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SPECIFICATIONS
DURHAM MEADOWS DMC STUDY AREA
REMEDIAL DESIGN

100% Design Submittal

Durham Meadows Superfund Site
Durham, Connecticut

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DIVISION 1

GENERAL REQUIREMENTS

SECTION 01 11 00

SUMMARY OF WORK

PART 1 GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

The general description below is given to indicate the approximate scope of this project only. It does not limit the work required under the project drawings and specifications.

The Project includes excavation of impacted soil, transport of impacted soils to off-site permitted disposal facilities, and site restoration. The remediation activities will be broken into phases to ensure that the manufacturing building is able to continue normal operations. Temporary site fencing and erosion controls are to be installed around a Phase 1A excavation in the parking area north of the building. The Phase 1A area would be excavated and fully restored before proceeding to isolate and excavate the Phase 1B area. Subsequently, the Phase 1B area would be excavated and fully restored before proceeding to isolate and excavate the Phase 2 (remaining excavation areas) to install temporary site fence. Specific details include:

1. Pre-mobilization including all preconstruction plans and submittals as identified in the Contract Documents and defined in specification Section 01 33 00 SUBMITTAL PROCEDURES.

2. All field engineering and preconstruction surveys.

3. Identification of and obtaining acceptance from EPA-approved disposal facilities as necessary to maintain project schedule.

4. Soil pre-characterization sampling program in order to characterize the soil as needed for off-site disposal, including all sampling and analyses necessary to obtain facility acceptance.

5. Mobilization, including installation of temporary facilities and controls. This includes but is not limited to sediment and erosion controls, decontamination facilities, traffic control/detour signage, stockpile areas, office trailers and all other temporary facilities, all necessary electrical connections to all Contractor's and Contracting Officer's equipment and facilities.

6. Installation and operation of a temporary onsite water storage and treatment area for use during excavation, including all associated sampling and analytical requirements.

7. Perimeter air monitoring and emissions control, including all associated analytical requirements.

8. Demolition of a 1-story concrete block storage building, including all associated sampling and analyses.

9. Providing temporarily power the DMC facility.

10. Disconnect the existing power supply.

11. Design and Construction of building and excavation support systems as required to complete the Work.

12. Excavate, transport and dispose of impacted soils at approved disposal facilities, including all associated sampling and analysis.

13. Backfilling and grading site to the elevations shown on the Drawings, including all associated sampling and analysis.

14. Dismantling and removing all temporary dewatering wells and piezometers, construction water treatment equipment, and associated conveyance piping.

15. Rebuilding the 1-story concrete block building at a location to be designated by the Owner.

16. Restore underground electric and connect back to utility supply.

17. Place gravel, topsoil, asphalt and seeding, as required on all disturbed areas including reconstruction of the loading docks.

18. Restore the Site including but not limited to sidewalks, parking lots, curbing, fencing, landscaping, lighting, and miscellaneous appurtenances

19. Clean site and demobilize all construction equipment, facilities and materials.

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-01 Preconstruction Submittals

Two-Week Schedule of Work Activities

In addition to the scheduling and notification requirements specified elsewhere in the contract, the Contractor shall provide to the Contracting Officer a detailed schedule of work activities, which the Contractor intends to perform over the following two week period (Monday thru Friday for two weeks).

Technical Execution Plan (TEP); G, DO

The Contractor shall submit a Technical Execution Plan that consists of a written narrative describing their proposal sequence and approach to the work. Additionally, the TEP shall compile all approved preconstruction submittals into one working document. No site work will be allowed until acceptance of the TEP by the Contracting Officer. See Subsection 1.3 of this Section.

SD-07 Certificates

Request Application; G, RO

Request Application to work outside the hours of operation.

SD-12 Other Submittals

Progress Reports; G, RO

1.3 TECHNICAL EXECUTION PLAN

The Contractor shall compile all pre-construction plans into one document, the Technical Execution Plan (TEP). TEP shall describe the Contractor's overall approach to the project. It shall be submitted and approved by the Contracting Officer prior to the start of site work and shall be updated throughout the project, as appropriate.

1. Section A: Project Coordination.

2. Section B: Progress Schedule.

3. Section C: Construction Facilities and Temporary Controls.

4. Section D: Storm Water Management

5. Section E: Soil Disposal Characterization

   a. Provide characterization data collected by the Contractor to date.
   b. Provide a soil disposition plan marked with areas and depths showing proposed disposal categories and location of RCRA characteristic waste, as determined by the Contractor sampling and analysis.

6. Section F: Excavation and Backfill.

7. Section G: Stockpile Management and Loading.

   a. Provide a Drawing showing the proposed layout for staging and loading of imported material, impacted material, and material to be tested. Show truck access given the space constraints on-site.
   b. Methods and facilities for managing stormwater run-on, runoff from stockpile areas, and water drained from saturated Impacted Soils.
   c. Truck loading areas, staging areas for incoming empty trucks.
   d. Coordination of excavation, stockpiling, and loading.

8. Section H: Off-site Transportation.

   a. Describe locations and procedures for staging and sequencing trucks from the Durham Manufacturing Company Site to minimize

disruption and obstruction of on-site operations and the area around the site.

b. Describe locations and equipment to be used to weigh haul trucks. Include frequency for obtaining true weight of trucks.

c. Provide a Traffic Control Plan showing how trucks will enter and exit the site, the location of flaggers and signs, truck driver orientation and acceptance forms that shall include truck driver responsibilities as specified in the Transportation Plan, designated haul route to and from the off-site disposal facilities with posted speed limits, warnings, etc., and incident reporting procedures for trucking related incidents. The Plan should include traffic details on both Route 17 and within the site.

d. Provide a plan for verifying the accuracy of weight scales.

9. Section I: Disposal Facilities

10. Section J: Site Restoration.

1.4 SUPERINTENDENCE BY THE CONTRACTOR

At all times during the performance of the contract and until the work is completed and accepted, the Contractor shall directly superintend the work or assign and have on the worksite a competent project superintendent who is satisfactory to the Contracting Officer and has the authority to act for the Contractor.

The project superintendent shall maintain a physical presence at the site at all times and be responsible for all construction and related activities at the site, except as otherwise acceptable to the Contracting Officer.

Failure to comply with these requirements shall be deemed as cause for a non-compensatory stoppage and suspension of work until the deficiency is remedied.

1.5 COORDINATION AND DIRECTION DURING CONSTRUCTION

The Contractor shall not take or accept any direction or instructions issued by any person, employed by the Government or otherwise, other than the Contracting Officer that changes the terms and conditions of contract actions, the scope, or any change that impacts the cost, price, or schedule. Changes authorized by the Contracting Officer will be in the form of a written, official, signed modification to the contract action received by the Contractor before the Contractor will act upon those changes. The Contractor will comply with the changes clause of this contract when the Contractor believes direction has been given from persons other than the Government Contracting Officer that equate to a change by notifying the Contracting Officer as directed by the clause. Any direction given by any Government employee or any other person outside their authority must be reported to the Contracting Officer.

The Contracting Officer Representative (COR) is limited to the authorities stated in the COR appointment letter. If a COR is appointed under this contract, they will be appointed by written letter from the Contracting Officer to the Contractor and COR specific to this contract only. COR appointment letters from previous contracts are not valid for this contract. See the Contracting Officer's Representative clause of this contract.

1.6 PROJECT/SITE CONDITIONS

The project area ("The Site") is located at the Durham Manufacturing Company at 201 and 203 Main Street, in Durham, CT. The Site contains an active manufacturing facility, which will remain in operation throughout the duration of the remedial work. The Contractor should expect considerable pedestrian and vehicle traffic around the Project Site.

1.6.1 Soil and Groundwater Contamination

The project area at the Durham Manufacturing Company at 201 and 203 Main Street will involve excavation in an area of known contamination. Known site soil and groundwater contaminants in the work area, include volatile organic compounds (VOCs), particularly TCE, PCE, methylene chloride, benzene, toluene, ethylbenzene, xylenes. Historical groundwater and soil data is presented in Appendix A. Additionally, any well abandonment performed as part of this project will involve potential contact with groundwater contaminated with VOCs. A summary of Site contamination is included in Appendix A of this specification. The Work is subject to the requirements for hazardous waste operations specified in Federal Occupational Safety and Health regulation 29 CFR 1910.120.

1.6.2 Abutting Property

The extent of soil contamination extends onto the southeastern portion of the property at 215 Main Street ("the Korn Property"). While excavation is not planned in close proximity to any structures on this property, care shall be taken to minimize damage to and restore landscaping, fencing, and other features disturbed during the course of the Work.

1.6.3 Site Security

The Contractor shall report any vandalism, suspicious activities or devices to the Contracting Officer or local police as soon as possible. The Contracting Officer will notify the Contractor of any heightened security measures and will expect vigilant monitoring of equipment and grounds while working. At a heightened security posture, there may be work areas that are restricted. The Contracting Officer will notify the Contractor of these restricted areas, and work may be delayed or restricted or will be performed in these areas under the direct supervision of U.S. Army Corps of Engineers personnel.

1.7 WORK SEQUENCE AND SCHEDULING

1.7.1 Hours of Operations

Normal work hours are from 7:00 a.m. through 4:00 p.m., Monday through Friday. The Contractor will not be permitted to work on Saturday, Sunday or legal holidays unless otherwise authorized by the Contracting Officer. The exclusion of work on Saturday, Sunday and legal holidays has been considered

in computing the performance time of this contract. The following legal holidays are observed:

January 1st
Third Monday in January
Third Monday in February
Last Monday of May
Juneteenth
July 4th
1st Monday of September
2nd Monday of October
11th of November
Fourth Thursday of November
25th of December

When one of the above designated legal holidays falls on a Sunday, the following Monday will be observed as a legal holiday. When a legal holiday falls on a Saturday, the preceding Friday is observed as a holiday.

Work outside the normal hours of operation requires Contracting Officer approval and will only be permitted if required and coordinated with the property owner. The request to work outside the hours of operation shall be made in writing to the Contracting Officer 10 calendar days prior to such work to allow arrangements to be made by the Government. The request application shall include specific dates, hours, location, type of work to be performed, contract number and project title, and names of all individuals who will be working outside the hours of operations. During periods of darkness, the different parts of the work shall be lighted in a manner approved by the Contracting Officer.

1.7.2 Restrictions During Annual Durham Fair

The Contractor shall be aware that special restrictions on allowed work areas and work tasks will apply during the period five days prior to the start of, during, and one day after the completion of the Durham Fair, held annually in late September on a Thursday through Sunday. Specifically, during this annual 10-day period (Saturday before through the second following Monday), no trucks or other equipment entering or leaving the Site or at any other location shall restrict the flow of traffic.

1.7.3 General Work Sequence

There are certain essential criteria relative to the preparation of a work sequence and time schedule which the Contractor will be required to implement and follow during the prosecution of the work. Minor variations in the sequence of the items of work as specified may be made by the Contractor, provided such variations do not conflict with critical elements of the schedule. Proposed minor variations shall be noted on the progress schedule. Variations shall be approved by the Contracting Officer prior to implementation.

1.7.3.1 Project Schedule

See Section 01 32 01 PROJECT SCHEDULE.

1.7.3.2 Two-Week Schedule of Work Activities

In addition to the scheduling and notification requirements specified elsewhere in the contract, the Contractor shall provide to the Contracting Officer a detailed schedule of work activities, which the Contractor intends to perform over the following two week period (Monday thru Friday for two weeks). The schedule of work activities shall be updated and submitted by the Contractor to the Contracting Officer on a weekly basis, by noon on every Thursday during the prosecution of work period. The schedule of work activities will be used as the basis for coordinating the Contractor's work with base activities, officials, and occupants. Failure to provide the two-week schedule of work activities may result in a stop work order being issued by the Contracting Officer. The denial of work activities due to the contractor's failure to submit the two-week schedule of work activities shall not be the basis for a government caused delay claim.

1.7.4 Organization at the Site

1.7.4.1 General

The Contractor shall employ ample personnel and sufficient equipment to accomplish the work of this contract in the least amount of time, within the prosecution period specified in SPECIAL CONTRACT REQUIREMENTS, Clause 1.

1.7.4.2 Rate of Progress

Should the Contractor fail to maintain a satisfactory rate of progress in accordance with the Contractor's approved progress schedule, the Contracting Officer may require that additional personnel and equipment be placed on the work and weekend and overtime work be performed, in order that the work be brought up to schedule and maintained.

1.8 CONTRACTOR'S USE OF FACILITIES AND HAULING ROUTES

The Contractor shall be responsible for the following:

1. Determining the trucking and hauling routes and associated restrictions to and from the work, to include the coordination for the use of such routes with local, State, and Federal authorities.

2. Coordination with Durham Manufacturing to minimize impacts on the facility operations.

3. Complying with all local, State, and Federal regulations and restrictions when using any facilities or hauling routes.

1.9 CONTRACTOR USE OF PREMISES

1.9.1 Access to the Site

Access to the project site is available for construction traffic. The Contractor is responsible for maintaining access necessary for its equipment, material, and plant to and from the work area.

1.9.2 Temporary Facilities and Utilities, and Storage Areas

The Contractor shall conform to Section 01 50 00 TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS regarding temporary facilities, temporary utilities, and storage areas. Confine all operations (including storage of materials)

on Government premises to areas authorized or approved by the Contracting Officer. The Contractor shall hold and save the Government, its officers and agents, free and harmless from liability of any nature occasioned by the Contractor's performance.

1.9.3 Work Limits

Work shall be restricted to the limits of work as shown on the contract drawings, to storage areas as indicated in Section 01 50 00 TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS, and as indicated by the Contracting Officer.

Do not disturb portions of the Project site beyond areas in which the Work is indicated.

1.9.4 Work Restrictions

Work Restrictions, General: Comply with restrictions on construction operations.

1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.

1.9.5 Occupying Private Land

The Contractor shall confirm with the Contracting Officer that access has been obtained before entering private property. When working on private property, the Contractor's personnel shall wear corporate identification tags.

1.9.6 Protection and Security

Protection to Contractor personnel or their equipment cannot be provided at the worksite by the Government.

The Contractor shall protect all its personnel, Government personnel, and the general public from injury.

The Contractor shall conduct all its work so as to prevent injury or unsafe conditions during construction.

1.9.7 Work By Other Contractors

During the performance period of this contract, no other work is anticipated to occur by other contractors.

1.9.8 Emergency Contacts

The Contractor shall provide a list of emergency contacts in the event of an emergency. The list shall include the contact names, addresses, and telephone numbers. As changes occur and additional information becomes available, correct and change the information contained in previous lists.

1.9.9 Damaged Property

Work shall proceed in a manner which will minimize disturbance or risk of damage to structures and surrounding lands. The Contractor shall repair

such items damaged in the course of carrying out the work at no additional cost to the Government. All repairs shall match similar existing items in all aspects. All replacements shall be in kind.

1.9.10 Contractor's Receipt of Supplies

The Contractor shall be responsible for all arrangements for the receipt of materials and supplies at the job site. Government personnel are not permitted to receive or sign for items delivered to the site.

1.9.11 Daily Clean Up

The Contractor shall at all times keep rubbish from entering surrounding lands and water. Rubbish accumulated at the temporary facilities shall be removed from the premises daily.

1.9.12 Government Sanitary Facilities

Toilet facilities are not available on site for Contractor's use. The Contractor shall provide portable toilets for its personnel and subcontractors as specified in Section 01 50 00 TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS.

1.9.13 Existing Utility Interruptions

Do not interrupt utilities serving the Durham Manufacturing Company or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:

1. Notify Contracting Officer not less than five working days days in advance of proposed utility interruptions.

2. Obtain Contracting Officer's written permission before proceeding with utility interruptions.

The Contractor shall confirm with the Contracting Officer that access has been obtained before entering private property. When working on private property, the Contractor's personnel shall wear corporate identification tags.

1.9.14 Contractor Employee Identification

The contractor shall require attire that identified the contractors and subcontractors such that the Durham Manufacturing Company staff and property owners will be aware that these individuals are associated with the project.

1.9.15 Pipe Locations

Exterior pipelines will be located substantially as indicated on the contract drawings, but the right is reserved to the Owner, acting through the Contracting Officer, to make such modifications in location as may be found desirable to avoid interference with existing structures or for other reasons. Where fittings, etc., are noted on the contract drawings, such notation is for the Contractor's convenience and does not relieve him from laying and jointing different or additional items where required. All locations shall be confirmed by the Level A SUE.

1.9.16 Dimensions of Existing Structures

The Contractor shall verify the dimensions and locations of existing structures in the field before the fabrication of any material or equipment which is dependent on the correctness of such information.

1.9.17 Open Excavations

All open excavations shall be adequately safeguarded by providing temporary barricades, fencing, caution signs, lights, and other means to prevent accidents to persons and damage to property, and in accordance with applicable occupational health and safety regulations. The Contractor shall, at his own expense, provide suitable and safe bridges and other crossings for accommodating travel by pedestrians and workmen. Bridges provided for access during construction shall be removed when no longer required. The length or size of excavation will be controlled by the particular surrounding conditions, but shall always be confined to the limits prescribed by the Contracting Officer. If the excavation becomes a hazard, or if it excessively restricts DMC operations at any point, the Contracting Officer may require special construction procedures such as limiting the length of the open excavation, prohibiting stacking excavated materials, and requiring that the excavation shall not remain open overnight.

The Contractor shall take precautions to prevent injury to the public due to open trenches. All trenches, excavated material, equipment, or other obstacles which could be dangerous to the public shall be well lighted at night.

1.9.18 Test Pits

Test pits for the purpose of locating underground pipeline or structures in advance of the construction shall be excavated and backfilled by the Contractor at the direction of the Contracting Officer. Test pits shall be backfilled immediately after their purpose has been satisfied and the surface restored and maintained in a manner satisfactory to the Contracting Officer.

1.9.19 Interference with and Protection of Streets

The Contractor shall not close or obstruct any portion of a street, road, or private way without obtaining permits therefor from the proper authorities. If any street, road, or private way shall be rendered unsafe by the Contractor's operations, he shall make such repairs or provide such temporary ways or guards as shall be acceptable to the proper authorities.

Streets, roads, private ways, and walks not closed shall be maintained passable and safe by the Contractor, who shall assume and have full responsibility for the adequacy and safety of provisions made therefore.

The Contractor shall, at least 24 hours in advance, notify the Police and Fire Departments in writing, with a copy to the Contracting Officer, if the closure of a street or road is necessary. The Contractor shall cooperate with the Local Officials and/or State Police as required in the establishment of alternate routes and shall provide adequate detour signs plainly marked, and well lighted, in order to minimize confusion.

1.10 PROGRESS REPORTS AND PROGRESS PHOTOGRAPHS

The Contractor shall produce and submit a written biweekly progress report, including progress photographs, to document, organize, and summarize the construction progress made during the previous two week period. The report shall include a narrative describing all work completed during the previous two weeks. Photographs, a minimum size of 3-inches by 5-inches, shall accompany the narrative in sufficient quantity to document all significant work items. The reports shall also include a narrative of work planned to be completed during the next two week work period. The narrative of planned work shall be coordinated with the two week look ahead schedule. Areas outside of the limits of work which are subject to possible impact by the Contractor's operations during the following two weeks, or which may be subject to damages from other future Contractor activities, shall also be photo-documented by the report. The written narrative, together with the photographs, shall constitute a recurring "Progress Report", which shall be submitted to the Contracting Officer for approval.

1.11 CARE AND PROTECTION OF PROPERTY

The Contractor shall be responsible for the preservation of all public and private property, and shall use every precaution necessary to prevent damage thereto. If any direct or indirect damage is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the work on the part of the Contractor, such property shall be restored by the Contractor, at his expense, to a condition similar or equal to that existing before the damage was done, or he shall make good the damage in other manner acceptable to the Contracting Officer.

1.12 INTERFERENCE WITH EXISTING WORKS

The Contractor shall at all times conduct his operations so as to interfere as little as possible with existing works. The Contractor shall develop a program, in cooperation with the Contracting Officer, the Owner, and interested officials, which shall provide for the construction and putting into service of the new works in the most orderly manner possible. This program shall be adhered to except as deviations therefrom are expressly permitted. All work of connecting with, cutting into, and reconstructing existing pipes or structures shall be planned to interfere with the existing facilities for the shortest possible time when the demands best permit such interference, even though it may be necessary to work outside of normal working hours to meet these requirements. Before starting work which will interfere with the operation of existing facilities, the Contractor shall do all possible preparatory work and shall see that all tools, materials, and equipment are made ready and at hand.

The Contractor shall have no claim for additional compensation by reason of delay or inconvenience in adapting his operations to meet the above requirements.

1.13 MAINTAINING FLOWS

The Contractor shall at his own cost, provide all the flow of drains and water courses interrupted during the progress of the work, and shall immediately cart away and remove all offensive matter. The entire procedure of maintaining existing flow shall be fully discussed with the Contracting Officer well in advance of the interruption of any flow.

1.14 PROTECTION AND RELOCATION OF EXISTING STRUCTURES AND UTILITIES

The Contractor shall assume full responsibility for the protection of all buildings, structures, and utilities, public or private, including poles, signs, services to buildings, utilities in the street, gas pipes, water pipes, hydrants, sewers, drains, and electric and telephone cables, whether or not they are shown on the contract drawings. The Contractor shall carefully support and protect all such structures and utilities from injury of any kind. Any damage resulting from the Contractor's operations shall be repaired by him at his expense.

The Contractor shall bear full responsibility for obtaining all locations of underground structures and utilities (including existing water services, drain lines, and sewers). Services to buildings shall be maintained, and all costs or charges resulting from damage thereto shall be paid by the Contractor.

Protection and temporary removal and replacement of existing utilities and structures as described in the Contract Documents shall be a part of the work under the Contract.

If, in the opinion of the Contracting Officer, permanent relocation of a utility is required, he may direct the Contractor, in writing, to perform the work. Work so ordered will be paid at the Contract unit prices, if applicable, or as extra work under Article 11 of the Supplementary Conditions. If relocation of a privately owned utility is required, the Contracting Officer will notify the Utility to perform the work as expeditiously as possible. The Contractor shall fully cooperate with the Contracting Officer and Utility, and shall have no claim for delay due to such relocation. The Contractor shall notify all utility companies in writing at least 72 hours (excluding Saturdays, Sundays, and Legal holidays) before excavating in any public way. Contractor shall also notify Call Before You Dig, 800-922-4455 at least 72 hours prior to start of work. The location of utilities on private property shall be confirmed by the Level A SUE.

The Contractor shall coordinate the removal and replacement of traffic loops and signals, if required for the performance of the work, at no additional cost to the Government.

1.15 INSPECTION OF WORK AWAY FROM THE SITE

If work to be done away from the construction site is to be inspected on behalf of the Contracting Officer during its fabrication, manufacture, or testing, or before shipment, the Contractor shall give notice to the Contracting Officer of the place and time where such fabrication, manufacture, testing, or shipping is to be done. Such notice shall be in writing and delivered to the Contracting Officer in ample time so that the necessary arrangements for the inspection can be made.

1.16 COOPERATION WITHIN THIS CONTRACT

All firms or persons authorized to perform any work under this Contract shall cooperate with General Contractor and his Subcontractors or trades and shall assist in incorporating the work of other trades where necessary or required.

Cutting and patching, drilling and fitting shall be carried out where required by the trade or subcontractor having jurisdiction, unless otherwise indicated herein or recommended by the Contracting Officer.

1.17 CLEANUP AND DISPOSAL OF EXCESS MATERIAL

During the course of the work, the Contractor shall keep the site of his operations in as clean and as neat a condition as is possible. He shall dispose of all residue resulting from the construction work and, at the conclusion of the work, he shall remove and haul away any surplus excavation, broken pavement, lumber, equipment, temporary structures, and any other refuse remaining from the construction operations, and shall leave the entire site of the work in a neat and orderly condition.

In order to prevent environmental pollution arising from the construction activities related to the performance of this Contract, the Contractor and his subcontractors shall comply with all applicable Federal, State, and local laws, and regulations concerning waste material disposal, as well as the specific requirements stated in this Section and elsewhere in the Specifications.

The Contractor is advised that the disposal of excess excavated material in wetlands, stream corridors, and plains is strictly prohibited even if the permission of the property owner is obtained. Any violation of this restriction by the Contractor or any person employed by him will be brought to the immediate attention of the responsible regulatory agencies, with a request that appropriate action be taken against the offending parties. Therefore, the Contractor will be required to remove the fill at his own expense and restore the area impacted.

1.18 LOCATION OF UNDERGROUND FACILITIES

Verify the elevations and horizontal location of existing piping, utilities, and any type of underground obstruction in locations to be impacted by the construction work of this project, using test pits where necessary. Verify elevations before installing new work.

1.18.1 Notification Prior to Excavation

For excavation work in Connecticut, call "Call-Before-You-Dig" at 1-800-922-4455. Notification shall not be earlier than 30 days prior, nor later than 3 days prior, to the planned excavation.

1.19 BURIED UTILITY WARNING AND IDENTIFICATION TAPE

Provide warning tape manufactured specifically for warning and identification of buried piping. Provide tape in rolls, 6 inches minimum width, color coded for the utility involved with warning and identification imprinted in bold black letters continuously and repeatedly over entire tape length. Warning and identification shall be CAUTION BURIED UTILITY PIPING BELOW or similar language. Use permanent code and letter coloring unaffected by moisture and other substances contained in trench backfill material. Bury tape with the printed side up at a depth as indicated in the contract drawings.

1.20 PROTECTION AGAINST ELECTROLYSIS

Where dissimilar metals are used in conjunction with each other, suitable insulation shall be provided between adjoining surfaces so as to eliminate direct contact and any resultant electrolysis. The insulation shall be bituminous impregnated felt, heavy bituminous coatings, nonmetallic separators or washers, or other acceptable materials.

1.21 CULTURAL RESOURCES

Compliance with the requirements of the National Historic Preservation Act (NHPA) and the Connecticut State Historic Preservation Office (SHPO).

1. During the life of this contract, the Contractor is herewith required to immediately notify the Contracting Officer in the event that any articles such as "charcoal", "bone", "shell", "cultural objects – fire cracked stones or stone flaking material" or any other such related items of historical significance are discovered.

2. No further Work may proceed in the area in question until the EPA determines that the Work is not reasonably expected to adversely affect the discovered Cultural Resources.

See Section 01 57 20 ENVIRONMENTAL PROTECTION for additional requirements.

1.22 MISCELLANEOUS PROVISIONS

1.22.1 Green Remediation

The Contractor shall incorporate EPA Green Remediation practices whenever practical, in accordance with: http://www2.epa.gov/superfund/superfund-green-remediation

The Contractor shall identify and submit the Green Remediation practices to be used during completion of the work.

1.23 EPA OFF-SITE RULE

Section 121(d)(3) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) applies to any CERCLA response action involving the off-site transfer of any hazardous substance, pollutant or contaminant (CERCLA wastes). That section requires that CERCLA wastes may only be placed in a facility operating in compliance with the Resource Conservation and Recovery Act (RCRA) or other applicable Federal or State requirements. That section further prohibits the transfer of CERCLA wastes to a land disposal facility that is releasing contaminants into the environment, and requires that any releases from other waste management units must be controlled. These principles are interpreted in the Off-Site Rule (OSR), set forth in the National Contingency Plan (NCP), at 40 CFR 300.440. The purpose of the OSR is to avoid having CERCLA wastes from response actions authorized or funded under CERCLA contribute to present or future environmental problems by directing these wastes to management units determined to be environmentally sound (preamble to final OSR, 58 FR 49200, 49201, Sept. 22, 1993).

The OSR establishes the criteria and procedures for determining whether facilities are acceptable for the receipt of CERCLA wastes from response

actions authorized or funded under CERCLA. The OSR establishes compliance criteria and release criteria, and establishes a process for determining whether facilities are acceptable based on those criteria. The OSR also establishes procedures for notification of unacceptability, reconsideration of unacceptability determinations, and re-evaluation of unacceptability determinations.

Contractor may ship hazardous substances, pollutants, and contaminants from the Site to an off-Site facility only if they comply with Section 121(d)(3) of CERCLA, 42 U.S.C. § 9621(d)(3), and 40 C.F.R. § 300.440. Contractor will be deemed to be in compliance with CERCLA § 121(d)(3) and 40 C.F.R. § 300.440 regarding a shipment if contractor obtain a prior determination from EPA that the proposed receiving facility for such shipment is acceptable under the criteria of 40 C.F.R. § 300.440(b). All requests shall be made using the EPA Off-Site Compliance Request Form, included as Attachment 1.

Contractor may ship Waste Material from the Site to an out-of-state waste management facility only if, prior to any shipment, they provide notice to the appropriate state environmental official in the receiving facility's state and to the EPA. This notice requirement will not apply to any off-Site shipments when the total quantity of all such shipments does not exceed 10 cubic yards. The notice must include the following information, if available: (1) the name and location of the receiving facility; (2) the type and quantity of Waste Material to be shipped; (3) the schedule for the shipment; and (4) the method of transportation. Contractor also shall notify the state environmental official referenced above and the EPA of any major changes in the shipment plan, such as a decision to ship the Waste Material to a different out-of-state facility. Contractor shall provide the notice to EPA at least 60 days prior to the date when Waste Material is scheduled to be shipped.

Ship to an off-Site facility only if they comply with Section 121(d)(3) of CERCLA, 42 U.S.C. § 9621(d)(3), 40 C.F.R. § 300.440, EPA's Guide to Management of Investigation Derived Waste, OSWER 9345.3-03FS (Jan. 1992), and any IDW-specific requirements contained in the Durham Meadows Record of Decision. Wastes shipped off-Site to a laboratory for characterization, and RCRA hazardous wastes that meet the requirements for an exemption from RCRA under 40 CFR § 261.4(e) shipped off-site for treatability studies, are not subject to 40 C.F.R. § 300.440.

The property at 201/203 Main Street in Durham, Connecticut, as designated on the drawings, shall be considered the Site, for the purpose of this Contract.

1.24 QUALITY ASSURANCE

All items of work not addressed in the contract documents shall be completed in strict accordance with the manufacturers' specifications.

The Government is not obligated to inspect the Contractor's work, or to protect the Contractor from the consequences of its work. Government inspections are a general examination of the Contractor's conduct and workmanship and are solely for the purpose of the Government. Government-designated Quality Assurance Representatives (QARs) do not have the authority to accept work, nor is a Government inspection to be construed as conclusive.

Government agents including QARs and project engineers are not authorized to change the contract without the written approval of the Contracting Officer; this lack of authority extends to all situations in which the action of these agents could be construed as constituting a change.

The quality of workmanship is subject to audit by Government or Government-designated QARs at any time during the contract. The Contractor shall cooperate fully and provide all information necessary for this audit.

The Contractor shall submit all requests for changes in writing to the Contracting Officer. Do not proceed with changes without possession of written authorization of the Contracting Officer.

The Contractor shall not conceal any work unless the Contracting Officer has approved all items of work which are to be concealed. The Contractor shall notify the Contracting Officer of its intention to conceal work at least 24 hours in advance of concealment.

1.25 GENERAL SAFETY REQUIREMENTS

1.25.1 General

The Contractor shall take all necessary precautions in observing safety regulations in accordance with Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS and 01 35 29.13 HEALTH, SAFETY, AND EMERGENCY RESPONSE FOR CONTAMINATED SITES, and shall assume the responsibility to guard against causing of fires and/or explosions and to protect Government property. The Contractor shall perform the work in a manner consistent with security and with fire safety regulations especially with regards to ingress and egress. Temporary closures shall not compromise life safety, security or fire safety.

1.26.2 Contractor's Project Superintendent

The Contractor's project superintendent shall take an active role in enforcing the safety requirements by participation in safety conferences, hazard analysis, tool box meetings, walk-through inspections, correction of violations, etc., and including that of any subcontractor's work.

1.27 ENVIRONMENTAL PROTECTION

To provide for control of all environmental pollution arising from construction activities, the Contractor and its subcontractors, in the performance of this contract, shall comply with Section 01 57 20 ENVIRONMENTAL PROTECTION, and all applicable federal, state, and local laws and regulations concerning environmental protection pollution control and abatement.

1.28 PRECONSTRUCTION CONFERENCE

The Contracting Officer will conduct a preconstruction conference with key Contractor personnel. The purpose of the conference is to review contract requirements and to establish a working relationship between the Contractor's Staff and the U.S. Army Corps of Engineers personnel who will be closely associated with the project. During the conference, the Contracting Officer will inform the Contractor concerning Job Safety, Quality Control, Labor Relations, and Environmental Protection. The

Contractor's Superintendent, Quality Control Representative, and Site Safety and Health Officer (SSHO) shall attend this conference.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

-- End of Section --

ATTACHMENT 1 TO SECTION 01 11 00

OFF-SITE RULE COMPLIANCE REQUEST FORM

United States Environmental Protection Agency – Region 1

Off-Site Rule Compliance Request Form

Date: (mm/dd/yy)		**Supporting Documentation Attached?** (yes/no)	

RECEIVING FACILITY INFORMATION:		
1	**Name of Facility receiving CERCLA waste:**	
2	**Address of Facility:**	
3	**City:**	
4	**State:**	
5	**Zip Code:**	
6	**EPA/State Facility ID: (**e.g. Haz. Waste/Muni. Waste ID)	
7	**Other Pertinent ID Numbers: (**e.g. License #, permit #**)**	
8	**Phone Number (**if available**):**	
9	**Contact Name (**if available**):**	
10	**FAX Number (**if available**):**	
11	**E-mail address (**if available**):**	

GENERATING FACILITY INFORMATION:		
12	**CERCLA Site Name:**	
13	**CERCLA Site Address:**	
14	**City:**	
15	**State:**	
16	**Zip Code:**	
17	**CERCLA Site ID:** (i.e. alpha-numeric)	
18	**EPA CERCLA ID #:**	
19	**Waste Media: (**e.g., Soil, Water, Air, etc.**)**	
20	**CERCLA Waste Contaminates: (**e.g. tce, pcb, lead**)**	
21	**Amount of CERCLA Waste:(**e.g., gallons, pounds, tons, ft^3, yd^3**)**	
22	**On Scene Coordinator/Tel.#:** (making waste determination)	
23	**Basis of Waste Determination: (**e.g. analyses, TCLP, etc.**)**	

SECTION 01 13 00

PERIMETER AIR MONITORING AND EMISSIONS CONTROL PLAN

PART 1 GENERAL

1.1 SCOPE OF WORK

Preparation, submission, and implementation of an acceptable Perimeter Air Monitoring and Emissions Control Plan.

1.2 RELATED SECTIONS

A. Section 01 35 26 - GOVERNMENTAL SAFETY REQUIREMENTS

B. Section 01 35 29.13 HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES FOR CONTAMINATED SITES

C Section 01 41 00 QUALITY ASSURANCE PROJECT PLAN/SAMPLING AND ANALYSIS PLAN

D. Section 01 33 00 - SUBMITTAL PROCEDURES

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

Perimeter Air Monitoring and Emission Control Plan; G, DO

SD-06 Test Reports; G, DO

Weekly Data Reports

1.4 STAFF ORGANIZATION, QUALIFICATION AND RESPONSIBILITY

1.4.1 Air Quality Technical Manager (AQTM)

The Air Quality Technical Manager (AQTM) shall be a qualified air quality professional with experience in developing, managing, and implementing perimeter air monitoring projects involving contaminated soil activities. This role may also be performed by the Safety and Health Manager as described in Section 01 35 29.10 1.5.1.

1.4.1.1 Additional Qualifications

The AQTM must have the following qualifications:

a. At least 10 years of experience developing, managing, and operating perimeter air monitoring projects involving contaminated soil activities.

b. Documented experience in supervising professional and technician level personnel.

c. Documented experience in developing air monitoring programs and techniques.

d. Working knowledge of state and Federal air quality standards and guidance.

1.4.1.2 Responsibilities and Duties

a. Development, oversight, and enforcement of the Perimeter Air Monitoring and Emissions Control Plan.

b. Provide onsite consultation, as needed, to ensure the Perimeter Air Monitoring and Emissions Control Plan is fully implemented.

c. Direct initial site-specific training regarding air monitoring activities.

d. Be present onsite during the first week of remedial activities.

e. Provide weekly review of the air monitoring data.

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

g. Provide a final written summary and evaluation of perimeter air monitoring results daily for the first week of intrusive work then weekly thereafter.

1.4.2 Air Monitoring Field Technician (AMFT)

Designate an individual and one alternate as the Air Monitoring Field Technician (AMFT) (this may be the same person as the SSHO). Include the name, qualifications (education and training summary and documentation), and work experience of the AMFT and alternates in the APP/SSHP.

1.4.2.1 Additional Qualifications

The AMFT must have the following qualifications:

a. A minimum of 1 year experience in implementing Perimeter Air Monitoring and Emissions Control Plans.

b. Has current 40-hour OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER)training.

c. Specific training in the proper use of air monitoring instruments and air sampling methods including monitoring for site-specific contaminants.

1.4.2 Responsibilities and Duties

a. Be assigned to the site on a full-time basis for the duration of field activities.

b. Complete daily and weekly monitoring tasks as described in the Perimeter Air Monitoring and Emissions Control Plan.

b. Complete required field quality assurance and quality control (QA/QC) documentation as described in the Perimeter Air Monitoring and Emissions Control Plan.

f. Be responsible for evaluating air monitoring data and recommending changes to engineering controls and work practices in consultation with the AQTM.

g. Provide a written summary and evaluation of perimeter air monitoring results daily for the first week of intrusive work then weekly thereafter for AQTM review and submittal.

PART 2 PRODUCTS

2.1 PERIMETER AIR MONITORING AND EMISSIONS CONTROL PLAN

2.1.1 General

The purpose of the Perimeter Air Monitoring and Emissions Control Plan is for emissions control and to maintain concentrations of Site-related constituents at or below regulatory levels. The air monitoring required by the Perimeter Air Monitoring and Emissions Control Plan is separate from the personnel air monitoring specified in 01 35 29.13 HEALTH SAFETY AND EMERGENCY RESPONSE PROCEDURES FOR CONTAMINATED SITES.

The Perimeter Air Monitoring and Emissions Control Plan shall describe in detail the Contractor's plan of operation, means and methods of construction, proposed locations, air monitoring instruments, air sampling methods, record keeping procedures, calibration frequency and specifications, and response procedures. The Plan shall include the development of Site-Specific Acceptable Air Concentrations (AACs) using the United States Environmental Protection Agency (USEPA) Regional Screening Level Calculator for use for Risk Assessment Guidance for Superfund (RAGS), Part A (USEPA 1989).

The Perimeter Air Monitoring and Emissions Control Plan shall describe in detail the Contractor's plan for implementing emissions control measures should the action levels specified herein or AACs are exceeded. The project includes both real-time monitoring for the indicating parameters and chemical-specific sampling to verify long term compliance with the AACs:

a. Real-Time Monitoring

1) Number and Location of Fixed Air Monitoring Stations

Four perimeter air-monitoring stations continuously measuring total volatile organic compound (TVOC) and particulate (PM10)

concentrations during impacted soil activities shall be established by the Contractor to collect data related to air quality at, and leaving, the Site.

The perimeter air monitoring stations shall be located immediately inside of the Site fencing, and on the 215 Main Street property when work is conducted on this property. Each of the perimeter air monitoring stations shall be located so that it is not shielded or otherwise obstructed from collecting samples representative of the air leaving the Site. If location of work and equipment prohibit this, alternate monitoring station locations shall be approved by the Contracting Officer.

Stations shall be positioned such that they account for predominant wind conditions based on regional climatological data with respect to the areas of excavation and site activities, locations of sensitive off-site receptors and proximity to building air-intake units. Air monitoring locations shall focus on the potential off-site exposure to near-by residences. Three areas should be selected for priority placement of downwind monitoring devices. The downwind sample locations shall be between the active work area and these off-site areas when the wind direction is moving toward these off-site areas. Regardless of wind direction, a minimum of four air-monitoring stations shall be maintained during activities in the active work area, as described below.

Stations shall be configured such that the instrumentation is collecting air quality conditions at breathing height free from obstructions.

Results of the real-time monitoring shall be compared to the Action Levels described herein.

b. Walk-Around Monitoring

1) Supplemental perimeter monitoring for TVOCs and PM10 will occur along the perimeter of the Site on an as-needed basis. Specific conditions that may trigger walk-around perimeter monitoring include:

Visible dust

Odor complaints

Detection of TVOCs and/or PM10s at concentrations exceeding an Action Limit (as described below)

Direction by the Contracting Officer

Hand-held TVOC and PM10 concentrations (instantaneous) will be collected at the site perimeter in the downwind direction between the work area and the nearest off-site receptors. When a triggering condition is observed during ground intrusive activity, supplemental downwind hand-held perimeter monitoring will occur at various locations until the conditions that triggered the monitoring have subsided. At each monitoring point, the data

value, sample time, and sample location will be collected and recorded. Additional temporary monitoring points may be established due to changing Site or meteorological conditions.

b. Meteorological Monitoring

1) Meteorological monitoring for wind direction, wind speed, temperature, and relative humidity (or dew point temperature) shall be conducted at an onsite location during remedial activities.

c. Chemical Specific Sampling for the Chemicals of Concern

1) VOCs: Integrated VOC samples (24 hours) will be collected once per week from each of the four fixed air monitoring stations (as described below) for the first two weeks of Site work; and once a month thereafter from each air monitoring station. The samples are collected to demonstrate that the real-time monitoring stations are effective in measuring the concentration of the VOC target compounds. VOC samples will be collected using 6-liter Summa® canisters (or equivalent vacuum canisters) and analyzed using USEPA Method TO-15 modified to include naphthalene. An accredited laboratory will perform the analytical testing on the canisters and will provide Category B deliverables. Results of the chemical-specific sampling shall be compiled such that the project average concentration for each chemical of concern is compared to the AACs as they are received by the laboratory. Progress towards compliance shall be demonstrated by comparing the project-to-date average to the applicable AAC for each sample location.

2.1.2 Duration of Perimeter Air Monitoring

Air monitoring shall be continuous during activities in the active work area. Air monitoring shall begin at least 30 minutes before work begins in the active work area and continue for at least 60 minutes after work ceases. These times are intended to allow for background levels to be established before generation of potential air contaminants and for materials generated during active work to reach the sampling locations.

2.1.3 Equipment

Air monitoring at each station shall be conducted with direct reading instruments for particulates and VOCs. Measurements shall be collected with data logging at one-minute intervals, to allow calculation and recording of 15-minute time weighted averages.

a. Air monitoring particulate detecting instruments shall be Data RAM Real-Time Aerosol Monitor Model No. MIE DATARAM with omni directional probe, or equal.

b. Air monitoring for VOCs shall be conducted with an analyzer employing flame or photometric ionization detection with a minimum detection level of 0.10 ppm for isobutylene. Acceptable equipment includes Mini RAE PID or equal.

c. Air monitoring equipment shall be equipped with real-time alarms, which shall send an alert to the Contractor's on-site SSHO.

One wind direction monitoring and recording device shall be maintained in the work area. The device shall include a wind direction indicator (wind sock or weathervane) that is visible from all positions of the work area and sited such that it is not influenced by obstructions.

If the Contractor does not provide an AC power source to air monitoring stations and the wind direction station, the Contractor shall maintain a sufficient supply of charged spare batteries or charged spare units, such that perimeter stations are always in service.

Provide Shop Drawings for air monitoring equipment in accordance with Section 01 33 00 Submittal Procedures.

