for shop drawings as indicated on the contract drawings. Identify materials and products for work shown.

1.4.4 Format of SD-03 Product Data

- a. Present product data submittals for each section as a complete, bound volume. Include table of contents, listing page and catalog item numbers for product data.
- b. Indicate, by prominent notation, each product which is being submitted; indicate specification section number and paragraph number to which it pertains.
- c. Supplement product data with material prepared for project to satisfy submittal requirements for which product data does not exist. Identify this material as developed specifically for project, with information and format as required for submission of SD-07 Certificates.
- d. Include the manufacturer's name, trade name, place of manufacture, and catalog model or number on product data. Also include applicable federal, military, industry and technical society publication references. Should manufacturer's data require

supplemental information for clarification, submit as specified for SD-07 Certificates.

- e. Where equipment or materials are specified to conform to industry and technical society reference standards of the organizations such as American National Standards Institute (ANSI), ASTM International (ASTM), National Electrical Manufacturer's Association (NEMA), Underwriters Laboratories (UL), and Association of Edison Illuminating Companies (AEIC), submit proof of such compliance. The label or listing by the specified organization will be acceptable evidence of compliance. In lieu of the label or listing, submit a certificate from an independent testing organization, competent to perform testing, and approved by the Contracting Officer. State on the certificate that the item has been tested in accordance with the specified organization's test methods and that the item complies with the specified organization's reference standard.
- f. Collect required data submittals for each specific material, product, unit of work, or system into a single submittal and marked for choices, options, and portions applicable to the submittal. Mark each copy of the product data identically. Partial submittals will not be accepted for expedition of construction effort.
- g. Submit manufacturer's instructions prior to installation.

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

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

1.4.6 Format of SD-06 Test Reports

- a. Provide reports on 8 1/2 by 11 inches paper in a complete bound volume.
- b. Indicate by prominent notation, each report in the submittal. Indicate specification number and paragraph number to which it pertains.

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

Comply with the requirements specified in Section 01 78 23 OPERATION AND MAINTENANCE DATA for O&M Data format.

1.4.8 Format of SD-01 Preconstruction Submittals and SD-11 Closeout Submittals

- a. When submittal includes a document which is to be used in project or become part of project record, other than as a submittal, do not apply Contractor's approval stamp to document, but to a separate sheet accompanying document.
- b. Provide all dimensions in administrative submittals in metric. Where data are included in preprinted material with English units only, submit metric dimensions on separate sheet.

1.5 QUANTITY OF SUBMITTALS

1.5.1 Number of Copies of SD-02 Shop Drawings

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

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

Submit in compliance with quantity requirements specified for shop drawings.

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

Submit in compliance with quantity requirements specified for shop drawings.

1.5.4 Number of Copies SD-06 Test Reports

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

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

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

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

Unless otherwise specified, submit two sets of administrative submittals.

1.6 INFORMATION ONLY SUBMITTALS

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

1.7 VARIATIONS / SUBSTITUTION REQUESTS

Variations from contract requirements require Government approval pursuant to contract Clause FAR 52.236-21 and will be considered where advantageous to Government.

1.7.1 Considering Variations

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

(VECP).

Specifically point out variations from contract requirements in transmittal letters. Failure to point out deviations may result in the Government requiring rejection and removal of such work at no additional cost to the Government.

1.7.2 Proposing Variations

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

1.7.3 Warranting That Variations Are Compatible

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

1.7.4 Review Schedule Is Modified

In addition to normal submittal review period, a period of 10 working days will be allowed for consideration by the Government of submittals with variations.

1.8 SUBMITTAL REGISTER

Prepare and maintain submittal register, as the work progresses. Do not change data which is output in columns (c), (d), (e), and (f) as delivered by Government; retain data which is output in columns (a), (g), (h), and (i) as approved. A submittal register showing items of equipment and materials for which submittals are required by the specifications is provided as an attachment. This list may not be all inclusive and additional submittals may be required. The Government will provide the initial submittal register with the following fields completed, to the extent that will be required by the Government during subsequent usage.

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

Column (d): Lists each submittal description (SD No. and type, e.g. SD-02 Shop Drawings) required in each specification section.

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

Column (f): Indicate approving authority for each submittal.

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

1.8.1 Use of Submittal Register

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

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

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

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

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

1.8.2 Contractor Use of Submittal Register

Update the following fields with each submittal throughout contract.

Column (b) Transmittal Number: Contractor assigned list of consecutive numbers.

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

Column (l) List date of submittal transmission.

Column (q) List date approval received.

1.8.3 Approving Authority Use of Submittal Register

Update the following fields.

Column (b) Transmittal Number: Contractor assigned list of consecutive numbers.

Column (l) List date of submittal receipt.

Column (m) through (p) List Date related to review actions.

Column (q) List date returned to Contractor.

1.8.4 Contractor Action Code and Action Code

Entries for columns (j) and (o), are to be used are as follows (others may be prescribed by Transmittal Form):

NR - Not Received

AN - Approved as noted

A - Approved

RR - Disapproved, Revise, and Resubmit

1.8.5 Copies Delivered to the Government

Deliver one copy of submittal register updated by Contractor to Government with each invoice request.

1.9 SCHEDULING

Schedule and submit concurrently submittals covering component items forming a system or items that are interrelated. Include certifications to be submitted with the pertinent drawings at the same time. No delay damages or time extensions will be allowed for time lost in late submittals.

- a. Coordinate scheduling, sequencing, preparing and processing of submittals with performance of work so that work will not be delayed by submittal processing. Allow for potential resubmittal of requirements.
- b. Submittals called for by the contract documents will be listed on the register. If a submittal is called for but does not pertain to the contract work, the Contractor is to include the submittal in the register and annotate it "N/A" with a brief explanation. Approval by the Contracting Officer does not relieve the Contractor of supplying submittals required by the contract documents but which have been omitted from the register or marked "N/A".
- c. Re-submit register and annotate monthly by the Contractor with actual submission and approval dates. When all items on the register have been fully approved, no further re-submittal is required.
- d. Carefully control procurement operations to ensure that each individual submittal is made on or before the Contractor scheduled submittal date shown on the approved "Submittal Register."
- e. Except as specified otherwise, allow review period, beginning with receipt by approving authority, that includes at least 15 working days for submittals for QC Manager approval and 20 working days for submittals for Contracting Officer approval. Period of review for submittals with Contracting Officer approval begins when Government receives submittal from QC organization.
- f. Period of review for each resubmittal is the same as for initial submittal.

1.9.1 Reviewing, Certifying, Approving Authority

The QC organization is responsible for reviewing and certifying that submittals are in compliance with contract requirements. Approving authority on submittals is QC Manager unless otherwise specified for specific submittal. At each "Submittal" paragraph in individual specification sections, a notation "G," following a submittal item, indicates Contracting Officer is approving authority for that submittal item.

1.9.2 Constraints

- a. Conform to provisions of this section, unless explicitly stated

otherwise for submittals listed or specified in this contract.

- b. Submit complete submittals for each definable feature of work. Submit at the same time components of definable feature interrelated as a system.
- c. When acceptability of a submittal is dependent on conditions, items, or materials included in separate subsequent submittals, submittal will be returned without review.
- d. Approval of a separate material, product, or component does not imply approval of assembly in which item functions.

1.9.3 QC Organization Responsibilities

- a. Note date on which submittal was received from Contractor on each submittal.
- b. Review each submittal; and check and coordinate each submittal with requirements of work and contract documents.
- c. Review submittals for conformance with project design concepts and compliance with contract documents.
- d. Act on submittals, determining appropriate action based on QC organization's review of submittal.

(1) When QC Manager is approving authority, take appropriate action on submittal from the possible actions defined in paragraph entitled, "Actions Possible."

(2) When Contracting Officer is approving authority or when variation has been proposed, forward submittal to Government with certifying statement or return submittal marked "not reviewed" or "revise and resubmit" as appropriate. The QC organization's review of submittal determines appropriate action.

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

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

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

Certified by Submittal Reviewer _____, Date _____
(Signature when applicable)

Certified by QC Manager _____, Date _____"
(Signature)

(2) When approving authority is QC Manager, QC Manager will use the following approval statement when returning submittals to Contractor as "Approved" or "Approved as Noted."

"I hereby certify that the (material) (equipment) (article) shown and marked in this submittal and proposed to be incorporated with contract Number [____], is in compliance with the contract drawings and specification, can be installed in the allocated spaces, and is approved for use.

Certified by Submittal Reviewer _____, Date _____
(Signature when applicable)

Approved by QC Manager _____, Date _____"
(Signature)

- g. Sign certifying statement or approval statement. The QC organization member designated in the approved QC plan is the person signing certifying statements. The use of original ink for signatures is required. Stamped signatures are not acceptable.
- h. Update submittal register [database] as submittal actions occur and maintain the submittal register at project site until final acceptance of all work by Contracting Officer.
- i. Retain a copy of approved submittals at project site, including Contractor's copy of approved samples.

1.10 GOVERNMENT APPROVING AUTHORITY

When approving authority is Contracting Officer, the Government will:

- a. Note date on which submittal was received from QC Manager.
- b. Review submittals for approval within scheduling period specified and only for conformance with project design concepts and compliance with contract documents.
- c. Identify returned submittals with one of the actions defined in paragraph entitled "Review Notations" and with markings appropriate for action indicated.

Upon completion of review of submittals requiring Government approval, stamp and date approved submittals. Two copies of the approved submittal will be retained by the Contracting Officer and one copy of the submittal will be returned to the Contractor.

1.10.1 Review Notations

Contracting Officer review will be completed within 30 calendar days after date of submission. Submittals will be returned to the Contractor with the following notations:

- a. Submittals marked "approved" or "accepted" authorize the Contractor to proceed with the work covered.
- b. Submittals marked "approved as noted" "or approved except as noted, resubmittal not required," authorize the Contractor to

proceed with the work covered provided he takes no exception to the corrections.

- c. Submittals marked "not approved" or "disapproved," or "revise and resubmit," indicate noncompliance with the contract requirements or design concept, or that submittal is incomplete. Resubmit with appropriate changes. No work shall proceed for this item until resubmittal is approved.
- d. Submittals marked "not reviewed" will indicate submittal has been previously reviewed and approved, is not required, does not have evidence of being reviewed and approved by Contractor, or is not complete. A submittal marked "not reviewed" will be returned with an explanation of the reason it is not reviewed. Resubmit submittals returned for lack of review by Contractor or for being incomplete, with appropriate action, coordination, or change.

1.11 DISAPPROVED SUBMITTALS

Contractor shall make corrections required by the Contracting Officer. If the Contractor considers any correction or notation on the returned submittals to constitute a change to the contract drawings or specifications; notice as required under the clause entitled, "Changes" is to be given to the Contracting Officer. Contractor is responsible for the dimensions and design of connection details and construction of work. Failure to point out deviations may result in the Government requiring rejection and removal of such work at the Contractor's expense.

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

1.12 APPROVED SUBMITTALS

The Contracting Officer's approval or acceptance of submittals is not be construed as a complete check, and indicates only that the general method of construction, materials, detailing and other information are satisfactory design. Approval or acceptance will not relieve the Contractor of the responsibility for any error which may exist. After submittals have been approved or accepted by the Contracting Officer, no resubmittal for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.

1.13 WITHHOLDING OF PAYMENT

Payment for materials incorporated in the work will not be made if required approvals have not been obtained. No payment will be made for any materials incorporated into the work for any conformance review submittals or information only submittals found to contain errors or deviations from the Solicitation or Accepted Proposal.

1.14 PROGRESS SCHEDULE

1.14.1 Project Network Analysis

Submit the initial progress schedule within 21 calendar days of notice to proceed. Schedule is to be updated and resubmitted monthly beginning 7

calendar days after return of the approved initial schedule. Updating to entail complete revision of the graphic and data displays incorporating changes in scheduled dates and performance periods. Redlined updates will only be acceptable for use as weekly status reviews.

Contractor to provide a single point contact from his on-site organization as his Schedule Specialist. Schedule Specialist is to have the responsibility of updating and coordinating the schedule with actual job conditions. Schedule Specialist to participate in weekly status meetings and present current information on the status of purchase orders, shop drawings, off-site fabrication, materials deliveries, Subcontractor activities, anticipated needs for Government furnished equipment, and any problem which may impact the contract performance period.

Include the following in the project network analysis:

- a. Graphically display with the standard network or arrow diagram capable of illustrating the required data. Drafting to be computer generated on standard 24 by 36 inch (nominal size) drafting sheets or on small (11 by 17 inch minimum) sheets with separate overview and detail breakouts. Provide a project network analysis that is legible with a clear, consistent method for continuations and detail referencing. Clearly delineate the critical path on the display. Clearly indicate the contract milestone date on the project network analysis graphic display.
- b. Data is to be presented as a separate printout on paper or, where feasible, may be printed on the same sheet as the graphic display. Data is to be organized in a logical coherent display capable of periodic updating.
- c. Include within the data verbal activity descriptions with a numerical ordering system cross referenced to the graphic display. Additionally, costs (broken down into separate materials and costs), duration, early start date, early finish date, late start date, late finish date, and float are to be detailed for each activity. A running total of the percent completion based on completed activity costs versus total contract cost is to be indicated. A system for indicating scheduled versus actual activity dates and durations is also to be provided.
- d. Sufficient detail to facilitate the Contractor's control of the job and to allow the Contracting Officer to readily follow progress for portions of the work should be shown within the schedule.

1.15 STATUS REPORT ON MATERIALS ORDERS

Within 30 calendar days after notice to proceed, submit, for approval by the Contracting Officer, an initial material status report on all materials orders. This report will be updated and re-submitted as the status on material orders changes.

Report to include list, in chronological order by need date, materials orders necessary for completion of the contract. The following information will be required for each material order listed:

- a. Material name, supplier, and invoice number.

- b. Bar chart line item or CPM activity number affected by the order.
- c. Delivery date needed to allow directly and indirectly related work to be completed within the contract performance period.
- d. Current delivery date agreed on by supplier.
- e. When item d exceeds item c, the effect that delayed delivery date will have on contract completion date.
- f. When item d exceeds item c, a summary of efforts made by the Contractor to expedite the delayed delivery date to bring it in line with the needed delivery date, including efforts made to place the order (or subcontract) with other suppliers.

1.16 STAMPS

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

CONTRACTOR
(Firm Name)
_____ Approved
_____ Approved with corrections as noted on submittal data and/or attached sheets(s)
SIGNATURE: _____
TITLE: _____
DATE: _____

For design-build construction, both the Contractor Quality Control System Manager and the Designer of Record are to stamp and sign to certify that the submittal meets contract requirements.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 01 35 29.13

HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES FOR CONTAMINATED SITES
01/08

PART 1 GENERAL

1.1 REFERENCES

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

INTERNATIONAL SAFETY EQUIPMENT ASSOCIATION (ISEA)

ISEA Z358.1 (2004) Emergency Eyewash and Shower Equipment

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)

NIOSH 85-115 (1985) Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities

U.S. ARMY CORPS OF ENGINEERS (USACE)

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

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

29 CFR 1904 Recording and Reporting Occupational Injuries and Illnesses

29 CFR 1910 Occupational Safety and Health Standards

29 CFR 1910.120 Hazardous Waste Operations and Emergency Response

29 CFR 1926 Safety and Health Regulations for Construction

29 CFR 1926.65 Hazardous Waste Operations and Emergency Response

1.2 DESCRIPTION OF WORK

This section requires Contractors to implement practices and procedures for working safely and in compliance with OSHA and USACE regulation while performing cleanup activities on uncontrolled hazardous waste sites.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office

that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Exposure Monitoring/Air Sampling Program

Personnel exposure monitoring/sampling results.

Site Control Log

Record of each entry and exit into the site, as specified.

Employee Certificates

A certificate for each worker performing cleanup operations with potential for contaminant-related occupational exposure signed by the safety and health manager and the occupational physician indicating the workers meet the training and medical surveillance requirements of this contract.

1.4 REGULATORY REQUIREMENTS

Comply with EM 385-1-1, OSHA requirements in 29 CFR 1910 and 29 CFR 1926 with work performed under this contract, especially OSHA's Standards 29 CFR 1926.65 and 29 CFR 1910.120 and state specific OSHA requirements where applicable. Submit to the Contracting Officer for resolution matters of interpretation of standards before starting work. The most stringent requirements apply where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary.

1.5 PRECONSTRUCTION SAFETY CONFERENCE

Conduct a preconstruction safety conference prior to the start of site activities and after submission of the Contractor's APP/SSHP. The objective of the meeting will be to discuss health and safety concerns related to the impending work, discuss project health and safety organization and expectations, review and answer comments and concerns regarding the APP/SSHP or other health and safety concerns the Contractor may have. Ensure that those individuals responsible for health and safety at the project level are available and attend this meeting.

1.6 ACCIDENT PREVENTION PLAN/SITE SAFETY AND HEALTH PLAN (APP/SSHP)

Develop and implement a Site Safety and Health Plan and attach to the Accident Prevention Plan (APP) as an appendix (APP/SSHP). Address all occupational safety and health hazards (traditional construction as well as contaminant-related hazards) associated with cleanup operations within the APP/SSHP. The APP/SSHP is a dynamic document, subject to change as project operations/execution change. The APP/SSHP will require modification to address changing and previously unidentified health and safety conditions. It is the Contractor's responsibility to ensure that the APP/SSHP is updated accordingly. Submit amendments to the APP/SSHP as the APP/SSHP is updated.

1.6.1 Acceptance and Modifications

Prior to submittal, the APP/SSHP must be signed and dated by the Safety and Health Manager and the Site Superintendent. Submit for review 15 days

prior to the Preconstruction Safety Conference. Deficiencies in the APP/SSHP will be discussed at the preconstruction safety conference, and be revised to correct the deficiencies and resubmitted for acceptance. Onsite work must not begin until the plan has been accepted. Maintain a copy of the written APP/SSHP onsite. Changes and modifications to must be made with the knowledge and concurrence of the Safety and Health Manager, the Site Superintendent, and the Contracting Officer. Bring to the attention of the Safety and Health Manager, the Site Superintendent, and the Contracting Officer any unforeseen hazard that becomes evident during the performance of the work, through the Site Safety and Health Officer (SSHO) for resolution as soon as possible. In the interim, take necessary action to re-establish and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public, and the environment. Disregard for the provisions of this specification or the accepted APP/SSHP will be cause for stopping work until the matter has been rectified.

1.6.2 Availability

Make available the APP/SSHP in accordance with 29 CFR 1910.120, (b)(1)(v) and 29 CFR 1926.65, (b)(1)(v).

1.7 SITE DESCRIPTION AND CONTAMINATION CHARACTERIZATION

1.7.1 Project/Site Conditions

Refer to the following reports and information for the site description and contamination characterization. They are available on the MCB Camp Lejeune UST Management Program Web Portal.