2.1.4 Records

The readings of the air monitoring instruments shall be recorded at least every 15-minutes during instrument operation. The record of the monitoring shall be available for inspection by the Contracting Officer and authorized agencies. Data logging instruments can be used as long as the data is retrievable on-site.

Records of calibration, according to the instrument manufacturer's instructions, shall be maintained by the Contractor and shall be available for inspection by the Contracting Officer and authorized agencies. The zero baseline shall be checked daily and at set intervals.

2.2 ACTION LEVELS

If the downwind PM10 (15-minute time weighted average) perimeter concentration exceeds 150 micrograms per cubic meter of air (150 µg/m3) (minus background) for two consecutive periods, soil-intrusive activities at the Site shall be stopped, the source of the PM10 identified, and dust control activities shall be initiated to reduce the PM10 concentrations below 150 µg/m3 at the perimeter or on residential property, as applicable.

If the downwind TVOC (15-minute time weighted average) perimeter concentration exceeds in the workers' breathing zone, or 1.0 ppm (minus background) for two consecutive periods, soil-intrusive activities at the Site shall be stopped, the source of the VOC identified, and actions shall be initiated to reduce the TVOC concentrations below 1.0 ppm at the perimeter or on residential property, as applicable.

PART 3 EXECUTION

3.1 GENERAL

The Contractor shall implement the Perimeter Air Monitoring and Emissions Control Plan.

The Contractor shall make every effort to minimize the generation of dust and odors. Appropriate methods to minimize the generation of dust include, but are not limited to:

1. Use of low permeability tarpaulin or suitable means to cover exposed areas and materials.

2. Limiting the amount of exposed areas.

3. Water spray. If water spray is used, run-off must be collected and managed as construction water, in accordance with Section 02245 - CONSTRUCTION WATER MANAGEMENT.

4. The use of chloride or petroleum containing compounds for emissions control is prohibited.

The Contractor shall submit a report to the Contracting Officer summarizing data collected during the implementation of this specification on a weekly basis. The report shall include a description of sampling procedures, a discussion of calibration procedures, a summary of meteorological data, and a summary of contaminant levels. The report shall also include a summary of measures taken by the Contractor to address exceedances of the Action Levels specified, on an incident-by-incident basis.

The Contractor shall update the Perimeter Air Monitoring and Emissions Control Plan as necessary to incorporate changes in Site conditions, equipment and potentially hazardous materials identified during Site activities. The Contractor's Perimeter Air Monitoring and Emissions Control Plan shall include alternate monitoring locations and relocation procedures to accommodate Site construction activities.

3.2 ACTION LEVEL EXCEEDANCE PROTOCOLS

3.2.1 Particulates (PM10)

As an early warning, if any of the 15-minute data averages from the perimeter exceed 100 µg/m3, the site supervisor should be notified immediately and corrective actions undertaken.

If 15-minute average data from any of the perimeter particulate PM10 monitors exceed 150 µg/m3 then an automatic alarm is triggered and the following procedure will be followed:

1. The AMFT will confirm the instrument is operating correctly.

2. The AMFT will determine the background levels for the period (the lowest 15-minute average from any of the 4 fixed air monitoring stations) and then subtract out the background levels for the 15-minute data average to determine if an action level exceedance has indeed occurred.

3. The Site Supervisor and the Contracting Officer will be immediately notified and continually updated until exceedances cease.

4. The AMFT in consultation with the AQTM will make an assessment as to whether the exceedance is due to onsite or offsite activities. The Contracting Officer will also be advised.

5. Particulate control measures will be undertaken by the remediation contractor. Control measures shall be implemented in accordance with

the Perimeter Air Monitoring and Emissions Control Plan and may include slowing the pace of work, relocating activities, wetting the site etc.

If after implementing the control measures, a 2nd consecutive 15-minute average (minus background) from any of the particulate PM10 monitors exceeds 150 µg/m3, all site intrusive activities must be stopped and site activities must be further evaluated so as to mitigate the particulate exposures at the perimeter Air Monitoring Stations. Additional control measures include those previously mentioned in addition to stopping work until a more effective control can be implemented.

3.2.2 Total Volatile Organic Compounds (TVOC)

As an early warning, if any of the 15-minute data averages from the perimeter air monitoring stations exceed 0.5 ppm, the site supervisor should be notified immediately and corrective actions undertaken. If 15-minute average data from any of the 4 perimeter TVOC monitors exceed 1.0 ppm, then an automatic alarm is triggered and the following procedure will be followed:

1. The AMFT will confirm the instrument is operating correctly.

2. The AMFT will determine the background levels for the period (the lowest 15-minute average from any of the 4 perimeter air monitoring stations) and then subtract out the background levels for the 15-minute data average to determine if an action level exceedance has indeed occurred.

3. The Site Supervisor and the Contracting Officer will be immediately notified and continually updated until exceedances cease.

4. The AMFT in consultation with the AQTM will make an assessment as to whether the exceedance is due to onsite or offsite activities. The Contracting Officer will also be advised.

5. Vapor control measures will be undertaken by the remediation contractor in accordance with the Perimeter Air Monitoring and Emissions Control Plan. Control measures may include slowing the pace of work, relocating activities, wetting the site, application of VOC suppression foam, covering stockpiles etc.

If after implementing the control measures, a 2nd consecutive 15-minute average (minus background) from any of the TVOC monitors exceeds 1.0 ppm, all site intrusive activities must be stopped and site activities must be further evaluated so as to mitigate the TVOC exposures at the perimeter Air Monitoring Stations. Additional control measures include those previously mentioned in addition to stopping work until a more effective control can be implemented.

-- End of Section --

SECTION 01 20 00

PROJECT MEETINGS

PART 1 TITLE

1.1 COORDINATION

A. General Contractor shall establish on-site lines of authority and communications.

1. Schedule and conduct progress meetings.

2. Establish procedures for intra-Project communications.

a. Submittals.

b. Reports and records.

c. Recommendations.

d. Coordination drawings.

e. Schedules.

f. Resolution of conflicts.

3. Interpret Contract Documents.

a. Consult with Contracting Officer to obtain interpretation, as required.

b. Assist in resolution of questions or conflicts which may arise.

c. Forward written interpretations to other Contractors, and to other concerned parties.

4. Assist in obtaining permits and approvals.

a. Building permits and special permits required for Work or temporary facilities.

b. Verify Contractors and Subcontractors have obtained inspections for Work and temporary facilities.

5. Control use of site.

a. Supervise field engineering and site layout.

b. Allocate space for each prime Contractor’s use for field offices, sheds, and Work and storage areas.

c. Allocate field office and storage space, and Work and storage areas, for use of each prime Contractor.

d. Establish access, traffic, and parking allocations and regulations.

e. Monitor use of site during construction

1.2 SUMMARY

A. Contractor shall schedule and administer progress meetings with their own staff and/or other contractors, construction foremen's meetings, and specially called meetings with these parties throughout progress of Work. Contractor shall:

1. Prepare agenda for meetings.

2. Distribute written notice of specially called meetings minimum of one working
day(s) in advance of meeting date.

3. Make physical arrangements for meetings.

4. Preside at meetings.

5. Record minutes; include significant proceedings and decisions.

6. Prepare formal minutes and distribute within 2 working days after each meeting to the following:

a. Meeting participants.

b. Parties affected by decisions made at meeting.

c. Contracting Officer.

B. Representatives of Contractor, Subcontractors, and Suppliers attending meetings shall be qualified and authorized to act on behalf of entity each represents.

C. Contracting Officer may attend meetings.

1.3 PRECONSTRUCTION CONFERENCE

A. Contracting Officer will schedule and conduct preconstruction conference in accordance with the Contract and this section.

B. Location: At location to be selected by Contracting Officer.

C. Attendance.

1. Contractor's Project Manager.

2. Contractor's Resident Superintendent.

3. Contractor's "hands-on" person designated by Contractor to submit Shop Drawings to Contracting Officer.

4. Subcontractors' or suppliers' representatives Contractor may desire to invite or Contracting Officer may request.

5. Contracting Officer.

6. Local utility representatives

D. Suggested format includes, but not be limited to following:

1. Project Safety.

2. Presentation of preliminary progress schedule in accordance with the "Construction Progress Schedule" and preliminary schedule of Shop Drawing and sample submissions in accordance with Section "Submittals" of Contract Documents.

3. Check of required insurance policies prior to Notice to Proceed.

5. Liquidated damages.

6. Procedures for handling submittals such as substitutions and Shop Drawings.

7. On-site witness testing by independent subconsultants and approval/regulatory agencies.

11. Direction of correspondence and coordinating responsibility.

12. Weekly and monthly progress meetings.

13. Equal opportunity requirements.

14. Laboratory and field testing requirements.

15. Provisions for inventory of material stored on-site or off-site if off-site storage is authorized.

16. Schedule of values, application for progress payment, and progress payment procedures.

17. Change Order procedures.

18. Posting of Funding Agency's sign.

19. Contractor's proposed Environmental Management and Erosion Control Plan.

20. Contractor's proposed Health and Safety Plan.

21. Contractor's proposed Quality Control Plan.

22. Coordination requirements with plant staff and ongoing operations.

23. Construction sequencing and stipulated construction and plant operational constraints.

1.4 PROGRESS MEETINGS WITH CONTRACTING OFFICER

A. In addition to other regular project meetings for other purposes (as indicated elsewhere in the Contract Documents), hold general progress

meetings with times coordinated with preparation of payment requests. Monthly meeting dates and schedule will be established by the Contracting Officer. All personnel then involved in the planning, coordination or performance of work to be represented at each meeting.

B. Suggested format includes, but not limited to following:

1. Review each entity's present and future needs including interface requirements

2. Construction sequence, coordination and shutdown requirements

3. Construction schedule and progress reporting

4. On-site witness testing by independent subconsultants and approval/regulatory agencies

5. Deliveries

6. Access

7. Site utilization

8. Temporary facilities and services

9. Hours of work

10. Safety, hazards and risks

11. Housekeeping

12. Submittals

13. Change managements (request for quotation, change directives, change orders)

14. Contract administration logs (request for information, etc.)

15. Documentation of information for payment requests

19. Coordination with landowners and local government

20. Restricted access (driveways), utility coordination, and traffic control

C. Discuss whether each element of current work is ahead of schedule. Determine how behind-time work will be expedited and secure commitments from the entities involved in doing so. Discuss whether schedule revisions are required to ensure that current work and subsequent work will be completed within the Contract Time. Review everything of significance which could affect the progress of the work.

D. Within two days after each progress meeting date, the Contracting Officer will forward copies of the minutes-of-the-meeting, to the Contractor.

E. Immediately following each progress meeting where revisions to the Progress Schedule/Critical Path Schedule have been made or recognized (regardless of whether agreed to by each entity represented), revise the Schedule. Reissue revised Schedule within 10 working days after meeting.

F. At intervals matching the preparation of payment requests, revise and reissue the Schedule to show actual progress of the work in relation to the latest revision of the Schedule.

1.5 CONSTRUCTION FOREMEN'S MEETINGS

A. Schedule weekly.

B. Location: Contractor's field office.

C. Attendance.

1. Resident superintendent.

2. Subcontractor's foremen.

D. Suggested Agenda

1. Health and safety.

2. Review agenda of Work progress since previous meeting.

3. Proposed progress and schedule for succeeding Work period.

4. Field observations, problems, and conflicts.

5. Problems which affect construction schedule.

6. Coordination and shutdown requirements.

1.6 HEALTH AND SAFETY MEETINGS

A. Schedule Biweekly.

B. Location: Contractor's field office.

C. Attendance.

1. Resident superintendent.

2. Subcontractor's foremen.

3. Contractor's Health and Safety Manager

4. Contracting Officer's Health and Safety Representative

5. Contracting Officer's Health and Safety Representative

D. Suggested Agenda.

1. Health and safety statistics.

2. Review Work progress since previous meeting.

3. New staff and training requirements.

1.7 STAKEHOLDER MEETINGS

A. Participate in regular stakeholder meetings that may be held weekly or biweekly, as determined by the Contracting Officer. Personnel from the EPA, CTDEEP, and Durham Manufacturing Company may participate in these regular stakeholder meetings.

B. Participate in public meetings, as requested by the Contracting Officer. These may occur outside normal working hours.

-- End of Section --

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PROJECT SCHEDULE

PART 1 GENERAL

1.1 REFERENCES

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

AACE INTERNATIONAL (AACE)

AACE 29R-03	(2011) Forensic Schedule Analysis
AACE 52R-06	(2006) Time Impact Analysis - As Applied in Construction

U.S. ARMY CORPS OF ENGINEERS (USACE)

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

1.2 SUBMITTALS

Government approval is required for submittals with a "G" 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 Scheduler Qualifications; G, RO

Preliminary Project Schedule; G, RO

Initial Project Schedule; G, RO

Periodic Schedule Update; G, RO

1.3 PROJECT SCHEDULER QUALIFICATIONS

Designate an authorized representative to be responsible for the preparation of the schedule and all required updating and production of reports. The authorized representative must have a minimum of two years experience scheduling construction projects similar in size and nature to this project with scheduling software that meets the requirements of this specification. Representative must have a comprehensive knowledge of CPM scheduling principles and application.

PART 2 PRODUCTS

2.1 SOFTWARE

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

2.1.1 Government Default Software

The Government intends to use Primavera P6.

2.1.2 Contractor Software

Scheduling software used by the Contractor must be commercially available from the software vendor for purchase with vendor software support agreements available. The software routine used to create the required sdef file must be created and supported by the software manufacturer.

2.1.2.1 Primavera

If Primavera P6 is selected for use, provide the "xer" export file in a version of P6 importable by the Government system.

2.1.2.2 Other Than Primavera

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

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

Prepare for approval a Project Schedule, as specified herein, pursuant to FAR Clause 52.236-15, SCHEDULE FOR CONSTRUCTION CONTRACTS. Show in the schedule the proposed sequence to perform the work and dates contemplated for starting and completing all schedule activities. The scheduling of the entire project is required. The scheduling of construction is the responsibility of the Contractor. Contractor management personnel must actively participate in its development. Subcontractors and suppliers working on the project must also contribute in developing and maintaining an accurate Project Schedule. Provide a schedule that is a forward planning as well as a project monitoring tool. Use the Critical Path Method (CPM) of network calculation to generate all Project Schedules. Prepare each Project Schedule using the Precedence Diagram Method (PDM).

3.2 BASIS FOR PAYMENT AND COST LOADING

The schedule is the basis for determining contract earnings during each update period and therefore the amount of each progress payment. The aggregate value of all activities coded to a contract CLIN must equal the value of the CLIN.

3.2.1 Activity Cost Loading

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

3.2.2 Withholdings / Payment Rejection

Failure to meet the requirements of this specification may result in the disapproval of the preliminary, initial or periodic schedule updates and subsequent rejection of payment requests until compliance is met.

In the event that the Contracting Officer directs schedule revisions and those revisions have not been included in subsequent Project Schedule revisions or updates, the Contracting Officer may withhold 10 percent of pay request amount from each payment period until such revisions to the project schedule have been made.

3.3 PROJECT SCHEDULE DETAILED REQUIREMENTS

3.3.1 Level of Detail Required

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

3.3.2 Activity Durations

Reasonable activity durations are those that allow the progress of ongoing activities to be accurately determined between update periods. Less than 2 percent of all non-procurement activities shall have Original Durations (OD) greater than 20 work days or 30 calendar days.

3.3.3 Procurement Activities

Include activities associated with the critical submittals and their approvals, procurement, fabrication, and delivery of long lead materials, equipment, fabricated assemblies, and supplies. Long lead procurement activities are those with an anticipated procurement sequence of over 90 calendar days.

3.3.4 Mandatory Tasks

Include the following activities/tasks in the initial project schedule and all updates.

a. Submission, review and acceptance of SD-01 Preconstruction Submittals (individual activity for each).

b. Submission, review and acceptance of features require design completion

c. Submission of mechanical/electrical/information systems layout drawings.

d. Long procurement activities

e. Submission and approval of as-built drawings.

k. Submission and approval of Building Commissioning Plan, test data, and reports: Develop the schedule logic associated with testing required for off-site disposal of materials

r. Contractor's pre-final inspection.

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

t. Government's pre-final inspection.

u. Correction of punch list from Government's pre-final inspection.

v. Final inspection.

3.3.5 Government Activities

Show Government and other agency activities that could impact progress. These activities include, but are not limited to: approvals, environmental permit approvals by State regulators, inspections, utility tie-in, Government Furnished Equipment (GFE) and Notice to Proceed (NTP) for phasing requirements.

3.3.6 Standard Activity Coding Dictionary

Use the activity coding structure defined in the Standard Data Exchange Format (SDEF) in ER 1-1-11. This exact structure is mandatory. All Activity Codes shall be developed and assigned to activities as detailed herein. A template SDEF compatible schedule backup file is available on the QCS web site: http://rms.usace.army.mil.

The SDEF format is as follows:

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

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

3.3.6.1 Workers Per Day (WRKP)

Assign Workers per Day for all field construction or direct work activities, if directed by the Contracting Officer. Workers per day shall be the average number of workers expected each day to perform a task for the duration of that activity.

3.3.6.2 Responsible Party Coding (RESP)

Assign responsibility code for all activities to the Prime Contractor, Subcontractor(s) or Government agency(ies) responsible for performing the activity.

a. Activities coded with a Government Responsibility code include, but are not limited to: Government approvals, Government design reviews, environmental permit approvals by State regulators, Government Furnished Property/Equipment (GFP) and Notice to Proceed (NTP) for phasing requirements.

b. Activities cannot have more than one Responsibility Code. Examples of acceptable activity code values are: DOR (for the designer of record); ELEC (for the electrical subcontractor); MECH (for the mechanical subcontractor); and GOVT (for USACE).

3.3.6.3 Area of Work Coding (AREA)

Assign Work Area code to activities based upon the work area in which the activity occurs. Define work areas based on resource constraints or space constraints that would preclude a resource, such as a particular trade or craft work crew from working in more than one work area at a time due to restraints on resources or space. Examples of Work Area Coding include different areas within a floor of a building, different floors within a building, and different buildings within a complex of buildings. Activities cannot have more than one Work Area Code.

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

3.3.6.4 Modification Number (MODF)

Assign a Modification Number Code to any activity or sequence of activities added to the schedule as a result of a Contract Modification, when approved by Contracting Officer. Key all Code values to the Government's modification numbering system. An activity can have only one Modification Number Code.

3.3.6.5 Bid Item Coding (BIDI)

Assign a Bid Item Code to all activities using the Contract Line Item Schedule (CLIN) to which the activity belongs, even when an activity is not cost loaded. An activity can have only one BIDI Code.

3.3.6.6 Phase of Work Coding (PHAS)

Assign Phase of Work Code to all activities. Examples of phase of work are procurement phase and construction phase. Each activity can have only one Phase of Work code.

a. Code proposed fast track design and construction phases proposed to allow filtering and organizing the schedule by fast track design and construction packages.

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

3.3.6.7 Category of Work Coding (CATW)

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

3.3.6.8 Feature of Work Coding (FOW)

Assign a Feature of Work Code to appropriate activities based on the Definable Feature of Work to which the activity belongs based on the approved QC plan.

Definable Feature of Work is defined in Section 01 45 00 QUALITY CONTROL. An activity can have only one Feature of Work Code.

3.3.7 Contract Milestones and Constraints

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

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

3.3.7.1 Project Start Date Milestone and Constraint

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

3.3.7.2 End Project Finish Milestone and Constraint

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

The project schedule must be constrained to the Contract Completion Date in such a way that if the schedule calculates an early finish, then the float calculation for "End Project" milestone reflects positive float on the longest path. If the project schedule calculates a late finish, then the "End Project" milestone float calculation reflects negative float on the longest path. The Government is under no obligation to accelerate Government activities to support a Contractor's early completion.

3.3.7.3 Interim Completion Dates and Constraints

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

3.3.7.3.1 Start Phase

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

3.3.7.3.2 End Phase

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

3.3.8 Calendars

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

If an activity is weather sensitive it should be assigned to a calendar showing non-work days on a monthly basis, with the non-work days selected at random across the weeks of the calendar, using the anticipated days provided in the contract clause TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER. The assignment of the non-work days should be over a seven-day week since weather records are compiled on seven-day weeks, which will cause some of the weather related non-work days to fall on weekends.

3.3.9 Open Ended Logic

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

Predecessor open ended logic may be allowed in a time impact analyses upon the Contracting Officer's approval.

3.3.10 Default Progress Data Disallowed

Actual Start and Finish dates must not automatically update with default mechanisms included in the scheduling software. Updating of the percent complete and the remaining duration of any activity must be independent functions. Disable program features that calculate one of these parameters from the other. Activity Actual Start (AS) and Actual Finish (AF) dates assigned during the updating process must match those dates provided in the Contractor Quality Control Reports. Failure to document the AS and AF dates in the Daily Quality Control report will result in disapproval of the Contractor's schedule.

3.3.11 Out-of-Sequence Progress

Activities that have progressed before all preceding logic has been satisfied (Out-of-Sequence Progress) will be allowed only on a case-by-case basis subject to approval by the Contracting Officer. Propose logic corrections to eliminate out of sequence progress or justify not changing the sequencing for approval prior to submitting an updated project schedule. Address out of sequence progress or logic changes in the Narrative Report and in the periodic schedule update meetings.

3.3.12 Added and Deleted Activities

Do not delete activities from the project schedule or add new activities to the schedule without approval from the Contracting Officer. Activity ID and description changes are considered new activities and cannot be changed without Contracting Officer approval.

3.3.13 Original Durations

Activity Original Durations (OD) must be reasonable to perform the work item. OD changes are prohibited unless justification is provided and approved by the Contracting Officer.

3.3.14 Leads, Lags, and Start to Finish Relationships

Lags must be reasonable as determined by the Government and not used in place of realistic original durations, must not be in place to artificially absorb float, or to replace proper schedule logic.

a. Leads (negative lags) are prohibited.

b. Start to Finish (SF) relationships are prohibited.

3.3.15 Retained Logic

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

3.3.16 Percent Complete

Update the percent complete for each activity started, based on the realistic assessment of earned value. Activities which are complete but for remaining minor punch list work and which do not restrain the initiation of

successor activities may be declared 100 percent complete to allow for proper schedule management.

3.3.17 Remaining Duration

Update the remaining duration for each activity based on the number of estimated work days it will take to complete the activity. Remaining duration may not mathematically correlate with percentage found under paragraph entitled Percent Complete.

3.3.18 Cost Loading of Closeout Activities

Cost load the "Correction of punch list from Government pre-final inspection" activity(ies) not less than 1 percent of the present contract value. Activity(ies) may be declared 100 percent complete upon the Government's verification of completion and correction of all punch list work identified during Government pre-final inspection(s).

3.3.18.1 As-Built Drawings

If there is no separate contract line item (CLIN) for as-built drawings, cost load the "Submission and approval of as-built drawings" activity not less than $35,000 or 1 percent of the present contract value, whichever is greater, up to $200,000. Activity will be declared 100 percent complete upon the Government's approval.

3.3.19 Anticipated Adverse Weather

Paragraph applicable to contracts with clause entitled TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER. Reflect the number of anticipated adverse weather delays allocated to a weather sensitive activity in the activity's calendar.

3.3.20 Early Completion Schedule and the Right to Finish Early

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

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

b. The Government is under no obligation to accelerate work items it is responsible for to ensure that the early completion is met nor is it responsible to modify incremental funding (if applicable) for the project to meet the contractor's accelerated work.

3.4 PROJECT SCHEDULE SUBMISSIONS

Provide the submissions as described below. The data CD/DVD, reports, and network diagrams required for each submission are contained in paragraph SUBMISSION REQUIREMENTS. If the Contractor fails or refuses to furnish the information and schedule updates as set forth herein, then the Contractor will be deemed not to have provided an estimate upon which a progress payment can be made.

Review comments made by the Government on the schedule(s) do not relieve the Contractor from compliance with requirements of the Contract Documents.

3.4.1 Preliminary Project Schedule Submission

Within 15 calendar days after the NTP is acknowledged submit the Preliminary Project Schedule defining the planned operations detailed for the first 90 calendar days for approval. The approved Preliminary Project Schedule will be used for payment purposes not to exceed 90 calendar days after NTP. Completely cost load the Preliminary Project Schedule to balance the contract award CLINS shown on the Price Schedule. The Preliminary Project Schedule may be summary in nature for the remaining performance period. It must be early start and late finish constrained and logically tied as specified. The Preliminary Project Schedule forms the basis for the Initial Project Schedule specified herein and must include all of the required plan and program preparations, submissions and approvals identified in the contract (for example, Quality Control Plan, Safety Plan, and Environmental Protection Plan) as well as design activities, planned submissions of all early design packages, permitting activities, design review conference activities, and other non-construction activities intended to occur within the first 90 calendar days. Government acceptance of the associated design package(s) and all other specified Program and Plan approvals must occur prior to any planned construction activities. Activity code any activities that are summary in nature after the first 90 calendar days with Bid Item (CLIN) code (BIDI), Responsibility Code (RESP) and Feature of Work code (FOW).

3.4.2 Initial Project Schedule Submission

Submit the Initial Project Schedule for approval within 42 calendar days after notice to proceed is issued. The schedule must demonstrate a reasonable and realistic sequence of activities which represent all work through the entire contract performance period. No payment will be made for work items not fully detailed in the Project Schedule.

The initial Progress Schedule shall be based on progress and completion of the Work within the following Construction Milestones:

1. Phase 01A Begin Mobilization
2. Install Temporary Power
3. Disconnect Public Power Supply
4. Phase 01A Ready for Excavation
5. Phase 01A Excavation Complete
6. Phase 01A Restoration Complete
7. Phase 01B Begin Mobilization
8. Phase 01B Ready for Excavation
9. Phase 01B Excavation Complete
10. Phase 01B Restoration Complete

11. Phase 02 Begin Mobilization

12. Phase 02 Ready for Excavation

13. Phase 02 Excavation Complete

14. Phase 02 Restoration Complete

15. Reconnect to Public Power Supply

3.4.3 Periodic Schedule Updates

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

a. Update information including Actual Start Dates (AS), Actual Finish Dates (AF), Remaining Durations (RD), and Percent Complete is subject to the approval of the Government at the meeting.

b. AS and AF dates must match the date(s) reported on the Contractor's Quality Control Report for an activity start or finish.

3.5 SUBMISSION REQUIREMENTS

Submit the following items for the Preliminary Schedule, Initial Schedule, and every Periodic Schedule Update throughout the life of the project:

3.5.1 Data CD/DVDs

Provide two sets of data CD/DVDs containing the current project schedule and all previously submitted schedules in the format of the scheduling software (e.g. .xer). Also include on the data CD/DVDs the Narrative Report and all required Schedule Reports. Label each CD/DVD indicating the type of schedule (Preliminary, Initial, Update), full contract number, Data Date and file name. Each schedule must have a unique file name and use project specific settings.

3.5.2 Narrative Report

Provide a Narrative Report with each schedule submission. The Narrative Report is expected to communicate to the Government the thorough analysis of the schedule output and the plans to compensate for any problems, either current or potential, which are revealed through that analysis. Include the following information as minimum in the Narrative Report:

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

b. A description of activities along the two most critical paths where the total float is less than or equal to 20 work days.

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

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

e. Identify and discuss all schedule changes by activity ID and activity name including what specifically was changed and why the change was needed. This should include at a minimum new and deleted activities, logic changes, duration changes, calendar changes, lag changes, resource changes, and actual start and finish date changes.

f. Identify and discuss out-of-sequence work.

3.5.3 Schedule Reports

The format, filtering, organizing, and sorting for each schedule report must be as directed by the Contracting Officer. Typically, reports shall contain Activity Numbers, Activity Description, Original Duration, Remaining Duration, Early Start Date, Early Finish Date, Late Start Date, Late Finish Date, Total Float, Actual Start Date, Actual Finish Date, and Percent Complete. Provide the reports electronically in .pdf format. Provide two sets of hardcopy reports. The following lists typical reports that will be requested:

3.5.3.1 Activity Report

List of all activities sorted according to activity number.

3.5.3.2 Logic Report

List of detailed predecessor and successor activities for every activity in ascending order by activity number.

3.5.3.3 Total Float Report

A list of all incomplete activities sorted in ascending order of total float. List activities which have the same amount of total float in ascending order of Early Start Dates. Do not show completed activities on this report.

3.5.3.4 Earnings Report by CLIN

A compilation of the Total Earnings on the project from the NTP to the data date. This report must reflect the earnings of activities based on the agreements made in the schedule update meeting defined herein. Provided a complete schedule update has been furnished, this report serves as the basis of determining progress payments. Group activities by CLIN number and sort by activity number. This report must also provide a total CLIN percent earned value, CLIN percent complete, and project percent complete. The printed report must contain the following for each activity: the Activity Number, Activity Description, Original Budgeted Amount, Earnings to Date, Earnings this period, Total Quantity, Quantity to Date, and Percent Complete (based on cost).

3.5.3.5 Schedule Log

Provide a Scheduling/Leveling Report generated from the current project schedule being submitted.

3.5.4 Network Diagram

The Network Diagram is required for the Preliminary, Initial and Periodic Updates. Depict and display the order and interdependence of activities and the sequence in which the work is to be accomplished. The Contracting Officer will use, but is not limited to, the following conditions to review compliance with this paragraph:

3.5.4.1 Continuous Flow

Show a continuous flow from left to right with no arrows from right to left. Show the activity number, description, duration, and estimated earned value on the diagram.

3.5.4.2 Project Milestone Dates

Show dates on the diagram for start of project, any contract required interim completion dates, and contract completion dates.

3.5.4.3 Critical Path

Show all activities on the critical path. The critical path is defined as the longest path.

3.5.4.4 Banding

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

3.5.4.5 Cash Flow / Schedule Variance Control (SVC) Diagram

With each schedule submission, provide a SVC diagram showing 1) Cash Flow S-Curves indicating planned project cost based on projected early and late activity finish dates, and 2) Earned Value to-date.

3.6 PERIODIC SCHEDULE UPDATE

3.6.1 Periodic Schedule Update Meetings

Conduct periodic schedule update meetings for the purpose of reviewing the proposed Periodic Schedule Update, Narrative Report, Schedule Reports, and progress payment. Conduct meetings at least monthly within five days of the proposed schedule data date. Provide a computer with the scheduling software loaded and a projector which allows all meeting participants to view the proposed schedule during the meeting. The Contractor's authorized scheduler must organize, group, sort, filter, perform schedule revisions as needed and review functions as requested by the Contractor and/or Government. The meeting is a working interactive exchange which allows the Government and Contractor the opportunity to review the updated schedule on a real time and interactive basis. The meeting will last no longer than 8

hours. Provide a draft of the proposed narrative report and schedule data file to the Government a minimum of two workdays in advance of the meeting. The Contractor's Project Manager and scheduler must attend the meeting with the authorized representative of the Contracting Officer. Superintendents, foremen and major subcontractors must attend the meeting as required to discuss the project schedule and work. Following the periodic schedule update meeting, make corrections to the draft submission. Include only those changes approved by the Government in the submission and invoice for payment.

3.6.2 Update Submission Following Progress Meeting

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

3.7 WEEKLY PROGRESS MEETINGS

Conduct a weekly meeting with the Government (or as otherwise mutually agreed to) between the meetings described in paragraph entitled 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. Use the current approved schedule update for the purposes of this meeting and for the production and review of reports. At the weekly progress meeting, address the status of RFIs, RFPs and Submittals.

3.8 REQUESTS FOR TIME EXTENSIONS

Provide a justification of delay to the Contracting Officer in accordance with the contract provisions and clauses for approval within 10 days of a delay occurring. Also prepare a time impact analysis for each Government request for proposal (RFP) to justify time extensions.

3.8.1 Justification of Delay

Provide a description of the event(s) that caused the delay and/or impact to the work. As part of the description, identify all schedule activities impacted. Show that the event that caused the delay/impact was the responsibility of the Government. Provide a time impact analysis that demonstrates the effects of the delay or impact on the project completion date or interim completion date(s). Multiple impacts must be evaluated chronologically; each with its own justification of delay. With multiple impacts consider any concurrency of delay. A time extension and the schedule fragnet becomes part of the project schedule and all future schedule updates upon approval by the Contracting Officer.

3.8.2 Time Impact Analysis (Prospective Analysis)

Prepare a time impact analysis for approval by the Contracting Officer based on industry standard AACE 52R-06. Utilize a copy of the last approved schedule prior to the first day of the impact or delay for the time impact analysis. If Contracting Officer determines the time frame between the last approved schedule and the first day of impact is too great, prepare an interim updated schedule to perform the time impact analysis. Unless

approved by the Contracting Officer, no other changes will be incorporated into the schedule being used to justify the time impact.

3.8.3 Forensic Schedule Analysis (Retrospective Analysis)

Prepare an analysis for approval by the Contracting Officer based on industry standard AACE 29R-03.

3.8.4 Fragmentary Network (Fragnet)

Prepare a proposed fragnet for time impact analysis. The proposed fragnet must consist of a sequence of new activities that are proposed to be added to the project schedule to demonstrate the influence of the delay or impact to the project's contractual dates. Clearly show how the proposed fragnet is to be tied into the project schedule including all predecessors and successors to the fragnet activities. The proposed fragnet must be approved by the Contracting Officer prior to incorporation into the project schedule.

3.8.5 Time Extension

The Contracting Officer must approve the Justification of Delay including the time impact analysis before a time extension will be granted. No time extension will be granted unless the delay consumes all available Project Float and extends the projected finish date ("End Project" milestone) beyond the Contract Completion Date. The time extension will be in calendar days.

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.

3.8.6 Impact to Early Completion Schedule

No extended overhead will be paid for delay prior to the original Contract Completion Date for an Early Completion IPS unless the Contractor actually performed work in accordance with that Early Completion Schedule. The Contractor must show that an early completion was achievable had it not been for the impact.

3.9 FAILURE TO ACHIEVE PROGRESS

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

3.9.1 Artificially Improving Progress

Artificially improving progress by means such as, but not limited to, revising the schedule logic, modifying or adding constraints, shortening activity durations, or changing calendars in the project schedule is prohibited. Indicate assumptions made and the basis for any logic, constraint, duration and calendar changes used in the creation of the recovery plan. Any additional resources, manpower, or daily and weekly work

hour changes proposed in the recovery plan must be evident at the work site and documented in the daily report along with the Schedule Narrative Report.

3.9.2 Failure to Perform

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

3.9.3 Recovery Schedule

Should the Contracting Officer find it necessary, submit a recovery schedule pursuant to FAR 52.236-15 Schedules for Construction Contracts.

3.10 OWNERSHIP OF FLOAT

Except for the provision given in the paragraph IMPACT TO EARLY COMPLETION SCHEDULE, float available in the schedule, at any time, shall not be considered for the exclusive use of either the Government or the Contractor including activity and/or project float. Activity float is the number of work days that an activity can be delayed without causing a delay to the "End Project" finish milestone. Project float (if applicable) is the number of work days between the projected early finish and the contract completion date milestone.

3.11 TRANSFER OF SCHEDULE DATA INTO RMS/QCS

Import the schedule data into the Quality Control System (QCS) and export the QCS data to the Government. This data is considered to be additional supporting data in a form and detail required by the Contracting Officer pursuant to FAR 52.232-5 - Payments under Fixed-Price Construction Contracts. The receipt of a proper payment request pursuant to FAR 52.232-27 - Prompt Payment for Construction Contracts is contingent upon the Government receiving both acceptable and approvable hard copies and matching electronic export from QCS of the application for progress payment.

3.12 PRIMAVERA P6 MANDATORY REQUIREMENTS

If Primavera P6 is being used, request a backup file template (.xer) from the Government, if one is available, prior to building the schedule. The following settings are mandatory and required in all schedule submissions to the Government:

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

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

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

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

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

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

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

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

i. Activity ID's must not exceed 10 characters.

j. Activity Names must have the most defining and detailed description within the first 30 characters.

-- End of Section --

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SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

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 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. Pick up and dispose of samples not incorporated into the work in accordance with manufacturer's Material Safety Data Sheets (MSDS) and in compliance with existing laws and regulations.

1.2 DEFINITIONS

1.2.1 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 start of construction (work) or the start of the next major phase of the construction on a multi-phase contract, includes schedules, 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.

Certificates of insurance

Surety bonds

List of proposed Subcontractors

List of proposed products

Construction Progress Schedule

Submittal register

Accident Prevention Plan/Site Specific Health & Safety Plan

Quality Control(QC) plan

Environmental Protection Plan

Quality Assurance Project Plan/Sampling and Analysis Plan

Structural Monitoring Plan

Baseline Monitoring Report

Temporary Power Work Plan

Soil Management Plan

Dewatering Plan

Waste Management Plan

Construction Water Management Plan

Demolition Plan

Excavation Plan

List of Backfill Sources

SD-02 Shop Drawings

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

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

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

SD-03 Product Data

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

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

SD-05 Design Data

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

SD-06 Test Reports

Report signed by authorized official of testing laboratory that a material, product or system identical to the material, product or system to be provided has been tested in accord with specified requirements. (Testing must have been within two years of date of contract award for the project.)

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

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

Investigation reports.

Daily logs and checklists.

SD-07 Certificates

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

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

SD-08 Manufacturer's Instructions

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

SD-10 Operation and Maintenance Data

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

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

SD-11 Closeout Submittals

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

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

1.2.2 Approving Authority

Office or designated person authorized to approve submittal.

1.2.3 Work

As used in this section, on- and off-site construction required by contract documents, including labor necessary to produce submittals, except those SD-01 Pre-Construction Submittals noted above, construction, materials, products, equipment, and systems incorporated or to be incorporated in such construction.

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 this section.

SD-01 Preconstruction Submittals

Submittal Register; G, RO

1.4 SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

1.4.1 Government Approved (G)

Government approval is required for extensions of design, critical materials, deviations, equipment whose compatibility with the entire system must be checked, and other items as designated by the Contracting Officer. Within the terms of the Contract Clause entitled, "Specifications and Drawings for Construction," they are considered to be "shop drawings."

1.4.1.1 Approval Codes

a. Construction/Operations Division {"AO" (Area Office), "RO" (Resident Office), or "PO" (Project Office) Reviewer}: An "AO", "RO", or "PO" in column "f" indicates that the submittal review action is by New England District Construction/Operations Division. Send all such submittals to the project Resident or Area Engineer, as applicable.

b. Engineering/Planning Division {"DO" (District Office) Reviewer): A "DO" on the attached submittal register, column "f" indicates that the submittal review action is by the New England District, Engineering/Planning Division,

or other organization in the District Office. Send all such submittals to the project Resident or Area Engineer for distribution to the appropriate approving authority.

c. Architect-Engineer Firm {"AE" reviewer): An "AE" on the attached submittal register, column "f" indicates that the submittal review action is by the Architect-Engineer firm associated with the project.

1.4.2 Information Only

Submittals not requiring 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.

1.5 PREPARATION

1.5.1 Transmittal Form

Use the ENG Form 4025-R transmittal form for submitting both Government-approved and information-only submittals. Submit in accordance with the instructions on the reverse side of the form. These forms are included in the RMS CM software that the Contractor is required to use for this contract. Properly complete this form by filling out all the heading blank spaces and identifying each item submitted. Exercise special care to ensure proper listing of the specification paragraph and sheet number of the contract drawings pertinent to the data submitted for each item.

1.5.2 Submittal Format

1.5.2.1 Format of SD-01 Preconstruction Submittals

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

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

1.5.2.2 Format for SD-02 Shop Drawings

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

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

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

Submit an electronic copy of drawings in PDF format.

1.5.2.2.1 Drawing Identification

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

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

Reserve a blank space on the right-hand side of each sheet for the Government disposition stamp.

1.5.2.3 Format of SD-03 Product Data

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

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

1.5.2.3.1 Product Information

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

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

1.5.2.3.2 Standards

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

1.5.2.3.3 Data Submission

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

Submit the manufacturer's instructions before installation.

1.5.2.4 Format of SD-04 Samples

1.5.2.4.1 Sample Characteristics

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

a. Sample of Equipment or Device: Full size.

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

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

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

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

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

g. Sample Panel: 4 by 4 feet.

h. Sample Installation: 100 square feet.

1.5.2.4.2 Sample Incorporation

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

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

1.5.2.4.3 Comparison Sample

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

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

1.5.2.5 Format of SD-05 Design Data

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

1.5.2.6 Format of SD-06 Test Reports

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

1.5.2.7 Format of SD-07 Certificates

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

1.5.2.8 Format of SD-08 Manufacturer's Instructions

Present manufacturer's instructions submittals for each section as a complete, bound volume. Include the manufacturer's name, trade name, place of manufacture, and catalog model or number on product data. Also include applicable federal, military, industry, and technical-society publication references. If supplemental information is needed to clarify the manufacturer's data, submit it as specified for SD-07 Certificates. Submit the manufacturer's instructions before installation.

1.5.2.8.1 Standards

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

1.5.2.9 Format of SD-09 Manufacturer's Field Reports

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

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

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

1.5.2.11 Format of SD-11 Closeout Submittals

When the submittal includes a document that is to be used in the project or is to become part of the project record, other than as a submittal, do not

apply the Contractor's approval stamp to the document itself, but to a separate sheet accompanying the document.
Provide data in the unit of measure used in the contract documents.

1.5.3 Source Drawings for Shop Drawings

1.5.3.1 Source Drawings

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

1.5.3.2 Terms and Conditions

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

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

1.5.4 Electronic File Format

Provide submittals in electronic format, with the exception of material samples required for SD-04 Samples items. Compile the submittal file as a single, complete document, to include the Transmittal Form described within. Name the electronic submittal file specifically according to its contents, and coordinate the file naming convention with the Contracting Officer. Electronic files must be of sufficient quality that all information is legible. Use PDF as the electronic format, unless otherwise specified or directed by the Contracting Officer. Generate PDF files from original documents with bookmarks so that the text included in the PDF file is

searchable and can be copied. If documents are scanned, optical character resolution (OCR) routines are required. Index and bookmark files exceeding 30 pages to allow efficient navigation of the file. When required, the electronic file must include a valid electronic signature or a scan of a signature

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

1.6 QUANTITY OF SUBMITTALS

Submit one electronic PDF copy of all submittals (except samples) and paper copies as indicated below.

1.6.1 Number of Copies of SD-02 Shop Drawings

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

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

Submit in compliance with quantity requirements specified for shop drawings.

1.6.3 Number of Samples SD-04 Samples

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

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

c. Submit one sample installation, where directed.

d. Submit one sample of non-solid materials.

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

Submit in compliance with quantity requirements specified for shop drawings.

1.6.5 Number of Copies SD-06 Test Reports and SD-09 Manufacturer's Field Reports

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

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

Submit one copy of O&M Data to the Contracting Officer for review and approval.

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

Unless otherwise specified, submit one set of administrative submittals.

1.7 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.

1.8 VARIATIONS

Variations from contract requirements require both Designer of Record (DOR) and Government approval pursuant to contract Clause FAR 52.236-21 and will be considered where advantageous to Government.

1.8.1 Considering Variations

Discussion with Contracting Officer prior to submission, after consulting with the DOR, will help ensure functional and quality requirements are met and minimize rejections and re-submittals. When contemplating a variation that 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.

1.8.2 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, including the DOR's written analysis and approval. 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.

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

1.8.3 Warranting That Variations Are Compatible

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

1.8.4 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.

1.9 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. Maintain a submittal register for the project in accordance with Section 01 40 00 QUALITY CONTROL. The Government will provide the initial submittal register in electronic format with the following fields completed, to the extent that will be required by the Government during subsequent usage.

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

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

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

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.