1.7.1.1 UST Documents

Corrective Action Plan Supplement.

1.8 TASK SPECIFIC HAZARDS, INITIAL PPE, HAZWOPER MEDICAL SURVEILLANCE AND TRAINING APPLICABILITY

Task specific occupational hazards, task specific HAZWOPER medical surveillance and training applicability and task specific initial PPE requirements for the project are listed on the Task Hazard and Control Sheets at the end of this section. It is the Contractor's responsibility to reevaluate occupational safety and health hazards as the work progresses and to adjust the PPE and onsite operations, if necessary, so that the work is performed safely and in compliance with occupational safety and health regulations.

1.9 STAFF ORGANIZATION, QUALIFICATION AND RESPONSIBILITIES

1.9.1 Safety and Health Manager

Safety and Health Manager must be an Industrial Hygienist certified by the American Board of Industrial Hygiene or other approved professional.

1). The Safety and Health Manager must have the following additional qualifications:

- a. A minimum of 3 years experience in developing and implementing safety and health programs at underground storage tank removal projects.
- b. Documented experience in supervising professional and technician

level personnel.

c. Documented experience in developing worker exposure assessment programs and air monitoring programs and techniques.

d. Documented experience in managing personal protective equipment programs and conducting PPE hazard evaluations for the types of activities and hazards likely to be encountered on the project.

e. Working knowledge of state and Federal occupational safety and health regulations.

2). The Safety and Health Manager will:

a. Be responsible for the development, implementation, oversight, and enforcement of the APP/SSHP.

b. Sign and date the APP/SSHP prior to submittal.

c. Conduct initial site-specific training.

d. Be available for consultation during the remedial activities and at the startup of each new major phase of work.

e. Visit the site as needed for the duration of activities, to audit the effectiveness of the APP/SSHP.

f. Be available for emergencies.

g. Provide onsite consultation as needed to ensure the APP/SSHP is fully implemented.

h. Coordinate any modifications to the APP/SSHP with the Site Superintendent, the SSHO, and the Contracting Officer.

i. Provide continued support for upgrading/downgrading of the level of personal protection.

j. Be responsible for evaluating air monitoring data and recommending changes to engineering controls, work practices, and PPE.

k. Review accident reports and results of daily inspections.

l. Serve as a member of the Contractor's quality control staff.

1.9.2 Site Safety and Health Officer

Designate an individual as the Site Safety and Health Officer (SSHO). The name, qualifications (education and training summary and documentation), and include work experience of the Site Safety and Health Officer in the APP/SSHP.

1). The SSHO must have the following qualifications:

a. A minimum of 1 year experience in implementing safety and health programs at underground storage tank removal projects where personal protective equipment was required.

b. Documented experience in construction techniques and construction

safety procedures.

c. Working knowledge of Federal and state occupational safety and health regulations.

d. Specific training in personal and respiratory protective equipment, confined space entry and in the proper use of air monitoring instruments and air sampling methods.

2). The Site Safety and Health Officer must:

a. Assist and represent the Safety and Health Manager in onsite training and the day to day onsite implementation and enforcement of the accepted APP/SSHP.

b. Be assigned to the site on a full time basis for the duration of field activities. The SSHO can have collateral duties in addition to Safety and Health related duties.

c. Have authority to ensure site compliance with specified safety and health requirements, Federal, state and OSHA regulations and all aspects of the APP/SSHP including, but not limited to, activity hazard analyses, air monitoring, use of PPE, decontamination, site control, standard operating procedures used to minimize hazards, safe use of engineering controls, the emergency response plan, confined space entry procedures, spill containment program, and preparation of records by performing a daily safety and health inspection and documenting results on the Daily Safety Inspection Log in accordance with 29 CFR 1904.

d. Have authority to stop work if unacceptable health or safety conditions exist, and take necessary action to re-establish and maintain safe working conditions.

e. Consult with and coordinate any modifications to the APP/SSHP with the Safety and Health Manager, the Site Superintendent, and the Contracting Officer.

f. Serve as a member of the Contractor's quality control staff on matters relating to safety and health.

g. Conduct accident investigations and prepare accident reports.

h. Conduct daily safety inspection and document safety and health findings into the Daily Safety Inspection Log. Track noted safety and health deficiencies to ensure that they are corrected.

i. In coordination with site management and the Safety and Health Manager, recommend corrective actions for identified deficiencies and oversee the corrective actions.

1.9.3 Occupational Physician

Utilize the services of a licensed physician, who is certified in occupational medicine by the American Board of Preventative Medicine, or who, by necessary training and experience is Board eligible. The physician must be familiar with this site's hazards and the scope of this project. Include the medical consultant's name, qualifications, and knowledge of the site's conditions and proposed activities in the APP/SSHP. The physician will be responsible for the determination of medical surveillance protocols

and for review of examination/test results performed in compliance with 29 CFR 1910.120, (f) and 29 CFR 1926.65, (f) and paragraph MEDICAL SURVEILLANCE.

1.9.4 Persons Certified in First Aid and CPR

At least two persons who are currently certified in first aid and CPR by the American Red Cross or other approved agency must be onsite at all times during site operations. They must be trained in universal precautions and the use of PPE as described in the Bloodborne Pathogens Standard of 29 CFR 1910, Section .1030. These persons may perform other duties but will be immediately available to render first aid when needed.

1.9.5 Safety and Health Technicians

For each work crew in the exclusion zone, one person, designated as a Safety and Health technician, must perform activities such as air monitoring, decontamination, and safety oversight on behalf of the SSHO. They must have appropriate training equivalent to the SSHO in each specific area for which they have responsibility and report to and be under the supervision of the SSHO.

1.10 TRAINING

Meet the following requirements in the Contractor's training program for workers performing cleanup operations and who will be exposed to contaminants.

1.10.1 General Hazardous Waste Operations Training

All Personnel performing duties with potential for exposure to onsite contaminants must meet and maintain the following 29 CFR 1910.120/29 CFR 1926.65 (e) training requirements:

- a. 40 hours of off site hazardous waste instruction.
- b. 3 days actual field experience under the direct supervision of a trained, experienced supervisor.
- c. 8 hours refresher training annually.

Onsite supervisors must have an additional 8 hours management and supervisor training specified in 29 CFR 1910.120/29 CFR 1926.65 (e) (4).

1.10.2 Pre-entry Briefing

Prior to commencement of onsite field activities, all site employees, including those assigned only to the Support Zone, must attend a site-specific safety and health training session. This session will be conducted by the Safety and Health Manager and the Site Safety and Health Officer to ensure that all personnel are familiar with requirements and responsibilities for maintaining a safe and healthful work environment. Thoroughly discuss procedures and contents of the accepted APP/SSHP. Each employee must sign a training log to acknowledge attendance and understanding of the training. Notify the Contracting Officer at least 5 days prior to the initial site-specific training session so government personnel involved in the project may attend.

1.10.3 Periodic Sessions

Conduct periodic onsite training by the SSHO at least weekly for personnel assigned to work at the site during the following week. Address safety and health procedures, work practices, any changes in the APP/SSHP, activity hazard analyses, work tasks, or schedule; results of previous week's air monitoring, review of safety discrepancies and accidents. Convene a meeting prior to implementation of the change must be convened should an operational change affecting onsite field work be made, to explain safety and health procedures. Conduct a site-specific training sessions for new personnel, visitors, and suppliers by the SSHO using the training curriculum outlines developed by the Safety and Health Manager. Each employee must sign a training log to acknowledge attendance and understanding of the training.

1.11 PERSONAL PROTECTIVE EQUIPMENT

1.11.1 Site Specific PPE Program

Provide onsite personnel exposed to contaminants with appropriate personal protective equipment. Components of levels of protection (B, C, D and modifications) must be relevant to site-specific conditions, including heat and cold stress potential and safety hazards. Use only respirators approved by NIOSH. Commercially available PPE, used to protect against chemical agent, must be approved. Keep protective equipment and clothing clean and well maintained. Include site-specific procedures to determine PPE program effectiveness and for onsite fit-testing of respirators, cleaning, maintenance, inspection, and storage of PPE within the PPE section of the APP/SSHP.

1.11.2 Levels of Protection

The Safety and Health Manager must establish and evaluate as the work progresses the levels of protection for each work activity. Also establish action levels for upgrade or downgrade in levels of PPE. Describe in the SSHP the protocols and the communication network for changing the level of protection. Address air monitoring results, potential for exposure, changes in site conditions, work phases, job tasks, weather, temperature extremes, individual medical considerations, etc. within the PPE evaluation protocol.

1.11.2.1 Initial PPE Components

The following items constitute initial minimum protective clothing and equipment ensembles.

- a. Level D.

1.12 MEDICAL SURVEILLANCE PROGRAM

Meet 29 CFR 1910.120/29 CFR 1926.65 (f) and the following requirements for medical surveillance program for workers performing cleanup operations and who will be exposed to contaminants. Assure the Occupational Physician or the physician's designee performs the physical examinations and reviews examination results. Participation in the medical surveillance program will be without cost to the employee, without loss of pay and at a reasonable time and place.

1.12.1 Frequency of Examinations

Medical surveillance program participants must receive medical examinations and consultations on the following schedule:

- a. Every 12 months
- b. If and when the participant develops signs and symptoms indicating a possible overexposure due to an uncontrolled release of a hazardous substance on the project.
- c. Upon termination or reassignment to a job where medical surveillance program participation is not required, unless his/her previous annual examination/consultation was less than 6 months prior to reassignment or termination.
- d. On a schedule specified by the occupational physician.

1.12.2 Content of Physical Examinations/Consultation

Verify the following information about medical surveillance program participants:

- a. Baseline health conditions and exposure history.
- b. Allergies/sensitivity/susceptibility to hazardous substances exposure.
- c. Ability to wear personal protective equipment inclusive of NIOSH certified respirators under extreme temperature conditions.
- d. Fitness to perform assigned duties.

Provide the occupational physician with the following information for each medical surveillance program participant:

- a. Information on the employee's anticipated or measured exposure.
- b. A description of any PPE used or to be used.
- c. A description of the employee's duties as they relate to the employee's exposures (including physical demands on the employee and heat/cold stress).
- d. A copy of 29 CFR 1910.120, or 29 CFR 1926.65.
- e. Information from previous examinations not readily available to the examining physician.
- f. A copy of Section 5.0 of NIOSH 85-115.
- g. Information required by 29 CFR 1910 Section .134.

1.12.3 Physician's Written Opinion

Obtain and furnish to the Safety and Health Manager; and the employee before work begins, a copy of the physician's written opinion for each employee. Address the employee's ability to perform hazardous waste site remediation work and containing the following:

- a. The physician's verification of the employee's fitness to perform duties as well as recommended limitations upon the employee's assigned work and/or PPE usage.
- b. The physician's opinion about increased risk to the employee's health resulting from work; and
- c. A statement that the employee has been informed and advised about the results of the examination.

1.12.4 Employee Certificates

Provide on employee certificates, documentation that employees have received medical examinations.

1.13 EXPOSURE MONITORING/AIR SAMPLING PROGRAM

Prepare and implement by the Safety and Health Manager an exposure monitoring/air sampling program to identify and quantify safety and health hazards and airborne levels of hazardous substances in order to assure proper selection of engineering controls, work practices and personal protective equipment for affected site personnel. Include action levels for upgrading/downgrading PPE in the program.

1.14 HEAT STRESS MONITORING AND MANAGEMENT

Document in the APP/SSHP and implement the procedures and practices in section 06.J. in EM 385-1-1 to monitor and manage heat stress.

1.15 SPILL AND DISCHARGE CONTROL

Develop and implement written spill and discharge containment/control procedures. Address laboratory waste packs, material handling equipment, as well as drum and container handling, opening, sampling, shipping and transport. Describe prevention measures, such as building berms or dikes; spill control measures and material to be used (e.g. booms, vermiculite); location of the spill control material; personal protective equipment required to cleanup spills; disposal of contaminated material; and who is responsible to report the spill. Storage of contaminated material or hazardous materials must be appropriately bermed, diked and/or contained to prevent any spillage of material on uncontaminated soil. If the spill or discharge is reportable, and/or human health or the environment are threatened, the National Response Center, the state, and the Contracting Officer must be notified as soon as possible.

1.16 HOT WORK

Hot work will not be permitted on or within the tanks or anywhere else not previously specified as a hot work area, except as outlined herein. Prior to conducting hot work, a hot work permit must be prepared by the person to be conducting the hot work and reviewed and signed off by the Contractor's qualified person. An additional hot work permit may need to be obtained from local authorities or in the case of military or other federal installations, the fire marshal. An example format for a hot work permit must be included in the APP/SSHP. The hot work prohibition includes welding, cutting, grinding, sawing, or other similar operations which could be expected to potentially generate combustion-producing temperatures or sparks, or which could produce potentially hazardous fumes or vapors.

Designate an individual at each hot work site as a fire watch. This person's sole responsibility is to monitor the hot work and have immediate access to the fire extinguisher located at each hot work site. A new permit must be obtained at the start of each work shift during which hot work will be conducted.

1.17 EMERGENCY EQUIPMENT AND FIRST AID REQUIREMENTS

Maintain, as a minimum, the following items onsite and available for immediate use:

- a. First aid equipment and supplies approved by the consulting physician.
- b. Emergency eyewashes and showers that comply with ISEA Z358.1.
- d. Provide fire extinguishers of sufficient size and type at site facilities and in all vehicles and at any other site locations where flammable or combustible materials present a fire risk.

1.18 EMERGENCY RESPONSE AND CONTINGENCY PROCEDURES

An Emergency Response Plan, that meets the requirements of 29 CFR 1910.120 (1) and 29 CFR 1926.65 (1), must be developed and implemented as a section of the APP/SSHP. In the event of any emergency associated with remedial action, without delay, alert all onsite employees and as necessary offsite emergency responders that there is an emergency situation; take action to remove or otherwise minimize the cause of the emergency; alert the Contracting Officer; and institute measures necessary to prevent repetition of the conditions or actions leading to, or resulting in, the emergency. Train employees that are required to respond to hazardous emergency situations to their level of responsibility according to 29 CFR 1910.120 (q) and 29 CFR 1926.65 (q) requirements. Rehearse the plan regularly as part of the overall training program for site operations. Review the plan periodically and revised as necessary to reflect new or changing site conditions or information. Provide copies of the Emergency Response Portion of the accepted APP/SSHP to the affected local emergency response agencies. Address, as a minimum, the following elements in the plan:

- a. Pre-emergency planning. Coordinate with local emergency response providers during preparation of the Emergency Response Plan. At a minimum, coordinate with local fire, rescue, hazardous materials response teams, police and emergency medical providers to assure all organizations are capable and willing to respond to and provide services for on-site emergencies. Ensure the Emergency Response Plan for the site is compatible and integrated with the local fire, rescue, medical and police security services available from local emergency response planning agencies.
- b. Personnel roles, lines of authority, communications for emergencies.
- c. Emergency recognition and prevention.
- d. Site topography, layout, and prevailing weather conditions.
- e. Criteria and procedures for site evacuation (emergency alerting procedures, employee alarm system, emergency PPE and equipment, safe distances, places of refuge, evacuation routes, site security and control).

f. Specific procedures for decontamination and medical treatment of injured personnel.

g. Route maps to nearest prenotified medical facility. Site-support vehicles must be equipped with maps. At the beginning of project operations, drivers of the support vehicles must become familiar with the emergency route and the travel time required.

h. Emergency alerting and response procedures including posted instructions and a list of names and telephone numbers of emergency contacts (physician, nearby medical facility, fire and police departments, ambulance service, Federal, state, and local environmental agencies; as well as Safety and Health Manager, the Site Superintendent, the Contracting Officer and/or their alternates).

i. Criteria for initiating community alert program, contacts, and responsibilities.

j. Procedures for reporting incidents to appropriate government agencies. In the event that an incident such as an explosion or fire, or a spill or release of toxic materials occurs during the course of the project, the appropriate government agencies must be immediately notified. In addition, verbally notify the Contracting Officer and the local district safety office immediately and receive a written notification within 24 hours. Include within the report the following items:

- (1) Name, organization, telephone number, and location of the Contractor.
- (2) Name and title of the person(s) reporting.
- (3) Date and time of the incident.
- (4) Location of the incident, i.e., site location, facility name.
- (5) Brief summary of the incident giving pertinent details including type of operation ongoing at the time of the incident.
- (6) Cause of the incident, if known.
- (7) Casualties (fatalities, disabling injuries).
- (8) Details of any existing chemical hazard or contamination.
- (9) Estimated property damage, if applicable.
- (10) Nature of damage, effect on contract schedule.
- (11) Action taken to ensure safety and security.
- (12) Other damage or injuries sustained, public or private.

k. Procedures for critique of emergency responses and follow-up.

1.19 CERTIFICATE OF WORKER/VISITOR ACKNOWLEDGEMENT

A copy of a Contractor-generated certificate of worker/visitor

acknowledgement must be completed and submitted for each visitor allowed to enter contamination reduction or exclusion zones, and for each employee, following the example certificate at the end of this section.

1.20 INSPECTIONS

Attach to and submit with the Daily Quality Control reports the SSHO's Daily Inspection Logs. Include with each entry the following: date, work area checked, employees present in work area, PPE and work equipment being used in each area, special safety and health issues and notes, and signature of preparer.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

-- End of Section --

SECTION 01 42 00

SOURCES FOR REFERENCE PUBLICATIONS

11/08

PART 1 GENERAL

1.1 REFERENCES

Various publications are referenced in other sections of the specifications to establish requirements for the work. These references are identified in each section by document number, date and title. The document number used in the citation is the number assigned by the standards producing organization, (e.g. ASTM B 564 Nickel Alloy Forgings). However, when the standards producing organization has not assigned a number to a document, an identifying number has been assigned for reference purposes.

1.2 ORDERING INFORMATION

The addresses of the standards publishing organizations whose documents are referenced in other sections of these specifications are listed below, and if the source of the publications is different from the address of the sponsoring organization, that information is also provided. Documents listed in the specifications with numbers which were not assigned by the standards producing organization should be ordered from the source by title rather than by number.

ACI INTERNATIONAL (ACI)
38800 Country Club Drive
Farmington Hills, MI 48331
Ph: 248-848-3700
Fax: 248-848-3701
E-mail: bkstore@concrete.org
Internet: <http://www.concrete.org>

ASTM INTERNATIONAL (ASTM)
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428-2959
Ph: 610-832-9500
Fax: 610-832-9555
E-mail: service@astm.org
Internet: <http://www.astm.org>

INTERNATIONAL SAFETY EQUIPMENT ASSOCIATION (ISEA)
1901 North Moore Street
Arlington, VA 22209-1762
Ph: 703-525-1695
Fax: 703-528-2148
E-mail: isea@safetyequipment.org
Internet: <http://www.safetyequipment.org/>

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)
Mail Stop C-13
4676 Columbia Parkway
Cincinnati, OH 45226-1998
Ph: 800-356-4674
Fax: 513-533-8573

E-mail: pubstaff@cdc.gov
Internet: <http://www.cdc.gov/niosh/homepage.html>

U.S. ARMY CORPS OF ENGINEERS (USACE)
Order CRD-C DOCUMENTS from:
U.S. Army Engineer Waterways Experiment Station
ATTN: Technical Report Distribution Section, Services
Branch, TIC
3909 Halls Ferry Road
Vicksburg, MS 39180-6199
Ph: 601-634-2664
Fax: 601-634-2388
E-mail: mtc-info@erdc.usace.army.mil
Internet: <http://www.wes.army.mil/SL/MTC/handbook.htm>

Order Other Documents from:
USACE Publications Depot
Attn: CEHEC-IM-PD
2803 52nd Avenue
Hyattsville, MD 20781-1102
Ph: 301-394-0081
Fax: 301-394-0084
E-mail: pubs-army@usace.army.mil
Internet: <http://www.usace.army.mil/publications>
or <http://www.hnd.usace.army.mil/techinfo/engpubs.htm>

-- End of Section --

SECTION 01 45 02.10

NAVFAC QUALITY CONTROL FOR MINOR CONSTRUCTION

11/08

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

QC Plan; G,

Submit a QC plan within 15 calendar days after receipt of Notice of Award.

1.2 INFORMATION FOR THE CONTRACTING OFFICER (KO)

Prior to commencing work on construction, the Contractor can obtain a single copy set of the current report forms from the KO. The report forms will consist of the Contractor Production Report, Contractor Production Report (Continuation Sheet), Contractor Quality Control (CQC) Report, CQC Report (Continuation Sheet), Preparatory Phase Checklist, Initial Phase Checklist, Rework Items List, and Testing Plan and Log.

Deliver the following to the KO:

- a. CQC Report: Original and one copy, by 10:00 AM the next working week after each weekthat work is performed;
- b. Contractor Production Report: Original and one copy by 10:00 AM the next working weekafter each weekthat work is performed;
- c. Preparatory Phase Checklist: Original attached to the original CQC Report and one copy attached to each copy;
- d. Initial Phase Checklist: Original attached to the original CQC Report and one copy attached to each copy;
- e. Field Test Reports: One copy, within the week after the test is performed, attached to the CQC Report;
- f. QC Meeting Minutes: One copy, within the week after the meeting; and
- g. QC Certifications: As required by the paragraph entitled "QC Certifications."

1.3 QC PROGRAM REQUIREMENTS

Establish and maintain a QC program as described in this section. The QC

program consists of a QC Manager, a QC plan, a Coordination and Mutual Understanding Meeting, QC meetings, three phases of control, submittal review and approval, testing, and QC certifications and documentation necessary to provide materials, equipment, workmanship, fabrication, construction and operations which comply with the requirements of this contract. The QC program shall cover on-site and off-site work and shall be keyed to the work sequence. No work or testing may be performed unless the QC Manager is on the work site.

1.3.1 Preliminary Work Authorized Prior to Acceptance

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

1.3.2 Acceptance

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

1.3.3 Notification of Changes

Notify the KO, in writing, of any proposed change, including changes in the QC organization personnel, a minimum of seven calendar days prior to a proposed change. Proposed changes shall be subject to the acceptance by the KO.

1.4 QC ORGANIZATION

1.4.1 QC Manager

1.4.1.1 Duties

Provide a QC Manager at the work site to implement and manage the QC program. In addition to implementing and managing the QC program, the QC Manager may perform the duties of project superintendent. The QC Manager is required to attend the Coordination and Mutual Understanding Meeting, conduct the QC meetings, perform the three phases of control, perform submittal review and approval, ensure testing is performed and provide QC certifications and documentation required in this contract. The QC Manager is responsible for managing and coordinating the three phases of control and documentation performed by others.

1.4.1.2 Qualifications

An individual with a minimum of 5 years combined experience as a superintendent, inspector, QC Manager, project manager, or construction manager on similar size and type construction contracts which included the major trades that are part of this contract.

1.4.1.3 Construction Quality Management Training

In addition to the above experience and education requirements, the QC Manager shall have completed the course Construction Quality Management for Contractors and will have a current certificate.

1.4.2 Alternate QC Manager Duties and Qualifications

Designate an alternate for the QC Manager to serve in the event of the designated QC Manager's absence. The period of absence may not exceed two weeks at one time, and not more than 30 workdays during a calendar year. The qualification requirements for the Alternate QC Manager shall be the same as for the QC Manager.

1.5 QC PLAN

1.5.1 Requirements

Provide, for acceptance by the KO, a QC plan submitted in a three-ring binder that covers both on-site and off-site work and includes the following with a table of contents listing the major sections identified with tabs.

I. QC ORGANIZATION: A chart showing the QC organizational structure and its relationship to the production side of the organization.

II. NAMES AND QUALIFICATIONS: In resume format, for each person in the QC organization. Include the CQM for Contractors course certification required by the paragraph entitled "Construction Quality Management Training".

III. DUTIES, RESPONSIBILITY AND AUTHORITY OF QC PERSONEL: Of each person in the QC organization.

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

V. SUBMITTAL PROCEDURES AND INITIAL SUBMITTAL REGISTER: Procedures for reviewing, approving and managing submittals. Provide the name(s) of the person(s) in the QC organization authorized to review and certify submittals prior to approval.

VI. TESTING LABORATORY INFORMATION: Testing laboratory information required by the paragraphs "Accredited Laboratories" or "Testing Laboratory Requirements", as applicable.

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

VIII. PROCEDURES TO COMPLETE REWORK ITEMS: Procedures to identify, record, track and complete rework items.

IX. DOCUMENTATION PROCEDURES: Use Government formats.

X. LIST OF DEFINABLE FEATURES: A Definable Feature of Work (DFOW) is a task, which is separate and distinct from other tasks, has the same control requirements and work crews. The list shall be cross-referenced to the Contractor's Construction Schedule and the specification sections. For projects requiring a Progress Chart, the list of definable features of work shall include but

not be limited to all items of work on the schedule. For projects requiring a Network Analysis Schedule, the list of definable features of work shall include but not be limited to all critical path activities.

XI. PROCEDURES FOR PERFORMING THREE PHASES OF CONTROL: For each DFOV provide Preparatory and Initial Phase Checklists. Each list shall include a breakdown of quality checks that will be used when performing the quality control functions, inspections, and tests required by the contract documents. The preparatory and initial phases shall be conducted with a view towards obtaining quality construction by planning ahead and identifying potential problems.

XII. PERSONNEL MATRIX: Not Applicable.

XIII. PROCEDURES FOR COMPLETION INSPECTION: See the paragraph entitled "COMPLETION INSPECTIONS".

XIV. TRAINING PROCEDURES AND TRAINING LOG: Not Applicable.

1.6 COORDINATION AND MUTUAL UNDERSTANDING MEETING

During the Pre-Construction conference and prior to the start of construction, discuss the QC program required by this contract. The purpose of this meeting is to develop a mutual understanding of the QC details, including documentation, administration for on-site and off-site work, and the coordination of the Contractor's management, production and the QC personnel. At the meeting, the Contractor will be required to explain how three phases of control will be implemented for each DFOV. Contractor's personnel required to attend shall include the QC Manager, project manager, and superintendent. Minutes of the meeting will be prepared by the QC Manager and signed by both the Contractor and the KO. The Contractor shall provide a copy of the signed minutes to all attendees. Repeat the coordination and mutual understanding meeting when a new QC Manager is appointed.

1.7 QC MEETINGS

After the start of construction, the QC Manager shall conduct QC meetings once every two weeks at the work site with the superintendent and the foreman responsible for the ongoing and upcoming work. The QC Manager shall prepare the minutes of the meeting and provide a copy to the KO within two working days after the meeting. As a minimum, the following shall be accomplished at each meeting:

- a. Review the minutes of the previous meeting;
- b. Review the schedule and the status of work and rework;
- c. Review the status of submittals;
- d. Review the work to be accomplished in the next two weeks and documentation required;
- e. Resolve QC and production problems (RFIs, etc.);
- f. Address items that may require revising the QC plan; and
- g. Review Accident Prevention Plan (APP).

1.8 THREE PHASES OF CONTROL

The three phases of control shall adequately cover both on-site and off-site work and shall include the following for each DFOW.

1.8.1 Preparatory Phase

Notify the KO at least two work days in advance of each preparatory phase. Conduct the preparatory phase with the superintendent and the foreman responsible for the definable feature of work. Document the results of the preparatory phase actions in the daily CQC Report and in the QC checklist. Perform the following prior to beginning work on each definable feature of work:

- a. Review each paragraph of the applicable specification sections;
- b. Review the contract drawings;
- c. Verify that appropriate shop drawings and submittals for materials and equipment have been submitted and approved. Verify receipt of approved factory test results, when required;
- d. Review the testing plan and ensure that provisions have been made to provide the required QC testing;
- e. Examine the work area to ensure that the required preliminary work has been completed;
- f. Examine the required materials, equipment and sample work to ensure that they are on hand and conform to the approved shop drawings and submitted data;
- g. Review the APP and appropriate Activity Hazard Analysis (AHA) to ensure that applicable safety requirements are met, and that required Material Safety Data Sheets (MSDS) are submitted; and
- h. Discuss specific controls used and the construction methods and the approach that will be used to provide quality construction by planning ahead and identifying potential problems for each DFOW.

1.8.2 Initial Phase

Notify the KO at least two work days in advance of each initial phase. When construction crews are ready to start work on a DFOW, conduct the Initial Phase with the foreman responsible for that DFOW. Observe the initial segment of the work to ensure that it complies with contract requirements. Document the results of the Initial Phase in the daily CQC Report and in the QC checklist. Perform the following for each DFOW:

- a. Establish the quality of workmanship required;
- b. Resolve conflicts;
- c. Ensure that testing is performed by the approved laboratory; and
- d. Check work procedures for compliance with the APP and the appropriate AHA to ensure that applicable safety requirements are

met.

1.8.3 Follow-Up Phase

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

- a. Ensure the work is in compliance with contract requirements;
- b. Maintain the quality of workmanship required;
- c. Ensure that testing is performed by the approved laboratory;
- d. Ensure that rework items are being corrected; and
- e. Assure manufacturers representatives have performed necessary inspections, if required.

1.8.4 Additional Preparatory and Initial Phases

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

1.8.5 Notification of Three Phases of Control for Off-Site Work

Notify the KO at least two weeks prior to the start of the preparatory and initial phases.

1.9 SUBMITTAL REVIEW AND APPROVAL

Procedures for submission, review, and approval of submittals are described in the submittal section of the specification.

1.10 TESTING

Except as stated otherwise in the specification sections, perform sampling and testing required under this contract.

1.10.1 Accreditation Requirements

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

1.10.2 Laboratory Accreditation Authorities

Laboratory Accreditation Authorities include the National Voluntary Laboratory Accreditation Program (NVLAP) administered by the National Institute of Standards and Technology, the American Association of State

Highway and Transportation Officials (AASHTO), International Accreditation Services, Inc. (IAS), U. S. Army Corps of Engineers Materials Testing Center (MTC), the American Association for Laboratory Accreditation (A2LA), the Washington Association of Building Officials (WABO) (Approval authority for WABO is limited to projects within Washington State), and the Washington Area Council of Engineering Laboratories (WACEL) (Approval authority by WACEL is limited to projects within the EFA Chesapeake and Public Works Center Washington geographical area).

1.10.3 Capability Check

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

1.10.4 Test Results

Cite applicable Contract requirements, tests or analytical procedures used. Provide actual results and include a statement that the item tested or analyzed conforms or fails to conform to specified requirements. If the item fails to conform, notify the KO immediately. Conspicuously stamp the cover sheet for each report in large red letters "CONFORMS" or "DOES NOT CONFORM" to the specification requirements, whichever is applicable. Test results shall be signed by a testing laboratory representative authorized to sign certified test reports. Furnish the signed reports, certifications, and other documentation to the KO.

1.11 QC CERTIFICATIONS

1.11.1 Contractor Quality Control Report Certification

Each CQC Report shall contain the following statement: "On behalf of the Contractor, I certify that this report is complete and correct and equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report."

1.11.2 Invoice Certification

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

1.11.3 Completion Certification

Upon completion of work under this contract, the QC Manager shall furnish a certificate to the KO attesting that "the work has been completed, inspected, tested and is in compliance with the contract."

1.12 COMPLETION INSPECTIONS

1.12.1 Punch-Out Inspection

Near the completion of all work or any increment thereof established by a completion time stated in the Contract clause "Commencement, Prosecution, and Completion of Work," or stated elsewhere in the specifications, the QC Manager shall conduct an inspection of the work and develop a punch list of

items which do not conform to the approved drawings and specifications. Include in the punch list any remaining items of the "Rework Items List", which were not corrected prior to the Punch-Out inspection. The punch list shall include the estimated date by which the deficiencies will be corrected. A copy of the punch list shall be provided to the KO. The QC Manager or staff shall make follow-on inspections to ascertain that all deficiencies have been corrected. Once this is accomplished, the Contractor shall notify the Government that the facility is ready for the Government "Pre-Final Inspection".

1.12.2 Pre-Final Inspection

The Government and QC manager will perform this inspection to verify that the facility is complete and ready to be occupied. A Government pre-final punch list may be developed as a result of this inspection. The QC Manager shall ensure that all items on this list are corrected prior to notifying the Government that a "Final" inspection with the customer can be scheduled. Any items noted on the "Pre-Final" inspection shall be corrected in a timely manner and shall be accomplished before the contract completion date for the work or any particular increment thereof if the project is divided into increments by separate completion dates.

1.12.3 Final Acceptance Inspection

The QC Manager, the superintendent, or other Contractor management personnel and the KO will be in attendance at this inspection. Additional Government personnel may be in attendance. The final acceptance inspection will be formally scheduled by the KO based upon results of the "Pre-Final Inspection". Notice shall be given to the KO at least 14 days prior to the final inspection. The notice shall state that all specific items previously identified to the Contractor as being unacceptable will be complete by the date scheduled for the final acceptance inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the KO to bill the Contractor for the Government's additional inspection cost in accordance with the contract clause "Inspection of Construction".

1.13 DOCUMENTATION

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

1.13.1 Quality Control Validation

Establish and maintain the following in a series of three ring binders.

Binders shall be divided and tabbed as shown below. These binders shall be readily available to the Government's Quality Assurance Team during all business hours.

- a. All completed Preparatory and Initial Phase Checklists, arranged by specification section.
- b. All milestone inspections, arranged by Activity/Event Number.
- c. A current up-to-date copy of the Testing and Plan Log with supporting field test reports, arranged by specification section.
- d. Copies of all contract modifications, arranged in numerical order. Also include documentation that modified work was accomplished.
- e. A current up-to-date copy of the Rework Items List.
- f. Maintain up-to-date copies of all punch lists issued by the QC Staff on the Contractor and Sub-Contractors and all punch lists issued by the Government.

1.13.2 As-Built Drawings

The QC Manager is required to review the as-built drawings, required by Section 01 78 00 CLOSEOUT SUBMITTALS, are kept current on a daily basis and marked to show deviations, which have been made from the Contract drawings. Ensure each deviation has been identified with the appropriate modifying documentation, e.g. PC number, modification number, RFI number, etc. The QC Manager shall initial each deviation or revision. Upon completion of work, the QC Manager shall submit a certificate attesting to the accuracy of the as-built drawings prior to submission to the KO.

1.14 NOTIFICATION ON NON-COMPLIANCE

The KO will notify the Contractor of any detected non-compliance with the foregoing requirements. The Contractor shall take immediate corrective action. If the contractor fails or refuses to correct the non-compliant work, the KO will issue a non compliance notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the KO may issue an order stopping all or part of the work until satisfactory corrective action has been taken. The Contractor shall make no part of the time lost due to such stop orders the subject of claim for extension of time, for excess costs, or damages.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

-- End of Section --

SECTION 01 50 00

TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS
10/07

PART 1 GENERAL

1.1 SUMMARY

Requirements of this Section apply to, and are a component of, each section of the specifications.

1.2 REFERENCES

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

U.S. FEDERAL HIGHWAY ADMINISTRATION (FHWA)

MUTCD (2000) Manual of Uniform Traffic Control
Devices

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for [Contractor Quality Control approval.][information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government.] Submitted the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Traffic control plan; G

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 EMPLOYEE PARKING

Contractor employees will park privately owned vehicles at Building 645 project site. Contractor employee parking must not interfere with existing and established parking requirements of the government installation.

3.2 AVAILABILITY AND USE OF UTILITY SERVICES

3.2.1 Temporary Utilities

Provide temporary utilities required for construction. Materials may be new or used, must be adequate for the required usage, not create unsafe conditions, and not violate applicable codes and standards.

3.3 TRAFFIC PROVISIONS

3.3.1 Maintenance of Traffic

a. Conduct operations in a manner that will not close any thoroughfare or interfere in any way with traffic on railways or highways except with written permission of the Contracting Officer at least 15 calendar days prior to the proposed modification date, and provide a Traffic Control Plan detailing the proposed controls to traffic movement for approval. The plan must be in accordance with State and local regulations and the MUTCD, Part VI. Contractor may move oversized and slow-moving vehicles to the worksite provided requirements of the highway authority have been met.

b. Conduct work so as to minimize obstruction of traffic, and maintain traffic on at least half of the roadway width at all times. Obtain approval from the Contracting Officer prior to starting any activity that will obstruct traffic.

c. Provide, erect, and maintain, at contractors expense, lights, barriers, signals, passageways, detours, and other items, that may be required by the Life Safety Signage, overhead protection authority having jurisdiction.

3.3.2 Protection of Traffic

Maintain and protect traffic on all affected roads during the construction period except as otherwise specifically directed by the Contracting Officer. Measures for the protection and diversion of traffic, including the provision of watchmen and flagmen, erection of barricades, placing of lights around and in front of equipment the work, and the erection and maintenance of adequate warning, danger, and direction signs, will be as required by the State and local authorities having jurisdiction. Protect the traveling public from damage to person and property. Minimize the interference with public traffic on roads selected for hauling material to and from the site. Investigate the adequacy of existing roads and their allowable load limit. Contractor is responsible for the repair of any damage to roads caused by construction operations.

3.3.3 Rush Hour Restrictions

Do not interfere with the peak traffic flows preceding and during normal operations without notification to and approval by the Contracting Officer.

3.4 CLEANUP

Remove construction debris, waste materials, packaging material and the like from the work site daily. Any dirt or mud which is tracked onto paved or surfaced roadways must be cleaned away. Store within the fenced area described above or at the supplemental storage area any materials resulting from demolition activities which are salvageable. Neatly stacked stored materials not in trailers, whether new or salvaged.