1.9.1 Use of Submittal Register

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

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

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

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

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

1.9.2 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.

1.9.3 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.

1.9.4 Copies Delivered to the Government

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

1.10 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.

1.11 GOVERNMENT APPROVING AUTHORITY

When approving authority is Contracting Officer, the Government will:

a. Note date on which submittal was received.

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

c. Identify returned submittals with one of the actions defined in paragraph entitled, "Review Notations," of this section and with markings appropriate for action indicated.

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

1.11.1 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.

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

1.12 DISAPPROVED SUBMITTALS

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. Submittals requiring resubmittal shall be resubmitted within 14 calendar days unless additional time is granted by the Government.

1.13 APPROVED SUBMITTALS

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

Approval or acceptance will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor under the Contractor Quality Control (CQC) requirements of this contract is responsible for dimensions, the design of adequate connections and details, and the satisfactory construction of all work.

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

1.14 APPROVED SAMPLES

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

Match the approved samples for materials and equipment incorporated in the work. If requested, approved samples, including those which may be damaged in testing, will be returned to the Contractor, at his expense, upon completion of the contract. Samples not approved will also be returned to the Contractor at its expense, if so requested.

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

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

Approval of the Contractor's samples by the Contracting Officer does not relieve the Contractor of his responsibilities under the contract.

1.15 WITHHOLDING OF PAYMENT

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

1.16 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: _____

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

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SECTION 01 33 29

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SECTION 01 33 29

SUSTAINABILITY REQUIREMENTS AND REPORTING

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN SOCIETY OF HEATING, REFRIGERATING, AND AIR-CONDITIONING ENGINEERS

ASHRAE 189.1	(2014) Standard for the Design of High-Performance Green Buildings

COUNCIL ON ENVIRONMENTAL QUALITY (CEQ) (WHITE HOUSE)

HPSB Guiding Principles	(2016) Guiding Principles for Sustainable Federal Buildings and Determining Compliance with the Guiding Principles for Sustainable Federal Buildings

U.S. DEPARTMENT OF AGRICULTURE (USDA)

FSRIA 9002	Farm Security and Rural Investment Act Section 9002 (USDA BioPreferred Program)

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

40 CFR 247	Comprehensive Procurement Guideline for Products Containing Recovered Materials
48 CFR 23	Environment, Energy and Water Efficiency, Renewable Energy Technologies, Occupational Safety, and Drug-Free Workplace

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. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Documentation Requirements; G, RO

Submit documentation that proves compliance with the listed requirement of this section.

1.3 SUMMARY

This specification includes general requirements and procedures for this project to be constructed and documented per the federally mandated "Guiding Principles" (GP) and other requirements identified in this specification.

1.4 LISTED ITEMS USED IN CONDUCT OF THE WORK BUT NOT INCORPORATED IN THE WORK

Many products listed in 40 CFR 247 and 48 CFR 23 have been designated or proposed by EPA and USDA to include recycled, recovered and biobased materials that may be used by the Contractor in performing the work but will not be incorporated into the work. These products include office products, temporary traffic control products, and pallets. It is recommended that these non-construction products, when used in the conduct of the work, contain the highest practicable percentage of recycled, recovered and biobased materials and that these products be recycled when no longer needed.

1.5 DOCUMENTATION REQUIREMENTS

Incorporate the following HPSB Guiding Principles Requirements into project construction and provide documentation that proves compliance with the listed requirements. The items below are organized according to the HPSB Guiding Principles.

1.5.1 Recycled Content

Comply with 40 CFR 247. Refer to https://www.epa.gov/smm/comprehensive-procurement-guidelines-cpm-program for assistance identifying products cited in 40 CFR 247. Selected products must comply with non-proprietary requirements of the Federal Acquisition Regulation, and must meet performance requirements. Provide the following documentation:

a. Manufacturers' documents stating the recycled content by material, or written justification for claiming one of the exceptions allowed on the cited website.

b. Substitutions: Submit for Government approval, proposed alternative products or systems that provide equivalent performance and appearance and have greater contribution to project recycled content requirements.

1.5.2 Landfill Disposal

Divert construction debris from landfill disposal in accordance with Section 01 74 19 CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT. Provide the following documentation:

a. Monthly documentation showing total amount, by weight, of construction debris diverted from landfill as a percentage of all construction debris on the project. The Contractor shall divert a minimum of 60 percent of waste and construction debris from landfill disposal as specified in Section 01 74 19 CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT.

b. Include in documentation the total solid waste generated in tons, the total solid waste diverted from landfill in tons, and the total cost of the solid waste generated.

c. Include project's Construction Waste Management Plan (see Section 01 74 19 CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT) and all dumpster haul tickets.

1.5.3 Bio-Based Products

Provide products and material composed of the highest percentage of biobased materials (including rapidly renewable resources and certified sustainably harvested products), consistent with FSRIA 9002 USDA BioPreferred Program, to the maximum extent possible without jeopardizing the intended end use or detracting from the overall quality delivered to the end user. Use only supplies and materials of a type and quality that conform to applicable specifications and standards.

Comply with FSRIA 9002 USDA BioPreferred Program. Refer to https://www.biopreferred.gov/BioPreferred/ for the product categories and BioPreferred Catalog. Selected products must comply with non-proprietary requirements of the Federal Acquisition Regulation, and must meet performance requirements. Provide the following documentation:

- USDA BioPreferred label for each product; for bio-based products used on project but not listed with BioPreferred program, provide bio-based content and percentage.

1.5.4 Regional Materials

If feasible and technically appropriate, the Contractor shall comply with ASHRAE 189.1, Section 9.4.1.2 "Regional Materials" requirements for project materials. Provide the following documentation: percentage of materials or products used, based on cost, which were regionally extracted/harvested/recovered or manufactured. Indicate name of the manufacturer, cost of each product and the use of each product on this project.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 SUSTAINABILITY COORDINATION

Provide sustainability focus and coordination at the following meetings to achieve sustainability goals. Contractor's designated sustainability professional responsible for GP documentation shall participate in the following meetings to coordinate documentation completion.

a. Pre-Construction Conference: Discuss the following: sustainability actions and documentation requirements, construction submittal requirements and schedule, and individuals responsible for achieving each Guiding Principle Requirement.

b. Construction Progress Meetings: Review GP sustainability requirements with project team including contractor and sub-contractor representatives.

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GOVERNMENTAL SAFETY REQUIREMENTS

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN PETROLEUM INSTITUTE (API)

API RP 2219	(2005; R 2012) Safe Operation of Vacuum Trucks in Petroleum Service

AMERICAN SOCIETY OF SAFETY ENGINEERS (ASSE/SAFE)

ASSE/SAFE A10.34	(2021) Protection of the Public on or Adjacent to Construction Sites
ASSE/SAFE A10.44	(2020) Control of Energy Sources (Lockout/Tagout) for Construction and Demolition Operations
ASSE/SAFE Z244.1	(2016) Control of Hazardous Energy Lockout/Tagout and Alternative Methods
ASSE/SAFE Z359.0	(2018) Definitions and Nomenclature Used for Fall Protection and Fall Arrest
ASSE/SAFE Z359.1	(2020) Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components
ASSE/SAFE Z359.11	(2014) Safety Requirements for Full Body Harnesses
ASSE/SAFE Z359.12	(2019) Connecting Components for Personal Fall Arrest Systems
ASSE/SAFE Z359.13	(2013) Personal Energy Absorbers and Energy Absorbing Lanyards
ASSE/SAFE Z359.14	(2014) Safety Requirements for Self-Retracting Devices for Personal Fall Arrest and Rescue Systems
ASSE/SAFE Z359.15	(2014) Safety Requirements for Single Anchor Lifelines and Fall Arresters for Personal Fall Arrest Systems
ASSE/SAFE Z359.2	(2017) Minimum Requirements for a Comprehensive Managed Fall Protection Program

ASSE/SAFE Z359.3	(2019) Safety Requirements for Positioning and Travel Restraint Systems
ASSE/SAFE Z359.4	(2013) Safety Requirements for Assisted-Rescue and Self-Rescue Systems, Subsystems and Components
ASSE/SAFE Z359.6	(2016) Specifications and Design Requirements for Active Fall Protection Systems
ASSE/SAFE Z359.7	(2019) Qualification and Verification Testing of Fall Protection Products

ASME INTERNATIONAL (ASME)

ASME B30.20	(2018) Below-the-Hook Lifting Devices
ASME B30.22	(2016) Articulating Boom Cranes
ASME B30.26	(2015; R 2020) Rigging Hardware
ASME B30.3	(2020) Tower Cranes
ASME B30.5	(2021) Mobile and Locomotive Cranes
ASME B30.8	(2020) Floating Cranes and Floating Derricks
ASME B30.9	(2018) Slings

ASTM INTERNATIONAL (ASTM)

ASTM F855	(2019) Standard Specifications for Temporary Protective Grounds to Be Used on De-energized Electric Power Lines and Equipment

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE 1048	(2016) Guide for Protective Grounding of Power Lines
IEEE C2	(2017; Errata 1-2 2017; INT 1 2017) National Electrical Safety Code

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 10	(2022) Standard for Portable Fire Extinguishers
NFPA 241	(2022) Standard for Safeguarding Construction, Alteration, and Demolition Operations
NFPA 51B	(2019; TIA 20-1) Standard for Fire Prevention During Welding, Cutting, and Other Hot Work

NFPA 70	(2020; ERTA 20-1 2020; ERTA 20-2 2020; TIA 20-1; TIA 20-2; TIA 20-3; TIA 20-4) National Electrical Code
NFPA 70E	(2021) Standard for Electrical Safety in the Workplace
NFPA 241	(2022) Standard for Safeguarding Construction, Alteration, and Demolition Operations
NFPA 306	(2019) Standard for the Control of Gas Hazards on Vessels

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	(2014) Safety and Health Requirements Manual

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

29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1910.120	Hazardous Waste Operations and Emergency Response
29 CFR 1910.146	Permit-required Confined Spaces
29 CFR 1910.147	Control of Hazardous Energy (Lock Out/Tag Out)
29 CFR 1910.333	Selection and Use of Work Practices
29 CFR 1915.89	Control of Hazardous Energy (Lockout/Tags-Plus)
29 CFR 1926	Safety and Health Regulations for Construction
29 CFR 1926.1400	Cranes and Derricks in Construction
29 CFR 1926.16	Rules of Construction
29 CFR 1926.450	Scaffolds
29 CFR 1926.500	Fall Protection
29 CFR 1926.65	Hazardous Waste Operations and Emergency Response

49 CFR 171	General Information, Regulations, and Definitions
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
29 CPL 2.100	(1995) Application of the Permit-Required Confined Spaces (PRCS) Standards, 29 CFR 1910.146

1.2 DEFINITIONS

1.2.1 Competent Person (CP)

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

1.2.2 Competent Person, Confined Space

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

1.2.3 Competent Person, Cranes and Rigging

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

1.2.4 Competent Person, Excavation/Trenching

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

hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.5 Competent Person, Fall Protection

The CP, Fall Protection, is a person meeting the competent person requirements as defined in EM 385-1-1 Appendix Q and in accordance with ASSE/SAFE Z359.0, who has been designated in writing by the employer to be responsible for immediate supervising, implementing and monitoring of the fall protection program, who through training, knowledge and experience in fall protection and rescue systems and equipment, is capable of identifying, evaluating and addressing existing and potential fall hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.6 Competent Person, Scaffolding

The CP, Scaffolding is a person meeting the competent person requirements in EM 385-1-1 Appendix Q, and designated in writing by the employer to be responsible for immediate supervising, implementing and monitoring of the scaffolding program. The CP for Scaffolding has enough training, knowledge and experience in scaffolding to correctly identify, evaluate and address existing and potential hazards and also has the authority to take prompt corrective measures with regard to these hazards. CP qualifications must be documented and include experience on the specific scaffolding systems/types being used, assessment of the base material that the scaffold will be erected upon, load calculations for materials and personnel, and erection and dismantling. The CP for scaffolding must have a documented, minimum of 8-hours of scaffold training to include training on the specific type of scaffold being used (e.g. mast-climbing, adjustable, tubular frame), in accordance with EM 385-1-1 Section 22.B.02.

1.2.7 Competent Person (CP) Trainer

A competent person trainer as defined in EM 385-1-1 Appendix Q, who is qualified in the material presented, and who possesses a working knowledge of applicable technical regulations, standards, equipment and systems related to the subject matter on which they are training Competent Persons. A competent person trainer must be familiar with the typical hazards and the equipment used in the industry they are instructing. The training provided by the competent person trainer must be appropriate to that specific industry. The competent person trainer must evaluate the knowledge and skills of the competent persons as part of the training process.

1.2.8 High Risk Activities

High Risk Activities are activities that involve work at heights, crane and rigging, excavations and trenching, scaffolding, electrical work, and confined space entry.

1.2.9 High Visibility Accident

A High Visibility Accident is any mishap which may generate publicity or high visibility.

1.2.10 Load Handling Equipment (LHE)

LHE is a term used to describe cranes, hoists and all other hoisting equipment (hoisting equipment means equipment, including crane, derricks, hoists and power operated equipment used with rigging to raise, lower or horizontally move a load).

1.2.11 Medical Treatment

Medical Treatment is treatment administered by a physician or by registered professional personnel under the standing orders of a physician. Medical treatment does not include first aid treatment even through provided by a physician or registered personnel.

1.2.12 Near Miss

A Near Miss is a mishap resulting in no personal injury and zero property damage, but given a shift in time or position, damage or injury may have occurred (e.g., a worker falls off a scaffold and is not injured; a crane swings around to move the load and narrowly misses a parked vehicle).

1.2.13 Operating Envelope

The Operating Envelope is the area surrounding any crane or load handling equipment. Inside this "envelope" is the crane, the operator, riggers and crane walkers, other personnel involved in the operation, rigging gear between the hook, the load, the crane's supporting structure (i.e. ground or rail), the load's rigging path, the lift and rigging procedure.

1.2.14 Qualified Person (QP)

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

1.2.15 Qualified Person, Fall Protection (QP for FP)

A QP for FP is a person meeting the requirements of EM 385-1-1 Appendix Q, and ASSE/SAFE Z359.0, with a recognized degree or professional certificate and with extensive knowledge, training and experience in the fall protection and rescue field who is capable of designing, analyzing, and evaluating and specifying fall protection and rescue systems.

1.2.16 Recordable Injuries or Illnesses

Recordable Injuries or Illnesses are any work-related injury or illness that results in:

a. Death, regardless of the time between the injury and death, or the length of the illness;

b. Days away from work (any time lost after day of injury/illness onset);

c. Restricted work;

d. Transfer to another job;

e. Medical treatment beyond first aid;

f. Loss of consciousness; or

g. A significant injury or illness diagnosed by a physician or other licensed health care professional, even if it did not result in (a) through (f) above.

1.2.17 USACE Property and Equipment

Interpret "USACE" property and equipment specified in USACE EM 385-1-1 as Government property and equipment.

1.2.18 Load Handling Equipment (LHE) Accident or Load Handling Equipment Mishap

A LHE accident occurs when any one or more of the eight elements in the operating envelope fails to perform correctly during operation, including operation during maintenance or testing resulting in personnel injury or death; material or equipment damage; dropped load; derailment; two-blocking; overload; or collision, including unplanned contact between the load, crane, or other objects. A dropped load, derailment, two-blocking, overload and collision are considered accidents, even though no material damage or injury occurs. A component failure (e.g., motor burnout, gear tooth failure, bearing failure) is not considered an accident solely due to material or equipment damage unless the component failure results in damage to other components (e.g., dropped boom, dropped load, or roll over). Document any mishap that meets the criteria described in the Contractor Significant Incident Report (CSIR) using the Crane High Hazard working group mishap reporting form.

1.3 DESCRIPTION OF WORK

The work under this contract will occur on the Durham Manufacturing Company (DMC) property located at 201 and 203 Main Street. DMC is an active manufacturing facility. The site soil and groundwater contaminants in the work area include volatile organic compounds (VOCs), particularly TCE, PCE, methylene chloride, benzene, toluene, ethylbenzene, xylenes. A summary of Site contamination is included in Appendix A "Historic Site Data" at the end of the specifications.

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. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Accident Prevention Plan (APP); G, RO

SD-02 Shop Drawings

Work Zones; G, RO

Decontamination Facilities; G, RO

SD-03 Product Data

Amendments to the APP/SSHP

Exposure Monitoring/Air Sampling Program

Site Control Log

Employee Certificates

Certificate of Worker/Visitor Acknowledgement

SSHO's Daily Inspection Logs

Safety and Health Phase-Out Report

SD-06 Test Reports

Monthly Exposure Reports

Notifications and Reports

Accident Reports; G, RO

LHE Inspection Reports

SD-07 Certificates

Crane Operators/Riggers

Standard Lift Plan; G, RO

Critical Lift Plan ; G, RO

Activity Hazard Analysis (AHA)

Confined Space Entry Permit

Hot Work Permit

Certificate of Compliance

License Certificates

1.5 MONTHLY EXPOSURE REPORTS

Provide a Monthly Exposure Report and attach to the monthly billing request. This report is a compilation of employee-hours worked each month for all site workers, both Prime and subcontractor. Failure to submit the report may result in retention of up to 10 percent of the voucher.

1.6 REGULATORY REQUIREMENTS

In addition to the detailed requirements included in the provisions of this contract, comply with the most recent edition of USACE EM 385-1-1 OSHA requirements in 29 CFR 1910 and 29 CFR 1926. OSHA Standards 29 CFR 1926.65 and 29 CFR 1910.120 state specific OSHA requirements here applicable. Submit matters of interpretation of standards to the appropriate administrative agency or Contracting Officer for resolution before starting work. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements govern.

1.7 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.

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

A Certified Industrial Hygienist (CIH) must prepare and implement a written site-specific APP including a Site Safety and Health Plan to be attached to the APP as an appendix. Prepare the APP/SSHP in accordance with the format and requirements of EM 385-1-1, Appendix A, and Section 33.B.02. Cover all paragraph and subparagraph elements. There are overlapping elements in Section 33.B.02 and Appendix A of EM 385-1-1. SSHP appendix elements that overlap with APP elements need not be duplicated in the APP/SSHP provided each SOH issue receives adequate attention and is documented in the APP/SSHP.

The APP/SSHP must be job-specific and address any unusual or unique aspects of the project or activity for which it is written. The APP/SSHP must interface with the Contractor's overall safety and health program. 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. For long duration projects, resubmit the APP/SSHP to the Contracting Officer annually for review. Submit amendments to the APP/SSHP to the COR as the APP/SSHP is updated.

The APP/SSHP shall describe methods to evaluate past safety performance of potential subcontractors in the selection process. Also, describe innovative methods used to ensure and monitor safe work practices of subcontractors. The Government considers the Prime Contractor to be the "controlling authority" for all work site safety and health of the subcontractors. Contractors are responsible for informing their subcontractors of the safety provisions under the terms of the contract and the penalties for noncompliance, coordinating the work to prevent one craft from interfering with or creating hazardous working conditions for other crafts, and inspecting subcontractor operations to ensure that accident prevention responsibilities are being carried out. The APP/SSHP must be signed by an officer of the firm (Prime Contractor senior person), the individual preparing the APP/SSHP, the on-site superintendent, the designated SSHO, and

the Contractor Quality Control Manager. The SSHO must provide and maintain the APP/SSHP and a log of signatures by each subcontractor foreman, attesting that they have read and understand the APP/SSHP, and make the APP/SSHP and log available on-site to the Contracting Officer. If English is not the foreman's primary language, the Prime Contractor must provide an interpreter.

Submit the APP/SSHP to the Contracting Officer 15 calendar days prior to the date of the preconstruction conference for acceptance. Work cannot proceed without an accepted APP/SSHP. Once reviewed and accepted by the Contracting Officer, the APP/SSHP and attachments will be enforced as part of the contract. Disregarding the provisions of this contract or the accepted APP/SSHP is cause for stopping of work, at the discretion of the Contracting Officer, until the matter has been rectified. Continuously review and amend the APP/SSHP, as necessary, throughout the life of the contract. Changes to the accepted APP/SSHP must be made with the knowledge and concurrence of the Contracting Officer, project superintendent, SSHO and Quality Control Manager.

Incorporate unusual or high-hazard activities not identified in the original APP/SSHP as they are discovered. Should any severe hazard exposure (i.e. imminent danger) become evident, stop work in the area, secure the area, and develop a plan to remove the exposure and control the hazard. Notify the Contracting Officer immediately of such a discovery. Eliminate and remove the hazard. In the interim, take all necessary action to restore and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public (as defined by ASSE/SAFE A10.34), and the environment.

It is the Contractor's responsibility to evaluate 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.

1.8.1 Acceptance and Modifications

Prior to submittal, the APP/SSHP must be signed and dated by the Safety and Health Manager, the SSHO, and the Site Superintendent. Submit for review 14 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.

1.8.2 Names and Qualifications

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

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

b. Qualifications of competent and of qualified persons. As a minimum, designate and submit qualifications of competent persons for each of the following major areas: excavation; scaffolding; fall protection; hazardous energy; confined space; health hazard recognition, evaluation and control of chemical, physical and biological agents; and personal protective equipment and clothing to include selection, use and maintenance.

1.8.3 Availability

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

1.9 SITE QUALIFICATIONS AND DUTIES

1.9.1 Personnel Qualifications

1.9.1.1 Safety and Health Manager

Safety and Health Manager must be a Certified Industrial Hygienist (CIH), certified by the American Board of Industrial Hygiene and have the following additional qualifications:

a. A minimum of 4 years experience in developing and implementing safety and health programs at hazardous waste sites.

b. At least 10 years of experience developing, managing, and implementing perimeter air monitoring projects involving contaminated soil activities.

c. Documented experience in supervising professional and technician level personnel.

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

e. 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.

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

1.9.1.2 Site Safety and Health Officer (SSHO)

The SSHO must meet the requirements of EM 385-1-1, Section 1. The SSHO must ensure that the requirements of 29 CFR 1926.16 are met for the project. Provide a Safety oversight team that includes a minimum of one (1) person at each project site to function as the Site Safety and Health Officer (SSHO). The SSHO or an equally-qualified Alternate SSHO must be at the work site at

all times to implement and administer the Contractor's safety program and government-accepted APP/SSHP. The SSHO and Alternate SSHO must have the required training, experience, and qualifications in accordance with EM 385-1-1 Section 01.A.17, and all associated sub-paragraphs. The SSHO shall have no other duties.

1.9.1.3 Contractor Quality Control (QC) Manager

The Contractor Quality Control (QC) person cannot be the SSHO on this project, even though the QC has safety inspection responsibilities as part of the QC duties.

1.9.1.4 Competent Person Qualifications

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

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

1.9.1.5 Competent Person for Scaffolding

Provide a Competent Person for Scaffolding who meets the requirements of EM 385-1-1, Section 22.B.02 and herein.

1.9.1.6 Competent Person for Fall Protection

Provide a Competent Person for Fall Protection who meets the requirements of EM 385-1-1, Section 21.C.04 and herein.

1.9.1.7 Competent Person for Confined Space Entry

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

1.9.1.8 Qualified Trainer Requirements

Individuals qualified to instruct the 40 hour contract safety awareness course, or portions thereof, must meet the definition of a Competent Person Trainer, and, at a minimum, possess a working knowledge of the following subject areas: EM 385-1-1, Electrical Standards, Lockout/Tagout, Fall Protection, Confined Space Entry for Construction; Excavation, Trenching and Soil Mechanics, and Scaffolds in accordance with 29 CFR 1926.450, Subpart L.

Instructors are required to:

a. Prepare class presentations that cover construction-related safety requirements. Ensure that all attendees attend all sessions by using a class roster signed daily by each attendee. Maintain copies of the roster for at least five (5) years. This is a certification class and must be attended 100 percent. In cases of emergency where an attendee cannot make it to a session, the attendee can make it up in another class session for the same subject.

b. Update training course materials whenever an update of the EM 385-1-1 becomes available.

c. Provide a written exam of at least 50 questions. Students are required to answer 80 percent correctly to pass.

1.9.1.9 Crane Operators/Riggers

Provide Operators meeting the requirements in EM 385-1-1, Section 15.B for Riggers and Section 16.B for Crane Operators. In addition, for mobile cranes with Original Equipment Manufacturer (OEM) rated capacities of 50,000 pounds or greater, designate crane operators qualified by a source that qualifies crane operators (i.e., union, a government agency, or an organization that tests and qualifies crane operators). Provide proof of current qualification.

1.9.2 Personnel Duties

1.9.2.1 Duties of the Safety and Health Manager

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 present onsite during the first 3 days of activities and at the startup of each new major phase of work.

e. Visit the site as needed and at least once per month 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.

1.9.2.2 Duties of the Site Safety and Health Officer (SSHO)

a. Conduct daily safety and health inspections and maintain a written log which includes area/operation inspected, date of inspection, identified hazards, recommended corrective actions, estimated and actual dates of corrections. Attach safety inspection logs to the Contractors' daily production report.

b. Conduct mishap investigations and complete required accident reports. Report mishaps and near misses.

c. Use OSHA's Form 300 to log work-related injuries and illnesses occurring on the project site for Prime Contractors and subcontractors. Post and maintain the Form 300 on the site Safety Bulletin Board.

d. Maintain applicable safety reference material on the job site.

e. Attend the pre-construction conference, pre-work meetings including preparatory meetings, and periodic in-progress meetings.

f. Review the APP and AHAs for compliance with EM 385-1-1, and approve, sign, implement and enforce them.

g. Establish a Safety and Occupational Health (SOH) Deficiency Tracking System that lists and monitors outstanding deficiencies until resolution.

h. Ensure subcontractor compliance with safety and health requirements.

i. Maintain a list of hazardous chemicals on site and their material Safety Data Sheets (SDS).

j. Provide and keep a record of site safety orientation and indoctrination for Contractor employees, subcontractor employees, and site visitors.

k. Maintain a weekly list of high hazard activities involving energy, equipment, excavation, entry into confined space, and elevation, and be prepared to discuss details during QC Meetings

Superintendent, QC Manager, and SSHO are subject to dismissal if the above duties are not being effectively carried out. If Superintendent, QC Manager, or SSHO are dismissed, project work will be stopped and will not be allowed to resume until a suitable replacement is approved and the above duties are again being effectively carried out.

1.9.3 Meetings

1.9.3.1 Preconstruction Conference

a. Contractor representatives who have a responsibility or significant role in accident prevention on the project must attend the preconstruction conference. This includes the project superintendent, Site Safety and Occupational Health officer, quality control manager, or any other assigned safety and health professionals who participated

in the development of the APP (including the Activity Hazard Analyses (AHAs) and special plans, program and procedures associated with it).

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

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

1.9.3.2 Safety Meetings

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

1.10 TRAINING

Meet the following requirements in the Contractor's training program for workers 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 and Sections 01.B.02 and 33.D.02 of EM 385-1-1. 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 PLANS

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

1.11.1 Standard Lift Plan (SLP)

Plan lifts to avoid situations where the operator cannot maintain safe control of the lift. Prepare a written SLP in accordance with EM 385-1-1, Section 16.A.03, using Form 16-2 for every lift or series of lifts (if duty cycle or routine lifts are being performed). The SLP must be developed, reviewed and accepted by all personnel involved in the lift in conjunction with the associated AHA. Signature on the AHA constitutes acceptance of the plan. Maintain the SLP on the LHE for the current lift(s) being made. Maintain historical SLPs for a minimum of 3 months.

1.11.2 Critical Lift Plan - Crane or Load Handling Equipment

Provide a Critical Lift Plan as required by EM 385-1-1, Section 16.H.01, using Form 16-3. Critical lifts require detailed planning and additional or unusual safety precautions. Develop and submit a critical lift plan to the Contracting Officer 30 calendar days prior to critical lift. Comply with load testing requirements in accordance with EM 385-1-1, Section 16.F.03.

In addition to the requirements of EM 385-1-1, Section 16.H.02, the critical lift plan must include the following:

1.11.2.1 Lifts of Personnel

For lifts of personnel, demonstrate compliance with the requirements of 29 CFR 1926.1400 and EM 385-1-1, Section 16.T.

1.11.2.2 Loads Suspended by Rigging Gear

Multi-purpose machines, material handling equipment, and construction equipment used to lift loads that are suspended by rigging gear, require proof of authorization from the machine OEM that the machine is capable of making lifts of loads suspended by rigging equipment. Demonstrate that the operator is properly trained and that the equipment is properly configured to make such lifts and is equipped with a load chart.

1.11.3 Fall Protection and Prevention (FP&P) Plan

The plan must comply with the requirements of EM 385-1-1, Section 21.D and ASSE/SAFE Z359.2, be site specific, and address all fall hazards in the work place and during different phases of construction. Include Fall Protection and Prevention Plan documentation in the APP/SSHP. Address how to protect and prevent workers from falling to lower levels when they are exposed to fall hazards above 6 feet. A competent person or qualified person for fall protection must prepare and sign the plan documentation. Include fall protection and prevention systems, equipment and methods employed for every phase of work, roles and responsibilities, assisted rescue, self-rescue and evacuation procedures, training requirements, and monitoring methods. Review and revise, as necessary, the Fall Protection and Prevention Plan documentation as conditions change, but at a minimum every six months, for lengthy projects, reflecting any changes during the course of construction due to changes in personnel, equipment, systems or work habits. Keep and maintain the accepted Fall Protection and Prevention Plan documentation at the job site for the duration of the project.

1.11.4 Rescue and Evacuation Plan

Provide a Rescue and Evacuation Plan in accordance with EM 385-1-1 Section 21.N and ASSE/SAFE Z359.2, and include in the FP&P Plan and as part of the APP. Include a detailed discussion of the following: methods of rescue; methods of self-rescue; equipment used; training requirement; specialized training for the rescuers; procedures for requesting rescue and medical assistance; and transportation routes to a medical facility.

1.11.5 Hazardous Energy Control Program (HECP)

Develop a HECP in accordance with EM 385-1-1 Section 12, 29 CFR 1910.147, 29 CFR 1910.333, 29 CFR 1915.89, ASSE/SAFE Z244.1, and ASSE/SAFE A10.44. Submit this HECP as part of the Accident Prevention Plan (APP). Conduct a preparatory meeting and inspection with all effected personnel to coordinate all HECP activities. Document this meeting and inspection in accordance with EM 385-1-1, Section 12.A.02. Ensure that each employee is familiar with and complies with these procedures.

1.11.6 Excavation Plan

Identify the safety and health aspects of excavation, and provide and prepare the plan in accordance with EM 385-1-1 and the appropriate technical specification sections.

1.11.7 Site Safety and Health Plan

Identify the safety and health aspects, and prepare in accordance with EM 385-1-1, Section 33.B.02 and specification section 01 35 29.13 paragraph 1.4.

1.11.8 Confined Space Entry Plan

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

1.12 PERSONAL PROTECTIVE EQUIPMENT

1.12.1 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. 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.

1.12.2 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.

1.12.2.1 Initial PPE Components

Initial minimum protective clothing and equipment shall conform to Level D.

1.13 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.

1.13.1 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.

1.13.2 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.

1.13.3 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.

1.13.4 Employee Certificates

Provided on employee certificates 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.

1.14 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. Submit personnel exposure monitoring/sampling results to the COR as soon as the data becomes available. Provide to the COR a written summary and evaluation of exposure monitoring/air sampling results within 24 hours after receipt of analytical data.

1.15 HEAT STRESS/COLD 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 and cold stress.

1.16 SPILL AND DISCHARGE CONTROL

Develop and implement written spill and discharge containment/control procedures. Address radioactive wastes, shock sensitive wastes, 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.

1.17 MATERIALS TRANSFER SAFETY

Remove liquids and residues from the tanks using explosion-proof or air-driven pumps. Bond to the tank and ground pump motors and suction hoses to prevent electrostatic ignition hazards. Use of a hand pump will be permitted to remove the last of the liquid from the bottom of the tanks. If a vacuum truck is used for removal of liquids or residues, the area of operation for the vacuum truck must be vapor free. locate the truck upwind from the tank and outside the path of probable vapor travel. Discharge the vacuum pump exhaust gases through a hose of adequate size and length downwind of the truck and tank area. Vacuum truck operating and safety practices must conform to API RP 2219. Collect tank residues in drums, tanks, or tank trucks labeled according to 49 CFR 171 and 49 CFR 172 and disposed of as specified. Disconnect and drain fittings and lines of their contents after the materials have been transferred and the tanks have been exposed. Do not spill contents into the environment during cutting or disconnecting of tank fittings. Transfer materials drained into DOT-approved drums for storage and/or transportation. Only non-sparking or non-heat producing tools shall be used to disconnect and drain or to cut through tank fittings. Electrical equipment (e.g., pumps, portable hand tools, etc.) used for tank preparation must be explosion-proof. Following cutting or disconnecting of the fittings, plug openings leading to the tanks.

1.18 SITE CONTROL MEASURES

1.18.1 Work Zones

Initial anticipated work zone boundaries (exclusion zone, contamination reduction zone, support zone, all access points and decontamination areas) are to be clearly delineated on the site drawings. Base delineation of work zone boundaries on the contamination characterization data and the hazard/risk analysis to be performed as described in paragraph: HAZARD/RISK ANALYSIS. As work progresses and field conditions are monitored, work zone boundaries may be modified (and site drawings modified) with approval of the Contracting Officer. Clearly identify work zones and marked in the field (using fences, tape, signs, etc.). Submit and post a site map, showing work zone boundaries and locations of decontamination facilities in the onsite office. Work zones must consist of the following:

1.18.1.1 Exclusion Zone (EZ)

The exclusion zone is the area where hazardous contamination is either known or expected to occur and the greatest potential for exposure exists. Control entry into this area and exit may only be made through the CRZ.

1.18.1.2 Contamination Reduction Zone (CRZ)

The CRZ is the transition area between the Exclusion Zone and the Support Zone. The personnel and equipment decontamination areas must be separate and unique areas located in the CRZ.

1.18.1.3 Support Zone (SZ)

The Support Zone is defined as areas of the site, other than exclusion zones and contamination reduction zones, where workers do not have the potential to be exposed to hazardous substances or dangerous conditions resulting from hazardous waste operations. Secure the Support Zone against active or passive contamination. Site offices, parking areas, and other support facilities must be located in the Support Zone.

1.19 SITE CONTROL LOG

A log of personnel visiting, entering, or working on the site must be maintained. Include the following: date, name, agency or company, time entering and exiting site, time entering and exiting the exclusion zone (if applicable). Before visitors are allowed to enter the Contamination Reduction Zone or Exclusion Zone, they must show proof of current training, medical surveillance and respirator fit testing (if respirators are required for the tasks to be performed) and fill out a Certificate of Worker or Visitor Acknowledgment. Record this visitor information, including date, in the log.

1.20 COMMUNICATION

Provide and install an employee alarm system that has adequate means of on and off site communication in accordance with 29 CFR 1910 Section .165. The means of communication must be able to be perceived above ambient noise or light levels by employees in the affected portions of the workplace. The signals must be distinctive and recognizable as messages to evacuate or to perform critical operations.

1.21 SITE SECURITY

Print signs in bold large letters on contrasting backgrounds. Signs must be visible from all points where entry might occur and at such distances from the restricted area that employees may read the signs and take necessary protective steps before entering.

1.22 PERSONAL HYGIENE AND DECONTAMINATION

Personnel entering the Exclusion or Contamination Reduction Zones or otherwise exposed to hazardous chemical vapors, gases, liquids, or contaminated solids must decontaminate themselves and their equipment prior to exiting the contamination reduction zone (CRZ) and entering the support zone. Consult Chapter 10.0 of NIOSH 85-115 when preparing decontamination procedures. Submit a detailed discussion of personal hygiene and decontamination facilities and procedures to be followed by site workers as part of the APP/SSHP. Train employees in the procedures and enforce the procedures throughout site operations.

1.22.1 Decontamination Facilities

Submit drawings showing the layout of the personnel and equipment decontamination areas per requirements of Section 02130 and as described herein.

1.22.2 Personnel Decontamination

Initially set up a decontamination line in the CRZ. Employees must exit the exclusion zone through the CRZ and implement the following decontamination

procedures and techniques: hand and face wash. Showers, if needed, must comply with 29 CFR 1910, Section.141 and EM 385-1-1, 02 C, Washing Facilities. It is the Site Safety and Health Officer's responsibility to recommend techniques to improve personnel decontamination procedures, if necessary.

1.22.3 Equipment Decontamination

Decontaminate the vehicles and equipment used in the EZ shall be decontaminated in the CRZ prior to leaving the site.

1.22.3.1 Procedures

Procedures for equipment decontamination must be developed and utilized to prevent the spread of contamination into the SZ and offsite areas. These procedures must address disposal of contaminated products and spent materials used on the site, including containers, fluids, oils, etc. Assume any item taken into the EZ to be contaminated and perform an inspection and decontaminate. Vehicles, equipment, and materials must be cleaned and decontaminated prior to leaving the site. Handle construction material in such a way as to minimize the potential for contaminants being spread and/or carried offsite. Prior to exiting the site, vehicles and equipment must be monitored to ensure the adequacy of decontamination.

1.23 ACTIVITY HAZARD ANALYSIS (AHA)

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

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

1.23.1 AHA Management

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

1.23.2 AHA Signature Log

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

1.24 DISPLAY OF SAFETY INFORMATION

1.24.1 Safety Bulletin Board

Within one calendar day after commencement of work, erect a safety bulletin board at the job site. Where size, duration, or logistics of project do not facilitate a bulletin board, an alternative method, acceptable to the Contracting Officer, that is accessible and includes all mandatory information for employee and visitor review, may be deemed as meeting the requirement for a bulletin board. Include and maintain information on safety bulletin board as required by EM 385-1-1, Section 01.A.06. Additional items required to be posted include:

a. Hot work permit

b. Confined space entry permit

1.24.2 Safety and Occupational Health (SOH) Deficiency Tracking System

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

a. Date deficiency identified;

b. Description of deficiency;

c. Name of person responsible for correcting deficiency;

d. Projected resolution date;

e. Date actually resolved.

1.25 SITE SAFETY REFERENCE MATERIALS

Maintain safety-related references applicable to the project, including those listed in paragraph REFERENCES. Maintain applicable equipment manufacturer's manuals.

1.26 EMERGENCY MEDICAL TREATMENT

Contractors must arrange for their own emergency medical treatment. Government has no responsibility to provide emergency medical treatment.

1.27 NOTIFICATIONS AND REPORTS

1.27.1 Mishap Notification

Notify the Contracting Officer as soon as practical, but no more than four hours, after any mishaps, including recordable accidents, incidents, and near misses, as defined in EM 385-1-1 Appendix Q, any report of injury, illness, load handling equipment (LHE) or rigging mishaps, or any property damage. The Contractor is responsible for obtaining appropriate medical and emergency assistance and for notifying fire, law enforcement, and regulatory agencies. Immediate reporting is required for electrical mishaps, to include Arc Flash; shock; uncontrolled release of hazardous energy (includes electrical and non-electrical); load handling equipment or rigging; fall from height (any level other than same surface); and underwater diving. These mishaps must be investigated in depth to identify all causes and to recommend hazard control measures.

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

1.27.2 Accident Reports

a. Conduct an accident investigation for recordable injuries and illnesses, property damage, and near misses as defined in EM 385-1-1, to establish the root cause(s) of the accident. Complete the applicable USACE Accident Report Form 3394, and lessons learned document and submit to the Contracting Officer within 5 calendar day(s) of the accident

b. Conduct an accident investigation for any load handling equipment accident (including rigging gear accidents) to establish the root cause(s) of the accident. Complete the Accident Report form and provide the report to the Contracting Officer within TEN calendar days of the accident. Do not proceed with crane operations until cause is determined and corrective actions have been implemented to the satisfaction of the Contracting Officer.

1.27.3 LHE Inspection Reports

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

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

Provide a FORM 16-1 Certificate of Compliance for LHE entering an activity under this contract and in accordance with EM 385-1-1. Post certifications on the crane.

Develop a Standard Lift Plan (SLP) in accordance with EM 385-1-1, Section 16.H.03 using Form 16-2 Standard Pre-Lift Crane Plan/Checklist for each lift

planned. Submit SLP to the Contracting Officer for approval within 15 calendar days in advance of planned lift.

1.28 HOT WORK

1.28.1 Permit and Personnel Requirements

Submit and obtain a written permit prior to performing "Hot Work" (i.e. welding or cutting) or operating other flame-producing/spark producing devices, from the local fire department. CONTRACTORS ARE REQUIRED TO MEET ALL CRITERIA BEFORE A PERMIT IS ISSUED. Provide at least two 20 pound 4A:20 BC rated extinguishers for normal "Hot Work". The extinguishers must be current inspection tagged, and contain an approved safety pin and tamper resistant seal. It is also mandatory to have a designated FIRE WATCH for any "Hot Work" done at this activity. The Fire Watch must be trained in accordance with NFPA 51B and remain on-site for a minimum of one hour after completion of the task or as specified on the hot work permit.

When starting work in the facility, require personnel to familiarize themselves with the location of the nearest fire extinguisher and fire alarm boxes and place in memory the emergency local fire department phone number. REPORT ANY FIRE, NO MATTER HOW SMALL, TO THE RESPONSIBLE LOCAL FIRE DEPARTMENT IMMEDIATELY.

1.29 CONFINED SPACE ENTRY REQUIREMENTS

In the event Confined space entry must comply with Section 34 of EM 385-1-1, OSHA 29 CFR 1926, OSHA 29 CFR 1910, OSHA 29 CFR 1910.146, and OSHA Directive CPL 2.100. Any potential for a hazard in the confined space requires a permit system to be used.

1.29.1 Entry Procedures

Prohibit entry into a confined space by personnel for any purpose, including hot work, until the qualified person has conducted appropriate tests to ensure the confined or enclosed space is safe for the work intended and that all potential hazards are controlled or eliminated and documented. Comply with EM 385-1-1, Section 34 for entry procedures. Hazards pertaining to the space must be reviewed with each employee during review of the AHA.

1.29.2 Forced Air Ventilation

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

1.29.3 Rescue Procedures and Coordination with Local Emergency Responders

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

1.30 SEVERE STORM PLAN

In the event of a severe storm warning, the Contractor must:

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

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

c. Ensure that temporary erosion controls are adequate.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 CONSTRUCTION AND OTHER WORK

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

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

a. Long Pants

b. Appropriate Safety Shoes

c. Hard Hat

d. Appropriate Class Reflective Vests

3.1.1 Worksite Communication

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

3.1.2 Hazardous Material Exclusions

Notwithstanding any other hazardous material used in this contract, radioactive materials or instruments capable of producing ionizing/non-ionizing radiation (with the exception of radioactive material and devices used in accordance with EM 385-1-1 such as nuclear density meters for compaction testing and laboratory equipment with radioactive sources) as well as materials which contain asbestos, mercury or polychlorinated biphenyls, di-isocyanates, lead-based paint, and hexavalent chromium, are

prohibited. The Contracting Officer, upon written request by the Contractor, may consider exceptions to the use of any of the above excluded materials. Low mercury lamps used within fluorescent lighting fixtures are allowed as an exception without further Contracting Officer approval. Notify the Radiation Safety Officer (RSO) prior to excepted items of radioactive material and devices being brought on base.

3.1.3 Unforeseen Hazardous Material

Contract documents identify materials such as PCB, lead paint, and friable and non-friable asbestos and other OSHA regulated chemicals (i.e. 29 CFR Part 1910.1000). If material(s) that may be hazardous to human health upon disturbance are encountered during construction operations, stop that portion of work and notify the Contracting Officer immediately. Within 14 calendar days the Government will determine if the material is hazardous. If material is not hazardous or poses no danger, the Government will direct the Contractor to proceed without change. If material is hazardous and handling of the material is necessary to accomplish the work, the Government will issue a modification pursuant to FAR 52.243-4, "Changes" and FAR 52.236-2, "Differing Site Conditions."

3.2 PRE-OUTAGE COORDINATION MEETING

Apply for utility outages at least 14 days in advance. As a minimum, the request must include the location of the outage, utilities being affected, duration of outage and any necessary sketches. Special requirements for electrical outage requests are contained elsewhere in this specification section. Once approved, and prior to beginning work on the utility system requiring shut down, attend a pre-outage coordination meeting with the Contracting Officer to review the scope of work and the lock-out/tag-out procedures for worker protection. No work will be performed on energized electrical circuits unless proof is provided that no other means exist.

3.3 CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT)

Provide and operate a Hazardous Energy Control Program (HECP) in accordance with EM 385-1-1 Section 12, 29 CFR 1910.333, 29 CFR 1915.89, and paragraph HAZARDOUS ENERGY CONTROL PROGRAM (HECP).

3.4 FALL PROTECTION PROGRAM

Establish a fall protection program, for the protection of all employees exposed to fall hazards. Within the program include company policy, identify roles and responsibilities, education and training requirements, fall hazard identification, prevention and control measures, inspection, storage, care and maintenance of fall protection equipment and rescue and evacuation procedures in accordance with ASSE/SAFE Z359.2 and EM 385-1-1, Sections 21.A and 21.D.

3.4.1 Training

Institute a fall protection training program. As part of the Fall Protection Program, provide training for each employee who might be exposed to fall hazards. Provide training by a competent person for fall protection in accordance with EM 385-1-1, Section 21.C. Document training and practical application of the competent person in accordance with EM 385-1-1, Section 21.C.04 and ASSE/SAFE Z359.2 in the AHA.

3.4.2 Fall Protection Equipment and Systems

Enforce use of personal fall protection equipment and systems designated (to include fall arrest, restraint, and positioning) for each specific work activity in the Site-Specific Fall Protection and Prevention Plan and AHA at all times when an employee is exposed to a fall hazard. Protect employees from fall hazards as specified in EM 385-1-1, Section 21.

Provide personal fall protection equipment, systems, subsystems, and components that comply with EM 385-1-1 Section 21.I, 29 CFR 1926.500 Subpart M,ASSE/SAFE Z359.0, ASSE/SAFE Z359.1, ASSE/SAFE Z359.2, ASSE/SAFE Z359.3, ASSE/SAFE Z359.4, ASSE/SAFE Z359.6, ASSE/SAFE Z359.7, ASSE/SAFE Z359.11, ASSE/SAFE Z359.12, ASSE/SAFE Z359.13, ASSE/SAFE Z359.14, and ASSE/SAFE Z359.15.

3.4.2.1 Additional Personal Fall Protection

In addition to the required fall protection systems, other protection such as safety skiffs, personal floatation devices, and life rings, are required when working above or next to water in accordance with EM 385-1-1, Sections 21.O through 21.O.06. Personal fall protection systems and equipment are required when working from an articulating or extendible boom, swing stages, or suspended platform. In addition, personal fall protection systems are required when operating other equipment such as scissor lifts. The need for tying-off in such equipment is to prevent ejection of the employee from the equipment during raising, lowering, travel, or while performing work.

3.4.2.2 Personal Fall Protection Harnesses

Only a full-body harness with a shock-absorbing lanyard or self-retracting lanyard is an acceptable personal fall arrest body support device. The use of body belts is not acceptable. Harnesses must have a fall arrest attachment affixed to the body support (usually a Dorsal D-ring) and specifically designated for attachment to the rest of the system. Snap hooks and carabiners must be self-closing and self-locking, capable of being opened only by at least two consecutive deliberate actions and have a minimum gate strength of 3,600 lbs in all directions. Use webbing, straps, and ropes made of synthetic fiber. The maximum free fall distance when using fall arrest equipment must not exceed 6 feet, unless the proper energy absorbing lanyard is used. Always take into consideration the total fall distance and any swinging of the worker (pendulum-like motion), that can occur during a fall, when attaching a person to a fall arrest system. All full body harnesses must be equipped with Suspension Trauma Preventers such as stirrups, relief steps, or similar in order to provide short-term relief from the effects of orthostatic intolerance in accordance with EM 385-1-1, Section 21.I.06.

3.4.3 Horizontal Lifelines (HLL)

Provide HLL in accordance with EM 385-1-1, Section 21.I.08.d.2. Commercially manufactured horizontal lifelines (HLL) must be designed, installed, certified and used, under the supervision of a qualified person, for fall protection as part of a complete fall arrest system which maintains a safety factor of 2 (29 CFR 1926.500). The competent person for fall protection may (if deemed appropriate by the qualified person) supervise the assembly, disassembly, use and inspection of the HLL system under the

direction of the qualified person. Locally manufactured HLLs are not acceptable unless they are custom designed for limited or site specific applications by a Registered Professional Engineer who is qualified in designing HLL systems.

3.4.4 Guardrails and Safety Nets

Design, install and use guardrails and safety nets in accordance with EM 385-1-1, Section 21.F.01 and 29 CFR 1926 Subpart M.

3.4.5 Rescue and Evacuation Plan and Procedures

When personal fall arrest systems are used, ensure that the mishap victim can self-rescue or can be rescued promptly should a fall occur. Prepare a Rescue and Evacuation Plan and include a detailed discussion of the following: methods of rescue; methods of self-rescue or assisted-rescue; equipment used; training requirement; specialized training for the rescuers; procedures for requesting rescue and medical assistance; and transportation routes to a medical facility. Include the Rescue and Evacuation Plan within the Activity Hazard Analysis (AHA) for the phase of work, in the Fall Protection and Prevention (FP&P) Plan, and the Accident Prevention Plan (APP). The plan must comply with the requirements of EM 385-1-1, ASSE/SAFE Z359.2, and ASSE/SAFE Z359.4.

3.5 WORK PLATFORMS

3.5.1 Scaffolding

Provide employees with a safe means of access to the work area on the scaffold. Climbing of any scaffold braces or supports not specifically designed for access is prohibited. Comply with the following requirements:

a. Scaffold platforms greater than 20 feet in height must be accessed by use of a scaffold stair system.

b. Ladders commonly provided by scaffold system manufacturers are prohibited for accessing scaffold platforms greater than 20 feet maximum in height.

c. An adequate gate is required.

d. Employees performing scaffold erection and dismantling must be qualified.

e. Scaffold must be capable of supporting at least four times the maximum intended load or without appropriate fall protection as delineated in the accepted fall protection and prevention plan.

f. Stationary scaffolds must be attached to structural building components to safeguard against tipping forward or backward.

g. Special care must be given to ensure scaffold systems are not overloaded.

h. Side brackets used to extend scaffold platforms on self-supported scaffold systems for the storage of material are prohibited. The first

tie-in must be at the height equal to 4 times the width of the smallest dimension of the scaffold base.

i. Scaffolding other than suspended types must bear on base plates upon wood mudsills (2 in x 10 in x 8 in minimum) or other adequate firm foundation.

j. Scaffold or work platform erectors must have fall protection during the erection and dismantling of scaffolding or work platforms that are more than six feet.

k. Delineate fall protection requirements when working above six feet or above dangerous operations in the Fall Protection and Prevention (FP&P) Plan and Activity Hazard Analysis (AHA) for the phase of work.

3.5.2 Elevated Aerial Work Platforms (AWPs)

Workers must be anchored to the basket or bucket in accordance with manufacturer's specifications and instructions (anchoring to the boom may only be used when allowed by the manufacturer and permitted by the CP). Lanyards used must be sufficiently short to prohibit worker from climbing out of basket. The climbing of rails is prohibited. Lanyards with built-in shock absorbers are acceptable. Self-retracting devices are not acceptable. Tying off to an adjacent pole or structure is not permitted unless a safe device for 100 percent tie-off is used for the transfer.

Use of AWPs must be operated, inspected, and maintained as specified in the operating manual for the equipment and delineated in the AHA. Operators of AWPs must be designated as qualified operators by the Prime Contractor. Maintain proof of qualifications on site for review and include in the AHA.

3.6 EQUIPMENT

3.6.1 Material Handling Equipment (MHE)

a. Material handling equipment such as forklifts must not be modified with work platform attachments for supporting employees unless specifically delineated in the manufacturer's printed operating instructions. Material handling equipment fitted with personnel work platform attachments are prohibited from traveling or positioning while personnel are working on the platform.

b. The use of hooks on equipment for lifting of material must be in accordance with manufacturer's printed instructions. Material Handling Equipment Operators must be trained in accordance with OSHA 29 CFR 1910, Subpart N.

c. Operators of forklifts or power industrial trucks must be licensed in accordance with OSHA.

3.6.2 Load Handling Equipment (LHE)

a. Equip cranes and derricks as specified in EM 385-1-1, Section 16.

b. Notify the Contracting Officer 15 working days in advance of any LHE entering the activity, in accordance with EM 385-1-1, Section 16.A.02, so that necessary quality assurance spot checks can be coordinated.

Contractor's operator must remain with the crane during the spot check. Rigging gear must comply with OSHA, ASME B30.9 Standards safety standards.

c. Comply with the LHE manufacturer's specifications and limitations for erection and operation of cranes and hoists used in support of the work. Perform erection under the supervision of a designated person (as defined in ASME B30.5). Perform all testing in accordance with the manufacturer's recommended procedures.

d. Comply with ASME B30.5 for mobile and locomotive cranes, ASME B30.22 for articulating boom cranes, ASME B30.3 for construction tower cranes, ASME B30.8 for floating cranes and floating derricks, ASME B30.9 for slings, ASME B30.20 for below the hook lifting devices and ASME B30.26 for rigging hardware.

e. Under no circumstance must a Contractor make a lift at or above 90 percent of the cranes rated capacity in any configuration.

f. When operating in the vicinity of overhead transmission lines, operators and riggers must be alert to this special hazard and follow the requirements of EM 385-1-1 Section 11, and ASME B30.5 or ASME B30.22 as applicable.

g. Do not use crane suspended personnel work platforms (baskets) unless the Contractor proves that using any other access to the work location would provide a greater hazard to the workers or is impossible. Do not lift personnel with a line hoist or friction crane. Additionally, submit a specific AHA for this work to the Contracting Officer. Ensure the activity and AHA are thoroughly reviewed by all involved personnel.

h. Inspect, maintain, and recharge portable fire extinguishers as specified in NFPA 10, Standard for Portable Fire Extinguishers.

i. All employees must keep clear of loads about to be lifted and of suspended loads.

j. Use cribbing when performing lifts on outriggers.

k. The crane hook/block must be positioned directly over the load. Side loading of the crane is prohibited.

l. A physical barricade must be positioned to prevent personnel access where accessible areas of the LHE's rotating superstructure poses a risk of striking, pinching or crushing personnel.

m. Maintain inspection records in accordance with EM 385-1-1, Section 16.D, including shift, monthly, and annual inspections, the signature of the person performing the inspection, and the serial number or other identifier of the LHE that was inspected. Records must be available for review by the Contracting Officer.

n. Maintain written reports of operational and load testing in accordance with EM 385-1-1, Section 16.F, listing the load test procedures used along with any repairs or alterations performed on the LHE. Reports must be available for review by the Contracting Officer.

o. Certify that all LHE operators have been trained in proper use of all safety devices (e.g. anti-two block devices).

p. Take steps to ensure that wind speed does not contribute to loss of control of the load during lifting operations. At wind speeds greater than 20 mph, the operator, rigger and lift supervisor must cease all crane operations, evaluate conditions and determine if the lift may proceed. Base the determination to proceed or not on wind calculations per the manufacturer and a reduction in LHE rated capacity if applicable. Include this maximum wind speed determination as part of the activity hazard analysis plan for that operation.

3.6.3 Machinery and Mechanized Equipment

a. Proof of qualifications for operator must be kept on the project site for review.

b. Manufacture specifications or owner's manual for the equipment must be on-site and reviewed for additional safety precautions or requirements that are sometimes not identified by OSHA or USACE EM 385-1-1. Incorporate such additional safety precautions or requirements into the AHAs.

3.6.4 USE OF EXPLOSIVES

Explosives shall not be used.

3.7 EXCAVATIONS

Soil classification must be performed by a competent person in accordance with 29 CFR 1926 and EM 385-1-1.

3.7.1 Utility Locations

Provide a third party, independent, private utility locating company to positively identify underground utilities in the work area in addition to any station locating service and coordinated with the station utility department.

3.7.2 Utility Location Verification

Physically verify underground utility locations, including utility depth, by hand digging using wood or fiberglass handled tools when any adjacent construction work is expected to come within three feet of the underground system.

3.7.3 Utilities Within and Under Concrete, Bituminous Asphalt, and Other Impervious Surfaces

Utilities located within and under concrete slabs or pier structures, bridges, parking areas, and the like, are extremely difficult to identify. Whenever contract work involves chipping, saw cutting, or core drilling through concrete, bituminous asphalt or other impervious surfaces, the existing utility location must be coordinated with station utility departments in addition to location and depth verification by a third party, independent, private locating company. The third party, independent, private locating company must locate utility depth by use of Ground

Penetrating Radar (GPR), X-ray, bore scope, or ultrasound prior to the start of demolition and construction. Outages to isolate utility systems must be used in circumstances where utilities are unable to be positively identified. The use of historical drawings does not alleviate the Contractor from meeting this requirement.

3.8 ELECTRICAL

Perform electrical work in accordance with EM 385-1-1, Appendix A, Sections 11 and 12.

3.8.1 Conduct of Electrical Work

As delineated in EM 385-1-1, electrical work is to be conducted in a de-energized state unless there is no alternative method for accomplishing the work. In those cases obtain an energized work permit from the Contracting Officer. The energized work permit application must be accompanied by the AHA and a summary of why the equipment/circuit needs to be worked energized. Underground electrical spaces must be certified safe for entry before entering to conduct work. Cables that will be cut must be positively identified and de-energized prior to performing each cut. Attach temporary grounds in accordance with ASTM F855 and IEEE 1048. Perform all high voltage cable cutting remotely using hydraulic cutting tool. When racking in or live switching of circuit breakers, no additional person other than the switch operator is allowed in the space during the actual operation. Plan so that work near energized parts is minimized to the fullest extent possible. Use of electrical outages clear of any energized electrical sources is the preferred method.

When working in energized substations, only qualified electrical workers are permitted to enter. When work requires work near energized circuits as defined by NFPA 70, high voltage personnel must use personal protective equipment that includes, as a minimum, electrical hard hat, safety shoes, insulating gloves and electrical arc flash protection for personnel as required by NFPA 70E. Insulating blankets, hearing protection, and switching suits may also be required, depending on the specific job and as delineated in the Contractor's AHA. Ensure that each employee is familiar with and complies with these procedures and 29 CFR 1910.147.

3.8.2 Qualifications

Electrical work must be performed by QP personnel with verifiable credentials who are familiar with applicable code requirements. Verifiable credentials consist of State, National and Local Certifications or Licenses that a Master or Journeyman Electrician may hold, depending on work being performed, and must be identified in the appropriate AHA. Journeyman/Apprentice ratio must be in accordance with State, Local requirements applicable to where work is being performed.

3.8.3 Arc Flash

Conduct a hazard analysis/arc flash hazard analysis whenever work on or near energized parts greater than 50 volts is necessary, in accordance with NFPA 70E.

All personnel entering the identified arc flash protection boundary must be QPs and properly trained in NFPA 70E requirements and procedures. Unless

permitted by NFPA 70E, no Unqualified Person is permitted to approach nearer than the Limited Approach Boundary of energized conductors and circuit parts. Training must be administered by an electrically qualified source and documented.

3.8.4 Grounding

Ground electrical circuits, equipment and enclosures in accordance with NFPA 70 and IEEE C2 to provide a permanent, continuous and effective path to ground unless otherwise noted by EM 385-1-1.

Check grounding circuits to ensure that the circuit between the ground and a grounded power conductor has a resistance low enough to permit sufficient current flow to allow the fuse or circuit breaker to interrupt the current.

3.8.5 Testing

Temporary electrical distribution systems and devices must be inspected, tested and found acceptable for Ground-Fault Circuit Interrupter (GFCI) protection, polarity, ground continuity, and ground resistance before initial use, before use after modification and at least monthly. Monthly inspections and tests must be maintained for each temporary electrical distribution system, and signed by the electrical CP or QP.

WEEKLY SAFETY MEETING

CENAE

Date Held _____
Time_____

SUBJECT: CONTRACT NO. _____ - WEEKLY SAFETY MEETING

CONTRACTOR _____

Date and Time Held: _____

Conducted By: _____

PERSONNEL PRESENT		
Contr.	Sub.	Govt.

All persons attending the meeting must sign the bottom or back of this form.

Subjects discussed (Note, delete, or add):
EM 385-1-1, Section:_____

Accident Prevention Plan	___	Individual Protective Equipment	___
Prevention of Falls	___	Back Injury/Safe Lifting Techniques	___
Fire Prevention	___	Sanitation, First Aid, Waste Disposal	___
Tripping Hazards	___	Clean-up - trash, nails in lumber	___

Staging, Ladders, Concrete Forms, Safety Nets ___

Hand Tools, Power Tools, Machinery, Chain Saws ___

Equipment Inspection & Maintenance (Zero Defects) ___

Hoisting Equipment, Winch and Crane Safety ___

Ropes, Hooks, Chains and Slings ___

Vehicle Operation Safety ___

Electrical Grounding, Temporary Wiring, GFCI ___

Lockouts/Safe clearance procedures
(electrical, pressure, moving parts) ___

Welding, Cutting	___	Excavation Hazard/Rescue	___
Loose Rock/Steep Slopes	___	Explosives	___
Water Safety	___	Boat Safety	___

HAZMAT, Toxic hazards, MSDS, respiratory, ventilation ___

Other Items of concern specific to this contract:

CQC Rep. Signature_____ CE Inspector _____

CF:

-- End of Section --

SECTION 01 35 29.13

HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES FOR CONTAMINATED SITES

1.1 REFERENCES

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

AMERICAN PETROLEUM INSTITUTE (API)

API RP 2219	(2016) Safe Operation of Vacuum Trucks Handling Flammable and Combustible Liquids in Petroleum Service

INTERNATIONAL SAFETY EQUIPMENT ASSOCIATION (ISEA)

ANSI/ISEA Z358.1	(2014) American National Standard for 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	(2014) Safety -- Safety and Health Requirements Manual
EM 385-1-97	(2013) Explosives -- Safety and Health Requirements Manual
ER 385-1-92	(2018) Safety -- Safety and Occupational Health Requirements for Environmental Cleanup Projects
ER 385-1-95	(2014) Safety -- Safety and Health Requirements for Operations and Activities Involving Munitions and Explosives of Concern

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

10 CFR 20	Standards for Protection Against Radiation
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
49 CFR 171	General Information, Regulations, and Definitions
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements

1.2 PRECONSTRUCTION SAFETY CONFERENCE

Conduct a preconstruction safety conference prior to the start of site activities and after submission of the Accident Prevention Plan/Site Safety And Health Plan (APP/SSHP). The objective of the meeting is 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. Ensure that those individuals responsible for health and safety at the project level are available and attend this meeting.

1.3 SUBMITTALS

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

SD-02 Shop Drawings

Work Zones; G, RO
Decontamination Facilities; G, RO

SD-03 Product Data

Amendments to the APP/SSHP
Exposure Monitoring/Air Sampling Program
Site Control Log
SSHO's Daily Inspection Logs

SD-07 Certificates

Certificate Of Worker/Visitor Acknowledgement

SD-11 Closeout Submittals

Safety And Health Phase-Out Report

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

Develop and implement a Site Safety and Health Plan in accordance with Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS, 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. Cover each SSHP element in sections 33.B.02 of EM 385-1-1 and each APP element in Appendix A of EM 385-1-1. There are overlapping elements in Section 33.B.02 and Appendix A of EM 385-1-1. SSHP appendix elements that overlap with APP elements need not be duplicated in the APP/SSHP provided each safety and occupational health (SOH) issue receives adequate attention and is documented in the APP/SSHP. The APP/SSHP is a dynamic document, subject to change as project operations/execution change. Modify the APP/SSHP to address changing and previously unidentified health and safety conditions. Ensure that the APP/SSHP is updated accordingly. Submit amendments to the APP/SSHP to the Contracting Officer as the APP/SSHP is updated. For long duration projects resubmit the APP/SSHP to the Contracting Officer annually for review. The APP/SSHP must contain all updates.

1.4.1 Acceptance and Modifications

Prior to submittal, the APP/SSHP must be signed and dated by the Safety and Health Manager, the SSHO, and the Site Superintendent. Submit for review 14 days prior to the Preconstruction Safety Conference. Deficiencies in the APP/SSHP will be discussed at the preconstruction safety conference, and must 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 the APP/SSHP 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 is cause for stopping work until the matter has been rectified.

1.4.2 Availability

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

1.5 STAFF ORGANIZATION, QUALIFICATION AND RESPONSIBILITIES

Provide hazardous waste operations and emergency response organization in accordance with EM 385-1-1, Section 33.

1.5.1 Safety and Health Manager

Safety and Health Manager must be a Certified Industrial Hygienist (CIH), certified by the American Board of Industrial Hygiene.

Apply the following in conjunction with the required qualifications and responsibilities stated in EM 385-1-1, Section 33.C.01.

1.5.1.1 Additional Qualifications

The Safety and Health Manager must have the following qualifications:

a. At least 4 years of experience as an SSHO on an uncontrolled hazardous waste site, and have 40-hour OSHA Hazardous Waste Operations training and 8-hour OSHA Supervisor training.

b. Documented experience in supervising professional and technician level personnel.

c. At least 10 years of experience developing, managing, and implementing perimeter air monitoring projects involving contaminated soil activities.

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

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

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

1.5.1.2 Responsibilities and Duties

a. Development, implementation, oversight, and enforcement of the APP/SSHP.

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

c. Conduct initial site-specific training.

d. Be present onsite during the first week of remedial activities and at the startup of each new major phase of work.

e. Visit the site as needed and at least once per week for the duration of activities, to audit the effectiveness of the APP/SSHP.

f. Be available for emergencies.

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

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

i. Provide a written summary and evaluation of perimeter air monitoring results daily for the first week of intrusive work then weekly thereafter for AQTM review and submittal.

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

j. Serve as a member of the quality control staff.

k. Review accident reports and results of daily inspections.

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

1.5.2 Site Safety and Health Officer

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

Apply the following in conjunction with the required qualifications and responsibilities stated in EM 385-1-1, Section 33.C.02.

1.5.2.1 Qualifications

The following requirements are in addition to those in Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS.

a. A minimum of 3 year experience in implementing SOH programs at HTRW sites] where Level B personal protective equipment was required.

b. Meet 29 CFR 1910.120/29 CFR 1926.65 requirements for 40-hour initial and 8-hour supervisor training and, maintain 8-hour refresher training requirements.

c. Specific training in personal and respiratory protective equipment, confined space entry and in the proper use of air monitoring instruments and air sampling methods including monitoring for site contaminants.

d. Documented experience in construction techniques and construction safety procedures.

e. Working knowledge of Federal and state occupational SOH regulations.

1.5.2.2 Responsibilities and Duties

The following requirements are in addition to those in Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS.

a. Assist 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. If operations are performed during more than 1 work shift per day, a site Safety and Health Officer must be present for each shift and when applicable. The SSHO shall remain on-site from the start of the site activities through completion.

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

d. Have authority to ensure site compliance with specified SOH 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 SOH inspection and documenting results on the Daily Safety Inspection Log in accordance with 29 CFR 1904.

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

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

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

h. Conduct accident investigations and prepare accident reports.

i. Serve as a member of the quality control staff on matters relating to SOH.

1.5.3 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 the 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 is 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 PROGRAM.

1.5.4 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 must be immediately available to render first aid when needed.

1.6 EMERGENCY RESPONSE AND CONTINGENCY PROCEDURES

Develop and implement an Emergency Response Plan, that meets the requirements of EM 385-1-1 Section 33.G, 29 CFR 1910.120 (l) and 29 CFR 1926.65 (l), 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. Route maps to nearest pre-notified 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.

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

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 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 submit 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.

1.7 CERTIFICATE OF WORKER/VISITOR ACKNOWLEDGEMENT

A copy of a 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 Of Worker/Visitor Acknowledgement at the end of this section.

1.8 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 SOH issues and notes, and signature of preparer.

1.9 SAFETY AND HEALTH PHASE-OUT REPORT

Submit a Safety and Health Phase-Out Report in conjunction with the project close out report, prior to final acceptance of the work. Include the following minimum information:

a. Summary of the overall performance of SOH (e.g., accidents or incidents including near misses, unusual events, lessons learned).

b. Final decontamination documentation including procedures and techniques used to decontaminate equipment, vehicles, and on-site facilities.

c. Summary of exposure monitoring and air sampling accomplished during the project.

d. Signatures of Safety and Health Manager and SSHO.

PART 2 PRODUCTS

2.1 REGULATORY REQUIREMENTS

Comply with EM 385-1-1, 29 CFR 1926.65, 29 CFR 1910.120, OSHA requirements in 29 CFR 1910 and 29 CFR 1926 with work performed under this contract, 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.

2.2 PERSONAL PROTECTIVE EQUIPMENT

2.2.1 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.

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, cartridge change out, and storage of PPE within the PPE section of the APP/SSHP.

2.2.2 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, and individual medical considerations within the PPE evaluation protocol.

2.2.2.1 Initial PPE Components

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

Level D	Hard hat, steel-toed boots, safety glasses with permanent side shields, long pants, shirts with sleeves, work gloves, high visibility vests, hearing protection
Modified Level D	All of Level D with coveralls

2.2.3 PPE for Government Personnel

Three clean sets of personal protective equipment and clothing (excluding air-purifying negative-pressure respirators and safety shoes, which will be provided by individual visitors), as required for entry into the Exclusion Zone and Contamination Reduction Zone, must be available for use by the Contracting Officer or official visitors. The items must be cleaned, maintained and stored in the Government office trailer and clearly marked: "FOR USE BY GOVERNMENT ONLY." Provide basic training in the use and limitations of the PPE provided.

2.3 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 that comply with ANSI/ISEA Z358.1.

c. 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.

PART 3 EXECUTION

3.1 SITE DESCRIPTION AND CONTAMINATION CHARACTERIZATION

3.1.1 Project/Site Conditions

Refer to the following reports and information for the site description and contamination characterization. They are located at:

http://www.epa.gov/superfund/durham

3.1.1.1 CERCLA Documents

Record of Decision, 2005

3.2 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 shall be determined by the Contractor and identified in their APP/SSHP using the Task Hazard and Control Sheets at the end of this section. 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.

3.3 TRAINING

In conjunction with EM 385-1-1, Section 33D, meet the training program requirements for workers performing cleanup operations and who will be exposed to contaminants.

3.3.1 General HTRW 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 HTRW instruction.

b. 3 days actual on-the-job 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).

3.3.2 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 SOH 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 and Sections 01.B.02 and 33.D.02 of EM 385-1-1 . 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.

3.3.3 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 SOH 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 should an operational change affecting onsite field work be made, to explain SOH 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.

3.4 MEDICAL SURVEILLANCE PROGRAM

Meet all requirements of 29 CFR 1910.120/29 CFR 1926.65 medical surveillance program and EM 385-1-1, Section 33.G for workers performing cleanup operations and who will be exposed to contaminants. Ensure the Occupational Physician or the physician's designee performs the physical examinations and reviews examination results. Participation in the medical surveillance

program is without cost to the employee, without loss of pay and at a reasonable time and place.

3.5 EXPOSURE MONITORING/AIR SAMPLING PROGRAM

Prepare and implement by the Safety and Health Manager an exposure monitoring/air sampling program to identify and quantify SOH 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. Submit personnel exposure monitoring/sampling results and written evaluation/summary to the COR 24 hours after sample results are received. Monitoring for site contaminants includes VOCs and CVOCs. Refer to the historical data tables included in Appendix A of the specifications for site contaminant data and to Section 01 13 00 for perimeter air monitoring requirements.

3.6 HEAT/COLD 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 and cold stress.

3.7 SPILL AND DISCHARGE CONTROL

Develop and implement written spill and discharge containment/control procedures. Address radioactive wastes, shock sensitive wastes, 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 contained to prevent any spillage of material on uncontaminated soil. If the spill or discharge is reportable, or human health or the environment are threatened, notify the National Response Center, the state, and the Contracting Officer as soon as possible. Provide control as required by Section 01 57 20 ENVIRONMENTAL PROTECTION.

3.8 MATERIALS TRANSFER SAFETY

Remove liquids and residues from the tanks using explosion-proof or air-driven pumps. In accordance with EM 385-1-1, Section 9, electrically bond the tank and ground pump motors and suction hoses to prevent electrostatic ignition hazards. Use of a hand pump will be permitted to remove the last of the liquid from the bottom of the tanks. If a vacuum truck is used for removal of liquids or residues, the area of operation for the vacuum truck must be vapor free. locate the truck upwind from the tank and outside the path of probable vapor travel. Discharge the vacuum pump exhaust gases through a hose of adequate size and length downwind of the truck and tank area. Vacuum truck operating and safety practices must conform to API RP 2219. Collect tank residues in drums, tanks, or tank trucks labeled according to 49 CFR 171 and 49 CFR 172 and disposed of as specified. Disconnect and drain fittings and lines of their contents after the materials have been transferred and the tanks have been exposed. Do not spill contents into the environment during cutting or disconnecting of tank

fittings. Transfer materials drained into DOT-approved drums for storage and transportation. Use only non-sparking or non-heat producing tools to disconnect and drain or to cut through tank fittings. Electrical equipment (e.g., pumps, portable hand tools) used for tank preparation must be explosion-proof. Following cutting or disconnecting of the fittings, plug openings leading to the tanks.

3.9 SITE CONTROL MEASURES

Coordinate site control measures with Section 01 57 20 ENVIRONMENTAL PROTECTION CONTROLS.

3.9.1 Work Zones

Initial anticipated work zone boundaries (exclusion zone, contamination reduction zone, support zone, all access points and decontamination areas) are to be clearly delineated on the site drawings. Base delineation of work zone boundaries on the contamination characterization data and the hazard/risk analysis to be performed as described in EM 385-1-1 06.A.02. As work progresses and field conditions are monitored, work zone boundaries may be modified (and site drawings modified) with approval of the Contracting Officer. Clearly identify work zones and mark in the field (using fences, tape, or signs). Submit and post a site map, showing work zone boundaries and locations of decontamination facilities in the onsite office. Work zones must consist of the following:

3.9.1.1 Exclusion Zone (EZ)

The exclusion zone is the area where hazardous contamination is either known or expected to occur and the greatest potential for exposure exists. Control entry into this area and exit may only be made through the Contamination Reduction Zone (CRZ).

3.9.1.2 Contamination Reduction Zone (CRZ)

The CRZ is the transition area between the Exclusion Zone and the Support Zone. The personnel and equipment decontamination areas must be separate and unique areas located in the CRZ.

3.9.1.3 Support Zone (SZ)

The Support Zone is defined as areas of the site, other than exclusion zones and contamination reduction zones, where workers do not have the potential to be exposed to hazardous substances or dangerous conditions resulting from HTRW operations. Secure the Support Zone against active or passive contamination. Site offices, parking areas, and other support facilities must be located in the Support Zone.

3.9.2 Site Control Log

A log of personnel visiting, entering, or working on the site must be maintained. Include the following: date, name, agency or company, time entering and exiting site, time entering and exiting the exclusion zone (if applicable). Before visitors are allowed to enter the Contamination Reduction Zone or Exclusion Zone, they must show proof of current training, medical surveillance and respirator fit testing (if respirators are required for the tasks to be performed) and fill out a Certificate of Worker or

Visitor Acknowledgment. Record this visitor information, including date, in the log.

3.9.3 Communication

Provide and install an employee alarm system that has adequate means of on and off-site communication in accordance with 29 CFR 1910 Section .165. The means of communication must be able to be perceived above ambient noise or light levels by employees in the affected portions of the workplace. The signals must be distinctive and recognizable as messages to evacuate or to perform critical operations.

3.9.4 Site Security

Provide the following site security: fencing, gates, and barriers around work areas; signs at every entrance and gate and at least 50 feet along the fence warning the general public that the Project Site contains physical and chemical hazards and that access is forbidden to unauthorized person. Print signs in bold large letters on contrasting backgrounds. Signs must be visible from all points where entry might occur and at such distances from the restricted area that employees may read the signs and take necessary protective steps before entering.

3.10 PERSONAL HYGIENE AND DECONTAMINATION

Personnel entering the Exclusion or Contamination Reduction Zones or otherwise exposed to hazardous chemical vapors, gases, liquids, or contaminated solids must decontaminate themselves and their equipment prior to exiting the contamination reduction zone (CRZ) and entering the support zone. Consult Chapter 10.0 of NIOSH 85-115 when preparing decontamination procedures. Submit a detailed discussion of personal hygiene and decontamination facilities and procedures to be followed by site workers as part of the APP/SSHP. Train employees in the procedures and enforce the procedures throughout site operations.

3.10.1 Decontamination Facilities

Submit drawings showing the layout of the personnel and equipment decontamination areas.

3.10.2 Personnel Decontamination

Initially set up a decontamination line in the CRZ. Employees must exit the exclusion zone through the CRZ and implement the following decontamination procedures and techniques: Scrub and rinse water proof outer garments, remove all outer garments, hand and face wash.

3.10.3 Equipment Decontamination

Decontaminate the vehicles and equipment used in the EZ in the CRZ prior to leaving the EZ.

3.10.3.1 Facilities for Equipment and Personnel

Provide a decontamination station within the CRZ for decontaminating vehicles and equipment leaving the EZ. Construct a decontamination station pad, which meets the site decontamination needs for all vehicles and larger

equipment decontamination. Construct the pad to capture decontamination water, including overspray, and allow for collection and removal of the decontamination water using sumps, dikes and ditches as required. Provide a high pressure, low volume, water wash area for equipment and vehicles. Provide a steam cleaning system for use after the mud or site material has been cleaned from the equipment. Perform dry decontamination using a broom to remove dry/loose spilled materials on accessible surfaces. Provide a designated "clean area" in the CRZ for performing equipment maintenance. Use this area when personnel are required by normal practices to come in contact with the ground, i.e., crawling under a vehicle to change engine oil. Equipment within the EZ or CRZ must be decontaminated before maintenance is performed.

3.10.3.2 Procedures

Procedures for equipment decontamination must be developed and utilized to prevent the spread of contamination into the SZ and offsite areas. These procedures must address disposal of contaminated products and spent materials used on the site, including, as a minimum, containers, fluids, and oils. Assume any item taken into the EZ to be contaminated and perform an inspection and decontaminate. Vehicles, equipment, and materials must be cleaned and decontaminated prior to leaving the site. Handle construction material in such a way as to minimize the potential for contaminants being spread or carried offsite. Prior to exiting the site, vehicles and equipment must be monitored to ensure the adequacy of decontamination.

Task Hazard and Control Requirements Sheet	
Task	
Initial Anticipated Hazards	
Initial PPE	
Initial Controls	
Initial Exposure Monitoring	
[Yes][No]	HAZWOPER Medical Surveillance Required
[Yes][No]	HAZWOPER Training Required

-- End of Section --

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SECTION 01 39 00

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-- End of Section Table of Contents --

SECTION 01 39 00

PRE- AND POST-CONSTRUCTION SURVEYS

PART 1 GENERAL

1.1 DESCRIPTION

A. Provide pre- and post-construction surveys and construction photographs as indicated and specified.

B. Section includes administrative and procedural requirements for the following:

1. Pre-construction photographs.

2. Final completion construction photographs.

3. Pre-construction video recordings.

4. Certified topographic field surveys performed by a registered land surveyor to determine first floor elevations, etc., as specified herein.

1.2 RELATED SECTIONS

A. SECTION 02165 - VIBRATION AND SETTLEMENT MONITORING

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-02 Shop Drawings

Qualification Data; G, RO

Samples of work by proposed photographer on construction photography of similar nature to the work under this Contract.

Field Reports; G, RO

Four copies of each draft and final Pre-Construction Survey reports. Four copies of each draft and final Post-Construction Survey reports.

Key Plan; G, RO

Submit key plan of Project site and building with notation of vantage points marked for location and direction of each photograph. Indicate elevation or story of construction. Include same information as corresponding photographic documentation.

Digital Photographs; G, RO

Submit image files within (3) days of taking photographs.

1. Digital Camera: Minimum sensor resolution of 10 megapixels.

2. Format: Minimum (3200 by 2400) pixels, in unaltered original files, with same aspect ratio as the sensor, uncropped, date and time stamped, in folder named by date of photograph, accompanied by key plan file.

3. Identification: Provide the following information with each image description in file metadata tag:
   a. Name of Project.
   b. Name and contact information for photographer.
   c. Name of Contractor.
   d. Date photograph was taken.
   e. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
   f. Unique sequential identifier keyed to accompanying key plan.

Video Recordings; G, RO

Submit video recordings within seven (7) days of recording.

1. Submit video recordings in digital video disc format acceptable to Contracting Officer.

2. Identification: With each submittal, provide the following information:
   a. Name of Project.
   b. Name and address of photographer.
   c. Name of Contractor.
   d. Date video recording was recorded.
   e. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
   f. Weather conditions at time of recording.

Transcript; G, RO

Provide in electronic format. Mark appropriate identification on front and spine of each binder. Include a cover sheet with same label information as corresponding video recording. Include name of Project and date of video recording on each page.

1.4 QUALITY CONTROL

A. Comply with the requirements specified in Section 01 40 00 QUALITY CONTROL.

B. Photographer to use techniques, material and equipment capable of producing photographs with a minimum of 10 megapixels.

C. Dates for photography at site to be coordinated with the Property Owner. The Owner must be present during photographic periods at site.

D. Photographer to make and retain all photographs and digital files.

E. The topographic survey shall be performed by or under the supervision of and certified by a Connecticut Registered Land Surveyor.

1.5 USAGE RIGHTS

Obtain and transfer copyright usage rights from photographer to Owner for unlimited reproduction of photographic documentation.

1.6 SEQUENCING AND SCHEDULING

Dates for Pre- and Post-Construction Survey at the site shall be coordinated with the Contracting Officer.

PART 2 PRODUCTS

2.1 PHOTOGRAPHIC MEDIA

A. Digital Images: Provide images in JPG format, produced by a digital camera with minimum sensor size of (10) megapixels, and at an image resolution of not less than (3200 by 2400) pixels.

B. Digital Video Recordings: Provide high-resolution, digital video disc in format acceptable to the Contracting Officer.

2.3 IMAGE IDENTIFICATION

A. Each image to carry identification and information without interfering with exposure.

B. Each photographic image shall have an identification number for reference and a legible description indicating name of Project, title of contract, number of contract, building, structure or road, owner, date taken, location identification, description data, and Contractor’s name.

C. Additional Information:

1. Project name, photographer’s numbered identification of exposure, time and date of exposure, name of photographer making exposure, detailed description of view including point from which exposure made, compass direction of view, vertical declination of view (horizontal, looking up, looking down, etc.) identification of main features in view and information pertinent to the purpose and identification of the exposure.

2. Weather conditions under which exposure made.

2.4 PHOTO-CD

Provide photographic compact disc (photo-CD) for digital image at the time of development of each print.

2.5 TOPOGRAPHIC SURVEYS

A. Provide first floor elevations, the corners of buildings and structures foundations both front and rear.

B. Provide elevations of sidewalks, driveways, edge of roadway, retaining walls, fence, garages, sheds, etc.

C. The location of each elevation shall be described in detail in words and located on the plan. The contour interval shall be 1-foot.

PART 3 EXECUTION

3.1 PRE- AND POST-CONSTRUCTION SURVEYS

Provide construction surveys for existing (pre-construction) and final (post-construction conditions in accordance with the following:

1. Notify the Owner a minimum of 48 hours prior to each survey.

2. Obtain the age of each facility, known permit modification and foundation information from local building departments.

3. Detailed examination shall include a visual internal and external survey of the building or structure; digital video and color photographs showing visually evident internal and external structural cracks and damage.

4. For the Pre-Construction Survey, interview Property Owner regarding existing conditions and structural faults, and determine dates and extent of recent repairs.

5. Color photographs shall be taken to indicate conditions. The Contractor shall furnish (two) photographic compact disk(s).

6. The report shall include location and description of site; results of visual inspection; color photographs; digital video recordings; sketches; results of property owner or tenant interviews. Description of existing facility foundation. Points where deterioration has occurred shall be noted and color photographs and digital video recording taken on all sides of the buildings and structures to show existing condition and any deterioration or other deficiencies. The absence of deficiencies shall also be recorded. The Contracting Officer shall examine said draft reports and may indicate additional information that is required. The final report copies shall be given to the Contracting Officer and the Property Owner.

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-- End of Section Table of Contents --

SECTION 01 40 00

QUALITY CONTROL

PART 1 GENERAL

1.1 PAYMENT

Separate payment will not be made for providing and maintaining an effective Quality Control program, and all associated costs will be included in the applicable Bid Schedule unit or lump-sum prices.

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. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Contractor Quality Control (CQC) Plan; G, RO

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

Establish and maintain an effective quality control (QC) system in compliance with the Contract Clause titled "Inspection of Construction". QC consist of plans, procedures, and organization necessary to produce an end product which complies with the contract requirements. Cover all construction operations, both onsite and offsite, and be keyed to the proposed construction sequence. The project superintendent will be held responsible for the quality of work and is subject to removal by the Contracting Officer for non-compliance with the quality requirements specified in the contract. In this context the highest level manager responsible for the overall construction activities at the site, including quality and production is the project superintendent. The project superintendent must maintain a physical presence at the site at all times and is responsible for all construction and related activities at the site, except as otherwise acceptable to the Contracting Officer.

3.2 CONTRACTOR QUALITY CONTROL (CQC) PLAN

Submit no later than 15 days after receipt of Notice to Proceed, the Contractor Quality Control (CQC) Plan proposed to implement the requirements of the Contract Clause titled "Inspection of Construction". The Government will consider an interim plan for the first 14 days of operation. Construction will be permitted to begin only after acceptance of the CQC

Plan or acceptance of an interim plan applicable to the particular feature of work to be started. Work outside of the accepted interim plan will not be permitted to begin until acceptance of a CQC Plan or another interim plan containing the additional work.

3.2.1 Content of the CQC Plan

Include, as a minimum, the following to cover all construction operations, both onsite and offsite, including work by subcontractors, fabricators, suppliers, and purchasing agents:

a. A description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff will implement the three phase control system for all aspects of the work specified. Include a CQC System Manager who reports to the project superintendent.

b. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function.

c. A copy of the letter to the CQC System Manager signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC System Manager, including authority to stop work which is not in compliance with the contract. Letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities will be issued by the CQC System Manager. Copies of these letters must be furnished to the Government.

d. Resume of Project Superintendent(s).

e. Identification of key personnel.

f. Detailed Project staffing plan showing staffing levels for each task and phase of Work, along with any plans for shift Work.

g. Detailed list of proposed subcontractors, including truckers, disposal facilities, analytical laboratory(ies), and independent vibration consulting and monitoring firm.

h. List of major Equipment, Systems, and Material, other than listed in Bid Form Schedule E.

i. List of Permits and Approvals to be obtained by Contractor, including contact names, titles, and phone numbers.

j. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, offsite fabricators, suppliers, and purchasing agents. These procedures must be in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.

k. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and

person responsible for each test. (Laboratory facilities approved by the Contracting Officer must be used.)

l. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation.

m. Procedures for tracking construction deficiencies from identification through acceptable corrective action. Establish verification procedures that identified deficiencies have been corrected.

n. Reporting procedures, including proposed reporting formats.

o. A list of the definable features of work. A definable feature of work is a task which is separate and distinct from other tasks, has separate control requirements, and may be identified by different trades or disciplines, or it may be work by the same trade in a different environment. Although each section of the specifications may generally be considered as a definable feature of work, there are frequently more than one definable features under a particular section. This list will be agreed upon during the coordination meeting.