-- End of Section --

SECTION 01 57 19.00 20

TEMPORARY ENVIRONMENTAL CONTROLS

11/08

PART 1 GENERAL

1.1 REFERENCES

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

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

40 CFR 112	Oil Pollution Prevention
40 CFR 241	Guidelines for Disposal of Solid Waste
40 CFR 243	Guidelines for the Storage and Collection of Residential, Commercial, and Institutional Solid Waste
40 CFR 273	Standards For Universal Waste Management
40 CFR 279	Standards for the Management of Used Oil
40 CFR 300	National Oil and Hazardous Substances Pollution Contingency Plan
40 CFR 355	Emergency Planning and Notification

1.2 DEFINITIONS

1.2.1 Sediment

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

1.2.2 Solid Waste

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

- a. Green waste: The vegetative matter from landscaping, land clearing and grubbing, including, but not limited to, grass, bushes, scrubs, small trees and saplings, tree stumps and plant roots. Marketable trees, grasses and plants that are indicated to remain, be re-located, or be re-used are not included.
- b. Surplus soil: Existing soil that is in excess of what is required for this work, including aggregates intended, but not used, for on-site mixing of concrete, mortars and paving. Contaminated soil meeting the definition of hazardous material or hazardous waste is not included.

- c. Debris: Non-hazardous solid material generated during the construction, demolition, or renovation of a structure which exceeds 2.5 inch particle size that is: a manufactured object; plant or animal matter; or natural geologic material (e.g. cobbles and boulders), broken or removed concrete, masonry, and rock asphalt paving; ceramics; roofing paper and shingles. Inert materials may not be reinforced with or contain ferrous wire, rods, accessories and weldments. A mixture of debris and other material such as soil or sludge is also subject to regulation as debris if the mixture is comprised primarily of debris by volume, based on visual inspection..
- d. Wood: Dimension and non-dimension lumber, plywood, chipboard, hardboard. Treated and/or painted wood that meets the definition of lead contaminated or lead based contaminated paint is not included.
- e. Recyclables: Materials, equipment and assemblies such as doors, windows, door and window frames, plumbing fixtures, glazing and mirrors that are recovered and sold as recyclable. Metal meeting the definition of lead contaminated or lead based paint contaminated may not be included as recyclable if sold to a scrap metal company. Paint cans may not be included as recyclable if sold to a scrap metal company.
- f. Hazardous Waste: By definition, to be a hazardous waste a material must first meet the definition of a solid waste. Hazardous waste and hazardous debris are special cases of solid waste. They have additional regulatory controls and must be handled separately. They are thus defined separately in this document.

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

1.2.3 Garbage

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

1.2.4 Oily Waste

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

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

- a. It is not prohibited in other State regulations or local ordinances
- b. The amount generated is "de minimus" (a small amount)
- c. It is the result of minor leaks or spills resulting from normal process operations
- d. All free-flowing oil has been removed to the practical extent possible

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

1.2.5 Regulated Waste

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

1.2.6 Class I Ozone Depleting Substance (ODS)

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

chlorofluorocarbon-11 (CFC-11)
chlorofluorocarbon-12 (CFC-12)
chlorofluorocarbon-13 (CFC-13)
chlorofluorocarbon-111 (CFC-111)
chlorofluorocarbon-112 (CFC-112)
chlorofluorocarbon-113 (CFC-113)
chlorofluorocarbon-114 (CFC-114)
chlorofluorocarbon-115 (CFC-115)
chlorofluorocarbon-211 (CFC-211)
chlorofluorocarbon-212 (CFC-212)
chlorofluorocarbon-213 (CFC-213)
chlorofluorocarbon-214 (CFC-214)
chlorofluorocarbon-215 (CFC-215)
chlorofluorocarbon-216 (CFC-216)
chlorofluorocarbon-217 (CFC-217)
chlorofluorocarbon-500 (CFC-500)
chlorofluorocarbon-502 (CFC-502)
chlorofluorocarbon-503 (CFC-503)
halon-1211
halon-1301
halon-2402
carbon tetrachloride
methyl bromide
methyl chloroform

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

hydrochlorofluorocarbon-21 (HCFC-21)
hydrochlorofluorocarbon-22 (HCFC-22)
hydrochlorofluorocarbon-31 (HCFC-31)

hydrochlorofluorocarbon-121 (HCFC-121)
hydrochlorofluorocarbon-122 (HCFC-122)
hydrochlorofluorocarbon-123 (HCFC-123)
hydrochlorofluorocarbon-124 (HCFC-124)
hydrochlorofluorocarbon-131 (HCFC-131)
hydrochlorofluorocarbon-132 (HCFC-132)
hydrochlorofluorocarbon-133 (HCFC-133)
hydrochlorofluorocarbon-141 (HCFC-141)
hydrochlorofluorocarbon-142 (HCFC-142)
hydrochlorofluorocarbon-221 (HCFC-221)
hydrochlorofluorocarbon-222 (HCFC-222)
hydrochlorofluorocarbon-223 (HCFC-223)
hydrochlorofluorocarbon-224 (HCFC-224)
hydrochlorofluorocarbon-225 (HCFC-225)
hydrochlorofluorocarbon-226 (HCFC-226)
hydrochlorofluorocarbon-231 (HCFC-231)
hydrochlorofluorocarbon-232 (HCFC-232)
hydrochlorofluorocarbon-233 (HCFC-233)
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hydrochlorofluorocarbon-241 (HCFC-241)
hydrochlorofluorocarbon-242 (HCFC-242)
hydrochlorofluorocarbon-243 (HCFC-243)
hydrochlorofluorocarbon-244 (HCFC-244)
hydrochlorofluorocarbon-251 (HCFC-251)
hydrochlorofluorocarbon-252 (HCFC-252)
hydrochlorofluorocarbon-253 (HCFC-253)
hydrochlorofluorocarbon-261 (HCFC-261)
hydrochlorofluorocarbon-262 (HCFC-262)
hydrochlorofluorocarbon-271 (HCFC-271)

1.2.6.1 Universal Waste

The universal waste regulations streamline collection requirements for certain hazardous wastes in the following categories: batteries, pesticides, mercury-containing equipment (e.g., thermostats) and lamps (e.g., fluorescent bulbs). The rule is designed to reduce hazardous waste in the municipal solid waste (MSW) stream by making it easier for universal waste handlers to collect these items and send them for recycling or proper disposal. These regulations can be found at 40 CFR 273.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Solid Waste Management Plan and Permit;

Environmental Management Plan; G

1.4 ENVIRONMENTAL PROTECTION REQUIREMENTS

Provide and maintain, during the life of the contract, environmental protection as defined. Plan for and provide environmental protective

measures to control pollution that develops during normal construction practice. Plan for and provide environmental protective measures required to correct conditions that develop during the construction of permanent or temporary environmental features associated with the project. Comply with Federal, State, and local regulations pertaining to the environment, including water, air, solid waste, hazardous waste and substances, oily substances, and noise pollution.

The Contractor may be required to promptly conduct tests and procedures for the purpose of assessing whether construction operations are in compliance with Applicable Environmental Laws. Analytical work shall be done by qualified laboratories; and where required by law, the laboratories shall be certified.

1.4.1 Conformance with the Environmental Management System

The Contractor shall perform work under this contract consistent with the policy and objectives identified in the installation's Environmental Management System (EMS). The Contractor shall perform work in a manner that conforms to objectives and targets, environmental programs and operational controls identified by the EMS. The Contractor will provide monitoring and measurement information as necessary to address environmental performance relative to environmental, energy, and transportation management goals. In the event an EMS nonconformance or environmental noncompliance associated with the contracted services, tasks, or actions occurs, the Contractor shall take corrective and/or preventative actions. In addition, the Contractor shall ensure that its employees are aware of their roles and responsibilities under the EMS and how these EMS roles and responsibilities affect work performed under the contract.

The Contractor is responsible for ensuring that their employees receive applicable environmental and occupational health and safety training, and keep up to date on regulatory required specific training for the type of work to be conducted onsite. All on-site Contractor personnel, and their subcontractor personnel, performing tasks that have the potential to cause a significant environmental impact shall be competent on the basis of appropriate education, training or experience. Upon contract award, the Contracting Officer's Representative will notify the installation's EMS coordinator to arrange EMS training. Refer to Section 01 57 19.01 20, Supplemental Temporary Environmental Controls for additional site specific EMS requirements related to construction. The installation's EMS coordinator shall identify training needs associated with environmental aspects and the EMS, and arrange training or take other action to meet these needs. The Contractor shall provide training documentation to the Contracting Officer. The EMS coordinator shall retain associated records.

1.5 QUALITY ASSURANCE

1.5.1 Preconstruction Survey

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

1.5.2 Regulatory Notifications

The Contractor is responsible for all regulatory notification requirements in accordance with Federal, State and local regulations. In cases where the Navy must also provide public notification (such as stormwater

permitting), the Contractor must coordinate with the Contracting Officer. The Contractor shall submit copies of all regulatory notifications to the Contracting Officer prior to commencement of work activities. Typically, regulatory notifications must be provided for the following (this listing is not all inclusive): demolition, renovation, NPDES defined site work, remediation of controlled substances (asbestos, hazardous waste, lead paint).

1.5.3 Environmental Brief

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

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

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 ENVIRONMENTAL MANAGEMENT PLAN

Prior to initiating any work on site, the Contractor will meet with the Contracting Officer to discuss the proposed Environmental Protection Plan and develop a mutual understanding relative to the details of environmental protection, including measures for protecting natural resources, required reports, and other measures to be taken. The Contractor's Environmental Plan shall incorporate construction related objectives and targets from the installation's Environmental Management System. The Environmental Management Plan will be submitted in the following format and shall include the elements specified below.

a. Description of the Environmental Management Plan

(1) General overview and purpose

(a). A brief description of each specific plan required by environmental permit or elsewhere in this contract.

(b). The duties and level of authority assigned to the person(s) on the job site that oversee environmental compliance.

(c). A copy of any standard or project specific operating procedures that will be used to effectively manage and protect the environment on the project site.

(d). Communication and training procedures that will be used to convey environmental management requirements to contractor employees and subcontractors.

- (e). Emergency contact information contact information (office phone number, cell phone number, and e-mail address).
- (2) General site information
- b. Management of Natural Resources
 - (1) Land resources
 - (2) Tree protection
 - (3) Replacement of damaged landscape features
 - (4) Temporary construction
 - (5) Stream crossings
 - (6) Fish and wildlife resources
 - (7) Wetland areas
- c. Protection of Historical and Archaeological Resources
 - (1) Objectives
 - (2) Methods
- d. Storm Water Management and Control
 - (1) Ground cover
 - (2) Erodible soils
 - (3) Temporary measures
 - (a) Mechanical retardation and control of runoff
 - (b) Vegetation and mulch
 - (4) Effective selection, implementation and maintenance of Best Management Practices (BMPs).
- e. Protection of the Environment from Waste Derived from Contractor Operations
 - (1) Control and disposal of solid and sanitary waste. If Section 01 74 19.05 20 is included in the contract, submit the plan required by that section as part of the Environmental Management Plan.
 - (2) Control and disposal of hazardous waste (Hazardous Waste Management Section)

It is not anticipated that hazardous waste will be encountered during the installation of the five bio-spargers and header pipes.
- f. Prevention of Releases to the Environment

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

g. Regulatory Notification and Permits

- (1) List what notifications and permit applications must be made. Demonstrate that those permits have been obtained by including copies of all applicable, environmental permits..

3.1.1 Environmental Protection Plan Review

Within thirty days after the Contract award date, submit the proposed Environmental Management Plan for further discussion, review, and approval. Commencement of work will not begin until the environmental management plan has been approved.

3.1.2 Licenses and Permits

Obtain all necessary licenses and permits pursuant to the "Permits and Responsibilities" FAR Clause 52.236-7.

3.2 PROTECTION OF NATURAL RESOURCES

Preserve the natural resources within the project boundaries and outside the limits of permanent work. Restore to an equivalent or improved condition upon completion of work. Confine construction activities to within the limits of the work indicated or specified. If the work is near streams, lakes, or other waterways, conform to the national permitting requirements of the Clean Water Act.

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

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

Protect existing trees which are to remain and which may be injured, bruised, defaced, or otherwise damaged by construction operations. Remove displaced rocks from uncleared areas. By approved excavation, remove trees with 30 percent or more of their root systems destroyed. Remove trees and other landscape features scarred or damaged by equipment operations, and replace with equivalent, undamaged trees and landscape features. Obtain Contracting Officer's approval before replacement.

The Contracting Officer's approval is required before any equipment will be permitted to ford live streams. In areas where frequent crossings are required, install temporary culverts or bridges. Obtain Contracting Officer's approval prior to installation.

3.2.1 Erosion and Sediment Control Measures

3.2.1.1 Burnoff

Burnoff of the ground cover is not permitted.

3.2.1.2 Protection of Erodible Soils

Immediately finish the earthwork brought to a final grade, as indicated or specified. Immediately protect the side slopes and back slopes upon completion of rough grading. Plan and conduct earthwork to minimize the duration of exposure of unprotected soils.

3.2.1.3 Temporary Protection of Erodible Soils

Use the following methods to prevent erosion and control sedimentation:

a. Mechanical Retardation and Control of Runoff

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

b. Sediment Basins

(1) Trap sediment in temporary sediment basins. Select a basin size to accommodate the runoff of a local 10-year storm. Pump dry and remove the accumulated sediment, after each storm. Use a paved weir or vertical overflow pipe for overflow. Remove collected sediment from the site. Institute effluent quality monitoring programs.

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

c. Vegetation and Mulch

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

(2) Seeding: Provide new seeding where ground is disturbed. Include topsoil or nutriment during the seeding operation necessary to establish or reestablish a suitable stand of grass.

3.2.2 Stormwater Drainage and Construction Dewatering

There will be no discharge of excavation ground water to the sanitary sewer, storm drains, or to the river without prior specific authorization of the Environmental Division in writing. Discharge of hazardous substances will not be permitted under any circumstances.

Construction site runoff will be prevented from entering any storm drain or the river directly by the use of straw bales or other method suitable to the Environmental Division. Contractor will provide erosion protection of the surrounding soils.

Construction Dewatering shall not be discharged to the sanitary sewer. If the construction dewatering is noted or suspected of being contaminated, it may only be released to the storm drain system if the discharge is specifically permitted. Authorization for any contaminated groundwater release shall be obtained in advance from the base Environmental Officer. Discharge of hazardous substances will not be permitted under any circumstances.

3.3 HISTORICAL AND ARCHAEOLOGICAL RESOURCES

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

3.4 SOLID WASTE MANAGEMENT PLAN and PERMIT

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

3.4.1 Solid Waste Management Report

Monthly, submit a solid waste disposal report to the Contracting Officer. For each waste, the report will state the classification (using the definitions provided in this section), amount, location, and name of the business receiving the solid waste.

The Contractor will include copies of the waste handling facilities' weight tickets, receipts, bills of sale, and other sales documentation. In lieu of sales documentation, the Contractor may submit a statement indicating the disposal location for the solid waste which is signed by an officer of the Contractor firm authorized to legally obligate or bind the firm. The sales documentation or Contractor certification will include the receiver's tax identification number and business, EPA or State registration number, along with the receiver's delivery and business addresses and telephone numbers. For each solid waste retained by the Contractor for his own use, the Contractor will submit on the solid waste disposal report the information previously described in this paragraph. Prices paid or received will not be reported to the Contracting Officer unless required by other provisions or specifications of this Contract or public law.

3.4.2 Control and Management of Solid Wastes

Pick up solid wastes, and place in covered containers which are regularly emptied. Do not prepare or cook food on the project site. Prevent

contamination of the site or other areas when handling and disposing of wastes. At project completion, leave the areas clean. Recycling is encouraged and can be coordinated with the Contracting Officer and the activity recycling coordinator. Remove all solid waste (including non-hazardous debris) from Government property and dispose off-site at an approved landfill. Solid waste disposal off-site must comply with most stringent local, State, and Federal requirements including 40 CFR 241, 40 CFR 243, and 40 CFR 258.

Manage spent hazardous material used in construction, including but not limited to, aerosol cans, waste paint, cleaning solvents, contaminated brushes, and used rags, as per environmental law.

3.5 WASTE DETERMINATION DOCUMENTATION

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

3.6 POLLUTION PREVENTION/HAZARDOUS WASTE MINIMIZATION

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

3.7 PETROLEUM PRODUCTS AND REFUELING

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

3.7.1 Oily and Hazardous Substances

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

occurs.

3.7.2 Inadvertent Discovery of Petroleum Contaminated Soil or Hazardous Wastes

If petroleum contaminated soil or suspected hazardous waste is found during construction that was not identified in the contract documents, the contractor shall immediately notify the contracting officer. The contractor shall not disturb this material until authorized by the contracting officer.

3.8 FUEL TANKS

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

3.9 RELEASES/SPILLS OF OIL AND HAZARDOUS SUBSTANCES

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

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

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

- a. The Contractor has not begun spill cleanup procedure within one hour of spill discovery/occurrence, or

b. If, in the government's judgment, the Contractor's spill cleanup is not adequately abating life threatening situation and/or is a threat to any body of water or environmentally sensitive areas.

3.10 DUST CONTROL

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

3.11 NOISE

Make the maximum use of low-noise emission products, as certified by the EPA. Blasting or use of explosives will not be permitted without written permission from the Contracting Officer, and then only during the designated times. Confine pile-driving operations to the period between 8 a.m. and 4 p.m., Monday through Friday, exclusive of holidays, unless otherwise specified.

-- End of Section --

SECTION 01 74 19

CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT
01/07

PART 1 GENERAL

1.1 REFERENCES

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

ASTM INTERNATIONAL (ASTM)

ASTM E 1609 (2001) Development and Implementation of a Pollution Prevention Program

1.2 GOVERNMENT POLICY

Government policy is to apply sound environmental principles in the design, construction and use of facilities. As part of the implementation of that policy the Contractor shall: (1) practice efficient waste management when sizing, cutting, and installing products and materials and (2) use all reasonable means to divert construction and demolition waste from landfills and incinerators and to facilitate their recycling or reuse. A minimum of 50 percent by weight of total project solid waste shall be diverted from the landfill.

1.3 MANAGEMENT

Develop and implement a waste management program in accordance with ASTM E 1609 and as specified. Take a pro-active, responsible role in the management of construction and demolition waste and require all subcontractors, vendors, and suppliers to participate in the effort. Construction and demolition waste includes products of demolition or removal, excess or unusable construction materials, packaging materials for construction products, and other materials generated during the construction process but not incorporated into the work. In the management of waste consideration shall be given to the availability of viable markets, the condition of the material, the ability to provide the material in suitable condition and in a quantity acceptable to available markets, and time constraints imposed by internal project completion mandates. The Contractor is responsible for implementation of any special programs involving rebates or similar incentives related to recycling of waste. Revenues or other savings obtained for salvage, or recycling accrue to the Contractor. Appropriately permit firms and facilities used for recycling, reuse, and disposal for the intended use to the extent required by federal, state, and local regulations. Also, provide on-site instruction of appropriate separation, handling, recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office

that will review the submittal for the Government. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Waste Management Plan G;

1.5 MEETINGS

Conduct Construction Waste Management meetings. After award of the Contract and prior to commencement of work, schedule and conduct a meeting with the Contracting Officer to discuss the proposed Waste Management Plan and to develop a mutual understanding relative to the details of waste management. The requirements for this meeting may be fulfilled during the coordination and mutual understanding meeting. At a minimum, environmental and waste management goals and issues shall be discussed at the following additional meetings:

- a. Preconstruction meeting.
- b. Regular site meetings.
- c. Work safety meetings.