3.2.2 Acceptance of Plan

Acceptance of the Contractor's plan is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the construction. The Government reserves the right to require the Contractor to make changes in his CQC Plan and operations including removal of personnel, as necessary, to obtain the quality specified.

3.2.3 Notification of Changes

After acceptance of the CQC Plan, notify the Contracting Officer in writing of any proposed change. Proposed changes are subject to acceptance by the Contracting Officer.

3.3 COORDINATION MEETING

After the Preconstruction Conference, before start of construction, and prior to acceptance by the Government of the CQC Plan, the Contractor shall meet with the Contracting Officer or Authorized Representative and discuss the Contractor's quality control system. Submit the CQC Plan a minimum of 14 calendar days prior to the Coordination Meeting. During the meeting, a mutual understanding of the system details must be developed, including the forms for recording the CQC operations, control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship of Contractor's Management and control with the Government's Quality Assurance. Minutes of the meeting will be prepared by the Government, signed by both the Contractor and the Contracting Officer and will become a part of the contract file. There may be occasions when subsequent conferences will be called by either party to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures which may require corrective action by the Contractor.

3.4 QUALITY CONTROL ORGANIZATION

3.4.1 Personnel Requirements

The requirements for the CQC organization are a CQC System Manager and sufficient number of additional qualified personnel to ensure safety and contract compliance. The Safety and Health Manager must report directly to a senior project (or corporate) official independent from the CQC System Manager. The Safety and Health Manager will also serve as a member of the CQC Staff. Personnel identified in the technical provisions as requiring specialized skills to assure the required work is being performed properly will also be included as part of the CQC organization. The Contractor's CQC staff must maintain a presence at the site at all times during progress of the work and have complete authority and responsibility to take any action necessary to ensure contract compliance. The CQC staff will be subject to acceptance by the Contracting Officer. Provide adequate office space, filing systems and other resources as necessary to maintain an effective and fully functional CQC organization. Promptly complete and furnish all letters, material submittals, shop drawing submittals, schedules and all other project documentation to the CQC organization. The CQC organization shall be responsible to maintain these documents and records at the site at all times, except as otherwise acceptable to the Contracting Officer.

3.4.2 CQC System Manager

Identify as CQC System Manager an individual within the onsite work organization who is responsible for overall management of CQC and have the authority to act in all CQC matters for the Contractor. The CQC System Manager shall be a construction person with a minimum of five years in related work. This CQC System Manager must be on the site at all times during construction and be employed by the prime Contractor. The CQC System Manager shall have no duties other than Quality Control. The CQC Manager may not serve as Project Superintendent. Identify in the plan an alternate to serve in the event of the CQC System Manager's absence. The requirements for the alternate are the same as the CQC System Manager.

3.4.3 Organizational Changes

Maintain the CQC staff at full strength at all times. When it is necessary to make changes to the CQC staff, revise the CQC Plan to reflect the changes and submit the changes to the Contracting Officer for acceptance.

3.4.4 Additional Requirement

In addition to the above experience requirements, the CQC System Manager shall have completed the course entitled "Construction Quality Management for Contractors". This course is periodically offered at the U.S. Army Corps of Engineers, New England District, 696 Virginia Road, Concord, MA.

3.5 SUBMITTALS AND DELIVERABLES

Submittals, if needed, must comply with the requirements in Section 01 33 00 SUBMITTAL PROCEDURES. The CQC organization is responsible for certifying that all submittals and deliverables are in compliance with the contract requirements.

3.6 CONTROL

Contractor Quality Control is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. At least three phases of control must be conducted by the CQC System Manager for each definable feature of the construction work as follows:

3.6.1 Preparatory Phase

This phase is performed prior to beginning work on each definable feature of work, after all required plans/documents/materials are approved/accepted, and after copies are at the work site. This phase includes:

a. A review of each paragraph of applicable specifications, reference codes, and standards. Make available during the preparatory inspection a copy of those sections of referenced codes and standards applicable to that portion of the work to be accomplished in the field. Maintain and make available in the field for use by Government personnel until final acceptance of the work.

b. Review of the contract drawings.

c. Check to assure that all materials and/or equipment have been tested, submitted, and approved.

d. Review of provisions that have been made to provide required control inspection and testing.

e. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the contract.

f. Examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.

g. Review of the appropriate activity hazard analysis to assure safety requirements are met.

h. Discussion of procedures for controlling quality of the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that feature of work.

i. Check to ensure that the portion of the plan for the work to be performed has been accepted by the Contracting Officer.

j. Discussion of the initial control phase.

k. The Government must be notified at least 24 hours in advance of beginning the preparatory control phase. Include a meeting conducted by the CQC System Manager and attended by the superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. Document the results of the preparatory phase actions by separate minutes prepared by the CQC System Manager and attach to the daily CQC report. Instruct applicable workers as to the

acceptable level of workmanship required in order to meet contract specifications.

3.6.2 Initial Phase

This phase is accomplished at the beginning of a definable feature of work. Accomplish the following:

a. Check work to ensure that it is in full compliance with contract requirements. Review minutes of the preparatory meeting.

b. Verify adequacy of controls to ensure full contract compliance. Verify required control inspection and testing.

c. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with required sample panels as appropriate.

d. Resolve all differences.

e. Check safety to include compliance with and upgrading of the safety plan and activity hazard analysis. Review the activity analysis with each worker.

f. The Government must be notified at least 24 hours in advance of beginning the initial phase. Prepare separate minutes of this phase by the CQC System Manager and attach to the daily CQC report. Indicate the exact location of initial phase for future reference and comparison with follow-up phases.

g. The initial phase should be repeated for each new crew to work onsite, or any time acceptable specified quality standards are not being met.

3.6.3 Follow-up Phase

Perform daily checks to assure control activities, including control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. Record the checks in the CQC documentation. Conduct final follow-up checks and correct all deficiencies prior to the start of additional features of work which may be affected by the deficient work. Do not build upon nor conceal non-conforming work.

3.6.4 Additional Preparatory and Initial Phases

Conduct additional preparatory and initial phases on the same definable features of work if: the quality of on-going work is unacceptable; if there are changes in the applicable CQC staff, onsite production supervision or work crew; if work on a definable feature is resumed after a substantial period of inactivity; or if other problems develop.

3.7 TESTS

3.7.1 Testing Procedure

Perform specified or required tests to verify that control measures are adequate to provide a product which conforms to contract requirements. Upon request, furnish to the Government duplicate samples of test specimens for possible testing by the Government. Testing includes operation and/or acceptance tests when specified. Procure the services of a Corps of Engineers approved testing laboratory or establish an approved testing laboratory at the project site. Perform the following activities and record and provide the following data:

a. Verify that testing procedures comply with contract requirements.

b. Verify that facilities and testing equipment are available and comply with testing standards.

c. Check test instrument calibration data against certified standards.

d. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.

e. Record results of all tests taken, both passing and failing on the CQC report for the date taken. Specification paragraph reference, location where tests were taken, and the sequential control number identifying the test. If approved by the Contracting Officer, actual test reports may be submitted later with a reference to the test number and date taken. Provide an information copy of tests performed by an offsite or commercial test facility directly to the Contracting Officer. Failure to submit timely test reports as stated may result in nonpayment for related work performed and disapproval of the test facility for this contract.

3.7.2 Testing Laboratories

All testing laboratories must be validated by the USACE Material Testing Center (MTC) for the tests to be performed. Information on the USACE MTC with web-links to both a list of validated testing laboratories and for the laboratory inspection request for can be found at: https://mtc.erdc.dren.mil/.

3.8 COMPLETION INSPECTION

3.8.1 Punch-Out Inspection

Conduct an inspection of the work by the CQC System Manager near the end of the work, or any increment of the work established by a time stated in FAR 52.211-10 Commencement, Prosecution, and Completion of Work, or by the specifications. Prepare and include in the CQC documentation a punch list of items which do not conform to the approved drawings and specifications, as required by paragraph DOCUMENTATION. Include within the list of deficiencies the estimated date by which the deficiencies will be corrected. The CQC System Manager or staff make a second inspection to ascertain that all deficiencies have been corrected. Once this is accomplished, notify the Government that the facility is ready for the Government Pre-Final inspection.

3.8.2 Pre-Final Inspection

The Government will perform the pre-final 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. Ensure that all items on this list have been corrected before notifying the Government, so that a Final inspection with the customer can be scheduled. Correct any items noted on the Pre-Final inspection in a timely manner. These inspections and any deficiency corrections required by this paragraph need to be accomplished within the time slated for completion of the entire work or any particular increment of the work if the project is divided into increments by separate completion dates.

3.8.3 Final Acceptance Inspection

The Contractor's Quality Control Inspection personnel, plus the superintendent or other primary management person, and the Contracting Officer's Representative is required to be in attendance at the final acceptance inspection. Additional Government personnel including, but not limited to, those from Base/Post Civil Facility Engineer user groups, and major commands can also be in attendance. The final acceptance inspection will be formally scheduled by the Contracting Officer based upon results of the Pre-Final inspection. Notify the Contracting Officer at least 14 days prior to the final acceptance inspection and include the Contractor's assurance that all specific items previously identified to the Contractor as being unacceptable, along with all remaining work performed under the Contract, will be complete and acceptable 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 Contracting Officer to bill the Contractor for the Government's additional inspection cost in accordance FAR 52.246-12 Inspection of Construction.</TXT>

3.9 DOCUMENTATION

3.9.1 Quality Control Activities

Maintain current records providing factual evidence that required quality control activities and tests have been performed. Include in these records the work of subcontractors and suppliers on an acceptable form that includes, as a minimum, the following information:

a. The name and area of responsibility of the Contractor/Subcontractor.

b. Operating plant/equipment with hours worked, idle, or down for repair.

c. Work performed each day, giving location, description, and by whom. When Network Analysis (NAS) is used, identify each phase of work performed each day by NAS activity number.

d. Test and control activities performed with results and references to specifications/drawings requirements. Identify the control phase (Preparatory, Initial, Follow-up). List of deficiencies noted, along with corrective action.

e. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawings requirements.

f. Submittals and deliverables reviewed, with Contract reference, by whom, and action taken.

g. Offsite surveillance activities, including actions taken.

h. Job safety evaluations stating what was checked, results, and instructions or corrective actions.

i. Instructions given/received and conflicts in plans and specifications.

3.10 SAMPLE FORMS

A sample blank "Daily Construction Quality Control Report" generated from the USACE Quality Control System (QCS) software package is attached at the end of this section. This form should be completed daily in QCS as required by Section 01 45 00 RESIDENT MANAGEMENT SYSTEM CONTRACTOR MODE (RMS CM) of these specifications.

3.11 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. Take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, will be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders will be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

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SECTION 01 41 00

QUALITY ASSURANCE PROJECT PLAN/SAMPLING AND ANALYSIS PLAN

PART 1 GENERAL

1.1 SCOPE OF WORK

A. Sampling and analysis requirements related to the following:

1. Testing of soil proposed to be imported from off-site sources to ensure they are acceptable for use in executing the Work.

2. Testing of soil to meet the requirements for disposal of materials.

3. Testing of excavation bottom and sidewalls to confirm that soil classified as RCRA Characteristic waste has been removed and segregated.

4. Testing of Construction Water treatment system effluent prior to discharge.

1.2 RELATED SECTIONS

A. Section 01 13 00- PERIMETER AIR MONITORING AND EMISSIONS CONTROL

B. Section 01 33 00- SUBMITTAL PROCEDURES

C. Section 02120 - OFF-SITE TRANSPORTATION AND DISPOSAL

D. Section 02240 - DEWATERING

E. Section 02245 - CONSTRUCTION WATER TREATMENT

F. Section 02260 - EXCAVATION

G. Section 02300 - BACKFILL AND GRADING

1.3 DEFINITIONS

AA	Atomic Absorption
CLP	USEPA Contract Laboratory Program
CTDEP	Connecticut Department of Environmental Protection
Cy	Cubic yard
DEC	Connecticut Residential Direct Exposure Criteria
DOT	United States Department of Transportation

AA	Atomic Absorption
EPA	United States Environmental Protection Agency
EPA-NE	EPA New England (Region I)
CT-ETPH	Connecticut Extractable Total Petroleum Hydrocarbons
GC/ECD	Gas chromatograph/electron capture detector
GC/FID	Gas chromatograph/flame ionization detector
GC/MS	Gas chromatograph/mass spectrometer
GWPC	Connecticut Groundwater Protection Criteria
ICP	Inductively coupled plasma
ICP-AES	Inductively coupled plasma/atomic emission spectrometer
ICP/MS	Inductively coupled plasma/mass spectrometer
LQMM	Laboratory Quality Management Manual
MCL	Drinking Water Maximum Contaminant Level
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NELAC	National Environmental Accreditation Conference
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PDF	Adobe Portable Document Format
PMC	Connecticut Pollutant Mobility Criteria
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RSR	Connecticut Remediation Standard Regulations
SAP	Sampling and Analysis Plan
SOP	Standard Operating Procedure
SPLP	Synthetic Precipitation Leaching Procedure, EPA Method SW846-1312
TCLP	Toxicity Characteristic Leaching Procedure, EPA Method SW846-1311

AA	Atomic Absorption
VOC	Volatile Organic Compound

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

Quality Assurance Project Plan (QAPP); G, DO

Sampling and Analysis Plan (SAP); G, DO

SD-06 Test Reports

Analytical Data

SD-11 Closeout Submittals

Record Drawings with sample locations

1.5 QUALITY ASSURANCE PROJECT PLAN (QAPP)

The Contractor is required to prepare a Quality Assurance Project Plan (QAPP) to describe the steps that will be taken to ensure that environmental data collected are of the correct type and quality required, and that presents an organized and systematic description of the ways in which QA and QC will be applied to the collection and use of environmental data. The QAPP shall be submitted for review and approval by the Contracting Officer. The Contractor shall follow the guidance provided by the Environmental Protection Agency (EPA) document entitled "Uniform Federal Policy for Quality Assurance Project Plans", dated March 2005. This document is available at the following internet address: https://www.epa.gov/sites/production/files/documents/ufp_qapp_v1_0305.pdf The QAPP shall be developed in coordination with the Sampling and Analysis Plan and is separate from the Construction Quality Control Plan required in Section 01 40 00.

1.6 SAMPLING AND ANAYLSIS PLAN (SAP)

1. Submit for approval a Sampling and Analysis Plan (SAP) developed in accordance with EPA New England Quality Assurance Project Plan Program Guidance. Based on this guidance, the plan must be prepared consistent with the Uniform Federal Policy for Quality Assurance Project Plans. The SAP must be submitted for approval at least 30 calendar days prior to any sampling activities. A SAP template is provided in Appendix B for the Contractor's use during SAP preparation. Table 01 41 00-1 summarizes the requirements for the analyses to be included in the SAP.

Table 01 41 00-1 Sampling and Analysis Summary				
Section	**Matrix**	**Testing Frequency**	**Analyses**	**Data Use**
01 13 00	Perimeter Air Monitoring	4 Stations. Weekly for 2 weeks, monthly thereafter	VOCs by TO-15, PM10	Demonstrate real-time instrumentation effective in measuring target constituents
02300	Backfill Material	1 per source area per 2,000 cy	RCRA8 total and SPLP metals, VOCs, SVOCs, CTETPH, PCBs, Pesticides	Document that imported material is considered clean fill.
02120	Soil Disposal	As required by disposal facility	As required by disposal facility	Classify excavated material for disposal facility acceptance
Drawing C-13	Confirmation Sampling (as shown on Drawing C-13)	1 sample per location: CB-1 (East of E7), CB-2 (North of EA-3-09), and CB-3 (West of EA-5)	VOCs	Demonstrate that cleanup levels have been met.

Table 01 41 00-1 Sampling and Analysis Summary

Section	Matrix	Testing Frequency	Analyses	Data Use
02245	Treated Construction Water Discharge	1 per batch treated	As specified in Contractor Construction Water Management Plan required by Section 02240	Water meets discharge criteria
02120	Delineation of extent of RCRA characteristic soil exceeding TCLP VOC criteria	To be specified in SAP by Contractor to document horizontal and vertical extent of exceedances have been delineated	Total VOCs, TCLP VOCs (required only if total individual VOCs exceed 20x rule)	Document extent of RCRA Characteristic soil

Table 01 41 00-1 Notes; See Section 1.3 for Definition of Terms

2. Prior to the start of Work, the Contractor shall provide a Laboratory Quality Management Manual (LQMM) for each laboratory to beused. The LQMM shall provide the chemical quality control procedures necessary for those chemical analyses to be performed by each contracted laboratory. This submittal may be in the form of a laboratory off-the-shelf Quality Management Manual, provided that allrelevant quality assurance (QA)/quality control (QC) procedures are present. The plan(s) shall be submitted by the Contractor upon selection of laboratories, at least 30 calendar days prior to any sampling activities. The LQMM(s) shall be included as an appendix to the SAP. Each laboratory identified is subject to an audit (either on-site or via document review) by the Contracting Officer.

3. Prior to start of Work, the Contractor shall provide documentation of project organization and quality management responsibilities. This information must be provided in the SAP.

B. Test Reports:

1. For analyses without an EPA Contract Laboratory Program (CLP) equivalent, CLP-like deliverables include summary forms and data as specified by the method's Connecticut Reasonable Confidence Protocol(CT RCP) criteria.

2. Fill and Backfill:

a. Analytical results shall be submitted to the Contracting Officer at least two business days prior to material being brought on-site. Data submittals shall include the results of all analyses, including duplicate sample analyses, and include comparison to theResidential Direct Exposure Criteria and GA/GAA Pollutant MobilityCriteria contained in the CT Remediation Standard Regulations. Results should also include any unusual observations such as the presence of interferences, etc. Details on the report contents and laboratory turnaround times must be provided in the SAP.

b. The analytical results shall be submitted to the Contracting Officer in the form of a Microsoft Excel spreadsheet and in Adobe (pdf) format via electronic mail or a download internet link. Field QC sample results (trip blanks, field duplicates, equipment blanks, matrix spike/matrix spike duplicates(MS/MSDs)) shall be included and clearly identified. After the data evaluation has been performed by the Contractor, the results shall be submitted to the Contracting Officer with the appropriate qualifiers in the same formats and include comparison to the backfill acceptance criteria specified in Section 02300i.

c. Submission of raw data and calculations by the laboratories is required in the format of a digital deliverable via electronic mail or a download internet link. The electronic deliverable shall contain full EPA CLP-like deliverables including all raw data.

3. Waste Characterization:

a. Analytical results shall be submitted to the Contracting Officer at least two business days prior to material being taken off-site andinclude comparison to the designated soil disposal facility limitsidentified in the Contractor's Soil Management Plan (as specified in Section 02120). Details on the report contents and laboratory turnaround times must be provided in the SAP.

b. The analytical results shall be submitted to the Contracting Officer in the form of a Microsoft Excel spreadsheet and in PDF format via electronic mail or a download internet link. Field QC sample results (trip blanks, field duplicates, equipment blanks, MS/MSDs) shall be included and clearly identified. After the data evaluation has been performed by the Contractor, the results shallbe submitted to the Contracting Officer with the appropriate qualifiers in the same formats and include comparison to the designated soil disposal facility limits.

c. Submission of raw data and calculations by the laboratories is required in the format of a digital deliverable via electronic mail or a download internet link s. The electronic deliverable shall contain full CLP-like deliverables including all raw data.

4. Confirmation Sampling:

a. Preliminary analytical results shall be submitted to the Contracting Officer at least two business days prior to continuing excavationin the sampled area and include comparison to the cleanup levels (CT RSRs). Final analytical results shall be submitted to the Contracting Officer within calendar 21 days of sample collection. Data submittals shall include the results of all analyses, including duplicate sample analyses. Results should also include any unusual observations such as the presence of interferences, etc. Details on the report contents and laboratory turnaround times must be provided in the SAP.

b. The analytical results shall be submitted to the Contracting Officer in the form of a Microsoft Excel spreadsheet and in PDF format via electronic mail or a download internet link. Field QC sample results (trip blanks, field duplicates, equipment blanks, MS/MSDs) shall be included and clearly identified. After the data evaluation has been performed by the Contractor, the results shallbe submitted to the Contracting Officer with the appropriate qualifiers in the same formats and include comparison to the cleanup levels.

c. Submission of raw data and calculations by the laboratories is required in the format of a digital deliverable via electronic mail or a download internet link. The electronic deliverable shall contain full CLP-like deliverables including all raw data.

5. Dewatering Discharge:

a. Preliminary analytical results shall be submitted to the Contracting Officer at least 8 business hours prior to discharge of treatedwater and include comparison to the discharge criteria specifiedin Section 02240. Final analytical results shall be submitted tothe Contracting Officer within 21 calendar days of sample collection. Datasubmittals shall include the results of all analyses, including duplicate sample analyses. Results should also include any unusual observations such as the presence of interferences, etc.Details on the report contents and laboratory turnaround times must be provided in the SAP.

b. The analytical results shall be submitted to the Contracting Officer in the form of a Microsoft Excel spreadsheet and in PDF format via electronic mail or a download internet link. Field QC sample results (trip blanks, field duplicates, equipment blanks, MS/MSDs) shall be included and clearly identified. After the data evaluation has been performed by the Contractor, the results shallbe submitted to the Contracting Officer with the appropriate qualifiers in the same formats and include comparison to the discharge criteria specified in Section 02245.

c. Submission of raw data and calculations by the laboratories is required in the format of a digital deliverable or a download internet link for archiving purposes. The electronic deliverable shall contain full CLP-like deliverables including all raw data.

6. RCRA Characteristic Delineation:

a. Analytical results shall be submitted to the Contracting Officer at least two business days prior to material being taken off-site andinclude comparison to the RCRA characteristic criteria and designated soil disposal facility limits. Data submittals shall include the results of all analyses, including duplicate sample analyses. Results should also include any unusual observations such as the presence of interferences, etc. Details on the reportcontents and laboratory turnaround times must be provided in the SAP.

b. The analytical results shall be submitted to the Contracting Officer in the form of a Microsoft Excel spreadsheet and in PDF

format via electronic mail or a download internet link. Field QC sample results (trip blanks, field duplicates, equipment blanks, MS/MSDs) shall be included and clearly identified. After the data evaluation has been performed by the Contractor, the results shallbe submitted to the Contracting Officer with the appropriate qualifiers in the same formats and include comparison to the TCLP criteria and designated soil disposal facility limits (if applicable) selected in Section 02120 OFF-SITE TRANSPORTATION AND DISPOSAL.

c. Submission of raw data and calculations by the laboratories is required in the format of a digital deliverable via electronic mail or a download internet link for archiving purposes. The electronic deliverable shall contain full CLP-like deliverables including all raw data.

C. Field Notes:

1. Copies of field logbook entries, all sample collection forms, and detailed sample location information for all sample collection shall be submitted with the test reports required above. Results of all field measurements performed must be included in these notes and/or summarized in spreadsheet format, as described above.

D. As-Built Plan Sample Locations:

1. The Contractor shall submit record drawings showing the surveyed locations of sample collection.

1.5 CONTRACTOR REQUIREMENTS

A. Laboratory Services:

1. The Contractor shall provide and coordinate the services of an environmental chemical laboratory to perform analyses. Laboratory capabilities must be provided for the duration of the work. Laboratories are subject to audit by the Contracting Officer, both on-site or viadocument review, at anytime.

a. Data Quality Requirements:

(1) The Contractor must adhere to the requirements detailed in their SAP for the project (as required in part 1.05.B of this specification.) The purpose of the SAP is to ensure that the Contractor adequately addresses all chemical quality management requirements associated with this project. The Contractor shall ensure that all technical data generated are accurate, precise, and representative. The types and quality of the sampling procedures and analytical testing shall be based on the requirements set forth in these specifications and the SAP. Each contracted laboratory shall submit a LQMM for review and approval by the Contracting Officer.

(2) Quality data shall be generated by the Contractor from the following sampling and analysis programs:

(a) Testing of backfill material.

(b) Characterization of excavated material for disposal purposes.

(c) Testing of excavation bottom and sidewalls in areas with soils classified as RCRA Characteristic.

(d) Testing of treated groundwater.

(e) Delineation of soil exceeding RCRA Characteristic criteria.

(3) Quality Control/Assurance Policy:

(a) The Contractor shall adhere to the requirements detailed in their approved SAP. The SAP will include consideration of the technical specification requirements and contains provisions to assure identification and compliance with requirements of EPA and Connecticut Department of Environmental Protection (CTDEP) regulations.

b. Responsibilities:

(1) The Contractor's Quality Management Program shall provide assurance that activities affecting chemical quality are documented and accomplished in accordance with written instructions, drawings and procedures. Provisions shall be established for communicating to all responsible individuals in the Contractor's organization that Quality Assurance policies, plans, and procedures are mandatory requirements which shall be implemented.

(2) Activities affecting quality shall be accomplished under controlled conditions. Controlled conditions include the use of appropriate procedures and equipment; suitable environmental conditions for accomplishing the activity, such as adequate cleanliness; documentation that specified decontamination procedures were followed; adequate off-site laboratory facilities; and assurance that all prerequisites for the given activity have been satisfied.

c. Quality Management Organization:

(1) The Contractor shall execute the SAP which will clearly define the organizational structure within which the SAP is to be implemented and executed. The Contractor shall detail the names, qualifications, authorities and responsibilities of all QA/QC personnel as well as the relationship and/or interrelationship with the overall project organization. The authority and responsibility of persons performing quality management activities shall be stated in writing. The Quality Management organization shall document the functional lines of authority within the Quality organization.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 INSTALLATION (BY OTHERS)

A. The Contractor shall provide details relative to the project organization and quality management responsibilities for the Contractorand any Subcontractors to be involved in the completion of the proposedwork. This information must be included in the SAP and shall clearly define the project management assignments by name and their responsibilities to ensure compliance with QA/QC protocols.

B. Overall Project Organization:

1. Overall project organization shall include schematic diagrams indicating key QA/QC individuals by name for the prime Contractor andany Subcontractor and showing all Contractor-Subcontractor interactions and responsibilities.

C. List of Key Individuals:

1. A listing of key individuals and descriptions of qualifications and experience relative to toxic or hazardous materials/wastes sampling and analyses shall be provided.

D. Sampling Program Organization:

1. The Contractor shall clearly specify the sampling program organization to be utilized during all field sampling efforts. The Contractor shall clearly identify whether individual Subcontractors will be responsible for specific sampling programs. The Contractor shall identify all Subcontractors responsible for chain-of-custody transfer between sample collection and receipt by the laboratories.

E. Contractor Quality Control Supervisor:

1. The Contractor's Quality Control Supervisor shall be responsible for overall management of the Chemical QA/QC System and have the authority to act in all QA/QC matters for the Contractor. The QC Supervisor for this contract shall have the ultimate responsibility toensure compliance with the approved SAP as well as be in charge of theContractor's Quality Control Program for the overall project specifications. The name of this person and/or authorized assistants shall be provided by the Contractor along with a summary of their prior experience which shall demonstrate their ability to perform correctly the duties required to the satisfaction of the Contracting Officer. All of the Contractor's submittals for approval shall be reviewed andmodified or corrected as needed by him or his authorized assistants and approved prior to forwarding of such submittals to the Contracting Officer.

2. The Contractor's Quality Control Supervisor may designate some of his responsibilities to another qualified person who shall be approved in advance by the Contracting Officer in the following situations:

a. When the Contractor's Quality Control Supervisor does not

personally have the requisite skills.

b. When the Contractor's Quality Control Supervisor is unable to be physically present when tasks involving chemical sampling and analysis activities are being conducted on Site.

c. When deemed necessary by the Contracting Officer.

F. Laboratory Certification:

1. The Contractor shall show evidence of the prequalification auditing of the certified laboratories. The prequalification shall include a description of the facilities, analytical instrumentation, and personnel responsible for the performance of all laboratory analyses, including supervisors, chemists and technicians. These persons shall be identified together with a corresponding descriptionof experience and qualifications. An on-site audit of the laboratoryis not required by the Contractor.

3.2 LABORATORY APPROVAL REQUIREMENTS

A. General:

1. The Contractor shall provide and coordinate the services of an analytical laboratory to perform analyses certified by the EPA's National Environmental Laboratory Accreditation Conference (NELAC) within the required turnaround time. The laboratory shall be certified by NELAC for the EPA analytical methodologies required under this program. The SAP must detail the matrices and methods which need to be documented as NELAC accredited. The laboratory is subject to inspection (auditing) and prior approval by the Contracting Officer. In addition,individual laboratories will be required to submit the necessary documentation demonstrating the NELAC certification for the EPA analytical methodologies required under this program.

2. Laboratories shall possess NELAC certification for each environmental matrix and each specific analytical method to be employed. The Contractor must show documentation of prequalification and auditing of all selected laboratories having NELAC certification for all of the analytes and matrices specific to the project. The documentation must show that the laboratories were chosen not only for the low price but for their qualifications. The laboratories' QA plan, resumes, Standard Operating Procedures (SOPs) and Statement of Qualifications which includes lists of laboratory instrumentation, facility description, and experience/references should be available for review by the Contracting Officer. If the laboratory was audited by the Contractor, a record of the results of that audit must be available tothe Contracting Officer. All of the above information must show relevance to theproject.

B. Inspection and Approval:

1. The Contractor's laboratory and organization must be approved by the Contracting Officer prior to receiving Site samples for analysis. Satisfactory completion of the entire laboratory certification processand approval of the individual Laboratory LQMM in accordance with thissection must be made before sampling and analysis of any samples may be performed.

C. Laboratory Personnel:

1. General:

a. The Contractor's laboratory or subcontracted laboratory shall be experienced in the type of testing to be performed. A representative of the laboratory shall coordinate sampling and testing to control the quality of the work. The laboratory personnel will be evaluated and approved with reference to their education and related professional experience in the performance of specified analytical and QA/QC activities. At a minimum, the laboratory personnel shall consist of the following:

2. Organic Laboratory Supervisor:

a. An Organic Laboratory Supervisor shall have a minimum of a bachelor's degree in chemistry or any physical science and at least three years of laboratory experience, including at least one year of supervisory experience.

3. GC/MS Operator:

a. A gas chromatograph/mass spectrometer (GC/MS) Operator shall have a minimum of a bachelor's degree in chemistry or any physicalscience and one year of experience in operating and maintaining GC/MS systems. This applies to operators of low resolution and high resolution GC/MS systems.

4. GC/ECD Operator:

a. A gas chromatograph/electron capture detector (GC/ECD) Operator shall have a minimum of a bachelor's degree in chemistryor any physical science and one year of experience in operating and maintaining GC/ECD systems.

5. GC/FID Operator:

a. A gas chromatograph/flame ionization detector (GC/FID) Operator shall have a minimum of a bachelor's degree in chemistryor any physical science and one year of experience in operating and maintaining GC/FID systems.

6. Mass Spectral Interpretations Specialist:

a. A Mass Spectral Interpretations Specialist shall have a minimum of a bachelor's degree in chemistry or any physical science, a training course(s) in mass spectral interpretation anda minimum of two years’ experience.

7. Organic Sample Preparation Specialist:

a. An organic sample preparation specialist shall have a minimum of a high school diploma and a college level course in general chemistry or equivalent, and a minimum of six months experience inan analytical laboratory.

8. Back-Up Technician:

a. The laboratory shall have a minimum of one (1) chemist available at any one time of operation as a back-up technical

person with a minimum of a bachelor's degree in chemistry or any physical science and a minimum of one year experience in each of the following areas: GC/MS operation and maintenance for volatileand semivolatile analyses; mass spectral interpretation; sample extraction and preparation; and GC/ECD operation and maintenance for pesticide/PCB analyses.

9. Inorganics Laboratory Supervisor:

a. An Inorganics Laboratory Supervisor shall have a minimum of a bachelor's degree in chemistry or any scientific/engineering discipline and a minimum of three years of laboratory experience, including at least one year in a supervisory position.

10. ICP/AES and/or ICP/MS Spectroscopist:

a. An Inductively coupled plasma/atomic emission spectrometer (ICP/AES) and/or ICP/mass spectrometer (MS) Spectroscopist shallhave a minimum of a bachelor's degree in chemistry or any scientific/engineering discipline, a specialized training in ICP/AES and/or ICP/MS Spectroscopy and a minimum of two years ofapplied experience with ICP/AES and/or ICP/MS analysis of environmental samples.

11. ICP/AES Operator:

a. An ICP/AES Operator shall have a minimum of a bachelor's degree in chemistry or any scientific/engineering discipline, aminimum of one year of experience in operating and maintaining ICP/AES instrumentation, in conjunction with the educational requirements; or, in lieu of educational requirements, three additional years of operating and maintaining ICP/AES instrumentation.

12. Atomic Absorption Operator:

a. An Atomic Absorption (AA) Operator shall have a minimum of a bachelor's degree in chemistry or any scientific/engineering discipline, a minimum of one year of experience in operating and maintaining AA instrumentation for whichever of the following AA techniques will be utilized during this program: (a) flame, (b) graphite furnace, and (c) cold vapor, in conjunction with the educational requirements; or, in lieu of educational requirements,three additional years of operating and maintaining AA instrumentation, including flame, graphite furnace, and cold vaportechniques.

13. Inorganic Sample Preparation Specialist:

a. An Inorganic Sample Preparation Specialist shall have a minimum of a high school diploma and a college level course in general chemistry or equivalent, and a minimum of six months ofexperience in an analytical laboratory.

14. Spectrophotometric and/or Titration Specialist:

a. A Spectrophotometric and/or Titration Specialist (based on which procedure is used for cyanide analysis) shall have a minimumof a high school diploma and a college level course in general chemistry or equivalent, and a minimum of six months of

experiencein an analytical laboratory.

15. Training:

a. The laboratory must provide documentation of all training. This will include the time of training, curriculum of material taught, the qualification of the trainers, and a testing procedureor method of documenting the learning process.

D. Laboratory Facilities:

1. Certain basic facilities are necessary for the safe, accurate and timely analysis of the required samples. At a minimum, the laboratory facilities shall include the following:

2. Sample Receipt Area:

a. A sample receipt area providing adequate, contamination-free, well-ventilated work space with chemical resistant bench tops for receipt and safe handling of samples.

3. Storage Area:

a. A Storage Area with sufficient refrigerator space to maintain unused sample volume for 60 days after data submission and sample extracts for 365 days after data submission. NOTE: Volatile samples, extractable organic samples, sample extracts, and standards must each be stored separately.

4. Sample Preparation Area:

a. A Sample Preparation Area shall have adequate, contamination-free, well-ventilated work space provided with:benches with chemical resistant tops, fume hoods, laboratory ovens, desiccators, a vacuum source (Note: Standards must be prepared in a separated hood or isolated area), source of distilled or demineralized organic-free water and analytical balance(s) located away from drafts and rapid changes in temperature.

E. Laboratory Instrumentation:

1. At a minimum, the laboratory shall have the following instruments in operation at the time of the post-award laboratory evaluation. The instruments must be committed for the full duration of the contract. The instruments must be capable of achieving the required reporting limits specified in the SAP.

2. Volatile Analysis:

a. For volatile analysis, a GC/MS system with a purge and trap device shall be provided.

3. Semivolatile Analysis:

a. For semivolatile analysis, a GC/MS system with an autosampler/injector shall be provided.

4. Backup for Organic Instrumentation:

a. As a backup for organic instrumentation, the laboratory shall provide, at a minimum, one (1) GC/MS system and one (1) purge and trap device. In addition, the laboratory shall have an in-house stock of instrument parts and circuit boards or maintain manufacturer instrument service contracts for each instrument to ensure continuous operation to meet contract-specified holding times and turnaround times.

5. Metals Analysis (Excluding Mercury):

a. For the analysis of metals, an ICP/AES and/or an ICP/MS shall be provided. The choice of instruments used will be dependent upon the laboratory and the required reporting limits for metals. The instrument chosen must meet the required reporting limits for metals presented in the SAP. If required reporting limits cannot be met by ICP/AES and an ICP/MS is unavailable to the laboratory,an atomic absorption spectrophotometer may be used, as specified in this section.

b. If an ICP/MS is unavailable to the laboratory, an AA Metals Analysis spectrophotometer with a graphite furnace shall be provided.

6. Mercury Analysis:

a. For mercury analysis, a mercury cold vapor AA analyzer or AA instrument modified for cold vapor analysis shall be provided.

7. Cyanide Analysis:

a. For cyanide analysis, a spectrophotometer suitable for measurements between 570 and 580 nanometers shall be provided.

8. Backup for Inorganic Instrumentation:

a. As a backup for inorganic instrumentation, the Contractor laboratory shall provide the following: one graphite furnace equipped atomic absorption spectrometer and one mercury cold vaporatomic absorption system. In addition, the Contractor laboratory shall have an in-house stock of circuit boards and instrument parts or maintain manufacturer instrument service contracts for each piece of equipment to ensure continuous operation to meet contract specified turnaround times.

F. Laboratory Management Capability:

1. The Contractor laboratory must have an organization with well-defined responsibilities for each individual in the management system to ensure sufficient resources for this contract and to maintain a successful operation. To establish this capability, the Contractor laboratory shall designate personnel to carry out the following responsibilities for the contract. Functions include, but are not limited to, the following:

2. Project Manager:

a. Project Manager shall be responsible for overall aspects of the contract (from sample receipt through data delivery) and shallbe the primary contact.

3. Sample Custodian:

a. Sample Custodian shall be responsible for receiving the samples (logging, handling and storage).

4. Quality Assurance Officer:

a. Quality Assurance Officer shall be responsible for overseeing the quality assurance aspects of the data, ensuring corrective action procedures are implemented when necessary and shall report directly to upper management.

5. Data Reporting and Delivery Officer:

a. Data Reporting and Delivery Officer shall be responsible for all aspects of data deliverables organization, packaging, copying,and delivery.

3.3 SAMPLING PROCEDURES

A. Sampling Plan Overview:

1. The SAP must include a sampling plan for each matrix to be sampled. Each plan clearly addresses procedures to obtain representative data. The SAP must contain descriptions of sampling equipment and sample sizes. The SAP must contain descriptions of sample containers, sample preservation, sample shipment and handling and sampling program organization. SOPs for sampling, if available, shall be provided by the Contractor and included as an Appendix of the SAP.

2. Sampling and sample custody procedures shall be consistent with EPAguidelines unless otherwise specified.

3. Specific sampling and analytical procedures must be identified in theSAP including related extraction procedures and analytical methodologies for appropriate chemical analyses. Detailed procedures must be provided in the SAP for analytical methodologies requiring special modifications.

4. The Contracting Officer shall have the right to direct modifications to thesampling methodology or SOPs to ensure representative sampling.

5. The SAP shall identify the proposed disposal facilities and describe the analytical and sample frequency requirements of each proposed disposal facility.

6. The SAP shall include one or more site plans showing proposed sampling locations for soil disposal characterization samples (if precharacterization is to be used), samples to define limits of RCRA characteristic soil, and confirmation samples.

7. The SAP shall describe, for all soil:

a. Sample depth interval

b. Rationale and method for creation of composite samples (if used) from grab samples.

B. Sampling and Analysis Requirements:

1. Sampling and analysis requirements for each matrix must be summarized in the SAP. Requirements are further described in Section 02120 - Off-Site Transportation and Disposal, Section 02240 - Dewatering, Section 02216 - Excavation, and Section 02300 - Backfill and Grading. Sampling rationale, frequency requirements associated with each matrix, associated target compounds, required reporting limits, chemical analyses and required QC analyses must be detailed inthe SAP.

C. Decontamination Procedures:

1. The Contractor shall follow the decontamination procedure that must be provided in the SAP for the decontamination of sampling equipment. Sampling methods and equipment shall be chosen to minimize decontamination requirements and the possibility of cross contamination. Any sampling equipment used must be decontaminated before use and between sampling locations.

D. Sample Handling:

1. Sample Containers and Preservation:

a. Containers for all samples and coolers shall be supplied by the laboratory. All sample containers utilized by the Contractor shall be provided from an EPA-approved supplier utilizing pre-cleaned containers.

b. The Contractor shall employ the sample preservation methods that must be detailed in the SAP following sample collection. The SAP must include all chemical preservatives to be used, required physical conditions of storage and shipment, and required holding times.

2. Chain of Custody:

a. Each sample container shall be clearly identified with the name of the project, the field sample number, date and time of sampling and the name of the sampling personnel. Field information shall be written in indelible ink and the label shall be affixed in such a manner to ensure that is does not become separated from its respective container.

b. The Contractor shall follow the sample custody procedures detailed in the SAP which will assure that any sample which is analyzed will yield results representative of the sample's condition at the time of sampling. The procedures provided are in conformance with the appropriate EPA guidelines.

c. The Contractor shall follow the chain-of-custody procedures detailed in the SAP and shall adequately record, for evidence, ata minimum, the following information:

(1) Sample type, sample number, date and time of collection and signatures of the collector.

(2) Signatures of persons involved in sample chain of custody.

(3) Inclusive dates of possession of all individuals involved in sample possession.

(4) Additional remarks the sample handler may have to transcribe onto the chain of custody form.

(5) Analytical parameters required (name and method number).

(6) Name of the project.

(7) Name and telephone number of the point of contact to call for any questions on the sample shipment.

d. The Contractor shall refer to the SAP for the methods by which written chain-of-custody information shall be stored for future use.

3. Sample Packaging and Shipping:

a. The Contractor shall follow the sample packaging and shipping procedures detailed in the SAP.

b. The Contractor shall be responsible for compliance with all appropriate EPA and United States Department of Transportation (DOT) regulations regarding sample shipment.

E. Documentation:

1. The Contractor shall refer to the SAP for the sample documentation program. The Contractor shall provide the Contracting Officer access to the field logbook at all times and shall turn it over to theContracting Officer in good condition at the conclusion of the project.

3.4 QUALITY CONTROL SAMPLES

A. General:

1. The Contractor shall be responsible for collecting field QC samples. The QC samples to be collected shall be identified in the SAP. The QC samples are a check on the Contractor's laboratory's overall quality.

B. Contractor Quality Control:

1. To assure analytical accuracy and consistency, the system of laboratory internal quality control checks specified in the SAP shallbe followed.

3.5 ANALYTICAL METHODS

A. The proposed contracted laboratory(ies) must be identified in the SAP and must be approved by the Contracting Officer. The laboratory must be, at a minimum, capable of performing the analyses cited in the SAP.

B. The SAP must provide a summary of the required analytical methods. The quantitation limits for each of the sample parameters must be comparable to published quantitation limits in SW-846 and referenced methods. The required analytical methods are presented in Table 01410-2. In addition, the quantitation limits must be sensitive enough to monitor compliance with the soil cleanup levels specified in the SAP.