1.6 WASTE MANAGEMENT PLAN

A waste management plan shall be submitted within 15 days after notice to proceed and not less than 10 days before the preconstruction meeting. The plan shall demonstrate how the project waste diversion goal shall be met and shall include the following:

- a. Name of individuals on the Contractor's staff responsible for waste prevention and management.
- b. Actions that will be taken to reduce solid waste generation, including coordination with subcontractors to ensure awareness and participation.
- c. Description of the regular meetings to be held to address waste management.
- d. Description of the specific approaches to be used in recycling/reuse of the various materials generated, including the areas on site and equipment to be used for processing, sorting, and temporary storage of wastes.
- e. Characterization, including estimated types and quantities, of the waste to be generated.
- f. Name of landfill and/or incinerator to be used and the estimated costs for use, assuming that there would be no salvage or recycling on the project.
- g. Identification of local and regional reuse programs, including non-profit organizations such as schools, local housing agencies, and organizations that accept used materials such as materials exchange networks and Habitat for Humanity. Include the name, location, and phone number for each reuse facility to be used, and provide a copy of the permit or license for each facility.

- h. List of specific waste materials that will be salvaged for resale, salvaged and reused on the current project, salvaged and stored for reuse on a future project, or recycled. Recycling facilities that will be used shall be identified by name, location, and phone number, including a copy of the permit or license for each facility.
- i. Identification of materials that cannot be recycled/reused with an explanation or justification, to be approved by the Contracting Officer.
- j. Description of the means by which any waste materials identified in item (h) above will be protected from contamination.
- k. Description of the means of transportation of the recyclable materials (whether materials will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler and removed from the site).
- l. Anticipated net cost savings determined by subtracting Contractor program management costs and the cost of disposal from the revenue generated by sale of the materials and the incineration and/or landfill cost avoidance.

Revise and resubmit Plan as required by the Contracting Officer. Approval of Contractor's Plan will not relieve the Contractor of responsibility for compliance with applicable environmental regulations or meeting project cumulative waste diversion requirement. Distribute copies of the Waste Management Plan to each subcontractor, the Quality Control Manager, and the Contracting Officer.

1.7 RECORDS

Records shall be maintained to document the quantity of waste generated; the quantity of waste diverted through sale, reuse, or recycling; and the quantity of waste disposed by landfill or incineration. Quantities may be measured by weight or by volume, but must be consistent throughout. List each type of waste separately noting the disposal or diversion date. Identify the landfill, recycling center, waste processor, or other organization used to process or receive the solid waste. Provide explanations for any waste not recycled or reused. With each application for payment, submit updated documentation for solid waste disposal and diversion, and submit manifests, weight tickets, receipts, and invoices specifically identifying the project and waste material. The records shall be made available to the Contracting Officer during construction, and a copy of the records shall be delivered to the Contracting Officer upon completion of the construction.

1.8 COLLECTION

Separate, store, protect, and handle at the site identified recyclable and salvageable waste products in a manner that maximizes recyclability and salvagability of identified materials. Provide the necessary containers, bins and storage areas to facilitate effective waste management and clearly and appropriately identify them. Provide materials for barriers and enclosures around recyclable material storage areas which are nonhazardous and recyclable or reusable. Locate out of the way of construction traffic. Provide adequate space for pick-up and delivery and convenience to subcontractors. Recycling and waste bin areas are to be kept neat and clean, and recyclable materials shall be handled to prevent contamination of materials from incompatible products and materials. Clean contaminated

materials prior to placing in collection containers. Use cleaning materials that are nonhazardous and biodegradable. Separate materials by one of the following methods:

1.8.1 Source Separated Method.

Waste products and materials that are recyclable shall be separated from trash and sorted as described below into appropriately marked separate containers and then transported to the respective recycling facility for further processing. Deliver materials in accordance with recycling or reuse facility requirements (e.g., free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process). Separate materials into the following category types as appropriate to the project waste and to the available recycling and reuse programs in the project area:

- a. Land clearing debris.
- b. Asphalt.
- c. Concrete and masonry.
- d. Metal (e.g. banding, stud trim, ductwork, piping, rebar, roofing, other trim, steel, iron, galvanized, stainless steel, aluminum, copper, zinc, lead brass, bronze).
 - (1) Ferrous.
 - (2) Non-ferrous.
- e. Wood (nails and staples allowed).
- f. Debris.
- g. Glass (colored glass allowed).
- h. Paper.
 - (1) Bond.
 - (2) Newsprint.
 - (3) Cardboard and paper packaging materials.
- i. Plastic.
 - (1) Type 1: Polyethylene Terephthalate (PET, PETE).
 - (2) Type 2: High Density Polyethylene (HDPE).
 - (3) Type 3: Vinyl (Polyvinyl Chloride or PVC).
 - (4) Type 4: Low Density Polyethylene (LDPE).
 - (5) Type 5: Polypropylene (PP).
 - (6) Type 6: Polystyrene (PS).
 - (7) Type 7: Other. Use of this code indicates that the package in

question is made with a resin other than the six listed above, or is made of more than one resin listed above, and used in a multi-layer combination.

- j. Gypsum.
- k. Non-hazardous paint and paint cans.
- l. Carpet.
- m. Ceiling tiles.
- n. Insulation.
- o. Beverage containers.

1.8.2 Co-Mingled Method.

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

1.8.3 Other Methods.

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

1.9 DISPOSAL

Control accumulation of waste materials and trash. Recycle or dispose of collected materials off-site at intervals approved by the Contracting Officer and in compliance with waste management procedures. Except as otherwise specified in other sections of the specifications, disposal shall be in accordance with the following:

1.9.1 Reuse.

First consideration shall be given to salvage for reuse since little or no re-processing is necessary for this method, and less pollution is created when items are reused in their original form. .

1.9.2 Recycle.

Waste materials not suitable for reuse, but having value as being recyclable, shall be made available for recycling. All fluorescent lamps, HID lamps, and mercury-containing thermostats removed from the site shall be recycled. Arrange for timely pickups from the site or deliveries to recycling facilities in order to prevent contamination of recyclable materials.

1.9.3 Waste.

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

1.9.4 Return

Set aside and protect misdelivered and substandard products and materials and return to supplier for credit.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used. -- End of Section --

SECTION 01 78 00

CLOSEOUT SUBMITTALS

01/08

PART 1 GENERAL

1.1 SUBMITTALS

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

SD-03 Product Data

As-Built Record of Equipment and Materials

Two copies of the record listing the as-built materials and equipment incorporated into the construction of the project.

Warranty Management Plan

One set of the warranty management plan containing information relevant to the warranty of materials and equipment incorporated into the construction project, including the starting date of warranty of construction. Furnish with each warranty the name, address, and telephone number of each of the guarantor's representatives nearest to the project location.

Warranty Tags

Two record copies of the warranty tags showing the layout and design.

Final Cleaning

Two copies of the listing of completed final clean-up items.

SD-10 Operation and Maintenance Data

Submit Operation and Maintenance Manuals in accordance with paragraph entitled, "Operation and Maintenance," of this section.

SD-11 Closeout Submittals

Record Drawings

Drawings showing final as-built conditions of the project. The manually prepared drawings must consist of 1 set of completed final as-built transparencies.

1.2 PROJECT RECORD DOCUMENTS

1.2.1 Record Drawings

This paragraph covers record drawings complete, as a requirement of the

contract. The terms "drawings," "contract drawings," "drawing files," "working record drawings" and "final record drawings" refer to contract drawings which are revised to be used for final record drawings showing as-built conditions.

1.2.1.1 Government Furnished Materials

One set of drawings revised to reflect all bid amendments will be provided by the Government at the preconstruction conference for projects requiring manually prepared record drawings .

1.2.1.2 Working Record and Final Record Drawings

Revise 2 sets of paper drawings by red-line process to show the as-built conditions during the prosecution of the project. Keep these working as-built marked drawings current on a weekly basis and at least one set available on the jobsite at all times. Changes from the contract plans which are made in the work or additional information which might be uncovered in the course of construction must be accurately and neatly recorded as they occur by means of details and notes. Prepare final record (as-built) drawings after the completion of each definable feature of work as listed in the Contractor Quality Control Plan (Foundations, Utilities, Structural Steel, etc., as appropriate for the project). The working as-built marked prints and final record (as-built) drawings will be jointly reviewed for accuracy and completeness by the Contracting Officer and the Contractor prior to submission of each monthly pay estimate. If the Contractor fails to maintain the working and final record drawings as specified herein, the Contracting Officer will deduct from the monthly progress payment an amount representing the estimated cost of maintaining the record drawings. This monthly deduction will continue until an agreement can be reached between the Contracting Officer and the Contractor regarding the accuracy and completeness of updated drawings. Show on the working and final record drawings , but not limited to, the following information:

a. Correct grade, elevations, cross section, or alignment of roads, earthwork, structures or utilities if any changes were made from contract plans.

b. Changes in details of design or additional information obtained from working drawings specified to be prepared and/or furnished by the Contractor; including but not limited to fabrication, erection, installation plans and placing details, pipe sizes, insulation material, dimensions of equipment foundations, etc.

c. The topography, invert elevations and grades of drainage installed or affected as part of the project construction.

d. Changes or modifications which result from the final inspection.

e. Where contract drawings or specifications present options, show only the option selected for construction on the final as-built prints.

f. Modifications (include within change order price the cost to change working and final record drawings to reflect modifications) and compliance with the following procedures.

(1) Follow directions in the modification for posting descriptive changes.

- (2) Place a Modification Circle at the location of each deletion.
- (3) For new details or sections which are added to a drawing, place a Modification Circle by the detail or section title.
- (4) For minor changes, place a Modification Circle by the area changed on the drawing (each location).
- (5) For major changes to a drawing, place a Modification Circle by the title of the affected plan, section, or detail at each location.
- (6) For changes to schedules or drawings, place a Modification Circle either by the schedule heading or by the change in the schedule.
- (7) The Modification Circle size shall be 1/2 inch diameter unless the area where the circle is to be placed is crowded. Smaller size circle shall be used for crowded areas.

1.2.1.3 Drawing Preparation

Modify the record drawings as may be necessary to correctly show the features of the project as it has been constructed by bringing the contract set into agreement with approved working as-built prints, and adding such additional drawings as may be necessary. These working as-built marked prints must be neat, legible and accurate. These drawings are part of the permanent records of this project and must be returned to the Contracting Officer after approval by the Government. Any drawings damaged or lost by the Contractor must be satisfactorily replaced by the Contractor at no expense to the Government.

1.2.2 Final Approved Shop Drawings

Furnish final approved project shop drawings 30 days after transfer of the completed facility.

1.2.3 Construction Contract Specifications

Furnish final record (as-built) construction contract specifications, including modifications thereto, 30 days after transfer of the completed facility.

1.2.4 Real Property Equipment

Furnish a list of installed equipment furnished under this contract. Include all information usually listed on manufacturer's name plate. In the "EQUIPMENT-IN-PLACE LIST" include, as applicable, the following for each piece of equipment installed: description of item, location (by room number), model number, serial number, capacity, name and address of manufacturer, name and address of equipment supplier, condition, spare parts list, manufacturer's catalog, and warranty. Furnish a draft list at time of transfer. Furnish the final list 30 days after transfer of the completed facility.

1.3 PREVENTATIVE MAINTENANCE

Submit Preventative Maintenance and Condition Monitoring (Predictive

Testing) and Inspection schedules with instructions that state when systems should be retested.

Define the anticipated length of each test, test apparatus, number of personnel identified by responsibility, and a testing validation procedure permitting the record operation capability requirements within the schedule. Provide a signoff blank for the Contractor and Contracting Officer for each test feature; e.g., gpm, rpm, psi. Include a remarks column for the testing validation procedure referencing operating limits of time, pressure, temperature, volume, voltage, current, acceleration, velocity, alignment, calibration, adjustments, cleaning, or special system notes. Delineate procedures for preventative maintenance, inspection, adjustment, lubrication and cleaning necessary to minimize corrective maintenance and repair.

Repair requirements must inform operators how to check out, troubleshoot, repair, and replace components of the system. Include electrical and mechanical schematics and diagrams and diagnostic techniques necessary to enable operation and troubleshooting of the system after acceptance.

1.4 WARRANTY MANAGEMENT

1.4.1 Warranty Management Plan

Develop a warranty management plan which contains information relevant to the clause Warranty of Construction. At least 30 days before the planned pre-warranty conference, submit the warranty management plan for Government approval. Include within the warranty management plan all required actions and documents to assure that the Government receives all warranties to which it is entitled. The plan must be in narrative form and contain sufficient detail to render it suitable for use by future maintenance and repair personnel, whether tradesmen, or of engineering background, not necessarily familiar with this contract. The term "status" as indicated below must include due date and whether item has been submitted or was accomplished. Warranty information made available during the construction phase must be submitted to the Contracting Officer for approval prior to each monthly pay estimate. Assemble approved information in a binder and turn over to the Government upon acceptance of the work. The construction warranty period will begin on the date of project acceptance and continue for the full product warranty period. A joint 4 month and 9 month warranty inspection will be conducted, measured from time of acceptance, by the Contractor, Contracting Officer and the Customer Representative. Include within the warranty management plan , but not limited to, the following:

a. Roles and responsibilities of all personnel associated with the warranty process, including points of contact and telephone numbers within the organizations of the Contractors, subContractors, manufacturers or suppliers involved.

b. A list for each warranted equipment, item, feature of construction or system indicating:

1. Name of item.
2. Model and serial numbers.
3. Location where installed.
4. Name and phone numbers of manufacturers or suppliers.
5. Names, addresses and telephone numbers of sources of spare parts.
6. Warranties and terms of warranty. Include one-year overall

warranty of construction. Items which have extended warranties must be indicated with separate warranty expiration dates.

7. Cross-reference to warranty certificates as applicable.
8. Starting point and duration of warranty period.
9. Summary of maintenance procedures required to continue the warranty in force.
10. Cross-reference to specific pertinent Operation and Maintenance manuals.
11. Organization, names and phone numbers of persons to call for warranty service.
12. Typical response time and repair time expected for various warranted equipment.

c. The Contractor's plans for attendance at the 4 and 9 month post-construction warranty inspections conducted by the Government.

d. Procedure and status of tagging of all equipment covered by extended warranties.

e. Copies of instructions to be posted near selected pieces of equipment where operation is critical for warranty and/or safety reasons.

1.4.2 Performance Bond

The Contractor's Performance Bond must remain effective throughout the construction period.

a. In the event the Contractor fails to commence and diligently pursue any construction warranty work required, the Contracting Officer will have the work performed by others, and after completion of the work, will charge the remaining construction warranty funds of expenses incurred by the Government while performing the work, including, but not limited to administrative expenses.

b. In the event sufficient funds are not available to cover the construction warranty work performed by the Government at the Contractor's expense, the Contracting Officer will have the right to recoup expenses from the bonding company.

c. Following oral or written notification of required construction warranty repair work, respond in a timely manner. Written verification will follow oral instructions. Failure of the Contractor to respond will be cause for the Contracting Officer to proceed against the Contractor.

1.4.3 Pre-Warranty Conference

Prior to contract completion, and at a time designated by the Contracting Officer, meet with the Contracting Officer to develop a mutual understanding with respect to the requirements of this section. Communication procedures for Contractor notification of construction warranty defects, priorities with respect to the type of defect, reasonable time required for Contractor response, and other details deemed necessary by the Contracting Officer for the execution of the construction warranty will be established/reviewed at this meeting. In connection with these requirements and at the time of the Contractor's quality control completion inspection, furnish the name, telephone number and address of a licensed and bonded company which is authorized to initiate and pursue construction warranty work action on behalf of the Contractor. This point of contact will be located within the local service area of the warranted construction, be continuously available, and

sbe responsive to Government inquiry on warranty work action and status. This requirement does not relieve the Contractor of any of its responsibilities in connection with other portions of this provision.

1.4.4 Warranty Tags

At the time of installation, tag each warranted item with a durable, oil and water resistant tag approved by the Contracting Officer. Attached each tag with a copper wire and spray with a silicone waterproof coating. The date of acceptance and the QC signature must remain blank until the project is accepted for beneficial occupancy. Show the following information on the tag.

- a. Type of product/material_____.
- b. Model number_____.
- c. Serial number_____.
- d. Contract number_____.
- e. Warranty period_____from_____to_____.
- f. Inspector's signature_____.
- g. Construction Contractor_____.
- Address_____.
- Telephone number_____.
- h. Warranty contact_____.
- Address_____.
- Telephone number_____.
- i. Warranty response time priority code_____.

j. WARNING - PROJECT PERSONNEL TO PERFORM ONLY OPERATIONAL MAINTENANCE DURING THE WARRANTY PERIOD.

1.5 OPERATION AND MAINTENANCE MANUALS

Operation and Maintenance Manuals must be consistent with the manufacturer's standard brochures, schematics, printed instructions, general operating procedures, and safety precautions. Bind information in manual format and grouped by technical sections. Test data must be legible and of good quality. Light-sensitive reproduction techniques are acceptable provided finished pages are clear, legible, and not subject to fading. Pages for vendor data and manuals must have 0.3937-inch holes and be bound in 3-ring, loose-leaf binders. Organize data by separate index and tabbed sheets, in a loose-leaf binder. Binder must lie flat with printed sheets that are easy to read. Caution and warning indications must be clearly labeled.

Submit classroom and field instructions in the operation and maintenance of systems equipment where required by the technical provisions. These services must be directed by the Contractor, using the manufacturer's

factory-trained personnel or qualified representatives. Contracting Officer will be given 7 calendar days written notice of scheduled instructional services. Instructional materials belonging to the manufacturer or vendor, such as lists, static exhibits, and visual aids, must be made available to the Contracting Officer.

Submit 6 copies of the project operation and maintenance manuals 30 calendar days prior to testing the system involved. Update and resubmit data for final approval no later than 30 calendar days prior to contract completion.