Table 01 41 00-2 Analytical Method Requirements

Parameter	**Method Reference**	**Analyte List***
VOCs	SW846-8260	Per CT RCP for method
SVOCs	SW846-8270	PAH compounds listed in CT RCP for method
PCBs	SW846-8082	Per CT RCP for method
Pesticides	SW846-8081	Per CT RCP for method
CT ETPH	CT RCP Method ETPH	Per CT RCP for method
Metals	SW846-6010 or SW846-6020 or SW846-7000	Per CT RCP for method
Mercury	SW846-7470 or SW846-7471	Per CT RCP for method
TCLP extraction (if required by disposal facility)	SW846-1311	Per CT RCP
Waste Characteristics	SW846-9000 series	As required by disposal facility

Table 01 41 00-2 Notes; See Section 1.4 for Definition of Terms
* Or as required by disposal facility for waste characterization

C. Analytical Instrumentation:

1. The apparatus and instrumentation to be used for all analyses shall be identified as part of the Laboratory(ies) LQMM:

a. Specific field and laboratory instrumentation including manufacturer and model number.

b. Operating parameters.

c. Laboratory chemicals necessary to perform the analyses.

d. Standards including those for calibration.

D. Corrective Action:

1. The Contractor shall refer to the SAP for the protocol describing the corrective actions to be taken by the Contractor should any analytical data fall outside of acceptable control limits during review.

E. Data Analysis and Reporting:

1. The Contractor shall refer to the SAP for the specific system to be used in handling the raw data from the time of analysis to the timeof reporting to the time of archival storage.

2. At a minimum, the Contractor shall conform to EPA SW-846 and shall have procedures in place to address the following items for eachanalytical method and major measurement parameter.

a. The laboratory data management system including:

(1) The date collected from the Chain of Custody and field manuals

(2) Field manual notes

(3) The raw data collection system

(4) The final calculated results

(5) The data storage system in its entirety including provisions for security and prevention of data loss

(6) Data quality assurance documentation including copies of the method-specified forms presented in SW-846

(7) Identification system for all data collected

(8) Identification of individuals involved in data management and reporting

(9) Identification of schedule for reporting QC analytical data to the Contracting Officer and EPA

b. The data analysis system including units and equations required to convert instrument response into chemical concentrations.

c. Plans for testing questionable or incorrect data or inaccurate programming sequences.

3. The Contractor shall determine the required laboratory turnaround times for each matrix, noting the following:

a. Continued excavation of areas adjacent to those identified as containing F-listed waste cannot occur until results of sidewall and excavation bottom samples indicate the excavated material would no longer be considered an F-listed waste, unless otherwise directed by the Contracting Officer.

b. Effluent water from the dewatering treatment system cannot be discharged until sample results are received and demonstrate the achievement of the discharge criteria.

c. Backfill cannot be brought on-site until documented that it meetscriteria for use on-site.

4. Data deliverable requirements must be outlined in the SAP. Electronic data deliverable requirements are outlined in Section 1.5 (c) and in the SAP.

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SECTION 01 45 00

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SECTION 01 45 00

RESIDENT MANAGEMENT SYSTEM CONTRACTOR MODE (RMS CM)

PART 1 GENERAL

1.1 REFERENCES

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

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2014) Safety -- Safety and Health Requirements Manual

1.2 MEASUREMENT AND PAYMENT

The work of this section is not measured for payment. The Contractor is responsible for the work of this section, without any direct compensation other than the payment received for contract items.

1.3 CONTRACT ADMINISTRATION

The Government will use the Resident Management System (RMS) to assist in its monitoring and administration of this contract. The Government accesses the system using the Government Mode of RMS (RMS GM) and the Contractor accesses the system using the Contractor Mode (RMS CM). The term RMS will be used in the remainder of this section for both RMS GM andRMS CM.

The joint Government-Contractor use of RMS facilitates electronicexchange of information and overall management of the contract. The Contractor accesses RMS to record, maintain, input, track, and electronically share information with the Government throughout the contract period in the following areas:

Administration
Finances
Quality Control
Submittal Monitoring
Scheduling
Closeout
Import/Export of Data

1.3.1 Correspondence and Electronic Communications

For ease and speed of communications, exchange correspondence and other documents in electronic format to the maximum extent feasible. Some correspondence, including pay requests and payrolls, are also to be provided in paper format with original signatures. Paper documents will govern, in the event of discrepancy with the electronic version.

1.3.2 Other Factors

Other portions of this document have a direct relationship to the

reporting accomplished through RMS. Particular attention is directed to FAR 52.236-15 Schedules for Construction Contracts; FAR 52.232-27 Prompt Payment for Construction Contracts; FAR 52.232-5 Payments Under Fixed-Priced Construction Contracts; Section 01 32 01.00 10 PROJECT SCHEDULE; Section 01 33 00 SUBMITTAL PROCEDURES; Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS; and Section 01 40 00.00 10 QUALITY CONTROL.

1.4 RMS SOFTWARE

RMS is a web based application. Download, install and be able to utilize the latest version of RMS within 7 calendar days of receipt of the Notice to Proceed. RMS software, user manuals, access and installation instructions, program updates and training information are available from the RMS website (https://rms.usace.army.mil). The Government and the Contractor will have different access authorities to the same contract database through RMS. The common database will be updated automatically each time a user finalizes an entry or change.

1.5 CONTRACT DATABASE - GOVERNMENT

The Government will enter the basic contract award data in RMS prior to granting the Contractor access. The Government entries into RMS will generally be related to submittal reviews, correspondence status, and Quality Assurance(QA)comments, as well as other miscellaneous administrative information.

1.6 CONTRACT DATABASE - CONTRACTOR

Contractor entries into RMS establish, maintain, and update data throughout the duration of the contract. Contractor entries generally include prime and subcontractor information, daily reports, submittals, RFI's, schedule updates and payment requests. RMS includes the ability to import attachments and export reports in many of the modules, including submittals. The Contractor responsibilities for entries in RMS typically include the following items:

1.6.1 Administration

1.6.1.1 Contractor Information

Enter all current Contractor administrative data and information into RMS within 7 calendar days of receiving access to the contract in RMS. This includes, but is not limited to, Contractor's name, address, telephone numbers, management staff, and other required items.

1.6.1.2 Subcontractor Information

Enter all missing subcontractor administrative data and information into RMS CM within 7 calendar days of receiving access to the contract in RMS or within 7 calendar days of the signing of the subcontractor agreement for agreements signed at a later date. This includes name, trade, address, phone numbers, and other required information for all subcontractors. A subcontractor is listed separately for each trade to be performed.

1.6.1.3 Correspondence

Identify all Contractor correspondence to the Government with a serial

number. Prefix correspondence initiated by the Contractor's site office with "S". Prefix letters initiated by the Contractor's home (main) office with "H". Letters are numbered starting from 0001. (e.g., H-0001 or S-0001). The Government's letters to the Contractor will be prefixed with "C" or "RFP".

1.6.1.4 Equipment

Enter and maintain a current list of equipment planned for use or being used on the jobsite, including the most recent and planned equipment inspection dates.

1.6.1.5 Reports

Track the status of the project utilizing the reports available in RMS. The value of these reports is reflective of the quality of the data input. These reports include the Progress Payment Request worksheet, Quality Control (QC) comments, Submittal Register Status, and Three-Phase Control worksheets.

1.6.1.6 Request For Information (RFI)

Create and track all Requests For Information (RFI) in the RMS Administration Module for Government review and response.

1.6.2 Finances

1.6.2.1 Pay Activity Data

Develop and enter a list of pay activities in conjunction with the project schedule. The sum of pay activities equals the total contract amount, including modifications. Each pay activity must be assigned to a Contract Line Item Number (CLIN). The sum of the activities assigned to a CLIN equals the amount of each CLIN.

1.6.2.2 Payment Requests

Prepare all progress payment requests using RMS. Update the work completed under the contract at least monthly, measured as percent or as specific quantities. After the update, generate a payment request and prompt payment certification using RMS. Submit the signed prompt payment certification and payment request as well as supporting data either electronically or by hard copy. Unless waived by the Contracting Officer, a signed paper copy of the approved payment certification and request is also required and will govern in the event of discrepancy with the electronic version.

1.6.3 Quality Control (QC)

Enter and track implementation of the 3-phase QC Control System, QC testing, transferred and installed property and warranties in RMS. Prepare daily reports, identify and track deficiencies, document progress of work, and support other Contractor QC requirements in RMS. Maintain all data on a daily basis. Insure that RMS reflects all quality control methods, tests and actions contained within the Contractor Quality Control (CQC) Plan and Government review comments of same within 7 calendar days of Government acceptance of the CQC Plan.

1.6.3.1 Quality Control (QC) Reports

The Contractor's Quality Control (QC) Daily Report in RMS is the official report. The Contractor can use other supplemental formats to record QC data, but information from any supplemental formats are to be consolidated and entered into the RMS QC Daily Report. Any supplemental information may be entered into RMS as an attachment to the report. QC Daily Reports must be finalized and signed in RMS within 24 hours after the date covered by the report. Provide the Government a printed signed copy of the QC Daily Report, unless waived by the Contracting Officer.

1.6.3.2 Deficiency Tracking.

Use the QC Daily Report Module to enter and track deficiencies. Deficiencies identified and entered into RMS by the Contractor or the Government will be sequentially numbered with a QC or QA prefix for tracking purposes. Enter each deficiency into RMS the same day that the deficiency is identified. Monitor, track and resolve all QC and QA entered deficiencies. A deficiency is not considered to be corrected until the Government indicates concurrence in RMS.

1.6.3.3 Three-Phase Control Meetings

Maintain scheduled and actual dates and times of preparatory and initial control meetings in RMS. Worksheets for the three-phase control meetings are generated within RMS.

1.6.3.4 Labor and Equipment Hours

Enter labor and equipment exposure hours on a daily basis. Roll up the labor and equipment exposure data into a monthly exposure report.

1.6.3.5 Accident/Safety Reporting

Both the Contractor and the Government enter safety related comments in RMS as a deficiency. The Contractor must monitor, track and show resolution for safety issues in the QC Daily Report area of the RMS QC Module. In addition, follow all reporting requirements for accidents and incidents as required in EM 385-1-1, Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS and as required by any other applicable Federal, State or local agencies.

1.6.3.6 Definable Features of Work

Enter each feature of work, as defined in the approved CQC Plan, into the RMS QC Module. A feature of work may be associated with a single or multiple pay activities, however a pay activity is only to be linked to a single feature of work.

1.6.3.7 Activity Hazard Analysis

Import activity hazard analysis electronic document files into the RMS QC Module utilizing the document package manager.

1.6.4 Submittal Management

Enter all current submittal register data and information into RMS within 7 calendar days of receiving access to the contract in RMS. The information shown on the submittal register following the specification Section 01 33 00 SUBMITTAL PROCEDURES will already be entered into the RMS database when access is granted. Group electronic submittal documents into transmittal packages to send to the Government, except very large

electronic files, samples, spare parts, mock ups, color boards, or where hard copies are specifically required. Track transmittals and update the submittal register in RMS on a daily basis throughout the duration of the contract. Submit hard copies of all submittals unless waived by the Contracting Officer.

1.6.5 Schedule

Enter and update the contract project schedule in RMS by either manually entering all schedule data or by importing the Standard Data Exchange Format (SDEF) file, based on the requirements in Section 01 32 01.00 13 PROJECT SCHEDULE.

1.6.6 Closeout

Closeout documents, processes and forms are managed and tracked in RMS by both the Contractor and the Government. Ensure that all closeout documents are entered, completed and documented within RMS.

1.7 IMPLEMENTATION

Use of RMS as described in the preceding paragraphs is mandatory. Ensure that sufficient resources are available to maintain contract data within the RMS system. RMS is an integral part of the Contractor's required management of quality control.

1.8 NOTIFICATION OF NONCOMPLIANCE

Take corrective action within 7 calendar days after receipt of notice of RMS non-compliance by the Contracting Officer.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

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SECTION 01 50 00

TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS

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.

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 241	(2013; Errata 2015) Standard for Safeguarding Construction, Alteration, and Demolition Operations
NFPA 70	(2014; AMD 1 2013; Errata 1 2013; AMD 2 2013; Errata 2 2013; AMD 3 2014; Errata 3-4 2014; AMD 4-6 2014) National Electrical Code
NFPA 70E	(2015; ERTA 1 2015) Standard for Electrical Safety in the Workplace

STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION

CTTRAFFIC	Traffic Control During Maintenance Operations

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2014) Safety and Health Requirements Manual

U.S. FEDERAL HIGHWAY ADMINISTRATION (FHWA)

MUTCD	(2009, Rev 2017) 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 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

Construction Site Plan; G, RO

Temporary Electrical System; G, RO

Traffic Control Plan; G, RO

SD-03 Product Data

Barricades

Safety Fence

1.4 CONSTRUCTION SITE PLAN

Prior to the start of work, submit a site plan showing the locations and dimensions of temporary facilities including layouts and details, equipment and material storage areas both onsite and offsite, access and haul routes, avenues of ingress/egress, and the number of trailers to be used. Identify any areas which may have to be graveled to prevent the tracking of mud. Show locations of safety fences, site trailers, construction entrances, trash dumpsters, temporary sanitary facilities, and worker parking areas. The plan shall also show where temporary utility hook-ups are to be located, if required, and how grounding of equipment and trailers will be achieved.

The Plan shall include:

1.

a. Locations, sizes, and requirements for utility services.

b. Layout of Support Zone and other Work Zones, including Decontamination Zone.

c. Level A Subsurface Utility Engineering (SUE) investigation.

d. Proposed design for Site Access for each phase of work.

e. Proposal disposal facilities.

f. Proposed design of Decontamination Stations.

g. Decontamination Methods and Equipment.

i. Procedures to prevent contamination of clean areas.

ii. Vehicle decontamination and inspection procedures.

iii. Procedures for collection, treatment, and disposal or discharge of decontamination residuals and used PPE.

PART 2 PRODUCTS

2.1 PROJECT SIGNS

A. Project Sign(s) shall be provided as required by funding and regulatory agencies and at a minimum shall include the following information.

1. Project title, as indicated on Contract Documents

2. Names and titles of authorities

3. Name of prime Contractor

B. Project sign(s) shall be located as approved by the Contracting Officer and be constructed to meet the following requirements:

1. Construction materials and erection supports to resist wind loads and all weather related impacts for the duration of the project.

2. Comply with CT DOT standards as approved by the Contracting Officer.

2.2 TEMPORARY CONCRETE BARRICADES AND SAFETY FENCE

The Contractor shall erect and maintain temporary concrete barricades and temporary safety fencing to limit public access to hazardous areas. Temporary barricades and safety fencing need not be new but shall be in overall good condition.

2.2.1 Temporary Concrete Barricades

Concrete barricades shall be required whenever safe public access to paved areas such as roads, parking areas or sidewalks is prevented by construction activities or as otherwise necessary to ensure the safety of both pedestrian and vehicular traffic. Concrete barricades shall be securely placed and clearly visible. All barricades shall be provided with a flashing light (amber yellow, 5 candelas effective intensity, 55-75 flashes per minute). All barricades must be anchored or of sufficient mass to retain an established position where they are placed. Continuous burning lights shall have an effective intensity of 10 candelas. Place barricades at 10 foot maximum intervals and use dual markers and lights at corners and ends. Flashing lights shall be maintained to operate nightly during construction with adequate illumination to provide sufficient visual warning of the hazard during both day and night. The Contractor shall check each flashing light for operation every night before leaving the project area.

2.2.2 Temporary Safety Fencing

Temporary safety fencing shall be used to limit access to active construction areas and the Site facilities area. The safety fencing shall be at least 6 feet high and aesthetically appropriate with respect to the abutting residential properties made of vinyl coated chain link with privacy slats or a wooden/plastic type fence.

PART 3 EXECUTION

3.1 EMPLOYEE PARKING

Contractor employees shall park privately owned vehicles on the project site as determined at the Preconstruction Conference, or in an area obtained by the Contractor.

3.2 AVAILABILITY AND USE OF UTILITY SERVICES

Water and electricity required in the prosecution of the work shall be furnished by the Contractor at his own expense. The Government will not supply water and electricity.

3.2.1 Water

Make connections to the nearest municipal water supply, where available, and or provide an alternate source of water, and use this supply for construction purposes. Any portions which are to become a part of the permanent system shall conform to the applicable sections of these specifications.

Furnish and maintain and subsequently provide the water meters and backflow preventers at each location. Furnish all extensions required. Provide drinking water, satisfactorily cooled.

3.2.2 Temporary Electrical Equipment and Connections

The Contractor, at his own expense and in a workmanlike manner satisfactory to the Contracting Officer, shall install and maintain all necessary temporary connections and distribution lines. All required temporary electrical equipment and lines shall be furnished, installed, connected, and maintained by the Contractor according to EM 385-1-1, Section 11.E, NFPA 241, and NFPA 70, Article 305-6(b), "Assured Equipment Grounding Conductor Program". All temporary equipment and lines shall be removed prior to final acceptance of the work. Materials and equipment need not be new, but must be in good repair and serviceable condition. Periodic inspections of systems and devices shall be made by the Contractor at intervals not to exceed one week.

Arrange for, furnish, and maintain all expenses for all electricity required for proper lighting, the use of power tools, for temporary heat for construction operations and for field offices up to the time of final acceptance of the project.

Furnish all wiring, fixtures, lamps and other accessories required for his or his subcontractors' work, and for proper lighting, the use of power tools and for temporary heat for construction operations up to the time of final acceptance. Power shall be obtained directly from power company lines or from portable, gasoline driven generator sets.

Use of solar-powered generators, or similar, shall be employed. Alternately, the Contractor shall participate in Northeast Clean Power when purchasing power from the local utility company.

3.3 SANITATION FACILITIES

In accordance with Section 2 of EM 385-1-1, provide, maintain, and make available to all workers provisions for sanitation. Maintain these provisions at all times without nuisance. Upon completion of the work, all sanitary provisions and facilities shall be removed from the premises by the Contractor, leaving the premises clean and free from nuisance.

In accordance with Section 2, Subpart 02.C of EM 385-1-1, provide, maintain, and make available to all workers an adequate supply of potable water for both drinking and personal cleansing. During hot weather, provide cool drinking water.

In accordance with Section 2, Subpart 02.E of EM 385-1-1, provide, maintain, and make available to all workers, inspectors, subcontractors and visitors adequate minimum field-type portable toilets. Portable toilets shall be properly secluded from public observation in such a manner as required or approved by the Contracting Officer. Periodically empty wastes into a municipal, district, or station sanitary sewage system, or remove waste to a commercial facility. Include provisions for pest control and elimination of odors. Any penalties and/or fines associated with improper discharge of wastewater shall be the responsibility of the Contractor. Government toilet facilities will not be provided.

3.4 TELECOMMUNICATIONS (VOICE/DATA)

Make arrangements, provide, and maintain telecommunication (voice and data) services desired.

3.5 FIRE PROTECTION

Provide temporary fire protection equipment for the protection of personnel and property during construction. Remove debris and flammable materials daily to minimize potential hazards.

3.6 TRAFFIC PROVISIONS AND TRAFFIC CONTROL PLAN

As this project involves a utility installation activity which will affect the movement of traffic and traffic safety, the Contractor shall submit a Traffic Control Plan for review and approval and utilize traffic control devises as necessary to ensure the safe and expeditious movement of traffic through the work zone and to enhance the safety of the workers within the work zone. All construction operations shall be planned to keep traffic interference to a minimum. All work shall be planned so that closure of intersecting streets, road approaches, or other access points is held to a minimum. The following restrictions shall be incorporated into the Traffic Control Plan:

During rush hour (Monday through Friday, 7am to 9am and 2pm to 6pm) the Contractor shall maintain two-way traffic on Route 17. The Contractor may use detours only with written permission of the Contracting Officer.

Minimum lane width shall be 11 feet.

The traffic Control Plan and traffic control devices used for this project shall conform to the State of Connecticut Department of Transportation guidelines of CTTRAFFIC (including Plan 13 of this document,) and the standards set forth in the current edition of MUTCD.

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 and the work, and the erection and maintenance of adequate warning, danger, direction signs, and other requirements, shall be as required CTTRAFFIC and MUTCD. The traveling public shall be protected from damage to person and property.

The Contractor's traffic on roads selected for hauling material to and from the site shall interfere as little as possible with public traffic. The

Contractor shall investigate the adequacy of existing roads and the allowable load limit on these roads. The Contractor shall be responsible for the repair of any damage to roads caused by construction operations.

3.7 USE OF STEEL PLATES IN STATE HIGHWAY RIGHTS OF WAY

The use of steel plates in State Highway rights of way shall be in accordance with the requirements of CTTRAFFIC.

3.8 PUBLIC CONVENIENCE AND SAFETY

All equipment, materials, equipment or material storage areas shall be placed, located, and used in ways that do not create a hazard to people or property, especially in areas open to public pedestrian or vehicular traffic. All materials shall be placed or stored in such a way and in such locations as will not create a hazard to the traveling public. In an area unprotected by barriers or other means, equipment and materials shall not be stored within 30 feet of any traveled way.

3.9 TEMPORARY SAFETY FENCING

The temporary safety fencing shall be installed as soon as practicable, but not later than 15 days after the date established for commencement of work. The Contractor shall furnish and erect temporary project safety fencing at the work site to limit access to active construction areas and along the construction site, and at other areas as needed to control access by unauthorized people or vehicles. The safety fencing shall be maintained by the Contractor during the life of the contract, adjusted and moved as appropriate to the progress of the work and, upon completion and acceptance of the work, shall become the property of the Contractor and shall be removed from the work site. This requirement is in addition to the chain link fence around storage areas and trailers.

3.10 CONTRACTOR'S TEMPORARY FACILITIES

3.10.1 Safety

Protect the integrity of any installed safety systems or personnel safety devices. If entrance into systems serving safety devices is required, the Contractor shall obtain prior approval from the Contracting Officer. If it is temporarily necessary to remove or disable personnel safety devices in order to accomplish contract requirements, provide alternative means of protection prior to removing or disabling any permanently installed safety devices or equipment and obtain approval from the Contracting Officer.

3.10.2 Administrative Field Offices

The Contractor shall provide and maintain administrative field office facilities within a storage and staging area provided by the Contractor at his expense. Field Office/Trailers utilized by the Contractor for administrative or material storage purposes must present a clean and neat exterior appearance and be in a state of good repair. Trailers which, in the opinion of the Contracting Officer, require exterior painting or maintenance will not be allowed on Government property.

3.10.3 Storage Area

There is no Government provided storage and staging area for use by the Contractor.

3.10.4 Storage of Hazardous Materials

Hazardous materials shall be stored using a secondary containment system at least 50 feet from any drainage inlets, waterbodies (rivers, streams, lakes), environmentally sensitive areas (wetlands, vernal pools).

3.10.5 Usage of Fuels and Lubricants

Refer to Section 01 57 20 ENVIRONMENTAL PROTECTION, subpart "Chemical Materials Management and Waste Disposal", subparagraph "Fuel and Lubricants".

3.10.6 Temporary Electrical System

a. Provide a temporary electrical distribution system for temporary power and lighting, to include equipment and connections, in accordance with EM 385-1-1, NFPA 70, and NFPA 70E. The Contractor, or his delegated subcontractor, shall enforce all the safety requirements of electrical extensions for the work of all subcontractors. All work shall be accomplished by skilled electrical tradesmen in a workmanlike manner, as approved by the Contracting Officer.

b. Temporary lighting circuits shall be separate from electrical tool circuits. Receptacle circuits shall be dedicated to either temporary lighting or electric tools and shall be labeled "LIGHTS ONLY" or "TOOLS ONLY," as acceptable.

c. A sketch of the proposed temporary electrical system shall be submitted and accepted by the Contracting Officer before temporary power and lighting is installed. The sketch shall indicate the location, voltages, and means of protection of all circuits, including receptacles, disconnecting means, grounding, GFCIs, and lighting circuits.

3.10.6.1 Temporary Wiring

Provide temporary wiring in accordance with NFPA 241 and NFPA 70, Article 305-6(b), Assured Equipment Grounding Conductor Program. Include frequent inspection of all equipment and apparatus.

3.10.6.2 Construction Equipment

In addition to the requirements of EM 385-1-1, all temporary wiring conductors installed for operation of construction tools and equipment shall be either Type TW or THW contained in metal raceways, or may be multiconductor cord. Temporary wiring shall be secured above the ground or floor in a workmanlike manner and shall not present an obstacle to persons or equipment. Open wiring may only be used outside of buildings, and then only in strict accordance with the provisions of the National Electrical Code.

3.10.6.3 Circuit Protection

In addition to the requirements in EM 385-1-1 and NFPA 70, all 15 and 20-ampere receptacle outlets used for obtaining power during construction shall

have ground fault circuit interrupters (GFCI) for personnel protection. All generator-powered 15- and 20-ampere, 60 Hertz receptacle outlets shall have GFCI'S, and shall be properly grounded. A testing means shall be provided which will impose a measured fault of 5 milliamperes, plus or minus 1 milliamperes, and result in tripping the GFCI unit.

3.10.7 Weather Protection of Stored Equipment and Materials

Take necessary precautions to ensure that stored equipment and materials, and openings and other critical openings in the temporary storage area are monitored carefully. Take immediate actions required to seal off such openings when rain or other detrimental weather is imminent, and at the end of each workday. Ensure that the openings are completely sealed off to protect materials and equipment in the temporary facilities from damage.

3.10.7.1 Building and Site Storm Protection

When a warning of gale force winds is issued, take precautions to minimize danger to persons, and protect the work and nearby Government property. Precautions must include, but are not limited to, closing openings; removing loose materials, tools and equipment from exposed locations; and removing or securing scaffolding and other temporary work. Close openings in the work when storms of lesser intensity pose a threat to the work or any nearby Government property.

3.10.8 Stormwater Pollution Prevention

To prevent sediment laden runoff from entering any resource areas such as lakes, ponds, rivers, or wetlands, provide erosion prevention and sediment controls (such as entrenched staked straw bales and sediment (silt) fence) in areas where land disturbance has resulted from the installation temporary facilities and use of storage areas. See Section 01 57 20 ENVIRONMENTAL PROTECTION.

3.10.9 Dust Control

Dust control methods and procedures must be approved by the Contracting Officer. Treat dust abatement on access roads with applications of calcium chloride, water sprinklers, or similar methods or treatment.

3.10.10 Work Zones

A. Contractor shall establish a Secured Zone, Support Zone, Exclusion Zone, and Decontamination Zone, as defined herein.

1. Contractor shall lay out the Work Zones and establish boundaries, barriers, facilities, and controls to ensure that all personnel and equipment exiting the Exclusion Zone shall pass through the Decontamination Zone before entering the Support Zone and before exiting the Project Site.

2. Contractor shall furnish, install, and maintain in good condition, orange plastic mesh fencing secured to metal posts to delineate the boundaries between Work Zones, including the Exclusion Zone, Decontamination Zone, and Support Zone and around the lined stockpile area.

B. Secured Zone. Contractor shall establish a general Secured Zone that excludes unauthorized personnel from entering the Project Site.

1. Access to Secured Zone shall be controlled by steel chain link fence and locking gates as shown on the Drawings.

2. Contractor shall furnish locks for Secured Zone gates and provide duplicate keys to Contracting Officer.

3. Contractor and Contracting Officer shall control access to the Secured Zone. The Contracting Officer shall be allowed free access to the Secured Zone 24 hours per day, subject to appropriate safety precautions.

4. Contractor shall maintain a log sheet on which all Contractor personnel and visitors must sign in and out upon entering or leaving the Secured Zone.

5. Contractor shall be responsible for the security and safety of equipment, facilities, personnel, and materials within the Secured Zone.

C. Support Zone. Contractor shall establish a Support Zone for field offices, storage, sanitary facilities, hand washing facilities, and non-construction vehicle parking.

1. The Support Zone shall be an area free of physical and chemical hazards.

2. Contractor shall maintain the Support Zone in a safe, clean, orderly, and sanitary manner at all times.

D. Exclusion Zone. Contractor shall establish an Exclusion Zone within the Secured Zone using the following criteria and other criteria deemed necessary by the Contracting Officer:

1. Open excavation areas shall be included in the Exclusion Zone.

2. Impacted Material stockpile area shall be designated an Exclusion Zone.

3. Consideration of meteorological conditions and the potential for contaminants or other materials to be blown or washed from the area.

4. OSHA Regulations and other applicable Laws and Regulations.

E. Temporary Activity Zones within Exclusion Zone. Contractor shall establish Temporary Activity Zones within the Exclusion Zone using high-visibility warning tape fastened to metal posts or weighted barrels to delineate areas where specific Work tasks will take place. Temporary Activity Zones shall be revised as necessary and as the Work progresses. Temporary Activity Zones shall be established to include the following tasks:

1. Excavation: Excavation areas shall be marked with yellow or orange caution tape at all times.

2. Stockpiling: Stockpile areas (i.e., impacted stockpiles, import material stockpiles) shall be established as Temporary Activity Zones and signs installed to indicate the type of material stockpiled in each stockpile area. Signs may consist of high visibility spray paint on the plastic membrane stockpile cover.

3. Storage: Storage areas for materials or equipment shall be established and maintained as Temporary Activity Zones.

4. Decontamination: Any temporary decontamination areas shall be marked as Temporary Activity Zones.

F. Decontamination Zone. Contractor shall establish a Decontamination Zone between the Support Zone and the Exclusion Zone.

1. Contractor shall provide suitable facilities for personnel decontamination in the Decontamination Zone, including emergency eyewash, hand washing, and shower facilities.

2. Contractor shall construct a vehicle and equipment decontamination facility, which shall allow for containment and collection of liquid and solid residuals from decontamination of construction vehicles and trucks bound for off-site disposal.

3. Contractor shall inspect and document inspection of each truck bound for disposal of Impacted Soil and debris. Contractor shall inspect all vehicles and equipment that have been in the Exclusion Zone prior to exiting the Exclusion Zone. Contractor shall remove loose mud and debris from all vehicles that have been in the Exclusion Zone prior to movement of equipment between the Exclusion Zone and Non-Exclusion Zone areas of the Secured Zone.

4. Contractor shall provide splash protection around the vehicle decontamination facility. Splash protection shall minimize potential contamination from splatter and mist during the vehicle and equipment decontamination process. Splash protection shall be temporary, but stable, and capable of being dismantled in the event of high winds.

5. Contractor shall provide a drainage and collection system for wastewater generated during decontamination procedures.

3.10.11 Enclosures And Fencing

A. Contractor shall furnish, install, and maintain all other proposed temporary fencing, gates and barriers around all work zones as required by the Contract Documents and to complete the Work.

B. Contractor shall furnish and post signs at every entrance and gate and at least every 50 feet along the fence warning the general public that the Project Site contains physical and chemical hazards and that access is forbidden to unauthorized persons.

C. Contractor shall furnish and post a professionally lettered sign, minimum size 4 feet by 4 feet, at each entrance, or gate to the site with the following text, or other similar text approved by the Contracting Officer.

"All Personnel and Visitors Beyond This Point
Must Wear Hard Hat, Safety Glasses, High-
Visibility Vest, and Steel Toe Boots."

3.11 GOVERNMENT FIELD OFFICE

3.11.1 Resident Engineer's Office

Provide the Government Resident Engineer with an office, approximately 200 square feet in floor area (not including hallways, conference rooms, closets, and toilet facilities), with at least two windows, located where directed and providing space heat, air conditioning, electric light and power, and toilet facilities consisting of one lavatory and one water closet complete with connections to water and sewer services, if available. If connection to a water service is not available, the Contractor shall provide a five gallon water dispenser for drinking water for duration of the project. If connection to a sewer service is not available, the Contractor shall provide an inside water closet connected to a holding tank exterior to the office trailer. The Contractor is responsible for service to the holding tank and emptying it on a regular basis. Field-type portable sanitary facilities, approved by the Contracting Officer, may be substituted for the water closet upon request. The office shall include, as a minimum, two overhead shelves, two double desks with pedestals, a 36 inch by 72 inch plan table, two single movable desks, and chairs for all desks. The conference area shall have a minimum 16 feet long conference table and 10 chairs. Provide one voice telephone line and one high speed data Internet connection (DSL or Broadband). Provide a mail slot in the door or a lockable mail box mounted on the surface of the door. Provide six sets of office keys. Provide a full-size refrigerator, microwave, and weekly cleaning service. Used furniture and equipment is acceptable provided items are in good condition and fully functional to the satisfaction of the Contracting Officer. The Contractor shall be responsible for snow removal, and mud and dust control of parking areas adjacent to the office. At completion of the project, the office will remain the property of the Contractor and be removed from the site. Utilities will be connected and disconnected in accordance with local codes and to the satisfaction of the Contracting Officer.

3.11.2 Trailer-Type Mobile Office

The Contractor may, at its option, furnish and maintain a trailer-type mobile office acceptable to the Contracting Officer and providing as a minimum the facilities specified above. Securely anchor the trailer to the ground at all four corners to guard against movement during high winds.

3.12 PLANT COMMUNICATION

Whenever the Contractor has the individual elements of its plant so located that operation by normal voice between these elements is not satisfactory, the Contractor shall install a satisfactory means of communication, such as telephone or other suitable devices and made available for use by Government personnel.

3.13 CLEANUP

Construction debris, waste materials, packaging material and the like shall be removed from the work site daily. Any dirt or mud which is tracked onto paved or surfaced roadways shall be cleaned away on a daily basis. Materials resulting from demolition activities which are salvageable shall be stored within the storage area. Stored material not in trailers, whether new or salvaged, shall be neatly stacked when stored.

3.13.1 Dumpster

Provide dumpsters for the collection of trash and debris. Equip dumpsters with a secure cover. Keep cover closed at all times, except when being loaded with trash and debris. Locate dumpsters behind the construction fence or out of the public view. Empty site dumpsters at least once a week or as needed to keep the site free of trash and debris. For large demolitions, large dumpsters without lids are acceptable but should not have trash and debris higher than the sides before emptying.

3.13.2 Burning

Burning of brush, trash, or debris will not be permitted on the project site nor Government property.

3.14 RESTORATION OF WORK AREAS

Upon completion of the project remove barricades, temporary utilities, sanitation facilities, construction vehicles, materials and equipment, and any other temporary equipment, materials, or products from within and around the work areas. Clean and repair damage caused by installation or removal of temporary materials, equipment, or utilities. Areas used by the Contractor for the storage of equipment or material, or other use, shall be restored to the original or better condition, including pavement repair, or top soil and seeding as necessary. Gravel used to traverse grassed areas shall be removed and the area restored to its original condition, including top soil and seeding as necessary.

-- End of Section --

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SECTION 01 57 20

ENVIRONMENTAL PROTECTION

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO M144	(2014) Calcium Chloride

ASTM INTERNATIONAL (ASTM)

ASTM D98	(2015) Calcium Chloride

U.S. ARMY (DA)

DA AR 200-1	(2007) Environmental Protection and Enhancement

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2014) Safety and Health Requirements Manual
WETLANDS DELINEATION MANUAL	(1987) Corps of Engineers Wetlands Delineation Manual
WDM Supplement	(2012) Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: North central

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

33 CFR 328	Definitions of Waters of the United States
40 CFR 150 - 189	Pesticide Programs
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 279	Standards for the Management of Used Oil
40 CFR 302	Designation, Reportable Quantities, and Notification
40 CFR 355	Emergency Planning and Notification
40 CFR 68	Chemical Accident Prevention Provisions

49 CFR 171 - 178 Hazardous Materials Regulations

1.2 DEFINITIONS

1.2.1 Environmental Pollution and Damage

Environmental pollution and damage is the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade the environment aesthetically, culturally and/or historically.

1.2.2 Environmental Protection

Environmental protection is the prevention/control of pollution and habitat disruption that may occur to the environment during construction. The control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.2.3 Contractor Generated Hazardous Waste

Contractor generated hazardous waste means materials that, if abandoned or disposed of, may meet the definition of a hazardous waste. These waste streams would typically consist of material brought on site by the Contractor to execute work, but are not fully consumed during the course of construction. Examples include, but are not limited to, excess paint thinners (i.e. methyl ethyl ketone, toluene etc.), waste thinners, excess paints, excess solvents, waste solvents, and excess pesticides, and contaminated pesticide equipment rinse water.

1.2.4 Project Pesticide Coordinator

The Project Pesticide Coordinator (PPC) is an individual that is responsible for oversight of pesticide application on Project grounds.

1.2.5 Land Application for Discharge Water

The term "Land Application" for discharge water implies that the Contractor shall discharge water at a rate which allows the water to percolate into the soil. No sheeting action, soil erosion, discharge into storm sewers, discharge into defined drainage areas, or discharge into the "waters of the United States" shall occur. Land Application shall be in compliance with all applicable Federal, State, and local laws and regulations.

1.2.6 Pesticide

Pesticide is defined as any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest, or intended for use as a plant regulator, defoliant or desiccant.

1.2.7 Pests

The term "pests" means arthropods, birds, rodents, nematodes, fungi, bacteria, viruses, algae, snails, marine borers, snakes, weeds and other

organisms (except for human or animal disease-causing organisms) that adversely affect readiness, military operations, or the well-being of personnel and animals; attack or damage real property, supplies, equipment, or vegetation; or are otherwise undesirable.

1.2.8 Surface Discharge

The term "Surface Discharge" implies that the water is discharged with possible sheeting action and subsequent soil erosion may occur. Waters that are surface discharged may terminate in drainage ditches, storm sewers, creeks, and/or "waters of the United States" and would require a permit to discharge water from the governing agency.

1.2.9 Waters of the United States

All waters which are under the jurisdiction of the Clean Water Act, as defined in 33 CFR 328.

1.2.10 Wetlands

Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, and bogs. Official determination of whether or not an area is classified as a wetland shall be done in accordance with WETLANDS DELINEATION MANUAL and WDM Supplement.

1.2.11 Dewatering Water

A. Dewatering Water is defined as shallow groundwater or runoff removing during trenching activities. Contamination other than sediment is not anticipated.

B. Construction Water shall be defined as water that may be impacted with contaminants from the Durham Superfund Site, and is defined as the following:

1. Water removing during trenching activities in designated areas on the Durham Manufacturing Company property.

2. Liquids generated during decontamination activities associated with the above activities.

1.3 GENERAL REQUIREMENTS

Minimize environmental pollution and damage that may occur as the result of construction operations. The environmental resources within the project boundaries and those affected outside the limits of permanent work shall be protected during the entire duration of this contract. Comply with all applicable environmental Federal, State, and local laws and regulations. Any delays resulting from failure to comply with environmental laws and regulations will be the Contractor's responsibility.

1.4 SUBCONTRACTORS

Ensure compliance with this section by subcontractors.

1.5 PAYMENT

No separate payment will be made for work covered under this section. Payment of fees associated with environmental permits, application, and/or notices obtained by the Contractor, and payment of all fines/fees for violation or non-compliance with Federal, State, Regional and local laws and regulations are the Contractor's responsibility. All costs associated with this section shall be included in the contract price.

1.6 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for 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

Environmental Protection Plan; G, RO

Wood Turtle Protection Plan; G, RO

1.7 ENVIRONMENTAL PROTECTION PLAN

Prior to commencing construction activities or delivery of materials to the site, submit an Environmental Protection Plan for review and approval by the Contracting Officer. The purpose of the Environmental Protection Plan is to present a comprehensive overview of known or potential environmental issues which the Contractor shall address during construction. Issues of concern shall be defined within the Environmental Protection Plan as outlined in this section. Address each topic at a level of detail commensurate with the environmental issue and required construction task(s). Topics or issues which are not identified in this section, but are considered necessary, shall be identified and discussed after those items formally identified in this section. Prior to submittal of the Environmental Protection Plan, meet with the Contracting Officer for the purpose of discussing the implementation of the initial Environmental Protection Plan; possible subsequent additions and revisions to the plan including any reporting requirements; and methods for administration of the Contractor's Environmental Plans. The Environmental Protection Plan shall be current and maintained onsite by the Contractor.

1.7.1 Compliance

No requirement in this Section will relieve the Contractor of any applicable Federal, State, and local environmental protection laws and regulations. During Construction, the Contractor will be responsible for identifying, implementing, and submitting for approval any additional requirements to be included in the Environmental Protection Plan.

1.7.2 Contents

Include in the environmental protection plan, but not limit it to, the following:

a. Name(s) of person(s) within the Contractor's organization who is(are) responsible for ensuring adherence to the Environmental Protection Plan.

b. Name(s) and qualifications of person(s) responsible for manifesting hazardous waste to be removed from the site, if applicable.

c. Name(s) and qualifications of person(s) responsible for training the Contractor's environmental protection personnel.

d. Description of the Contractor's environmental protection personnel training program.

e. An erosion and sediment control plan which identifies the type and location of the erosion and sediment controls to be provided. The plan shall include monitoring and reporting requirements to assure that the control measures are in compliance with the erosion and sediment control plan, Federal, State, and local laws and regulations. A Storm Water Pollution Prevention Plan (SWPPP) may be substituted for this plan and submitted with the Environmental Protection Plan. See Section 01 57 23 TEMPORARY STORM WATER POLLUTION CONTROL for additional requirements All phases of sedimentation and erosion control shall comply with best management practices, guidance, and regulations issued USEPA, Connecticut Department of Energy and Environmental Protection and the local Conservation Commission.

f. Drawings showing locations of proposed temporary material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to contain materials on the site.

g. Traffic control plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Plan shall include measures to minimize the amount of mud transported onto paved public roads by vehicles or runoff.

h. Work area plan showing the proposed activity in each portion of the area and identifying the areas of limited use or nonuse. Plan shall include measures for marking the limits of use areas including methods for protection of features to be preserved within authorized work areas.

i. Include in the Spill Control plan the procedures, instructions, and reports to be used in the event of an unforeseen spill of a substance regulated by 40 CFR 68, 40 CFR 302, 40 CFR 355, and/or regulated under State or Local laws and regulations. The Spill Control Plan supplements the requirements of EM 385-1-1. Include in this plan, as a minimum:

(1) The name of the individual who will report any spills or hazardous substance releases and who will follow up with complete documentation. This individual will immediately notify the Contracting Officer and Facility Environmental Office in addition to the legally required Federal, State, and local reporting channels (including the National Response Center 1-800-424-8802) if a reportable quantity is released to the environment. Include in the plan a list of the required reporting channels and telephone numbers.

(2) The name and qualifications of the individual who will be responsible for implementing and supervising the containment and cleanup.

(3) Training requirements for Contractor's personnel and methods of accomplishing the training.

(4) A list of materials and equipment to be immediately available at the job site, tailored to cleanup work of the potential hazard(s) identified.

(5) The names and locations of suppliers of containment materials and locations of additional fuel oil recovery, cleanup, restoration, and material-placement equipment available in case of an unforeseen spill emergency.

(6) The methods and procedures to be used for expeditious contaminant cleanup.

j. A non-hazardous solid waste disposal plan identifying methods and locations for solid waste disposal. Coordinate with the requirements of Section 01 74 19 CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT.

(1) Identify any subcontractors responsible for the transportation and disposal of solid waste. Submit licenses or permits for solid waste disposal sites that are not a commercial operating facility.

(2) Evidence of the disposal facility's acceptance of the solid waste shall be attached to this plan during the construction. Attach a copy of each of the Non-hazardous Solid Waste Diversion Reports to the disposal plan. Submit the report for the previous quarter on the first working day after the first quarter that non-hazardous solid waste has been disposed and/or diverted (e.g. the first working day of January, April, July, and October).

(3) Indicate in the report the total amount of waste generated and total amount of waste diverted in cubic yards or tons along with the percent that was diverted.

(4) A recycling and solid waste minimization plan with a list of measures to reduce consumption of energy and natural resources. Detail in the plan the Contractor's actions to comply with and to participate in Federal, State, Regional, and local government sponsored recycling programs to reduce the volume of solid waste at the source.

k. An air pollution control plan detailing provisions to assure that dust, debris, materials, trash, etc., do not become air borne and travel off the project site.

l. A contaminant prevention plan that: identifies potentially hazardous substances to be used on the job site; identifies the intended actions to prevent introduction of such materials into the air, water, or ground; and details provisions for compliance with Federal, State, and local laws and regulations for storage and handling of these materials. In accordance with EM 385-1-1, a copy of the

Material Safety Data Sheets (MSDS) and the maximum quantity of each hazardous material to be onsite at any given time shall be included in the contaminant prevention plan. Update the plan as new hazardous materials are brought onsite or removed from the site.

m. A waste water management plan that identifies the methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as clean-up water. If a settling/retention pond is required, the plan shall include the design of the pond including drawings, removal plan, and testing requirements for possible pollutants. If land application will be the method of disposal for the waste water, the plan shall include a sketch showing the location for land application along with a description of the pretreatment methods to be implemented. If surface discharge will be the method of disposal, include a copy of the permit and associated documents as an attachment prior to discharging the waste water. If disposal is to a sanitary sewer, the plan shall include documentation that the Waste Water Treatment Plant Operator has approved the flow rate, volume, and type of discharge.

n. A historical resources, archaeological resources, cultural resources, biological resources, and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, and biological resources and wetlands known to be on the project site: and/or identifies procedures to be followed if historical archaeological, cultural, and biological resources and wetlands not previously known to be onsite or in the area are discovered during construction. Include in the plan methods to assure the protection of known or discovered resources, identifying lines of communication between Contractor personnel and the Contracting Officer.

o. Include and update a pesticide treatment plan, if pesticide treatment becomes necessary, as information becomes available. Include in the plan: sequence of treatment, dates, times, locations, pesticide trade name, EPA registration numbers, authorized uses, chemical composition, formulation, original and applied concentration, application rates of active ingredient (i.e. pounds of active ingredient applied), equipment used for application and calibration of equipment. Federal, State, Regional and Local pest management record keeping and reporting requirements as well as any additional Installation Project Office specific requirements are the Contractor's responsibility in conformance with DA AR 200-1 Chapter 5--Pest Management, Section 5-4 "Program requirements" for data required to be reported to the Installation.

1.7.3 Appendix

Attach to the Environmental Protection Plan, as an appendix, copies of all environmental permits, permit application packages, approvals to construct, notifications, certifications, reports, and termination documents.

1.8 EMERGENCY RESPONSE AND REPORTING

If any event occurs during performance of the Work that causes or threatens to cause a release of Waste Material on, at, or from the Site and that either constitutes an emergency situation or that may present an immediate threat to public health or welfare or the environment, the Contractor shall:

(1) immediately take all appropriate action to prevent, abate, or minimize such release or threat of release; (2) immediately notify the Contracting Officer orally; and (3) take such actions in consultation with the Owner and the Contracting Officer in accordance with all applicable provisions of the Health and Safety Plan, the Emergency Response Plan, and any other deliverable approved under the contract.

Upon the occurrence of any event during performance of the Work that Contractor is required to report pursuant to Section 103 of CERCLA, 42 U.S.C. § 9603, or Section 304 of the Emergency Planning and Community Right-to-know Act (EPCRA), 42 U.S.C. § 11004, contractor shall immediately notify the Contracting Officer orally. The contractor shall: (1) within 14 days after the onset of such event, submit a report to Contracting Officer describing the actions or events that occurred and the measures taken, and to be taken, in response thereto; and (2) within 30 days after the conclusion of such event, submit a report to Contracting Officer describing all actions taken in response to such event. These reporting requirements are in addition to the reporting required by CERCLA § 103 or EPCRA § 304.

1.9 PROTECTION FEATURES

This paragraph supplements the Contract Clause PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS. Prior to start of any onsite construction activities, the Contractor and the Contracting Officer will make a joint condition survey. Immediately following the survey, the Contractor will prepare a brief report including a plan describing the features requiring protection under the provisions of the Contract Clauses, which are not specifically identified on the drawings as environmental features requiring protection along with the condition of trees, shrubs and grassed areas immediately adjacent to the site of work and adjacent to the Contractor's assigned storage area and access route(s), as applicable. This survey report will be signed by both the Contractor and the Contracting Officer upon mutual agreement as to its accuracy and completeness. The Contractor shall protect those environmental features included in the survey report and any indicated on the drawings, regardless of interference which their preservation may cause to the work under the contract.

1.10 ENVIRONMENTAL ASSESSMENT OF CONTRACT DEVIATIONS

Any deviations from the drawings and specifications, requested by the Contractor and which may have an environmental impact, will be subject to approval by the Contracting Officer and may require an extended review, processing, and approval time. The Contracting Officer reserves the right to disapprove alternate methods, even if they are more cost effective, if the Contracting Officer determines that the proposed alternate method will have an adverse environmental impact.

1.11 NOTIFICATION

The Contracting Officer will notify the Contractor in writing of any observed noncompliance with Federal, State or local environmental laws or regulations, permits, and other elements of the Contractor's Environmental Protection plan. After receipt of such notice, the Contractor will inform the Contracting Officer of the proposed corrective action and take such action when approved by the Contracting Officer. The Contracting Officer may issue an order stopping all or part of the work until satisfactory

corrective action has been taken. No time extensions will be granted or equitable adjustments allowed for any such suspensions. This is in addition to any other actions the Contracting Officer may take under the contract, or in accordance with the Federal Acquisition Regulation or Federal Law.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 PROTECTION OF NATURAL RESOURCES

The Contractor shall minimize interference with, disturbance to, and damage to fish, wildlife, and plants, including their habitat. The Contractor shall be responsible for the protection of threatened and endangered animal and plant species, including their habitat, in accordance with Federal, State, Regional, and local laws and regulations.

3.2 LAND RESOURCES

Confine all activities to areas defined by the drawings and specifications. Identify any land resources to be preserved within the work area prior to the beginning of any construction. Do not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, and land forms without approval. Ropes, cables, or guys will not be fastened to or attached to any trees for anchorage unless specifically authorized. Provide effective protection for land and vegetation resources at all times, as defined in the following subparagraphs.

3.3.1 Work Area Limits

Mark the areas that need not be disturbed under this contract prior to commencing construction activities. Mark or fence isolated areas within the general work area which are not to be disturbed. Protect monuments and markers before construction operations commence. Where construction operations are to be conducted during darkness, any markers must be visible in the dark. The Contractor's personnel must be knowledgeable of the purpose for marking and/or protecting particular objects.

3.3.2 Landscape

The Contractor shall make every effort not to damage existing plant materials to remain. The Contractor is required to install fencing to protect aboveground plant material and the critical root zone of trees. The Critical Root Zone (CRZ) is three feet outside the perimeter of the leaf canopy of the tree to be protected. This area shall not be disturbed during construction operations. Protection of vegetation shall remain in place and be maintained in working condition by the Contractor until directed for removal by the Contracting Officer. All protection devices shall be removed from the site by the Contractor as directed by the Contracting Officer. Restore landscape features damaged or destroyed during construction operations outside the limits of the approved work area.

Existing trees and shrubs to be saved or protected within or outside

the contract limits which, in the opinion of the Contracting Officer, become damaged shall be repaired or replaced as recommended and approved by the Contracting Officer. Repair is preferred if long-term survival and growth of the plant is likely as determined by the Contracting Officer. Repairs may include wound treatments, cabling, bracing, pruning, fertilizing, watering, aeration, alleviation of compacted soil, other soil practices, insect and disease treatments, and other measures to assure long term survival and growth of the affected plant. If the plant is damaged beyond repair it shall be removed and replaced. Removal shall include removal and off-site disposal of aboveground vegetation and stumps, restoration of the ground surface, and seeding. Tree replacement shall include installation of the largest caliper diameter specimen obtainable for the species from a New England region nursery. Two shrubs shall be planted for each shrub damaged beyond repair. Trees greater than 6" in diameter that lie in the path of planned construction shall be evaluated by the Contracting Officer and Contractor prior to the work to determine if rerouting of the work is feasible. The replacement trees shall be planted on-site or at off-site locations approved by the Contracting Officer. All costs associated with the repair, removal and replacement of damaged trees and shrubs shall be borne by the Contractor without additional cost to the Government. These costs include but ae not limited to the cost of repairs and monitoring, removal of vegetation, replanting, and maintenance of planted material during an establishment and guarantee period.

3.3.3 Contractor Facilities and Work Areas

Place field offices, staging areas, stockpile storage, and temporary buildings in areas designated on the drawings or as directed by the Contracting Officer. Temporary movement or relocation of Contractor facilities will be made only when approved. Erosion and sediment controls must be provided for onsite borrow and spoil areas to prevent sediment from entering nearby waters. Temporary excavation and embankments for plant and/or work areas shall be controlled to protect adjacent areas.

3.3.4 Erosion and Sediment Controls

The Contractor shall be responsible for providing erosion and sediment control measures in accordance with Federal, State, and local laws and regulations. The erosion and sediment controls selected and maintained by the Contractor shall be such that water quality standards are not violated as a result of the Contractor's construction activities. The area of bare soil exposed at any one time by construction operations should be kept to a minimum. The Contractor shall construct or install temporary and permanent erosion and sediment control best management practices (BMPs) as indicated on the contract drawings, as specified in Section 01 57 23 TEMPORARY STORM WATER POLLUTION CONTROL and in General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities, the Erosion and Sediment Control Plan, 2002 revision of the Connecticut Guidelines for Soil Erosion and Sediment Control, Connecticut's Soil Erosion and Sediment Control Act (Public Act 83-388, codified in sections 22a-325 through 22a-329 of the Connecticut General Statutes. BMPs may include, but not be limited to, vegetation cover, slope stabilization, silt fences, sediment traps, and inlet and outfall protection. Any temporary measures shall be removed after the area has been stabilized.

3.3.5 Wood Turtle

A special concern species (Wood Turtle, Glyptemys insculpta) is present in areas near the Allyn Brook and Hersig Brook crossings. In addition, several wetland dependent species were noted in the vicinity of the proposed Allyn Brook crossings, included Slimy Sculpin (Cottus cognatus). The Contractor shall consult a certified wetland biologist and follow best management practices to perform the work to protect these species to the extent possible. A detailed Wood Turtle Protection Plan addressing schedules and approaches shall be submitted to the Contracting Officer for review and approval before start of work in these areas. The Plan and work shall adhere to the following to the extent possible:

1. To protect wood turtles, silt fencing shall be used around stockpiles of dirt to exclude them from nesting. Nesting season is in early spring and late summer.

2. Vehicles and machinery shall not be parked in turtle habitat. Turtle habitat includes wetlands and undisturbed forest floor.

3. Construction contractor shall be apprised of the possible presence of turtles and their description. Any turtles discovered shall be moved to an appropriate area as outlined in the CT DEEP, Wildlife Division information in Attachment.

4. Work conducted during early morning and evening hours will occur with special care not to harm basking or foraging individuals.

3.4 WATER RESOURCES

Monitor all water areas affected by construction activities to prevent pollution of surface and ground waters. Do not apply toxic or hazardous chemicals to soil or vegetation. Paints, oils, and other chemical and hazardous materials shall be stored as far as possible from any drainage inlets, waterbodies (rivers, streams, lakes), environmentally sensitive areas (wetlands, vernal pools), but in no case shall the distance be less than 50 feet.

3.4.1 Wetlands

Do not enter, disturb, or destroy, wetlands, except as required in work areas shown on the contract drawings. Do not allow discharge of contaminants into any wetlands.

All construction activities that require limited work within the wetlands shall be performed under the supervision of a wetland scientist. Appropriate construction mats shall be employed for construction equipment to operate from.

3.5 AIR RESOURCES

Equipment operation, activities, or processes will be in accordance with all Federal and State air emission and performance laws and standards.

3.5.1 Particulates

Dust particles, aerosols and gaseous by-products from construction activities and processing and preparation of materials shall be controlled at all times including weekends, holidays, and hours when work is not in progress. Maintain work and storage areas within or outside the project boundaries free from particulates which would cause the Federal, State, and local air pollution standards to be exceeded or which would cause a hazard or a nuisance. Comply with all State and local visibility regulations.

Sprinkling, to be approved, must be repeated at such intervals as to keep all parts of the disturbed area at least damp at all times, and the Contractor must have sufficient competent equipment on the job to accomplish this if sprinkling is used. Dust control shall be performed as the work proceeds and whenever a dust nuisance or hazard occurs, as determined by the Contracting Officer.

Perform dust control operations whenever necessary or when directed even though other work on the project may be suspended. Dust control on exposed soil in trenches or rights of way shall be generally accomplished by the use of water. Calcium chloride may be used when necessary to control dust nuisance on paved surfaces or sidewalks.

Calcium Chloride: Calcium chloride shall conform to the requirements of AASHTO M144, Type I or Type II and ASTM D98. The calcium chloride shall be packaged in moisture-proof bags or airtight drums marked with the manufacturer's name, name of product, date of manufacture, net weight and percentage of calcium chloride guaranteed by the manufacturer, all legibly marked on each container. Calcium chloride failing to meet the requirements of the aforementioned specifications, or that which has become caked or sticky in shipment, etc., may be subject to rejection at the discretion of the Contracting Officer.

Water: Water shall be reasonably clean, shall not be salty or brackish, and shall be free from petroleum products, acids, injurious alkalis and vegetable matter or other deleterious material. The water shall be tested in accordance with AASHTO Method T26 (except if water originates from the municipality's water mains). Where a water supply system is available, the Contractor may utilize water from said supply system for controlling dust; however, prior to the use of such water, the Contractor shall make the necessary arrangements with the respective water department.

3.5.2 Odors

Odors from construction activities shall be controlled at all times. The odors shall be in compliance with State regulations and/or local ordinances and may not constitute a health hazard.

3.5.3 Sound Intrusions

Keep construction activities under surveillance and control to minimize environment damage by noise. Comply with the provisions of the State of Connecticut rules. The Contractor shall also be bound by local regulations governing noise limitations. Contractor shall pay particular attention to these regulations and obtain pertinent approvals (as necessary) during excavation operations. Equipment shall be equipped with silencers or mufflers designed to operate with the least possible noise in compliance with State and Federal (OSHA) regulations.

3.5.4 Burning

Burning is prohibited on the project site.

3.5.5 BMPs

The Contractor shall employ BMPs to minimize, and when possible eliminate, the production of Green House Gas (GHGs) emissions. Requirements include use of solar power generators; selection of lower GHG emitting fuel sources (e.g., biodiesel) for small equipment and trucks. Restrict idling whenever possible. Employ energy conservation and efficiency approaches, including use of Energy Star equipment and renewable forms of energy to the maximum extent possible. Obtain materials, including backfill, and from local sources to the maximum extent possible. Choose suppliers with production and distribution centers near the work area to minimize fuel consumption associated with delivery.

3.6 CHEMICAL MATERIALS MANAGEMENT AND WASTE DISPOSAL

Disposal of wastes will be as directed below, unless otherwise specified in other sections and/or shown on the drawings.

3.6.1 Solid Wastes

Place solid wastes in containers which are emptied on a regular schedule. Handling, storage, and disposal shall be conducted to prevent contamination. Employ segregation measures so that no hazardous or toxic waste will become co-mingled with solid waste. Transport solid waste off Government property and dispose of it in compliance with Federal, State, and local requirements for solid waste disposal. A Subtitle D RCRA permitted landfill will be the minimum acceptable offsite solid waste disposal option. Verify that the selected transporters and disposal facilities have the necessary permits and licenses to operate. See Section 01 74 19 CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT for additional requirements.

3.6.2 Ash Wood

Ash wood shall be disposed pursuant to CT DEEP regulations intended to prevent the spread of the Emerald Ash Borer.

3.6.3 Chemicals and Chemical Wastes

Dispense chemicals ensuring no spillage to the ground or water. Perform and document periodic inspections of dispensing areas to identify leakage and initiate corrective action. This documentation will be periodically reviewed by the Government. Collect chemical waste in corrosion resistant, compatible containers. Collection drums shall be monitored and removed to a staging or storage area when contents are within six inches of the top. Wastes will be classified, managed, stored, and disposed of in accordance with Federal, State, and local laws and regulations.

3.6.4 Contractor Generated Hazardous Wastes/Excess Hazardous Materials

Hazardous wastes are defined in 40 CFR 261, or are as defined by applicable State and local regulations. Hazardous materials are defined in 49 CFR 171 - 178. At a minimum, manage and store hazardous waste in compliance with 40 CFR 262. Take sufficient measures to prevent spillage of hazardous and

toxic materials during dispensing. Segregate hazardous waste from other materials and wastes, protect it from the weather by placing it in a safe covered location, and take precautionary measures such as berming or other appropriate measures against accidental spillage. Storage, describing, packaging, labeling, marking, and placarding of hazardous waste and hazardous material in accordance with 49 CFR 171 - 178, State, and local laws and regulations is the Contractor's responsibility. Transport Contractor generated hazardous waste off Government property within 60 days in accordance with the Environmental Protection Agency and the Department of Transportation laws and regulations. Dispose of hazardous waste in compliance with Federal, State and local laws and regulations. Spills of hazardous or toxic materials shall be immediately reported to the Contracting Officer and the Facility Environmental Office. Cleanup and cleanup costs due to spills are the Contractor's responsibility. The disposition of Contractor generated hazardous waste and excess hazardous materials are the Contractor's responsibility.

3.6.5 Fuel and Lubricants

Storage, fueling and lubrication of equipment and motor vehicles shall be conducted in a manner that affords the maximum protection against spill and evaporation. Manage and store fuel, lubricants and oil in accordance with all Federal, State, Regional, and local laws and regulations. Used lubricants and used oil to be discarded shall be stored in marked corrosion-resistant containers and recycled or disposed in accordance with 40 CFR 279, State, and local laws and regulations. Storage of fuel on the project site is not allowed. Fuel shall be brought to the project site each day that work is performed. Storage and usage of lubricants and daily fueling of machinery and equipment shall occur at least 50 feet from any drainage inlets, waterbodies (rivers, streams, lakes), environmentally sensitive areas (wetlands, vernal pools).

3.6.6 Waste Water

Waste water from construction activities, such as onsite material processing, clean-up water, etc., will not be allowed to enter water ways or to be discharged prior to being treated to remove pollutants. Dispose of the construction related waste water off of the project site in accordance with all Federal, State, Regional and Local laws and regulations.

3.7 RECYCLING AND WASTE MINIMIZATION

The Contractor shall participate in State and local government sponsored recycling programs. The Contractor is further encouraged to minimize solid waste generation throughout the duration of the project.

3.8 HISTORICAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

A Phase 1A Archaeological Assessment was completed to determine the potential for encountering National Register-eligible archaeological resources in areas where subsurface disturbance will occur as a result of project actions. The report concluded that the project will have No Effect on NRHP-eligible archaeological resources. If previously unidentified items that may be Cultural Resources are discovered during the Work, the Contractor shall immediately notify the Contracting Officer, and the Contracting Officer shall immediately notify the EPA. The EPA, in consultation with the Contracting Officer and CTDEEP, shall determine

whether the Work may reasonably be expected to adversely affect the discovered Cultural Resources. If EPA determines that the Work is reasonably expected to have an adverse effect on the discovered Cultural Resources, (a) Work on that portion of the Site will stop immediately, except as may be required for emergency response, or as deemed necessary by the Contracting Officer and the EPA, in consultation with CTDEEP, to protect public health, safety, or the environment, and (b) no further Work may proceed in the area in question until the EPA determines that the Work is not reasonably expected to adversely affect the discovered Cultural Resources. In the event that EPA determines that the Work will not likely have an adverse effect on discovered Cultural Resources, the Work may continue.

3.9 BIOLOGICAL RESOURCES

Minimize interference with, disturbance to, and damage to fish, wildlife, and plants, including their habitat. The protection of threatened and endangered animal and plant species, including their habitat, is the Contractor's responsibility in accordance with Federal, State, Regional, and local laws and regulations.

3.10 INTEGRATED PEST MANAGEMENT

In order to minimize impacts to existing fauna and flora, the Contractor, through the Contracting Officer, shall coordinate with the Project Pesticide Coordinator (PPC) at the earliest possible time prior to pesticide application, if pesticide treatment becomes necessary. Discuss integrated pest management strategies with the PPC and receive concurrence from the PPC through the Contracting Officer prior to the application of any pesticide associated with these specifications. Installation Project Office Pest Management personnel will be given the opportunity to be present at all meetings concerning treatment measures for pest or disease control and during application of the pesticide. The use and management of pesticides are regulated under 40 CFR 150 - 189.

3.10.1 Pesticide Delivery and Storage

Deliver pesticides to the site in the original, unopened containers bearing legible labels indicating the EPA registration number and the manufacturer's registered uses. Store pesticides according to manufacturer's instructions and under lock and key when unattended.

3.10.2 Qualifications

For the application of pesticides, use the services of a subcontractor whose principal business is pest control. The subcontractor shall be licensed and certified in the state where the work is to be performed.

3.10.3 Pesticide Handling Requirements

Formulate, treat with, and dispose of pesticides and associated containers in accordance with label directions and use the clothing and personal protective equipment specified on the labeling for use during all phases of the application. Furnish Material Safety Data Sheets (MSDS) for all pesticide products.

3.10.4 Application

Apply pesticides using a State Certified Pesticide Applicator in accordance with EPA label restrictions and recommendation. The Certified Applicator shall wear clothing and personal protective equipment as specified on the pesticide label. The Contracting Officer will designate locations for water used in formulating. Do not allow the equipment to overflow. All equipment shall be inspected for leaks, clogging, wear, or damage and repaired prior to application of pesticide.

3.11 PREVIOUSLY USED EQUIPMENT

Clean all previously used construction equipment prior to bringing it onto the project site. Ensure that the equipment is free from soil residuals, egg deposits from plant pests, noxious weeds, and plant seeds. Consult with the USDA jurisdictional office for additional cleaning requirements.

3.12 MAINTENANCE OF POLLUTION FACILITIES

Maintain permanent and temporary pollution control facilities and devices for the duration of the contract or for that length of time construction activities create the particular pollutant.

3.13 TRAINING OF CONTRACTOR PERSONNEL

The Contractor's personnel shall be trained in all phases of environmental protection and pollution control. Conduct environmental protection/pollution control meetings for all personnel prior to commencing construction activities. Additional meetings shall be conducted for new personnel and when site conditions change. Include in the training and meeting agenda: methods of detecting and avoiding pollution; familiarization with statutory and contractual pollution standards; installation and care of devices and instruments required for monitoring purposes to ensure adequate and continuous environmental protection/pollution control; anticipated hazardous or toxic chemicals or wastes, and other regulated contaminants; recognition and protection of archaeological sites, artifacts, wetlands, and endangered species and their habitat that are known to be in the area.

3.14 POST CONSTRUCTION CLEANUP

The Contractor will clean up all areas used for construction in accordance with Contract Clause "Cleaning Up". Unless otherwise instructed in writing by the Contracting Officer, obliterate all signs of temporary construction facilities and other vestiges of construction prior to final acceptance of the work. The disturbed area shall be graded, filled and the entire area seeded unless otherwise indicated.

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TEMPORARY STORM WATER POLLUTION CONTROL

PART 1 GENERAL

1.1 REFERENCES

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

ASTM INTERNATIONAL (ASTM)

ASTM D4439	(2014) Geosynthetics
ASTM D4491	(1999a; R 2014; E 2014) Water Permeability of Geotextiles by Permittivity
ASTM D4533/D4533M	(2015) Standard Test Method for Trapezoid Tearing Strength of Geotextiles
ASTM D4632/D4632M	(2015) Grab Breaking Load and Elongation of Geotextiles
ASTM D4751	(2012) Determining Apparent Opening Size of a Geotextile
ASTM D4873	(2015) Identification, Storage, and Handling of Geosynthetic Rolls and Samples

1.2 GENERAL

The Contractor shall implement the storm water pollution prevention measures specified in this section in a manner which will meet the requirements of Section 01 57 20 ENVIRONMENTAL PROTECTION.

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-07 Certificates

Mill Certificate or Affidavit.

Certificate attesting that the Contractor has met all specified requirements.

1.4 EROSION AND SEDIMENT CONTROLS

The controls and measures required by the Contractor are described below.

1.4.1 Stabilization Practices

The stabilization practices to be implemented shall include silt fences, staked hay bale barriers, silt socks, temporary seeding, mulching, geotextiles, protection of trees, preservation of mature vegetation, or other appropriate measures chosen by the Contractor. On his daily CQC Report, the Contractor shall record the dates when the major earth-moving activities occur, (e.g., excavation, placing fill, etc.); when construction activities temporarily or permanently cease on a portion of the site; and when stabilization practices are initiated. Except as provided in paragraphs UNSUITABLE CONDITIONS and NO ACTIVITY FOR LESS THAN 21 DAYS, stabilization practices shall be initiated as soon as practicable, but no more than 14 days after activities have temporarily or permanently ceased, in any portion of the site.

1.4.1.1 Unsuitable Conditions

Where the initiation of stabilization measures by the fourteenth day after construction activity temporarily or permanently ceases is precluded by unsuitable conditions caused by the weather, stabilization practices shall be initiated as soon as practicable after conditions become suitable.

1.4.1.2 No Activity for Less Than 21 Days

Where construction activity will resume on a portion of the site within 21 days from when activities ceased (e.g., the total time period that construction activity is temporarily ceased is less than 21 days), then stabilization practices do not have to be initiated on that portion of the site by the fourteenth day after construction activity temporarily ceased.

1.4.2 Structural Practices

Structural practices shall be implemented to divert flows from exposed soils, temporarily store flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Structural practices shall be implemented in a timely manner during the construction process to minimize erosion and sediment runoff. Structural practices shall include silt fences, straw bale barriers, silt socks, or other approved devices as chosen by the Contractor. Location and details of installation and construction shall be as required by the Contractor's construction methods and as shown on the contract drawings to limit runoff and the discharge of pollutants from exposed areas of the site. Structural practices shall include the following devices (silt fences, straw bale barriers, silt socks), and may be required to be used independently or in conjunction as the conditions of the site require.

1.4.2.1 Silt Fences

The Contractor shall provide silt fences as a temporary structural practice to minimize erosion and sediment runoff. Silt fences shall be properly installed to effectively retain sediment immediately after completing each phase of work where erosion would occur in the form of sheet and rill erosion (e.g., tree and stump removal, excavation, etc.). Silt fences shall be installed as required by the Contractor's construction methods. Final removal of silt fence barriers shall be upon approval by the Contracting Officer.

1.4.2.2 Straw Bales

The Contractor shall provide bales of straw as a temporary structural practice to minimize erosion and sediment runoff. Bales shall be properly placed to effectively retain sediment immediately after completing each phase of work where erosion would occur in the form of sheet and rill erosion (e.g., tree and stump removal, grading, excavation, etc.), and in each independent runoff area. Bales shall be placed as work progresses and shall be removed/replaced/relocated as needed for work to progress in the drainage area. Straw bales shall be installed as required by the Contractor's construction methods. Final removal of straw bale barriers shall be upon approval by the Contracting Officer. Rows of bales of straw shall be provided as follows:

a. Along the downhill perimeter edge of all areas disturbed.

b. Along the top of the slope or top bank of drainage ditches, channels, swales, etc. that traverse disturbed areas.

c. Along the toe of all cut slopes and fill slopes of the construction areas.

d. Perpendicular to the flow in the bottom of existing drainage ditches, channels, swales, etc., that traverse disturbed areas or carry runoff from disturbed areas.

e. Perpendicular to the flow in the bottom of new drainage ditches, channels, and swales.

f. At the entrance to culverts that receive runoff from disturbed areas.

1.4.3 Silt Socks

The Contractor shall provide silt socks as a temporary structural practice to minimize erosion and sediment runoff. Silt socks shall be properly installed to effectively retain sediment immediately after completing each phase of work where erosion would occur in the form of sheet and rill erosion (e.g., tree and stump removal, excavation, etc.). Silt socks shall be installed as required by the Contractor's construction methods. Final removal of silt sock barriers shall be upon approval by the Contracting Officer.

PART 2 PRODUCTS

2.1 COMPONENTS FOR SILT FENCES

2.1.1 Filter Fabric

The geotextile shall comply with the requirements of ASTM D4439, and shall consist of polymeric filaments which are formed into a stable network such that filaments retain their relative positions. The filament shall consist of a long-chain synthetic polymer composed of at least 85 percent by weight of ester, propylene, or amide, and shall contain stabilizers and/or inhibitors added to the base plastic to make the filaments resistance to deterioration due to ultraviolet and heat exposure. Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizers to provide a

minimum of six months of expected usable construction life at a temperature range of 0 to 120 degrees F. The filter fabric shall meet the following requirements:

FILTER FABRIC FOR SILT SCREEN FENCE

PHYSICAL PROPERTY	TEST PROCEDURE	STRENGTH REQUIREMENT
Grab Tensile Elongation (%)	ASTM D4632/D4632M	100 lbs. min. 30 % max.
Trapezoid Tear	ASTM D4533/D4533M	55 lbs. min.
Permittivity	ASTM D4491	0.2 sec-1
AOS (U.S. Std Sieve)	ASTM D4751	20-100

2.1.2 Silt Fence Stakes and Posts

The Contractor may use either wooden stakes or steel posts for fence construction. Wooden stakes utilized for silt fence construction shall have a minimum cross section of 2 inches by 2 inches when oak is used and 4 inches by 4 inches when pine is used, and shall have a minimum length of 5 feet. Steel posts (standard "U" or "T" section) utilized for silt fence construction, shall have a minimum weight of 1.33 pounds per linear foot and a minimum length of 5 feet.

2.1.3 Mill Certificate or Affidavit

A mill certificate or affidavit shall be provided attesting that the fabric and factory seams meet chemical, physical, and manufacturing requirements specified above. The mill certificate or affidavit shall specify the actual Minimum Average Roll Values and shall identify the fabric supplied by roll identification numbers. The Contractor shall submit a mill certificate or affidavit signed by a legally authorized official from the company manufacturing the filter fabric.

2.1.4 Identification Storage and Handling

Filter fabric shall be identified, stored and handled in accordance with ASTM D4873.

2.2 COMPONENTS FOR STRAW BALES

The straw in the bales shall be stalks from oats, wheat, rye, barley, rice, or from grasses such as byhalia, bermuda, etc., furnished in air dry condition. The bales shall have a standard cross section of 14 inches by 18 inches. All bales shall be either wire-bound or string-tied. The Contractor may use either wooden stakes or steel posts to secure the straw bales to the ground. Wooden stakes utilized for this purpose, shall have a minimum dimensions of 2 inches x 2 inches in cross section and shall have a minimum length of 3 feet. Steel posts (standard "U" or "T" section) utilized for securing straw bales, shall have a minimum weight of 1.33 pounds per linear foot and a minimum length of 3 feet.

2.3 SILT SOCKS

Silt socks shall be made from biodegradable materials and filled with wood chip compost. The Contractor may use either wooden stakes or steel posts to secure to the ground. Wooden stakes utilized for this purpose, shall have a minimum dimensions of 2 inches x 2 inches in cross section and shall have a minimum length of 3 feet. Steel posts (standard "U" or "T" section) utilized for securing straw bales, shall have a minimum weight of 1.33 pounds per linear foot and a minimum length of 3 feet.

PART 3 EXECUTION

3.1 INSTALLATION OF SILT FENCES

Silt fences shall extend a minimum of 16 inches above the ground surface and shall not exceed 34 inches above the ground surface. Filter fabric shall be from a continuous roll cut to the length of the barrier to avoid the use of joints. When joints are unavoidable, filter fabric shall be spliced together at a support post, with a minimum 6 inch overlap, and securely sealed.

In non-wetlands areas, a trench shall be excavated approximately 4 inches wide and 4 inches deep on the upslope side of the location of the silt fence. The 4-inch by 4-inch trench shall be backfilled and the soil compacted over the filter fabric. Silt fences shall be removed upon approval by the Contracting Officer.

In wetlands areas, silt fences shall not be installed in trenches. The lower portion of the silt fence shall be anchored with stakes or other approved methods.

3.2 INSTALLATION OF STRAW BALES

Straw bales shall be placed in a single row, lengthwise on the contour, with ends of adjacent bales tightly abutting one another. Straw bales shall be installed so that bindings are oriented around the sides rather than along the tops and bottoms of the bales in order to prevent deterioration of the bindings.

In non-wetland areas, the barrier shall be entrenched and backfilled. A trench shall be excavated the width of a bale and the length of the proposed barrier to a minimum depth of 4 inches. After the bales are staked and chinked (gaps filled by wedging with straw), the excavated soil shall be backfilled against the barrier. Backfill soil shall conform to the ground level on the downhill side and shall be built up to 4 inches against the uphill side of the barrier.

In wetlands areas, the barrier shall not be installed in trenches. The bales shall be anchored with just stakes as described below, or other approved methods.

Loose straw shall be scattered over the area immediately uphill from a straw bale barrier to increase barrier efficiency. Each bale shall be securely anchored by at least two stakes driven through the bale, more if trenching is not used. The first stake or steel post in each bale shall be driven toward the previously laid bale to force the bales together. Stakes or steel pickets shall be driven a minimum 18 inches deep into the ground to securely anchor the bales.

3.3 INSTALLATION OF SILT SOCKS

Silt socks shall be placed lengthwise on the contour. Silt socks shall be securely anchored as recommended by the manufacturer.

3.4 MAINTENANCE

The Contractor shall maintain the temporary and permanent vegetation, erosion and sediment control measures, and other protective measures in good and effective operating condition by performing routine inspections to determine condition and effectiveness, by restoration of destroyed vegetative cover, and by repair of erosion and sediment control measures and other protective measures. The following procedures shall be followed to maintain the protective measures.

3.4.1 Silt Fence Maintenance

Silt fences shall be inspected in accordance with paragraph INSPECTIONS. Any required repairs shall be made promptly. Close attention shall be paid to the repair of damaged silt fence resulting from end runs and undercutting. Should the fabric on a silt fence decompose or become ineffective, and the barrier is still necessary, the fabric shall be replaced promptly. Sediment deposits shall be removed when deposits reach one-third of the height of the barrier. When a silt fence is no longer required, it shall be removed. The immediate area occupied by the fence and any sediment deposits shall be shaped to an acceptable grade. The areas disturbed by this shaping shall be seeded.

3.4.2 Straw Bale Maintenance

Straw bale barriers shall be inspected in accordance with paragraph INSPECTIONS. Close attention shall be paid to the repair of damaged bales, end runs and undercutting beneath bales. Necessary repairs to barriers or replacement of bales shall be accomplished promptly. Sediment deposits shall be removed when deposits reach one-half of the height of the barrier. Bale rows used to retain sediment shall be turned uphill at each end of each row. When a straw bale barrier is no longer required, it shall be removed. The immediate area occupied by the bales and any sediment deposits shall be shaped to an acceptable grade. The areas disturbed by this shaping shall be seeded.

3.4.3 Silt Sock Maintenance

Silt socks shall be inspected in accordance with paragraph INSPECTIONS. Close attention shall be paid to the repair of damages. Necessary repairs to shall be accomplished promptly. Sediment deposits shall be removed when deposits reach one-half of the height of the installed sock. Silt sock runs used to retain sediment shall be turned uphill at each end of each run. When a silt sock is no longer required, it shall be removed. The immediate area occupied by the sock and any sediment deposits shall be shaped to an acceptable grade. The areas disturbed by this shaping shall be seeded.

3.5 INSPECTIONS

3.5.1 General

The Contractor shall inspect disturbed areas of the construction site, areas used for storage of materials that are exposed to precipitation that have not been finally stabilized, stabilization practices, structural practices, other controls, and area where vehicles exit the site at least once every seven (7) calendar days and within 24 hours of the end of any storm that produces 0.5 inches or more rainfall at the site. Where sites have been finally stabilized, such inspection shall be conducted at least once every month.

3.5.2 Inspections Details

Disturbed areas and areas used for material storage that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. Erosion and sediment control measures identified in the Storm Water Pollution Prevention Plan or Erosion Control Plan (see Section 01 57 20 ENVIRONMENTAL PROTECTION, subpart "Environmental Protection Plan") shall be observed to ensure that they are operating correctly. Discharge locations or points shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters. Locations where vehicles exit the site shall be inspected for evidence of offsite sediment tracking.

3.5.3 Inspection Reports

For each inspection conducted, the Contractor shall prepare a report summarizing the scope of the inspection, name(s) and qualifications of personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of the Storm Water Pollution Prevention Plan, maintenance performed, and actions taken. The report shall be furnished to the Contracting Officer within 24 hours of the inspection as a part of the Contractor's daily CQC REPORT. A copy of the inspection report shall be maintained on the job site.

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FIELD ENGINEERING

PART 1 GENERAL

1.1 SUMMARY

1.1.1 Engineering Services

The Contractor shall provide and pay for field engineering services required for the project, including the following:

a. Survey work required in execution of the project and for determining quantities of work performed and for submission of progress payment requisitions. All survey work shall be performed by a Land Surveyor registered in the State of Connecticut.

b. Level A Subsurface Utility Engineering (SUE) investigation and as-built map as defined by the National Consensus Standard titled ASCE C-I 38-02, Standard Guidelines for the Collection and Depiction of Existing Subsurface Utility Data. This shall include but not be limited to, locating all existing utilities and facilities, by public utilities and private utility locating contractors within the work area and in any areas that utilities are shown to potentially exist on the Drawings.

c. Civil, structural or other professional engineering services specified, or required to execute Contractor's construction methods. Record drawings shall be signed by Professional Engineer licensed in the State of Connecticut.

1.1.2 Existing Control Points

Control points are indicated on the contract drawings. The Contractor's registered land surveyor shall establish the control points in the field for the work of this project. Prior to the placement or removal of any material, the registered land surveyor shall establish construction control markers clearly visible and understandable to workmen placing material.

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-07 Certificates

Qualifications

Name and address of the Surveyor and Professional Engineer and proof of registration.

1.3 QUALIFICATIONS

1.3.1 Registered Land Surveyor

Registered land surveyor licensed in the State of Connecticut and approved by the Contracting Officer.

1.3.2 Professional Engineer

Professional Engineer licensed in the State of Connecticut and approved by the Contracting Officer.

1.4 LAYOUT OF WORK

a. The Government has indicated control points for the work of this project which are described on the contract drawings.

b. From these control points the Contractor's surveyor shall lay out the work by establishing all lines and grades at the site necessary to control the work and shall be responsible for all measurements that may be required for the execution of the work to the location and limit marks prescribed in the specifications or on the contract drawings. The Contractor shall establish and maintain at the site of the work such stakes and markers as are necessary for control and guidance of his construction operations. All survey data shall be recorded in accordance with standard and approved methods. All field notes, sketches, recordings and computations made by the Contractor in establishing above horizontal and vertical control points shall be available at all times during the progress of the work for ready examination by the Contracting Officer or his duly authorized representative.

c. The Contractor shall furnish, at his own expense, all such stakes, spikes, steel pins, templates, platforms, equipment, tools and material and all labor as may be required in laying out any part of the work from the control points established by the Government. It shall be the responsibility of the Contractor to maintain and preserve all stakes and other markers established by him until authorized to remove them. If any of the control points established at the site by the Government are destroyed by or through the negligence of the Contractor prior to their authorized removal, they may be replaced by the Contracting Officer, and the expense of replacement will be deducted from any amount due or which may become due the Contractor. The Contracting Officer may require that work be suspended at any time when horizontal and vertical control points established at the site by the Contractor are not reasonably adequate to permit checking the work. Such suspension will be withdrawn upon proper replacement of the control points.

d. During the layout of the work, the Contractor shall notify the Government of any inconsistencies or conflicts which arise due to the supplied control points or features of the project.

PART 2 PRODUCTS (NOT USED)

Not used.

PART 3 EXECUTION

3.1 SURVEY REQUIREMENTS:

All site survey data must be provided in the following coordinate systems:

1. North American Vertical Datum of 1988 (NAVD88), and

2. Horizontal North American Datum of 1983 (Connecticut State Plan Coordinate System).

The Contractor's Land Surveyor will conduct an initial survey of boundaries for limits of excavation and excavation shoring as shown on the Drawings. This survey shall utilize recognized engineering survey practices appropriate for obtaining the information specified. The Contractor shall conduct additional layout survey during the Work as needed to ensure that the Work performed is to the limits shown of the Drawings.

The Contractor's Land Surveyor shall survey all soil borings conducted as required on the Drawings and as needed to provide soil data for disposal facility acceptance.

A. The Contractor's Land Surveyor shall conduct a comprehensive final as-built survey which shall include a minimum of the following:

1. Horizontal and vertical limits of the excavation;

2. Horizontal and vertical limits of the demarcation barrier;

3. Horizontal and vertical limits of the common fill placement;

4. Horizontal and vertical limits of the bituminous pavement placement;

5. Horizontal and vertical limits of the topsoil placement;

6. Site final grades and elevations;

7. Surface utilities;

a. Storm drain system features, including:

1. Pipe centerlines,

2. Manhole and catch basin locations,

3. Pipe, manhole, and catch basin size and materials,

4. Pipe invert elevations,

5. Manhole and catch basin rim, invert, and sump elevations

b. Footprint of replacement CMU block storage building;

c. And all other significant site features changed during construction.

B. Record Drawings shall include cross-sections, and profiles as necessary to accurately represent conditions.

C. Statements that design features were built “to plan” will not be an acceptable substitute for final as-built survey information.

D. Surveying personnel shall be in full compliance with all requirements of CFR.1910.120 before entering the Exclusion Zone.

E. Contractor shall preserve the survey stakes, including replacement by a Registered Land Surveyor, at Contractor’s expense, if destroyed or moved.

F. During the course of the backfilling and site restoration Work, the Contractor will record elevations and locations in completed working areas for each restoration material used.

G. Contractor shall promptly report to the Contracting Officer the loss or destruction of any reference point or relocation required because of changes in grades or other reasons. Contractor shall make no changes without prior written notice to the Contracting Officer.

H. The Work shall be executed in conformance with the lines and grades shown on the Drawings, unless otherwise directed by the Contracting Officer.

I. If the Contracting Officer believes that Contractor constructed the excavation outside the limits shown on the Drawings in certain areas, Work in that area shall be temporarily discontinued upon notification to Contractor. The Contractor may then employ a Registered Land Surveyor to determine actual elevations and locations of excavation.

J. At the end of construction, the Contractor’s surveyor shall prepare Record Drawings as required by Contracting Officer.

-- End of Section --

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SECTION 01 74 19

CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT

PART 1 GENERAL

1.1 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: (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.

1.2 MANAGEMENT

Develop and implement a waste management program. 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.

1.3 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

Demolition Plan; G, RO

Waste Management Plan; G, RO

The Contractor shall develop a Waste Management Plan in accordance with the requirements of this section.

1.4 MEETINGS

Conduct Construction Waste Management meetings. After award of the Contract and prior to commencement of work, schedule and conduct a meeting with the Contracting Officer to discuss the proposed Waste Management Plan and to develop a mutual understanding relative to the details of waste management. The requirements for this meeting may be fulfilled during the coordination and mutual understanding meeting outlined in Section 01 40 00 QUALITY CONTROL. At a minimum, environmental and waste management goals and issues shall be discussed at the following additional meetings:

a. Preconstruction meeting.

b. Regular QC meetings.

c. Work safety meetings.