1.6 CLEANUP

Leave premises "broom clean." Clean equipment and fixtures to a sanitary condition. Sweep paved areas and rake clean landscaped areas. Remove waste and surplus materials from the site. Promptly and legally transport and dispose of any trash.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

-- End of Section --

SECTION 01 78 23

OPERATION AND MAINTENANCE DATA

07/06

PART 1 GENERAL

1.1 SUBMISSION OF OPERATION AND MAINTENANCE DATA

Submit Operation and Maintenance (O&M) Data specifically applicable to this contract and a complete and concise depiction of the provided equipment, product, or system. Organize and present information in sufficient detail to clearly explain O&M requirements at the system, equipment, component, and subassembly level. Include an index preceding each submittal. Submit in accordance with this section and Section 01 33 00 SUBMITTAL PROCEDURES.

1.1.1 Package Quality

Documents must be fully legible. Poor quality copies and material with hole punches obliterating the text or drawings will not be accepted.

1.1.2 Package Content

Data package content shall be as shown in the paragraph titled "Schedule of Operation and Maintenance Data Packages." Comply with the data package requirements specified in the individual technical sections, including the content of the packages and addressing each product, component, and system designated for data package submission.

1.1.3 Changes to Submittals

Manufacturer-originated changes or revisions to submitted data shall be furnished by the Contractor if a component of an item is so affected subsequent to acceptance of the O&M Data. Changes, additions, or revisions required by the Contracting Officer for final acceptance of submitted data, shall be submitted by the Contractor within 30 calendar days of the notification of this change requirement.

1.2 TYPES OF INFORMATION REQUIRED IN O&M DATA PACKAGES

1.2.1 Operating Instructions

Include specific instructions, procedures, and illustrations for the following phases of operation for the installed model and features of each system:

1.2.1.1 Safety Precautions

List personnel hazards and equipment or product safety precautions for all operating conditions.

1.2.1.2 Operator Prestart

Include procedures required to install, set up, and prepare each system for use.

1.2.1.3 Startup, Shutdown, and Post-Shutdown Procedures

Provide narrative description for Startup, Shutdown and Post-shutdown operating procedures including the control sequence for each procedure.

1.2.1.4 Normal Operations

Provide narrative description of Normal Operating Procedures. Include Control Diagrams with data to explain operation and control of systems and specific equipment.

1.2.1.5 Emergency Operations

Include Emergency Procedures for equipment malfunctions to permit a short period of continued operation or to shut down the equipment to prevent further damage to systems and equipment. Include Emergency Shutdown Instructions for fire, explosion, spills, or other foreseeable contingencies. Provide guidance and procedures for emergency operation of all utility systems including required valve positions, valve locations and zones or portions of systems controlled.

1.2.1.6 Operator Service Requirements

Include instructions for services to be performed by the operator such as lubrication, adjustment, inspection, and recording gage readings.

1.2.1.7 Environmental Conditions

Include a list of Environmental Conditions (temperature, humidity, and other relevant data) that are best suited for the operation of each product, component or system. Describe conditions under which the item equipment should not be allowed to run.

1.2.2 Preventive Maintenance

Include the following information for preventive and scheduled maintenance to minimize corrective maintenance and repair for the installed model and features of each system. Include potential environmental and indoor air quality impacts of recommended maintenance procedures and materials.

1.2.2.1 Preventive Maintenance Plan and Schedule

Include manufacturer's schedule for routine preventive maintenance, inspections, tests and adjustments required to ensure proper and economical operation and to minimize corrective maintenance. Provide manufacturer's projection of preventive maintenance work-hours on a daily, weekly, monthly, and annual basis including craft requirements by type of craft. For periodic calibrations, provide manufacturer's specified frequency and procedures for each separate operation.

1.2.3 Corrective Maintenance (Repair)

Include manufacturer's recommended procedures and instructions for correcting problems and making repairs for the installed model and features of each system. Include potential environmental and indoor air quality impacts of recommended maintenance procedures and materials.

1.2.3.1 Troubleshooting Guides and Diagnostic Techniques

Include step-by-step procedures to promptly isolate the cause of typical malfunctions. Describe clearly why the checkout is performed and what conditions are to be sought. Identify tests or inspections and test equipment required to determine whether parts and equipment may be reused or require replacement.

1.2.3.2 Maintenance and Repair Procedures

Include instructions and a list of tools required to repair or restore the product or equipment to proper condition or operating standards.

1.2.3.3 Removal and Replacement Instructions

Include step-by-step procedures and a list required tools and supplies for removal, replacement, disassembly, and assembly of components, assemblies, subassemblies, accessories, and attachments. Provide tolerances, dimensions, settings and adjustments required. Instructions shall include a combination of text and illustrations.

1.2.4 Corrective Maintenance Work-Hours

Include manufacturer's projection of corrective maintenance work-hours including requirements by type of craft. Corrective maintenance that requires completion or participation of the equipment manufacturer shall be identified and tabulated separately.

1.2.5 Appendices

Provide information required below and information not specified in the preceding paragraphs but pertinent to the maintenance or operation of the product or equipment. Include the following:

1.2.5.1 O&M Submittal Data

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

1.2.5.2 Parts Identification

Provide identification and coverage for all parts of each component, assembly, subassembly, and accessory of the end items subject to replacement. Include special hardware requirements, such as requirement to use high-strength bolts and nuts. Identify parts by make, model, serial number, and source of supply to allow reordering without further identification. Provide clear and legible illustrations, drawings, and exploded views to enable easy identification of the items. When illustrations omit the part numbers and description, both the illustrations and separate listing shall show the index, reference, or key number that will cross-reference the illustrated part to the listed part. Parts shown in the listings shall be grouped by components, assemblies, and subassemblies in accordance with the manufacturer's standard practice. Parts data may cover more than one model or series of equipment, components, assemblies, subassemblies, attachments, or accessories, such as typically shown in a master parts catalog

1.2.5.3 Warranty Information

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

1.2.5.4 Personnel Training Requirements

Provide information available from the manufacturers that is needed for use in training designated personnel to properly operate and maintain the equipment and systems.

1.2.5.5 Testing Equipment and Special Tool Information

Include information on test equipment required to perform specified tests and on special tools needed for the operation, maintenance, and repair of components.

1.2.5.6 Contractor Information

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

1.3 SCHEDULE OF OPERATION AND MAINTENANCE DATA PACKAGES

Furnish the O&M data packages specified in individual technical sections. The required information for each O&M data package is as follows:

1.3.1 Data Package 1

- a. Safety precautions
- b. Cleaning recommendations
- c. Maintenance and repair procedures
- d. Warranty information
- e. Contractor information
- f. Spare parts and supply list

1.3.2 Data Package 2

- a. Safety precautions
- b. Normal operations
- c. Environmental conditions
- d. Lubrication data

- e. Preventive maintenance plan and schedule
- f. Cleaning recommendations
- g. Maintenance and repair procedures
- h. Removal and replacement instructions
- i. Spare parts and supply list
- j. Parts identification
- k. Warranty information
- l. Contractor information

1.3.3 Data Package 3

- a. Safety precautions
- b. Operator prestart
- c. Startup, shutdown, and post-shutdown procedures
- d. Normal operations
- e. Emergency operations
- f. Environmental conditions
- g. Lubrication data
- h. Preventive maintenance plan and schedule
- i. Cleaning recommendations
- j. Troubleshooting guides and diagnostic techniques
- k. Wiring diagrams and control diagrams
- l. Maintenance and repair procedures
- m. Removal and replacement instructions
- n. Spare parts and supply list
- o. Product submittal data
- p. O&M submittal data
- q. Parts identification
- r. Warranty information
- s. Testing equipment and special tool information
- t. Testing and performance data
- u. Contractor information

1.3.4 Data Package 4

- a. Safety precautions
- b. Operator prestart
- c. Startup, shutdown, and post-shutdown procedures
- d. Normal operations
- e. Emergency operations
- f. Operator service requirements
- g. Environmental conditions
- h. Lubrication data
- i. Preventive maintenance plan and schedule
- j. Cleaning recommendations
- k. Troubleshooting guides and diagnostic techniques
- l. Wiring diagrams and control diagrams
- m. Maintenance and repair procedures
- n. Removal and replacement instructions
- o. Spare parts and supply list
- p. Corrective maintenance man-hours
- q. Product submittal data
- r. O&M submittal data
- s. Parts identification
- t. Warranty information
- u. Personnel training requirements
- v. Testing equipment and special tool information
- w. Testing and performance data
- x. Contractor information

1.3.5 Data Package 5

- a. Safety precautions
- b. Operator prestart
- c. Start-up, shutdown, and post-shutdown procedures

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

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 02 61 13

EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL
04/06

PART 1 GENERAL

1.1 REFERENCES

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

ASTM INTERNATIONAL (ASTM)

ASTM D 2487 (2006e1) Soils for Engineering Purposes
(Unified Soil Classification System)

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

40 CFR 302 Designation, Reportable Quantities, and
Notification

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Excavation Work Plan; G

Work Plan within 30 calendar days after notice to proceed. No work at the site, with the exception of site inspections and surveys, shall be performed until the Work Plan is approved. The Contractor shall allow 30 calendar days in the schedule for the Government's review. No adjustment for time or money will be made if resubmittals of the Work Plan are required due to deficiencies in the plan. At a minimum, the Work Plan shall include:

- a. Schedule of activities.
- b. Method of excavation and equipment to be used.
- c. Shoring or side-wall slopes proposed.
- d. Dewatering plan.
- e. Storage methods and locations for liquid and solid contaminated material.
- f. Borrow sources and haul routes.
- g. Decontamination procedures.

h. Spill contingency plan.

1.3 REGULATORY REQUIREMENTS

1.3.1 Permits and Licenses

The Contractor shall obtain required federal, state, and local permits for excavation and storage of contaminated material. Permits shall be obtained at no additional cost to the Government.

1.4 DESCRIPTION OF WORK

The work shall consist of installing five bio-sparge wells and header piping. Approximate locations of the proposed wells are shown on the contract drawings. The Contractor shall submit a Work Plan as specified in the Submittals paragraph. The Contracting Officer shall be notified within 24 hours, and before excavation, if contaminated material is discovered that has not been previously identified or if other discrepancies between data provided and actual field conditions are discovered. Ground water is approximately 16 feet below ground surface.

PART 2 PRODUCTS

2.1 BACKFILL

Backfill material shall be obtained from offsite sources approved by the Contracting Officer. Backfill shall be classified in accordance with ASTM D 2487 as GW, GP, GM, GC, SW, SP, SM, SC, ML, MH, CL, or CH and shall be free from roots and other organic matter, trash, debris, snow, ice or frozen materials.

Backfill shall not be used until borrow source chemical and physical test results have been submitted and approved.

2.2 SPILL RESPONSE MATERIALS

The Contractor shall provide appropriate spill response materials including, but not limited to the following: containers, adsorbents, shovels, and personal protective equipment. Spill response materials shall be available at all times when contaminated materials/wastes are being handled or transported. Spill response materials shall be compatible with the type of materials and contaminants being handled.

PART 3 EXECUTION

3.1 EXISTING STRUCTURES AND UTILITIES

No excavation or well installations shall be performed until site utilities have been field located. The Contractor shall take the necessary precautions to ensure no damage occurs to existing structures and utilities. Damage to existing structures and utilities resulting from the Contractor's operations shall be repaired at no additional cost to the Government. Utilities encountered that were not previously shown or otherwise located shall not be disturbed without approval from the Contracting Officer.

3.2 CLEARING

Clearing shall be performed if necessary.

3.3 CONTAMINATED MATERIAL STORAGE

Drill cuttings from the installation of the five bio-sparge wells will be contained in 55-gallon drums and properly disposed of in a timely manner. Storage units shall be in good condition and constructed of materials that are compatible with the material or liquid to be stored. If multiple storage units are required, each unit shall be clearly labeled with an identification number and a written log shall be kept to track the source of contaminated material in each temporary storage unit. The following paragraphs describe additional methods of material storage.

3.3.1 Stockpiles

Stockpiles shall be constructed to isolate stored contaminated material from the environment. Stockpiles shall be constructed to include:

- a. A chemically resistant geomembrane liner free of holes and other damage. Non-reinforced geomembrane liners shall have a minimum thickness of 20 mils. The ground surface on which the geomembrane is to be placed shall be free of rocks greater than 0.5 inches in diameter and any other object which could damage the membrane.
- b. Geomembrane cover free of holes or other damage to prevent precipitation from entering the stockpile. Non-reinforced geomembrane covers shall have a minimum thickness of 10 mils. Scrim reinforced geomembrane covers shall have a minimum weight of 26 lbs. per 1000 square feet. The cover material shall be extended over the berms and anchored or ballasted to prevent it from being removed or damaged by wind.
- c. Berms surrounding the stockpile, a minimum of 12 inches in height. Vehicle access points shall also be bermed.
- d. The liner system shall be sloped to allow collection of leachate. Storage and removal of liquid which collects in the stockpile, in accordance with paragraph Liquid Storage.

3.3.2 Roll-Off Units

Roll-off units used to temporarily store contaminated material shall be water tight. A cover shall be placed over the units to prevent precipitation from contacting the stored material. Liquid which collects inside the units shall be removed and stored in accordance with paragraph Liquid Storage.

3.3.3 Liquid Storage

Liquid collected from excavations and stockpiles shall be temporarily stored in 55 gallon barrels. Liquid storage containers shall be water-tight.

3.4 SAMPLING

3.4.1 Sampling of Stored Material

Samples of stored material shall be collected at a frequency of once per 55 gallon drum.

Stored material with contaminant levels that exceed the action levels shall be treated. Analyses for contaminated material to be taken to an offsite treatment facility shall conform to local, state, and federal criteria as well as to the requirements of the treatment facility. Documentation of all analyses performed shall be furnished to the Contracting Officer. Additional sampling and analyses to the extent required by the approved offsite treatment, storage or disposal (TSD) facility shall be the responsibility of the Contractor.

3.5 SPILLS

In the event of a spill or release of a hazardous substance (as designated in 40 CFR 302), pollutant, contaminant, or oil (as governed by the Oil Pollution Act (OPA), 33 U.S.C. 2701 et seq.), the Contractor shall notify the Contracting Officer immediately. If the spill exceeds the reporting threshold, the Contractor shall follow the pre-established procedures as described in the RCRA Contingency Plan for immediate reporting and containment. Immediate containment actions shall be taken to minimize the effect of any spill or leak. Cleanup shall be in accordance with applicable federal, state, and local regulations. As directed by the Contracting Officer, additional sampling and testing shall be performed to verify spills have been cleaned up. Spill cleanup and testing shall be done at no additional cost to the Government.

3.6 BACKFILLING

3.6.1 Confirmation Test Results

Excavations shall be backfilled immediately after all contaminated materials have been removed and confirmation test results have been approved. Backfill shall be placed and compacted to the lines and grades shown on the drawings.

3.6.2 Compaction

Approved backfill shall be placed in lifts with a maximum loose thickness of 8 inches. Soil shall be compacted to 90 percent of the maximum dry density.

3.7 DISPOSAL REQUIREMENTS

Offsite disposal of contaminated material shall be in accordance with Federal, State, and Local laws.

-- End of Section --

SECTION 02 90 00

REMEDIATION SYSTEM INSTALLATION

08/04

PART 1 GENERAL

The work includes providing all labor, supervision, tools, materials, equipment, and transportation necessary to install a deep zone bio-sparge system for the restoration of petroleum contaminated groundwater at the 645 site. Components of this project include: obtaining the necessary construction permits; installation of bio-sparge wells; installing bio-sparge header piping and associated valves, gauges, and fittings; installation of soil vapor wells; system start-up; and site cleanup and other related work

After remediation system installation and start-up, the Contractor shall operate and monitor the remediation system for a period of 180-days. The Contractor shall be responsible for correction and repairing all problems that may occur during this period.

1.1 SUBMITTALS

Submit the following in accordance with Section 01330 SUBMITTAL PROCEDURES.

1.1.1 SD-03, Product Data

The Contractor shall provide the following as part of the Bio-Sparge System:

- Well Heads and Covers; G
- Valves and Gauges; G
- Well Casing; G
- Well Screen; G
- Bio-Sparge Header Piping; G

1.1.2 SD-06, Instructions

a. Drill Plan; G

The Contractor shall provide a Drill Plan describing all equipment construction procedures, labor and materials associated with installation of bio-sparge and soil vapor wells. At a minimum the plan shall include:

1. Proposed drilling equipment
2. Proposed mud system, pits, pumps, etc.
3. Spill prevention plan for drilling fluids
4. Sequence of drilling and well installation procedures
5. Well materials and proposed well detail
6. Drill cutting and mud disposal method
7. Well development procedures

8. Development water disposal method
9. Disposal manifests

b. Bio-Sparge Header Pipe Installation Plan

Should the Contractor elect to install bio-sparging header pipe using horizontal directional drilling, the Contractor shall provide a Bio-Sparge Header Pipe Installation Plan describing all equipment, construction procedures, labor, and materials associated with the installation of the header piping. At a minimum the plan should include:

1. Proposed drilling equipment
2. Spill prevention plan
3. Sequence of drilling and piping installation
4. Piping materials
5. Traffic control

1.1.3 SD-12, Field Test Reports

The following field test reports are required to be submitted:

- a. Bio-Sparge and Soil Vapor Well As-built Well Details
- b. Bio-Sparge and Soil Vapor Well Boring Logs
- c. North Carolina Department of Environment Health and Natural Resources Well Construction Records
- d. After Action Report

1.1.4 SD-13, Certifications

- a. Well Heads, Junction Boxes, Frames and Covers; G

1.1.5 SD-19, Operation, Maintenance, and Monitoring Manuals

Submit Operation and Maintenance (O&M) Manuals, 90 days prior to completion of the Contract, which are specifically applicable to this contract and a complete concise depiction of the provided equipment or product. Data containing extraneous information to be sorted through to find applicable instruction will not be accepted. Present information in sufficient detail to clearly explain user O&M requirements at the system, equipment, component and subassembly level. At a minimum, provide updated operation and maintenance information related to the following:

- a. Air sparge unit
- b. Vapor collection unit

Types of information required:

- a. Operating Instructions
- b. Preventative Maintenance
- c. Corrective Maintenance
- d. Safety Precautions

The Contractor shall also describe initial start-up and testing activities including procedures for equipment start-up and adjustment, along with

field measurements and adjustment procedures for the bio-sparge wells.

In addition, the Contractor shall describe site monitoring activities to confirm remediation system effectiveness and plot contamination migration. Monitoring activities shall be in conformance with the recommendations of the Corrective Action Plan Supplement Report, State and local requirements, and reporting requirements.

The Contractor should describe activities for training government personnel on the operation, maintenance, and monitoring of the bio-sparge and vapor collection systems.

PART 2 PRODUCTS

2.1 COMPATIBILITY, DURABILITY AND AVAILABILITY

All products, materials and equipment incorporated into the remediation system shall be compatible with the fluids and contaminants with which they will be in contact and shall be suitable for continuous operation under the environmental conditions in which the system will be operating.

Products and materials shall be of sufficient strength and design and remediation system components installed in a manner that provides for continuous operation for the anticipated lifetime of the remediation system of ten years at required loads, pressures and flow rates.

Products, materials and equipment shall be obtained from manufacturers regularly engaged in the production of such items.

2.2 SPECIFIC SYSTEM COMPONENTS

Additional performance requirements, required ratings and minimum capacities for specific system components are listed below.

2.2.1 Bio-Sparging System

2.2.1.1 Bio-Sparge Wells

Provide suitable piping for bio-sparge wells designed to provide an even distribution of air to the subsurface, throughout the entire area of the intended sparging zone.

2.2.1.2 Bio-Sparge Header Piping

The bio-sparge header line shall be solid piping capable of delivering the required air flow and rated for at least 100 psig. Provide header piping designed for a maximum headloss of 10 psi at the required flow rate.

2.2.1.3 Bio-Sparge Air Flow Control

Appropriate air valving and pressure regulation shall be provided at each sparge well to adjust injected air. Pressure regulators shall be rated for 100 psig and up to 20 cfm.

2.2.1.4 Soil Vapor Wells

Provide suitable piping for soil vapor wells designed to monitor vapors escaping from the subsurface from the biosparging process. The soil vapor wells should be installed above the water table.

2.2.2 GENERAL

2.2.2.1 Well Heads, Junction Boxes, and Covers

Well heads, junction boxes, and covers shall be capable of supporting an H-20 wheel load as defined by AASHTO in non-aircraft access areas. The well heads and junction boxes shall be of sufficient size to allow adequate operator access to piping, valves and controls.

Provide certification by the manufacturer that the well heads, junction boxes, and covers meet the load design requirements.

2.2.2.2 Drilling Fluid

The Contractor may use a drilling fluid during installation of the bio-spargers and soil vapor wells. The drilling fluid or "mud" shall have the proper consistency to prevent clogging of the formation as well as a suitable gel strength to carry sand and silt from the bore hole. The drilling fluid shall be commercially available and used in accordance with the manufacturer's recommendations.

2.2.2.3 Sand Pack

Provide clean, round, hard, water-worn quartz with less than 5 percent feldspar, no fossils, carbonate, or organics. Provide commercially available sand pack.

2.2.2.4 Bentonite

Provide commercially available high yield bentonite consisting of sodium montmorillonite clay. Provide bentonite meeting all State and local requirements as a suitable monitoring well agent.

2.2.2.5 Grout for Wells

Provide grout in accordance with ASTM C 150. The mixed grout shall contain no more than 7 gallons of water per bag (1.0 cubic or 94 pounds).

PART 3 EXECUTION

The contractor shall perform all construction tasks and provide all materials, equipment, and labor to install the bio-sparger system at the 645 project site.

3.1 PERMITTING AND REGULATORY COMPLIANCE

The remediation system shall be installed in a manner that allows for operation of the system in compliance with all local, State, and Federal rules and laws.

The Contractor must acquire all construction permits applicable for installation of the bio-sparger system.

3.2 SECURITY AND CONFORMITY WITH SITE OPERATIONS

All equipment incorporated into the remediation system shall be adequately secured to prevent access to the equipment by unauthorized personnel. All components of the system shall be protected from damage by vehicular

traffic.

The system shall be installed in a manner that will conform to and not interfere with existing and reasonably anticipated site operations and maintenance activities.

3.3 SAFETY

The installed remediation system shall meet all requirements of the National Fire Protection Association and Occupational Safety and Health Administration.

3.4 EXCAVATION, PIPE INSTALLATION, AND BACKFILLING

Pipe installation and backfill shall be in accordance with the manufacturer's recommendations. Compaction requirements for backfill shall be 90 percent of ASTM D 698 maximum density. Under areas to be repaved, backfill shall be compacted to 95 percent of ASTM D 698 maximum density. Methods of preventing sedimentation and erosion shall be performed in accordance with all local, State, and Federal rules and laws.

Excavation may encounter petroleum contaminated soils. Soils containing greater than 10 parts per million (ppm) of total petroleum hydrocarbons as gasoline (TPH/gasoline) per EPA Method 5030; 40 ppm TPH/diesel per EPA Method 3550, or 250 ppm TPH/oil and grease per Method 9071 shall be considered contaminated, not suitable for backfill, and shall be handled and disposed of in accordance with all local, State, and Federal rules and laws.

3.5 BIO-SPARGE AND SOIL VAPOR WELL INSTALLATION

The bio-sparge and soil vapor wells shall be installed in conformance with North Carolina well construction rules by a driller licensed in the State of North Carolina. Provide an engineer or geologist trained in using visual/manual techniques as described in ASTM D-2487 and ASTM D-2488 for soil classification on site during drilling and well installation.

The bio-sparge wells shall be constructed in a manner to achieve a uniform radial distribution of air into the subsurface at depths of approximately 90 feet below land surface (BLS) as indicated on the contract drawings. Installation techniques shall avoid the creation of high permeability conduits in the bore hole which can be capable of short circuiting the sparged air. The minimum required air flow rate per sparge well in the deep zone is 5 cfm.

3.5.1 Environmental Protection

The Contractor shall develop and follow a Spill Prevention Plan to prevent drilling fluids from spilling onto the ground or into drainage systems. Additionally, stockpiled soils or cutting shall be stored in accordance with North Carolina Department of Environment, Health and Natural Resources (NCDENR) guidance document entitled, "UST Section Guidelines for the Investigation and Remediation of Contamination from Non-UST Petroleum Releases", to prevent erosion or runoff.

3.5.2 Drilling Safety

The Contractor shall prepare a Site Specific Health and Safety Plan and provide a Health and Safety Manager to monitor adherence to the plan at all

times. All drilling personnel or other employees shall have appropriate health and safety training as required by OSHA regulations.

3.5.3 Utility Locations

The known existing utilities are shown on the contract drawings. However, the Contractor shall use a private utility locator, to verify utility locations prior to beginning any construction. Utility conflicts with the proposed construction shall be brought to the attention of the ROICC NTR and resolved prior to the beginning of construction operations.

3.5.4 Drilling Rig

The drilling rig shall be in first class working condition and be of sufficient size and power capable of installation of the bio-spargers and soil vapor wells. The Contractor shall have all equipment, instruments (including survey equipment) and qualified personnel to ensure installation of the bio-spargers and soil vapor wells at the required depth and at the location as shown on the contract drawings.

3.5.5 Well Development

After installation of the bio-spargers, the Contractor shall fully develop each well to remove residual drilling fluids/materials and to restore the natural hydraulic flow condition of the subsurface. Each bore hole shall be developed until specific conductivity, pH, temperature have stabilized and the water is visibly free of sediment. Disposal of development fluids shall be the responsibility of the Contractor.

3.5.6 Bore Hole Grouting

The Contractor is required to seal the void between the borehole and the bio-sparger riser piping to prevent short circuiting. The Drill Plan shall describe the Contractor's proposed grouting procedure and proposed grout type.

3.5.7 Records

Provide for all well installations, Well Construction Records as required by NCDENR as well as an as-built well detail.

3.6 INSTALLATION OF WELL HEADS AND JUNCTION BOXES

The well heads, junction boxes, and covers, as installed, shall be capable of supporting an H-20 live load as defined by AASHTO. The well heads shall be of sufficient size to allow adequate operator access to piping, valves, and controls.

3.7 PAVEMENT REPAIRS

Perform repairs where trenches, pits, and other excavations are made in existing pavements. The restored pavement shall be the same kind and thickness of existing pavement and shall match and tie into the surrounding pavement in a neat and cohesive manner. Materials of construction shall be in accordance with the NCDOT Standard Specifications:

Bituminous Concrete: Type I, Section 645
Stone Base Course: Sections 1005 and 1010 for aggregate base course
standard size no. ABC

Bituminous Tack Coat: Section 605

3.8 SYTEM START-UP AND TESTING

System start-up and testing shall be performed by the Contractor. Following completion of start-up and testing activities the Contractor shall submit to the Enginner and ROICC NTR a After Action Report. Start-up and testing activitites shall include testing of each system in service, to determine compliance with the contract requirements and warranty. All equipment shall be tested in operation for a continuous period of not less than 5 days. During the tests, all equipment shall be tested under every condition of operation. All defects in the work provided by the Contractor shall be corrected by him at his own expense and the test repeated until proved satisfactory.

3.9 VAPOR MONITORING

During system start-up and testing and periodically after system operation has commenced, the Contractor shall provide vapor monitoring of the soil vapor sentinel wells and the crawl space vents in nearby buildings to ensure petroleum vapors are not present. The air space under Building 40 shall be accessed through the crawl space vents that exist around the perimeter of the building.

3.9.1 PID Calibration

Vapor monitoring shall be performed utilizing a MiniRAE 2000 Photo Ionization Detector (PID) using a 10.6 eV lamp or approved equivalent. Should the Contractor elect to use a different piece of equipment for vapor monitoring, the equipment must be submitted for approval prior to use. The 10.6 eV lamp will detect any compounds that have an Ionization Potential (IP) below 10.6 eV. Benzene has an IP of 9.25 eV, Ethylbenzene has an IP of 8.77 eV, Toluene has an IP of 8.82 eV, and Xylenes have an IP of 8.56 eV. Equipment calibration shall be in accordance with the manufacture's instruction. The following calibration procedures are specific for the MiniRAE 2000.

1. Press and hold the "Mode" button and scroll through options until the screen reads "Calibrate/Select Gas?"
2. Press the "Yes" button and the display should read "Fresh Air Cal"
3. Once the screen displays "Fresh Air Cal" press yes
4. The display will read "zero in progress..." after 15 seconds a reading will display. Ensure the reading is steady and not above 0.5 parts per million (ppm).
 - a. Re-zero the unit if the reading is unstable
 - b. Re-zero the unit if the reading is above 0.5 ppm
5. A 100 ppm isobutylene calibration gas shall be utilized
 - a. Fill a tedlar bag with 100 ppm isobutylene
 - i. Fill the bag all the way
 - ii. Close the valve on the bag before removing it from the regulator to prevent air from getting inside the bag
 - b. The screen on the PID should read "Span cal?". Press the yes button
 - c. The screen should read "Cal gas = Isobutylene...Span value = 100...Apply gas now"
 - d. Open the valve on the tedlar bag and connect the bag tube to the probe tip. the screen will read "wait" followed by a 30 second count down. Once the countdown is completed, the unit will display a reading. The reading should be between 98 and 102 ppm.

- i. If the reading is low, refill the tedlar bag with 100 ppm isobutylene and connect it to the probe tip.
 - ii. If the readings are too high, low, or unstable, perform the fresh air cal and span cal. again.
6. Once the PID is calibrated with the 100 ppm isobutylene gas change the correction factor on the PID to 0.9 (for gasoline)

3.9.2 Vapor Monitoring

1. Vapor Monitoring using PID
 - a. Monitor two sentinel wells
 - i. Open sentinel well
 - ii. Stick tip of PID into the top of the well and take a reading.
 - b. Monitor crawl space vents in nearby building
 - i. Connect tubing to the tip of the PID and insert tip into the crawl space
 - ii. Take and record the PID reading and check all crawl space vents
2. Collecting Grab Samples
 - a. Use a Summa(TM) Canister and collect samples from the sentinel wells, crawl space vents, and inside the building as necessary.
 - b. Prior to collecting a sample, purge three sample tube volumes.
 - c. To limit stripping of contaminants and minimize air infiltration, flow rates shall not exceed 0.2 liters per minute during sample collection.
 - d. Indoor samples shall be collected at a height similar to the general breathing zone.
 - e. Indoor samples shall be collected over an 8 hour period.
 - f. Send Summa(TM) Canister to laboratory for analysis of Volatile Organic Compounds per EPA Method Toxic Organic 15 (TO-15).

3.9.3 Vapor Monitoring Schedule

In order to adequately monitor possible vapor intrusion the Contractor shall collect baseline PID data prior to system start-up. After system start-up, PID readings will be taken from the two sentinel wells and all crawl space vents. Vapors shall be monitored on a weekly basis for the first month after system start-up. After the initial month of sampling, vapor monitoring shall continue on a monthly basis for the first year. After a year, vapor monitoring will be conducted on a quarterly basis. Additional monitoring will be needed if PID readings exceed trigger levels.

3.9.4 Trigger Levels

The following trigger levels have been established in order to protect the public health.

1 ppm - If during vapor monitoring, any PID reading exceeding 1 ppm is detected at a crawl space the Contractor shall take an additional PID reading from inside the building. If there is any detectable level inside of the building then grab vapor samples will be collected using Summa(TM) Canisters. If there are no detectable levels inside the building then a grab vapor sample will be collected with a Summa(TM) Canister from the crawl space vent with the highest PID reading.

5 ppm - If during vapor monitoring, any PID reading exceeding 5 ppm is detected at any of the crawl space vents procedures from the 1 ppm trigger level will be implemented and a fan will be utilized to vent the crawl space.

10 ppm - If during vapor monitoring, any PID reading exceeding 10 ppm is detected at any of the crawl space vents the building will be evacuated and procedures from the 1 ppm and 5 ppm trigger levels will also be implemented.

3.9.5 Exit Criteria

As stated in section 3.9.3, vapor monitoring will occur throughout the biosparging process. Vapor monitoring will be discontinued after a year of monitoring if no contamination has been detected at any of the crawl space vents. If trace levels are measured during the first year, monitoring frequency will be decreased to quarterly and vapor monitoring will be discontinued only after four consecutive quarters of non-detectable concentrations are recorded. Once vapor monitoring at the crawl space vents has been discontinued the sentinel wells will continue to be monitored using a PID meter. If a PID reading at any sentinel well should exceed 5 ppm, vapor monitoring will be restarted at the crawl space vents.

3.10 OPERATION, MAINTENANCE, AND MONITORING

After successful completion of start-up and testing activities, the bio-sparge system shall be maintained for the 180 day operation, maintenance, and monitoring period by the Contractor. A Registered Professional Engineer or Geologist in the State of North Carolina shall monitor and direct the operations and shall provide periodic progress reports. Monitoring activities shall be in accordance with the CAP Supplement. After 180 days of operation of the systems by the Contractor the MCB will assume operation of the systems. The Contractor is to provide training for up to eight MCB personnel in the proper operation and maintenance of the systems. This training shall be given by the Professional Engineer or Geologist for one 8-hour work day.

-- End of Section --

SECTION 03 30 53

MISCELLANEOUS CAST-IN-PLACE CONCRETE

04/08

PART 1 GENERAL

1.1 SUMMARY

Create 3' by 3' concrete well pads for the five proposed bio-spargers using ready-mix concrete.

1.2 REFERENCES

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

ACI INTERNATIONAL (ACI)

ACI MCP SET (2008) Manual of Concrete Practice

ASTM INTERNATIONAL (ASTM)

ASTM C 150 (2007) Standard Specification for Portland Cement

ASTM C 33 (2007) Standard Specification for Concrete Aggregates

ASTM C 94/C 94M (2007) Standard Specification for Ready-Mixed Concrete

1.3 QUALITY ASSURANCE

Indicate specific locations of concrete pads on installation drawings and include, but not be limited to, square feet of concrete placements, thicknesses and widths, plan dimensions, and arrangement of cast-in-place concrete section.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Cementitious Materials

Provide cementitious materials that conform to the appropriate specifications listed:

2.1.1.1 Portland Cement

ASTM C 150, Type I, IA, II, IIA, III, IIIA or V except that the tricalcium aluminate of the Type III or IIIA cement shall be limited to 8 percent].

2.1.1.2 Pozzolan

Provide pozzolan that conforms to ASTM C 618, Class C or F.

2.1.2 Aggregates

Fine and coarse aggregates shall meet the quality and grading requirements of ASTM C 33 Class Designations 4M or better. Perform evaluation of fine and coarse aggregates separately and in combination, matching the proposed mix design proportioning. All results of the separate and combination testing shall have a measured expansion less than 0.10 (0.08) percent at 16 days after casting.

2.1.3 Admixtures

Admixtures to be used, when required or approved, shall comply with the appropriate specification listed. Retest chemical admixtures that have been in storage at the project site, for longer than 6 months or that have been subjected to freezing, at the expense of the Contractor at the request of the Contracting Officer and will be rejected if test results are not satisfactory.

2.1.3.1 Air-Entraining Admixture

Provide air-entraining admixture that meets the requirements of ASTM C 260.

2.1.3.2 Water-Reducing or Retarding Admixture

Provide water-reducing or retarding admixture meeting the requirements of ASTM C 494/C 494M, Type A, B, or D.

2.1.4 Water

Use fresh, clean, potable water for mixing and curing, free from injurious amounts of oil, acid, salt, or alkali, except that unpotable water may be used if it meets the requirements of COE CRD-C 400.

2.1.5 Formwork

The design and engineering of the formwork as well as its construction, will be the responsibility of the Contractor.

2.1.6 Form Coatings

Coat forms, for exposed surfaces, with a nonstaining form oil to be applied shortly before concrete is placed.

2.1.7 Curing Materials

Provide curing materials conforming to the following requirements.

2.1.7.1 Impervious Sheet Materials

Impervious sheet materials, ASTM C 171, type optional, except polyethylene film, if used, shall be white opaque.

2.1.7.2 Membrane-Forming Curing Compound

ASTM C 309, Type 1-D or 2, Class A.

2.2 READY-MIX CONCRETE

- a. Concrete shall be ready-mix concrete with mix design data conforming to ACI MCP SET Part 2.
- b. Non-exposed concrete elements: 3000 psi minimum compressive strength.
- c. Direct-exposed concrete elements (including air-conditioned rooms): 5000 psi minimum compressive strength as determined in 28 calendar days.
- d. Slump: 1 to 4 inch according to ASTM C 143/C 143M and ACI MCP SET Part 1.
- e. Portland Cement conforming to ASTM C 150.
- f. Blended hydraulic cement conforming to ASTM C 595.
- g. Use one brand and type of cement for formed concrete having exposed-to-view finished surfaces.
- h. Air-Entraining Admixtures conforming to ASTM C 260.
- i. Water-reducing admixtures, retarding admixtures, accelerating admixtures, water-reducing and accelerating admixtures, and water-reducing and retarding admixtures shall conform to ASTM C 494/C 494M.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 General

Prior to constructing the concrete well heads remove snow, ice, standing or flowing water, loose particles, debris, and foreign matter. Earth foundations shall be satisfactorily compacted. The entire preparation shall be accepted by the Government prior to placing.

3.1.2 Formwork Installation

Forms shall be constructed of wood, prior to the placement of concrete and aligned and adequately supported. Provide smooth form surfaces, free from irregularities, dents, sags, or holes when used for permanently exposed faces. Chamfer all exposed joints and edges, unless otherwise indicated.

3.1.3 Production of Concrete

3.1.3.1 Ready-Mixed Concrete

Provide ready-mixed concrete conforming to ASTM C 94/C 94M except as otherwise specified.

3.2 CONVEYING AND PLACING CONCRETE

Perform conveying and placing concrete in conformance with the following

requirements.

3.2.1 General

Concrete placement is not permitted when weather conditions prevent proper placement and consolidation without approval. When concrete is mixed and/or transported by a truck mixer, deliver the concrete to the site of the work completing the discharge within 1-1/2 hours. Convey concrete from the mixer to the forms as rapidly as practicable by methods which prevent segregation or loss of ingredients. Concrete shall be in place and consolidated within 15 minutes after discharge from the mixer. Deposit concrete as close as possible to its final position in the forms and regulate it so that it may be effectively consolidated in horizontal layers 18 inches or less in thickness with a minimum of lateral movement. Carry on the placement at such a rate that the formation of cold joints will be prevented.

3.2.2 Consolidation

Consolidate each layer of concrete by rodding, spading, or internal vibrating equipment.

3.2.3 Cold-Weather Requirements

No concrete is to be mixed or placed when the ambient temperature is below 36 degrees F or if the ambient temperature is below 41 degrees F and falling. Provide suitable covering and other means as approved for maintaining the concrete at a temperature of at least 45 degrees F for not less than 72 hours after placing and at a temperature above freezing for the remainder of the curing period. Do not mix salt, chemicals, or other foreign materials with the concrete to prevent freezing. Remove and replace concrete damaged by freezing at the expense of the Contractor.

3.2.4 Hot-Weather Requirements

When the rate of evaporation of surface moisture, as determined by use of Figure 1 of ACI MCP SET Part 2, is expected to exceed 0.2 psf per hour, provisions for windbreaks, shading, fog spraying, or covering with a light-colored material shall be made in advance of placement, and such protective measures taken as quickly as finishing operations will allow.

3.3 FORM REMOVAL

Do not remove forms before 24 hours after concrete placement, except as otherwise specifically authorized. Do not remove supporting forms and shoring until the concrete has cured for at least 5 days. When conditions require longer curing periods, forms shall remain in place.

3.4 FORM WORK

Form work shall conform to ACI MCP SET Parts 2 through 5.

3.4.1 Preparation of Form Surfaces

Forms shall be constructed around the well head using wooden boards. Form surfaces for permanently exposed faces shall be smooth, free from irregularities, dents, sags, or holes. Chamfer exposed joints and exposed edges. Arrange internal ties so that when the forms are removed, the form ties are not less than 2 inches from concrete surfaces permanently exposed

to view or exposed to water on the finished structure.

3.4.2 Removal of Forms

Remove forms carefully to prevent damage to the concrete. Do not remove forms before the concrete has had a sufficient time to harden.

3.5 BILL OF LADING

Bill of Lading for each ready-mix concrete delivery shall be in accordance with ASTM C 94/C 94M.

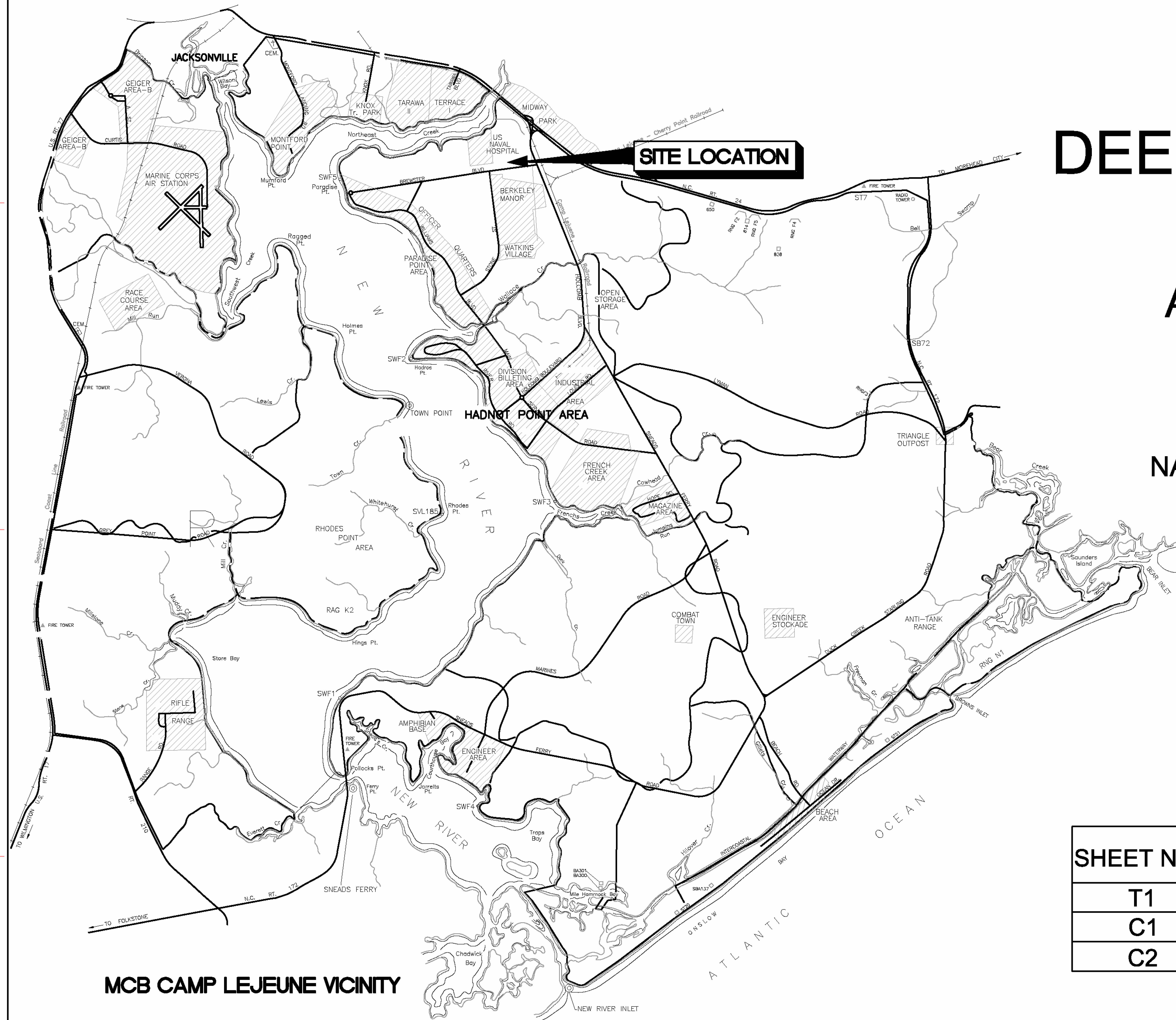
3.6 CHEMICAL-HARDENER TREATMENT

Apply Liquid-Chemical Floor Hardener where indicated, after curing and drying concrete surface. Dilute liquid hardener with water and apply in three coats. First coat shall be one-third strength, second coat one-half strength, and third coat two-thirds strength. Apply each coat evenly and allow it to dry 24 hours before applying next coat. Apply proprietary chemical hardeners in accordance with manufacturer's printed directions.

-- End of Section --

APPENDIX C

CONSTRUCTION DRAWINGS



BUILDING 645 DEEP ZONE BIO-SPARGE SYSTEM

AT MARINE CORPS BASE
CAMP LEJEUNE
NORTH CAROLINA

NAVY CONTRACT NO. N62470-05-D-6200
DELIVERY ORDER NO. 0054
CATLIN PROJECT NO. 208-018

AUGUST 14, 2009

SHEET NO.	SHEET TITLE
T1	COVER SHEET
C1	LAYOUT OF BIO-SPARGE SYSTEM
C2	SYSTEM DETAILS

APPROVED
DATE
BY

DESIGNED
DATE
BY

DRAWN
DATE
BY

CHECKED
DATE
BY

PROJECT MANAGER
DATE
BY

QUALITY CONTROL
DATE
BY

BRANCH MANAGER
DATE
BY

DESIGN DIRECTOR
DATE
BY

APPROVED
DATE
BY

DESIGNED
DATE
BY

DRAWN
DATE
BY

CHECKED
DATE
BY

PROJECT MANAGER
DATE
BY

QUALITY CONTROL
DATE
BY

BRANCH MANAGER
DATE
BY

DESIGN DIRECTOR
DATE
BY

APPROVED
DATE
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DESIGNED
DATE
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DRAWN
DATE
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CHECKED
DATE
BY

PROJECT MANAGER
DATE
BY

QUALITY CONTROL
DATE
BY

BRANCH MANAGER
DATE
BY

DESIGN DIRECTOR
DATE
BY

CATLIN
Engineers
Scientists
Architects
Civil Engineers
Mechanical Engineers
Electrical Engineers
Environmental Engineers
Surveyors
Geotechnical Engineers
Construction Management
Program Management
Professional Services
Wilmington, NC 28405
Corporate License No. for Engineering Services C0086

APPROVED
DATE
BY

DESIGNED
DATE
BY

DRAWN
DATE
BY

CHECKED
DATE
BY

PROJECT MANAGER
DATE
BY

QUALITY CONTROL
DATE
BY

BRANCH MANAGER
DATE
BY

DESIGN DIRECTOR
DATE
BY

NAVY FACILITIES ENGINEERING COMMAND
MARINE CORPS BASE, CAMP LEJEUNE, N.C.

BUILDING 645
DEEP ZONE BIO-SPARGE SYSTEM

COVER SHEET

CODE ID NO.

SCALE: AS SHOWN

FED NO. FILE

STA PROJ NO. 7777

SPEC NO. N/A

CONSTRN CONTR NO. N/A

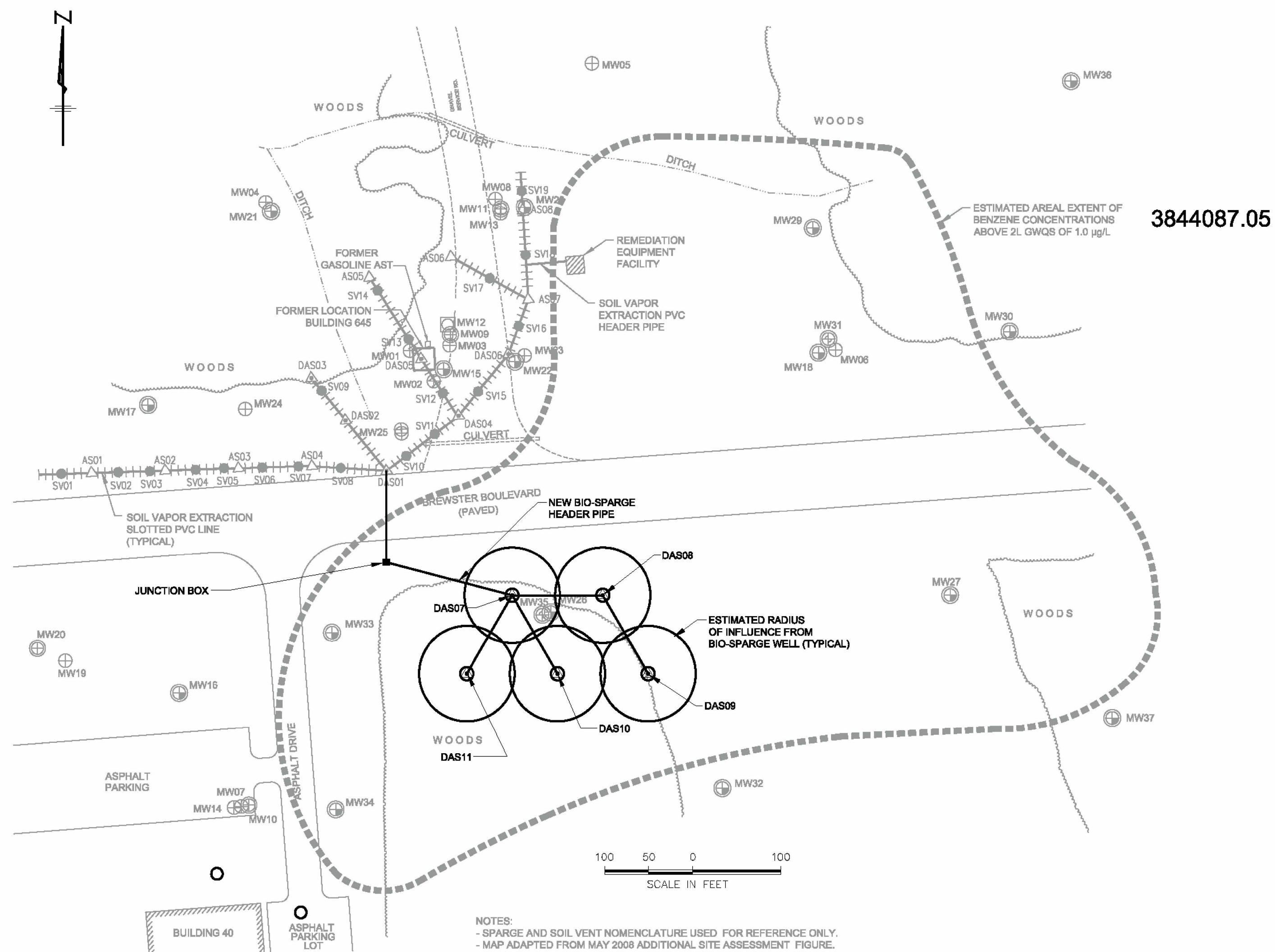
NAVJAC DRAWING NO.

SHEET 1 OF 3

T1

208-018-BOD-JAN08-T1

6,000 0 6,000 12,000
SCALE IN FEET



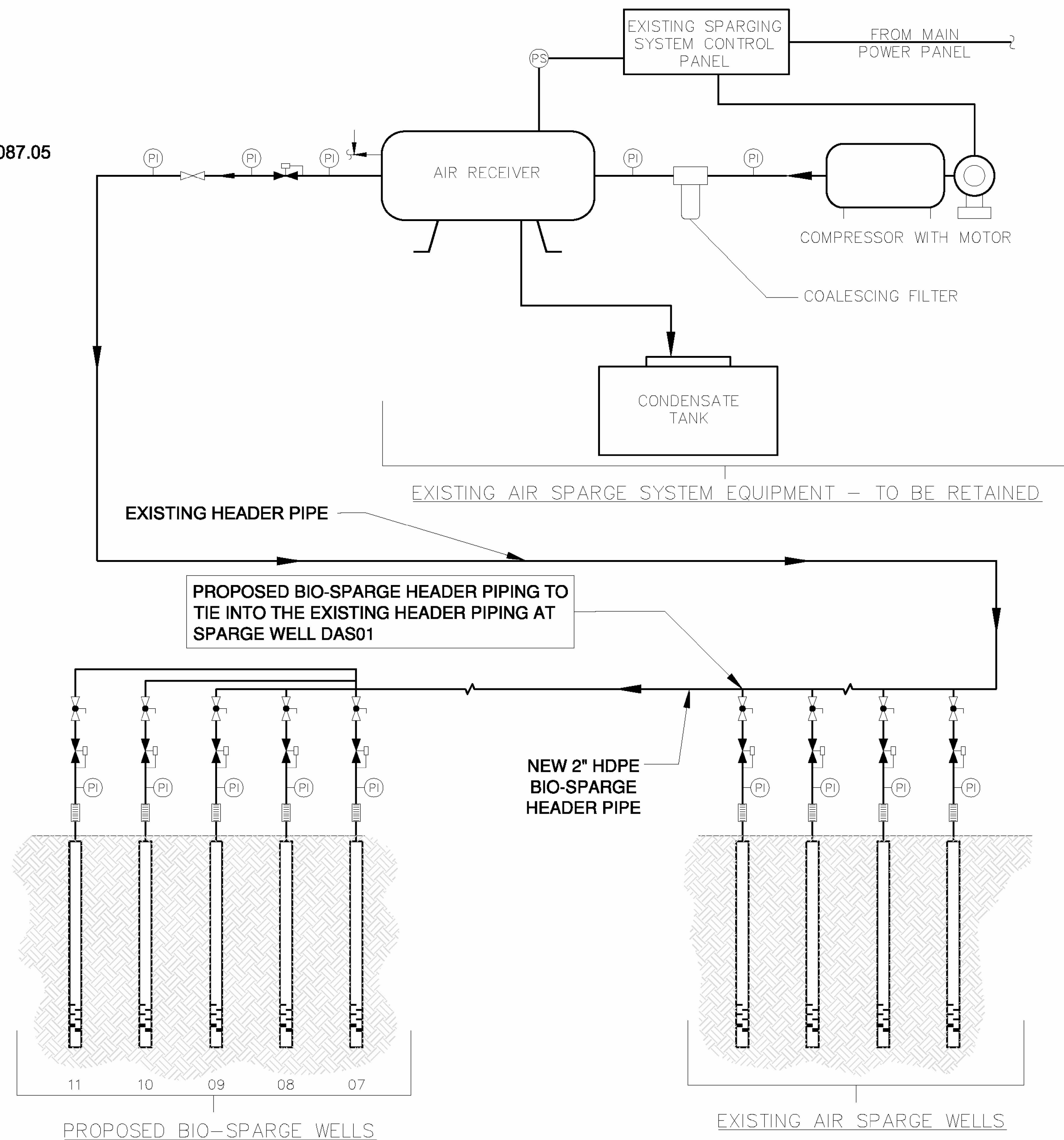
LEGEND	
EXISTING	PROPOSED DESCRIPTION
	BUILDING
	SHALLOW ZONE WELL (DEPTH <40')
	INTERMEDIATE ZONE WELL (DEPTH >40' - <60')
	DEEP ZONE WELL (DEPTH >60' - <90')
	DEEP ZONE WELL (DEPTH >90')
	PUMPING WELL
	SOIL VENT BORING
	AIR SPARGE WELL - 80 FEET DEEP
	AIR SPARGE WELL - 50 FEET DEEP
	BIOSPARGE WELL - 90' DEEP
	SOIL VAPOR SENTINEL WELL - 100' DEEP

BIO-SPARGE WELL	COORDINATES
UST645-DAS07	E: 285294.4346 N: 3844234.3815
UST645-DAS08	E: 285310.1076 N: 3844234.3815
UST645-DAS09	E: 285317.9441 N: 3844220.8400
UST645-DAS10	E: 285302.2712 N: 3844220.8400
UST645-DAS11	E: 285286.5982 N: 3844220.8400

NOTE: COORDINANTES IN UTM, ZONE 18N, NAD83,
METERS

TREATMENT SYSTEM LAYOUT

1 INCH = 100 FEET



LEGEND

	PRESSURE REGULATOR		PRESSURE RELIEF VALVE		PRESSURE INDICATOR		CHECK VALVE		BALL VALVE (OPEN)
	PRESSURE SWITCH		FILTER		ELECTRICAL LINE		GATE VALVE		FLOW METER

TREATMENT SYSTEM SCHEMATIC

NOT TO SCALE

[illegible]

APPENDIX D

PROJECT COST ESTIMATE