1.5 DEMOLITION PLAN

a. Describe proposed sequence, methods, and equipment for demolition and disposal of structure.

b. Provide detailed list of material to be removed and a list of recycling/disposal facilities for each type of material.

c. Describe proposed sequence, methods, and equipment for reconstruction of a new concrete block storage building.

d. Provide shop drawings for new storage building.

e. Describe dust control measures, anticipated truck traffic on each day of work, protective measures to be used to safeguard workers and pedestrians during demolition and reconstruction, and the approach to utility location, shutoff, and reconnection, as needed.

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 the Waste Management 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 COLLECTION

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

materials prior to placing in collection containers. Use cleaning materials that are nonhazardous and biodegradable. Handle hazardous waste and hazardous materials in accordance with applicable regulations and coordinate with Section 01 57 20 ENVIRONMENTAL PROTECTION. Separate materials by one of the following methods:

1.7.1 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.

1.7.2 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.

1.7.3 Other Methods

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

1.8 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:

1.8.1 Reuse

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

1.8.2 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.

1.8.3 Waste

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

1.8.4 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.

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SECTION 01 78 00

CLOSEOUT SUBMITTALS

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. DEPARTMENT OF DEFENSE (DOD)

UFC 1-300-08	(2009, with Change 2) Criteria for Transfer and Acceptance of DoD Real Property

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for 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 information relevant to the warranty of materials and equipment incorporated into the construction project, including the starting date of warranty of construction. The Contractor shall furnish with each warranty the name, address, and telephone number of each of the guarantor's representatives nearest to the project location.

SD-08 Manufacturer's Instructions

Instructions

Posted instructions.

SD-11 Closeout Submittals

Record Drawings; G, RO

Interim Form DD1354; G, RO

Checklist for Form DD1354; G, RO

Construction Completion Report; G, RO

Remedial Action Report (RAR); G, RO

1.3 CONSTRUCTION COMPLETION REPORT

The Contractor shall prepare a Construction Completion Report.

1. The Construction Completion Report shall contain: 1) all project documentation identified in the specifications, including but not limited to as-built plans, test results, weight slips, material disposal documentation, and photo/video documentation; 2) a summary of all work performed with sufficient detail to provide an unfamiliar person a good understanding of the completed work.

2. The Construction Completion Report shall be submitted in draft form to the Contracting Officer for review.

3. Each Construction Completion Report shall contain:

   a. An executive summary in fact sheet format providing a general overview with figures to describe the work performed
   b. An introduction
   c. a summary of all work performed with sufficient detail to provide an unfamiliar person a good understanding of the completed work;
   d. A chronology of the activities performed;
   e. A section describing performance standards and quality control which shall include, at a minimum, a description of the performance standards and the quality control activities, tables showing all test results along with the performance criteria compared to applicable standard;
   f. A section describing Inspections and providing the Certifications
   g. Contact information
   h. References
   i. Sufficient figures and tables to support the text
   j. Appendices to each Completion Report shall include:
      i. All approved submittals;
      ii. Meeting minutes and project correspondence;
      iii. Documentation showing the completed work in sufficient detail to support that the work was performed in compliance with the project requirements;
      iv. Project Record Drawings as required by Section 1.5;
      v. Daily Quality Control Reports along with sufficient photo-documentation to document the work was performed in conformance with the plans and specifications;
      vi. Pre-final and final inspection documentation, including punch lists and documentation of completion of punch list items.
      vii. Analytical and other test results
      viii.

4. Each Construction Completion Report shall also include the following: (1) certified statements by the contractor's project manager, and a registered professional engineer/Connecticut

Licensed Site Professional (LSP) that, after review of the project information including the conformed design specifications and drawings, record drawings, contractor quality control documentation, and making additional reasonable inquiries and by the contractor that construction is complete and that the system is functioning properly and as designed; (2) be prepared in accordance with Chapter 2 (Remedial Action Completion) of EPA's Close Out Procedures for NPL Sites guidance (May 2011).

5. The Construction Completion Report shall be submitted in draft form to the Contracting Officer for review and approval.

6. Upon receipt of comments, the contractor shall revise the Construction Completion Report as directed and re-submit for review and approval. This cycle shall be repeated until the Contracting Officer accepts the Construction Complete Report and final.

7. A final Construction Completion Report shall be submitted in final form in PDF format with all attachments.

1.4 REMEDIAL ACTION REPORT (RAR)

Upon approval of the Construction Completion Report, the Contractor shall prepare a Remedial Action Report (RAR), in accordance with EPA's Close Out Procedures for NPL Sites guidance (May 2011):

http://www.epa.gov/superfund/programs/npl_hrs/closeout/pdf/2011guidance.pdf

The RAR shall be prepared in accordance with Chapter 2 (Remedial Action Completion) of EPA's Close Out Procedures for NPL Sites guidance (May 2011).

1.5 PROJECT RECORD DOCUMENTS

1.5.1 Record Drawings

Drawings showing final as-built conditions of the project. This paragraph covers record drawings complete, as a requirement of the contract. The terms "drawings", "contract drawings", "drawing files", "working record drawings", and "final record drawings" refer to contract drawings which are revised to be used for final record drawings showing as-built conditions.

1.5.1.1 Working Record and Final Record Drawings

Revise two sets of paper drawings by red-line process to show the as-built conditions during the prosecution of the project. Keep these working record 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 shall 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 record marked drawings 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, as appropriate for the project:

a. The actual location, kinds and sizes of all sub-surface utility lines. In order that the location of these lines and appurtenances may be determined in the event the surface openings or indicators become covered over or obscured, show by offset dimensions to two permanently fixed surface features the end of each run including each change in direction on the record drawings. Locate valves, splice boxes and similar appurtenances by dimensioning along the utility run from a reference point. Also record the average depth below the surface of each run.

b. The location and dimensions of any changes within the building structure.

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

d. 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.

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

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

g. Where contract drawings or specifications present options, show only the option selected for construction on the final record drawings.

h. If borrow material for this project is from sources on Government property, or if Government property is used as a spoil area, furnish a contour map of the final borrow pit/spoil area elevations.

i. Systems designed or enhanced by the Contractor, such as HVAC controls, fire alarm, fire sprinkler, and irrigation systems.

j. 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.

1.5.1.2 Drawing Preparation

Modify the contract drawings as necessary to correctly show the features of the project as it has been constructed by bringing the contract drawings into agreement with the working record drawings, and adding such additional drawings as may be necessary. The working record drawings must be neat, legible and accurate. The working record drawings are part of the permanent records of this project and shall be scanned into PDF format and returned to the Contracting Officer For Information Only (FIO). Any drawings damaged or lost by the Contractor must be satisfactorily replaced by the Contractor at no expense to the Government.

1.5.1.3 Computer Aided Design and Drafting (CADD) Drawings

Only employ personnel proficient in the preparation of CADD drawings to modify the contract drawings or prepare additional new drawings. Additions and corrections to the contract drawings must be equal in quality and detail to that of the originals. Line colors, line weights, lettering, layering conventions, and symbols shall be the same as the original line colors, line weights, lettering, layering conventions, and symbols. If additional drawings are required, prepare them using the specified electronic file format applying the same graphic standards specified for original drawings. The title block and drawing border to be used for any new final record drawings shall be identical to that used on the contract drawings. Accomplish additions and corrections to the contract drawings using CADD files. The Contractor shall produce "as-designed" drawings in AutoCAD. The Contractor shall be responsible for providing all software and hardware necessary to prepare final record drawings in AutoCAD. The Contracting Officer will review final record drawings for accuracy and return them to the Contractor for required corrections, changes, additions, and deletions.

a. Provide CADD "base" colors of red, green, and blue. Color code for changes as follows:

(1) Deletions (Red) - Over-strike deleted graphic items (lines), lettering in notes and leaders.

(2) Additions (Green) - Added items, lettering in notes and leaders.

(3) Special (Blue) - Items requiring special information, coordination, or special detailing or detailing notes.

b. Rename the Contract Drawing files in a manner related to the contract number (i.e., 98-C-10.DGN) as instructed in the Pre-Construction conference. Use only those renamed files for the Marked-up changes. All changes shall be made on the layer/level as the original item.

c. When final revisions have been completed, show the wording "AS-BUILT" followed by the name of the Contractor in letters at least 3/16 inch high on the cover sheet drawing. Mark all other contract drawings either "As-built" drawing denoting no revisions on the sheet or " As-built" denoting one or more revisions. Date original contract drawings in the revision block.

d. Prepare CADD working record drawings and submit these drawings for Government review and approval, the Government will promptly return drawings annotated with any necessary corrections.

e. They shall be complete in all details and identical in form and function to the contract drawing files supplied by the Government. Any transactions or adjustments necessary to accomplish this is the responsibility of the Contractor. The Government reserves the right to reject any drawing files it deems incompatible with the customer's CADD system. Paper prints, drawing files and storage media submitted will become the property of the Government upon final approval. Failure to submit final record drawing files and working record drawings as specified will be cause for withholding any payment due the Contractor under this contract. Approval and acceptance of final record drawings shall be accomplished before final payment is made to the Contractor.

f. Upon approval of the CADD working record drawings from the Contracting Officer, submit the final record drawing packages consisting of the following:

24 X 36 inch final record drawings including two sets of printed final record drawings, three sets of ½ scale printed final record drawings, and electronic copies in PDF and AutoCAD.

1.5.1.4 Payment

No separate payment will be made for record drawings required under this contract, and all costs accrued in connection with such drawings are considered a subsidiary obligation of the Contractor.

1.6 WARRANTY MANAGEMENT

1.6.1 Warranty Management Plan

Develop a warranty management plan which contains information relevant to FAR 52.246-21 Warranty of Construction. At least 30 days before the planned pre-warranty conference, submit the warranty management plan. Include within the warranty management plan all required actions and documents to assure

that the Government receives all warranties to which it is entitled. The plan narrative must contain sufficient detail to render it suitable for use by future maintenance and repair personnel, whether tradesmen, or of engineering background, not necessarily familiar with this contract. The term "status" as indicated below must include due date and whether item has been submitted or was accomplished. Submit warranty information, made available during the construction phase, to the Contracting Officer for approval prior to each monthly pay estimate. Assemble approved information in a binder and turn over to the Government upon acceptance of the work. The construction warranty period must begin on the date of project acceptance and continue for the full product warranty period. Conduct a joint 4 month and 9 month warranty inspection, measured from time of acceptance; with the Contractor, Contracting Officer and the Customer Representative. The warranty management plan must include, but is not limited to, the following:

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

b. Furnish with each warranty the name, address, and telephone number of each of the guarantor's representatives nearest to the project location.

c. Listing and status of delivery of all Certificates of Warranty for extended warranty items, to include roofs, HVAC balancing, pumps, motors, transformers, and for all commissioned systems such as fire protection and alarm systems, sprinkler systems, lightning protection systems, etc.

d. As-Built Record of Equipment and Materials</SUB> list for each warranted equipment, item, feature of construction or system indicating:

(1) Name of item.
(2) Model and serial numbers.
(3) Location where installed.
(4) Name and phone numbers of manufacturers or suppliers.
(5) Names, addresses and telephone numbers of sources of spare parts.
(6) Warranties and terms of warranty. Include one-year overall warranty of construction, including the starting date of warranty of construction. Items which have extended warranties must be indicated with separate warranty expiration dates.
(7) Cross-reference to warranty certificates as applicable.
(8) Starting point and duration of warranty period.
(9) Summary of maintenance procedures required to continue the warranty in force.
(10) Cross-reference to specific pertinent Operation and Maintenance manuals.
(11) Organization, names and phone numbers of persons to call for warranty service.
(12) Typical response time and repair time expected for various warranted equipment.

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

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

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

Provide sufficient copies of warranties to distribute to the Contracting Officer, the EPA, the CT DEEP, and Durham Manufacturing Company. Provide additional copies of each warranty to include in operation and maintenance manuals.

1.6.2 REMOVED

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

1.6.4 Contractor's Response to Construction Warranty Service Requirements

Following oral or written notification by the Contracting Officer, respond to construction warranty service requirements in accordance with the "Construction Warranty Service Priority List" and the three categories of priorities listed below. Submit a report on any warranty item that has been repaired during the warranty period. Include within the report the cause of the problem, date reported, corrective action taken, and when the repair was completed. If the Contractor does not perform the construction warranty within the timeframes specified, the Government will perform the work and backcharge the construction warranty payment item established.

a. First Priority Code 1. Perform onsite inspection to evaluate situation, and determine course of action within 4 hours, initiate work within 6 hours and work continuously to completion or relief.

b. Second Priority Code 2. Perform onsite inspection to evaluate situation, and determine course of action within 8 hours, initiate work within 24 hours and work continuously to completion or relief.

c. Third Priority Code 3. All other work to be initiated within 3 work days and work continuously to completion or relief.

d. The "Construction Warranty Service Priority List" is as follows:

Code 1-Electrical
(1) Power failure (entire area or any building operational after 1600 hours).
(2) Security lights
(3) Smoke detectors

Code 2-Electrical
(1) Power failure (no power to a room or part of building).
(2) Receptacle and lights (in a room or part of building).

Code 3-Electrical
Street lights.

Code 1-Gas
(1) Leaks and breaks.
(2) No gas to building.

Code 1-Heat
(1) Area power failure affecting heat.

Code 2-Water (Exterior)
No water to facility.

Code 2-Water (Hot)
No hot water in portion of building listed.

Code 3-All other work not listed above.

1.7 CLEANUP

Leave premises "broom clean". As appropriate for the project, clean interior and exterior glass surfaces exposed to view; remove temporary

labels, stains and foreign substances; polish transparent and glossy surfaces; vacuum carpeted and soft surfaces. Clean equipment and fixtures to a sanitary condition. Clean filters of operating equipment. Clean debris from roofs, gutters, downspouts and drainage systems. Sweep paved areas and rake clean landscaped areas. Remove waste and surplus materials, rubbish and construction facilities from the site.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

DIVISION 2

SITE CONSTRUCTION

DIVISION 2

SITE CONSTRUCTION

SECTION 02000

TEMPORARY ELECTRIC SERVICE AND LINE REPLACEMENT

PART 1 - GENERAL

The Contractor shall obtain the services of an Electrical Contractor, licensed in the State of Connecticut, to provide a temporary source of power to the DMC Manufacturing Facility during execution of subsurface work and replace permanent utility lines upon completion of the work, as described herein, and shown on Drawings C-02 through C-06. All work and associated costs shall be the responsibility of the Contractor.

1.01 PHASE 01A WORK

Electrical contractor shall be responsible to provide temporary generator system (480V, 3ph) to power existing building “A” (manufacturing side), (Transformer A handles the load of Admin power support at the front of the structure) loads for the duration of the remediation project. The electrical contractor shall acquire the services of an onsite generator mechanic who will be onsite at all times for the duration of the site remediation project during the plants operating hours when the temporary generator system is onsite and providing power to the building(s). The temporary generator shall operate 24 hours per day; however, the onsite generator mechanic shall be onsite during regular work hours. The Contractor shall be responsible for coordination with the DMC’s Facilities Manager regarding the exact time of the plants operating hours. The onsite generator mechanic shall be responsible for the operation, maintenance, fuel purchasing, fuel delivery and refueling for the uninterrupted operation of the temporary generator system. All necessary down time and maintenance of the temporary generator system shall be performed when the plant is not operating.

The electrical contractor shall run temporary power cables from the temporary generator system to the existing switchgear main breaker located in building “A”. The electrical contractor shall be responsible for determining the best way to connect temporary power conductors from the temporary generator system to the existing switchgear main breaker to allow remediation work to be performed in and around the existing building and other structures for the duration of the remediation project. The electrical contractor shall coordinate all work in this area with the general contractor and the DMC’s Facilities Manager.

The electrical contractor shall coordinate with the Contractor for all the required excavation needed for site electrical work. The general contractor must take care when digging in or around the existing buildings and other structures when running temporary power cables from the temporary generator system to the existing main breaker and when installing new utility conduits. Call-Before-You-Dig shall be called prior to any work being performed on the site. The electrical contractor shall trace any questionable underground conduits systems (including direct buried conductors) and make notation of such conduits systems and develop drawings based on this information and existing site conditions, prior to any work being done.

The electrical contractor shall develop work plans and schedules in coordination with Utility (Eversource) and the building(s) DMC’s Facilities Manager to ensure that power will not be interrupted for the duration of the remediation project except for the general plant shutdown when transfer from utility power to the temporary generator system at the beginning of the project and at the end of project when power is

transferred from the temporary generator system back to utility power. The Contractor and electrical contractor shall be responsible for all coordination, including but not limited to the disconnect of main power and design and engineering of lines by Eversource. Assuming XRMRs and secondary conductors/conduits to main switchboard(s) are not to be disturbed. Assume a minimum of 1 day of downtime required to disconnect the utility transformer(s) and 1 day to reconnect the utility transformer(s) this timeline shall be confirmed with the utility.

Once it is determined that the temporary generator system is running and is a reliable power source then the remediation work can commence.

After temporary power is up and running and while the remediation process is taking place the electrical contractor can begin installing new utility conduits to replace the existing underground utility cables. The electrical contractor shall install new conduits from the existing transformer “A” (west side) located in the front of the existing building to a new pull point (handhole or manhole) at the corner of the building (north side). Provide one spare conduit for the medium voltage (MV) +/- 13.8KV power.

When the remediation process along the north side of the building is at a point where it is level and a minimum of 30+ inches from finished grade, the electrical contractor can start installing the Utility conduits from the new pull point (handhole or manhole) to the utility transformer “B” location (north side).

At this point the utility will pull new conductors between transformer “A” and transformer “B”.

All outside areas shall be NEMA 3R.

All buried conduits shall be schedule 40 PVC installed in concrete duct banks (the exact requirements of the utility conduits and conduit installation will need to be coordinated with utility).

All conduits installed in buildings shall be rigid galvanized steel (RGS).

The general contractor shall be responsible for all site excavation.

The general contractor shall be responsible for all the site restoration work.

The electrical contractor shall be responsible for acquiring the Utility bills to determine the loads the temporary generator system will be required to handle.

The electrical contractor shall acquire all necessary local, state and federal permits.

The electrical contractor shall pay for all fees and permits associated with the electrical work.

The electrical contractor shall be responsible for all Utility fees associated with the electrical work.

The electrical contractor shall be responsible for the testing of the electrical system upon completion of the electrical work.

All work shall be performed per the latest edition of the NEC and per all local, state, and federal codes and regulations.

1.02 PHASE 01B WORK

The electrical contractor shall be responsible to provide temporary generator system (480V, 3ph) to power existing building “B” loads during the duration of the remediation project. The electrical contractor

shall acquire the services of an onsite generator mechanic who will be onsite at all times for the duration of the site remediation project during the plants operating hours when the temporary generator system is onsite and providing power to the building(s). The Contractor shall be responsible for coordination with the DMC's Facilities Manager regarding the exact time of the plants operating hours. The onsite generator mechanic shall be responsible for the operation, maintenance, fuel purchasing, fuel delivery and refueling for the uninterrupted operation of the temporary generator system during the plant operating hours. All necessary down time and maintenance of the temporary generator system shall be performed when the plant is not operating.

The electrical contractor shall run temporary power cables from the temporary generator system(s) set to the existing panelboard "A" main breaker located in existing building "B". The electrical contractor shall be responsible for determining the best way to connect temporary power conductors from the temporary generator system(s) to the existing panelboard "A" main breaker. Note that the existing panelboard "B" located in existing building "B" is not currently energized and does not need to be kept energized during the remediation project.

The electrical contractor shall coordinate with the general contractor for all the required excavation needed for site electrical work. The general contractor must take care when digging, in or around the existing buildings and other structures when running temporary power cables from the temporary generator system(s) set to the existing main breaker and when installing new conduits. Call-Before-You-Dig shall be called prior to any work being performed on the site. The electrical contractor shall trace any questionable underground conduits systems (including direct buried conductors) and make notation of such conduits systems and develop drawings based on this information and existing site conditions, prior to any work being done.

The electrical contractor shall develop work plans and schedules in coordination with DMC's Facilities Manager to ensure that power will not be interrupted for the duration of the remediation project except for the transfer of power from building "A" to the temporary generator system(s) to power existing building "B" loads and transfer of power from the temporary generator system(s) to the power from building "A" to restore power to building "B" at the end of the Phase 01B work. Assume a minimum of 4 hours of downtime required to disconnect and reconnect the power each time.

Once it is determined that the temporary generator system is running and is a reliable power source then the re-routing of power can commence.

After temporary power is up and running and while the remediation process is taking place along the north and east sides of building "A" the electrical contractor can begin installing new conduits and conductors to replace existing the existing conduits and conductors. The electrical contractor shall install new conduits from the existing switchboard located in building "A" to the existing panelboard "B" located in existing building "B" (east of existing building "A").

Once the remediation is completed the installation of the new conduits and conductors for both Panelboards A and B can be completed and both panels can be reconnected to the switchboard and placed back in service.

All outside areas shall be NEMA 3R.

All buried conduits shall be schedule 40 PVC installed in concrete duct banks.

All conduits installed in buildings shall be rigid galvanized steel (RGS).

The general contractor shall be responsible for all site excavation.

The general contractor shall be responsible for all the site restoration work.

The electrical contractor shall be responsible for acquiring the Utility bills to determine the loads the temporary generator system will be required to handle.

The electrical contractor shall acquire all necessary local, state and federal permits.

The electrical contractor shall pay for all fees and permits associated with the electrical work.

The electrical contractor shall be responsible for all Utility fees associated with the electrical work.

The electrical contractor shall be responsible for the testing of the electrical system upon completion of the electrical work.

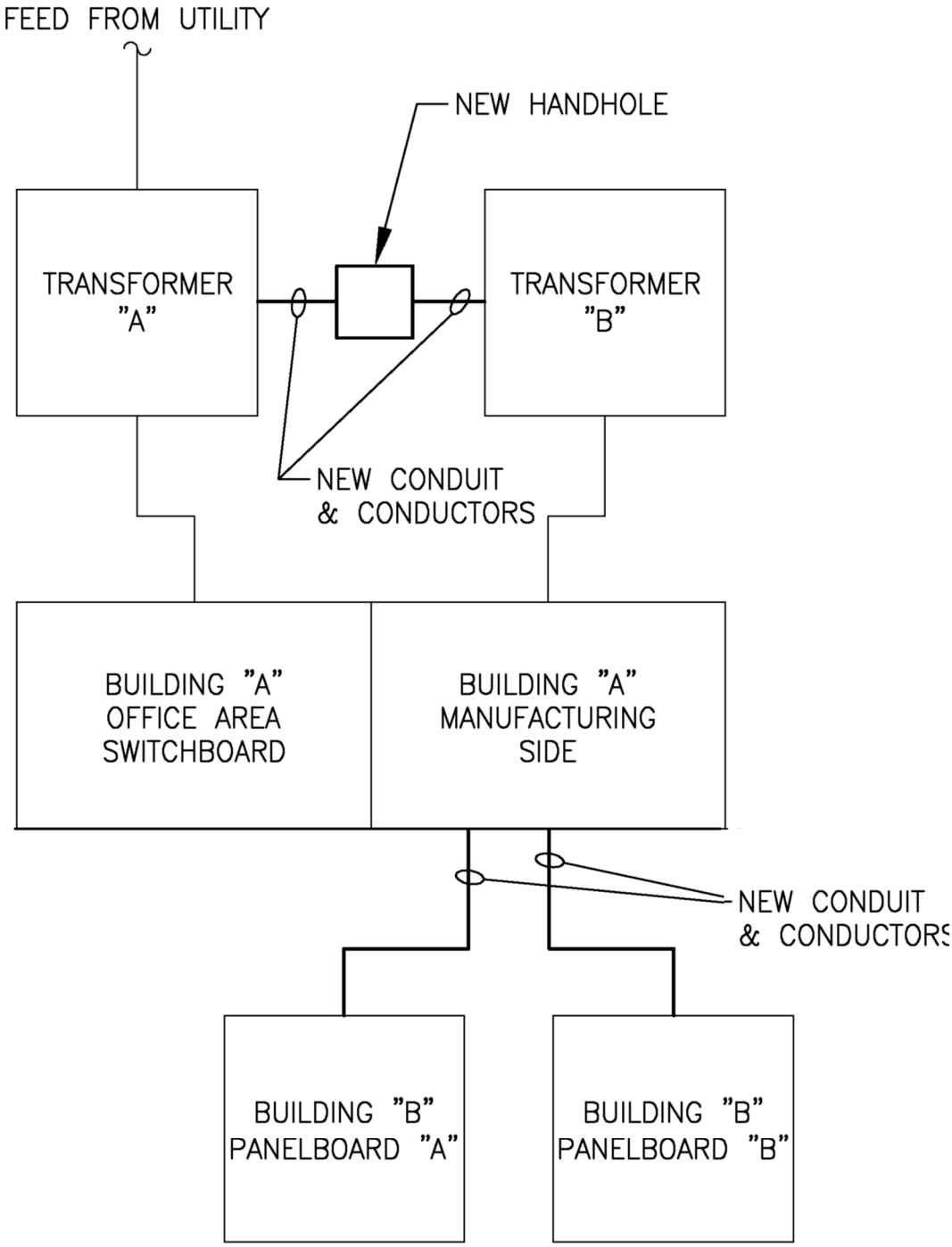
All work shall be performed per the latest edition of the NEC and per all local, state, and federal codes and regulations.

1.03 SUBMITTALS:

A. See Section 01 33 00 – Submittal Procedures

B. Temporary Power Work Plan:

1. Submit for approval a Temporary Power Work Plan. At a minimum, the Plan shall include:
   - Load calculations for temporary electrical power for both buildings,
   - Utility back charges,
   - A plan for refueling,
   - A schedule showing when a generator mechanic will be on site for each building,
   - Coordination plan for hours of operation of the generator, Back-up power plan
   - Drawings for the replacement of permanent power at completion of the work, stamped by a Professional Engineer, registered in the State of Connecticut.



BLOCK DIAGRAM

SECTION 02050

DEMOLITION

PART 1 – GENERAL

1.01 SCOPE OF WORK

A. Demolish and replace in-kind one story equipment storage building and slab foundation, as indicated on drawings, as specified, and as directed by the Contracting Officer. The storage building was constructed between 1970 and 1980, of CMU blocks, with slab on grade foundation. The building is single story, approximately 30 feet long by 15 feet wide, with a roll-up garage door, one man door, four windows, and capped by an asphalt roof. The Contractor shall assume that the building is painted with lead-based paint, and dispose of LBP-contaminated material, as required, in accordance with the applicable regulations. The Contractor shall confirm all dimensions and building contents, as necessary, for demolition. The building shall be reconstructed in a to-be-determined location on the DMC property.

B. No asbestos nor asbestos containing material (ACM) is known to be present at the Site; however, prior to demolishing the building, the Contractor shall conduct an investigative survey for ACM on and within the building structure.

C. Remove all window caulk, window frames, and glass panes and 1-inch layer of concrete adjacent to the window frames for disposal as TSCA waste. These materials shall be assumed to contain PCBs at concentrations equal to or greater than 50 ppm and shall be disposed of as PCB bulk waste.

D. Remove and temporarily store contents of the storage building, as directed by the Contracting Officer . Content will be replaced in new building at completion.

1.02 RELATED SECTIONS

A. Section 01 33 00 – Submittal Procedures

B. Section 01 40 00 - Quality Control

C. Section 01 35 26 Govermental Safety Requirements and 01 35 29.13 – Health, Safety and Emergency Response Procedures for Contamindated Sites

D. Section 01 71 23 – Field Engineering

E. Section 02260 - Excavation

1.03 REFERENCES

A. 29 CFR 1926.32

B. 40 CFR Part 761-763

C. Connecticut General Statutes Chapter 541, Sections 29-401 through 29-403

1.04 SUBMITTALS

A. Submit the following in accordance with Section 01 33 00 Submittal Procedures:

1. Demolition Plan. Submit to the Contracting Officer for review within 14 days of Notice to Proceed, a demolition plan describing proposed sequence, methods, and equipment for demolition and disposal of the structure. The plan shall incude a detailed list of material to be removed, including and a list of recycling/disposal facilities for each type of material. The plan shall include a description of the proposed dust control measures, anticipated truck traffic each day of work, and a list of recycling/disposal facilities for each type of material to be removed from the site. It shall also include a description of protective measures to be used to safeguard workers and pedestrians during demolitions and of the approach to utility location and shut off as needed. Submit under Section 01 74 19.

2. Connecticut Class B Certificate of Registration, in accordance with Chapter 541 Section 29-401.

3. ACM Survey Report. Submit to the Contracting Officer for review the ACM Survey Report within two (2) weeks of completing the effort. The report shall include a summary of the investigation efforts, including the location of all samples collected; results of the ACM analyses; types, quantities, and locations of ACM; and estimated costs for the removal, handling, and disposal of such materials. The Report shall be prepared by a Competent Person, capable of identifying existing asbestos, tremolite, anthophyllite, or actinolite hazards and corrective measures to eliminate them, as specified in 29 CFR 1926.32 and 40 CFR Part 763.

4. Storage Building construction drawings and material specifications reviewed and approved by a CT certified Connecticut Professional Engineer.

1.05 PERFORMANCE REQUIREMENTS

A. Provide in accordance with Section 01 40 00 Quality Control and as specified.

B. Demolish and remove existing construction, utilities, equipment, and appurtenances.

C. Store equipment to be salvaged where directed by the Contracting Officer, and if necessary, protect from damage during Work.

D. Exercise all necessary precautions for fire prevention. Make acceptable fire extinguishers available at all times in areas where demolition work by burning torches is being done. Do not burn demolition debris on or off Site.

E. Protect persons and property throughout progress of Work. Proceed in such manner as to minimize spread of dust and flying particles and to provide safe working conditions for personnel.

F. Maintain circulation of traffic within area at all times during demolition operations.

G. Obtain permission from Contracting Officer before abandoning or removing any existing structures, materials, equipment and appurtenances.

H. Make necessary arrangements with and perform Work required by utility companies and municipal departments for discontinuance or interruption of utility services due to demolition Work.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 PREPARATION

A. Provide three reference points for each survey marker and monument removed, established by a licensed civil engineer or land surveyor and record locations and designations of survey markers and monuments prior to removal.

B. Store removed markers and monuments during demolition work, and replace upon completion of Work. Reestablish survey markers and monuments in conformance with recorded reference points. Forward letter to the Contracting Officer signed by licensed civil engineer or land surveyor verifying reestablishment of survey markers and monuments.

3.02 ACM SURVEY

A. Prior to building demolition, the Contractor shall mobilize the necessary tools, equipment and personnel to complete the ACM survey.

B. The Work shall be conducted by a Competent Person, licensed to perform work in the State of Connecticut and capable of identifying existing asbestos, tremolite, anthophyllite, or actinolite hazards and corrective measures to eliminate them, as specified in 29 CFR 1926.32 and 40 CFR Part 763.

C. ACM samples collected for asbestos analysis shall be handled, wetted, and bagged in accordance with standard collection practices. The ACM samples shall be analyzed to determine the type and content of asbestos in accordance with the EPA-endorsed Polarized Light Microscopy with Dispersion Staining (PLM/DS) method. Some samples may require additional analysis to quantify the asbestos concentration. The “point counting” technique (specified under the PLM/DS method) shall be used.

D. Samples collected for lead analysis shall be handled in accordance with standard collection procedures. Lead analysis shall be performed in accordance with the current version of EPA SW-846 methods by a certified laboratory.

E. The Contractor shall review all ACM laboratory data, summarize the results, estimate quantities and areas for each type of ACM (including approximate pipe lengths and square footage of surfaces affected), and estimate the costs to remove and properly dispose of asbestos as required, in accordance with the applicable regulations.

3.03 REMOVAL AND DISPOSAL OF WINDOW CAULK, FRAMES, AND GLASS PANES

A. The Contractor shall remove all window caulk, window frames, and glass panes for disposal as PCB waste at an EPA-approved TSCA disposal facility.

B. The Contractor shall remove a 1-inch deep section of concrete along the full depth of the concrete block at the bottom of each window for disposal as PCB-contaminated TSCA waste.

C. The Contractor shall remove a 1-inch wide, 1-inch deep volume of concrete along the top and sides of each window, closest to and at the point where the caulking is or historically was present.

D. Once materials have been removed they shall be placed in appropriate containers for proper disposal at an approved TSCA landfill. It is the Contractor's responsibility to comply with the requirements of the disposal facility.

E. All work shall be conducted in accordance with Connecticut and Federal rules and regulations for PCB removal and disposal. When disposed, the caulk, window frames, panes, and concrete must be managed as *PCB bulk product waste*, defined at 40 CFR § 761.3. Regulations governing the cleanup and disposal of *PCB bulk product waste* are provided at 40 CFR § 761.62. Additional information on disposal is available at http://www.epa.gov/pcbsincaulk/.

3.04 DEMOLITION

A. Confine apparatus, storage of materials, demolition work, new construction, and operations of workmen to work areas only. Maintain the Site in a neat and orderly condition at all times.

B. Prevent traffic and tripping hazards by maintaining neat piles and bundles of material.

C. Remove and properly store all material and equipment contained within the storage building in a location to be designated by the Contracting Officer. .

D. Demolish and remove the storage building and down to concrete foundation. Concrete foundation shall be removed and disposed with excavated soil.

E. Wet down Work during demolition operations to prevent dust from arising. Do not over-saturate or otherwise cause flooding or runoff from excessive use of water.

3.05 SALVAGE

A. Materials, equipment, and appurtenances shall be removed from the Site and disposed of at a facility or recycling facility that is permitted to accept such materials for disposal or processing. A record of shipment (such as a weight slip) for each truck load of debris removed from the Site must be retained and copied for the Contracting Officer's.records. Haul from Site and dispose of at no additional compensation.

B. Contractor must provide safe trucking equipment and drivers for materials leaving the Site. All truck drivers must have a valid Connecticut license to operate such vehicles and must obey all traffic laws and safety regulations.

3.06 Construction

A. Contractor will replace in kind the demolished storage building upon completion of Phase 01A, 01B, and 02 excavation in a to-be-determined location on the DMC property.
B. Contractor will ensure that the new storage building has the same dimensions as the previous storage building.
C. No utility connections are required.
D. Contractor will provide construction drawings and material specifications reviewed and approved by a CT certified Connecticut Professional Engineer.

3.05 CONTRACT CLOSEOUT

A. Provide in accordance with Section 01 71 23 Field Engineering and 01 78 00 Closeout Submittals.

END OF SECTION

SECTION 02120

OFF-SITE TRANSPORTATION AND DISPOSAL

PART 1 - GENERAL

1.01 SCOPE OF WORK:

A. The Contractor shall comply with the requirements of this section for transport, access, institutional and regulatory requirements for disposal of excavated materials from the Site. The Contractor shall be responsible for managing excavated materials so as to conduct the Work as described herein, within the boundaries of this property.

B. The Contractor is responsible, subject to review by the Contracting Officer, for characterizing excavated materials, as needed for disposal and to transport and dispose of the materials in a safe and legal manner. The Contractor shall conduct a precharacterize program to precharacterize soil in place prior to excavation, as appropriate to meet disposal facility requirements. Excavated materials shall not be stored off-site prior to transport for disposal. The Contractor shall determine the destination facilities subject to approval by EPA, and means of transport using a licensed hauler, and shall prepare appropriate shipping documentation. Available soil data from this location are included in Appendix A of the Contract Documents.

C. The Contractor is responsible for the coordination and cost of all material transportation and disposal, including but not limited to obtaining and providing all data and documentation required by the facilities and obtaining the necessary approvals for all disposal facilities to be used. It is the responsibility of the Contractor to utilize equipment and personnel capable of navigating the local traffic patterns while maintaining minimum daily production required to meet the project milestones. The Contractor is also responsible for limiting truck traffic in accordance with the times allowed Specification Section 01 11 00 – Quality Assurance Project Plan/Sampling and Analysis Plan. The Contractor shall be responsible for all delays caused as a result not obtaining disposal facility approvals in a timely manner, inadequate scheduling of trucks, or from utilizing equipment that cannot safely navigate the local roadways.

D. The Contractor shall ensure the vehicle contents are properly contained and secured in the vehicle including proper lining and covering of loads. The Contractor shall abide by all load limits and weight limits for all vehicles leaving the Project Site, and is responsible for any fines, taxes, penalties, or judgments resulting from overweight or improperly loaded vehicles.

E. All activities that require tractor trailers and other large trucks to enter and exit the Site must be scheduled in advance. Contractor will employ a uniformed police officer to be at the site to direct traffic on Main Street. Dedicated flaggers shall be employed on-site as necessary to protect workers from trucks entering and exiting the site. Trucks shall only enter and exit the site at locations shown on the Drawings unless approved by the Contracting Officer he work area.

1.02 RELATED SECTIONS:

A. Section 01 33 00 – Submittal Procedures

B. Section 01 35 26 – Governmental Safety Requirements and 01 35 29.13 Health, Safety and Emergency Response Procedures for Contaminated Sites

C. Section 01 40 00 – Quality Control

D. Section 01 41 00 – Quality Assurance Project Plan/Sampling and Analysis Plan

E. Section 02260 – Excavation

1.03 REFERENCES:

A. Compliance with all applicable regulations, including but not limited to the following, is required. All Work shall be conducted in compliance with applicable regulations and policies, as well as any changes or addenda to the same as set forth prior to the completion of the Work. Nothing in this section will limit the Contractor's responsibility to adhere to these regulations and recognized standards and regulatory practices. The Contracting Officer nor EPA will not be responsible at any time for Contractor's violations of any applicable local, state, or federal regulations or endangerment of his employees or of his Subcontractors.

B. Code of Federal Regulations (CFR)

1. Code of Federal Regulations (CFR) Title 40: Protection of Environment, including but not limited to the following:

a. 40 CFR Part 261 - Identification and Listing of Hazardous Waste

b. 40 CFR Part 262 - Standards Applicable to Generators of Hazardous Waste

c. 40 CFR Part 263 - Standards Applicable to Transporters of Hazardous Waste

d. 40 CFR Part 264 - Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

e. 40 CFR Part 265 - Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

f. 40 CFR Part 266 - Standards for the Management of Specific Hazardous Waste and Specific Types of Hazardous Waste Management Facilities

g. 40 CFR 300.440 - Procedures for planning and implementing off-site response actions

2. CFR Title 49: Transportation, including but not limited to the following:

a. 49 CFR Part 172 - Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, Training Requirements, and Security Plans

b. 49 CFR Part 173 - Shippers -- General Requirements for Shipments and Packaging.

c. 49 CFR Part 178 - Specifications for Packaging

d. 49 CFR Part 179 - Specifications for Tank Cars

e. Resource Conservation and Recovery Act (40 CFR 260 through 267)

C. State Regulations:

1. Connecticut Regulation of Department of Environmental Protection concerning Remediation Standard (Sections 22a-133k-1 thru 22a-133k-3 of Regulations of Connecticut State Agencies).

2. Connecticut Hazardous Waste Management Regulations (Sections 22a-454-1 and 22a-209-17 of the Regulations of Connecticut State Agencies).

3. Connecticut Hazardous Waste Transporter Permit Regulations (Section 22a-449(c)-11 of the regulations of Connecticut State Agencies).

4. Connecticut Solid Waste Management Regulations (Chapter 446d).

5. Connecticut General Permit for Contaminated Soil and/or Sediment Management (Staging and Transfer) (Section 22a-208a(i).

6. Connecticut Permit Requirements for Waste Facilities (Section 22a-6h and 22a-454).

7. Connecticut RCRA “Contained-In” Policy.

D. Local Fire Department regulations.

1.04 DEFINITIONS:

A. CT RSR: Connecticut Regulation of Department of Environmental Protection concerning Remediation Standard.

B. EPA: U.S. Environmental Protection Agency

C. Embedded Debris: Man-made debris greater than 6” length in any dimension, encountered within or in contact with soil which is excavated. Embedded Debris may include pavement and foundations.

D. Excavated Material: Excavated soil and embedded debris

E. OSHA: Occupational Safety and Health Administration

F. PID: Photoionization Detector

G. Shipping documents: refers to Uniform Hazardous Waste manifests or other manifests, Bills-of-Lading, Material Shipping Records, or any other document required by State or Federal regulation, or by the destination facility, to be carried by the excavated material transporter. The Transport document must also provide for certification of receipt by the destination facility. The Transport document shall describe the contents of the load in accordance with State or Federal regulations or destination facility requirements.

H. Classifications for Excavated Material:

1. Characteristic Hazardous Waste: Excavated soil defined as RCRA characteristic hazardous waste as determined by the Toxic Characteristic Leaching Procedure in accordance with 40 CFR 261. Note: based on available data, as provided in Appendix A, soil that meets the definition of RCRA Characteristic Hazardous Waste is expected to be present in the excavation area.

2. Soil Suitable for Reuse at a Massachusetts Lined Landfill: Soil that meets the acceptance criteria for reuse at one or more Massachusetts Lined Landfill.

3. Soil Suitable for Disposal at a Subtitle D Disposal Facility: Soil that meets the acceptance criteria for disposal at one or more Subtitle D Disposal Facility.

1.05 SUBMITTALS:

A. Submit in accordance with Section 01 33 00 – Submittal Procedures.

B. Submittals shall include all required information specified in this section.

C. Soil Management Plan: The Contractor shall provide the plan to the Contracting Officer for review 60 calendar days after NTP.

D. Daily Construction Report shall include detailed documentation of all loading and transport activities.

E. Shipping documents for excavated materials: The Contractor shall submit the signature-ready shipping documents to the Contracting Officer for signature 14 days prior to soil removal. Submittals shall be prepared in accordance with applicable regulations. The Contractor shall not be paid for shipments with unsigned shipping documentation.

F. Excavated Material Disposal Report: The Contractor shall provide the completion report to the Contracting Officer within 30 days of completion of soil removal.

G. Completed Shipping documents: Within twenty-one (21) days after final transport off-site of contaminated soil or water, the Contractor shall submit completed copies of the documentation related to the disposal, including but not limited to certified disposal facility weight slips. The Contractor shall submit final shipping documents to state agencies as required by state regulations of Connecticut and the destination states, with copies provided to the Contracting Officer. The Contractor shall not be paid for any shipment if there are discrepancies between Daily Trucking Logs and facility weigh tickets until the discrepancy is resolved, as determined by the Contracting Officer.

H. Transporters: No less than one week prior to transportation, provide name and address of all hazardous material transporters to be used to complete project including state transporter identification number and expiration date and proof of permit, license, or authorization to transport hazardous material in all affected states.

I. Destination Facilities: No less than three weeks prior to transport of any contaminated material off-site, the Contractor shall submit a written list of proposed destination facilities, including facility name, address, contact name and phone number, title of contact person, and EPA permit numbers for the facility, the facility criteria for acceptance (test type and frequency) of soil, and any other relevant information related to the facility, including but not limited to: working hours; days of operation; name, address, and telephone number of the chief municipal officer and health officer of the town/city in which the landfill or recycling/disposal facility is located; and information on landfill closure schedule, if applicable.

J. Daily Trucking Log:

1. The Contractor shall provide a Daily Trucking Log to the Contracting Officer for approval providing information on each off-site shipment from the site, including trucking company, truck and trailer registration number, date, pre-characterization source ID, destination

facility, estimated quantity, verification of decontamination, verification of all permits and Contractor personnel's initials.

2. The Contractor shall fill in the Daily Trucking Log for each shipment at the time it leaves the site.

3. The Contractor shall submit the completed Daily Trucking Log to the Contracting Officer electronically as specified in Specifications Section 01 40 00 – Quality Control and 01 11 00 Summary of Work and Specifications Section 01 33 00 – Submittal Procedures.

4. The Contractor shall not be paid for any shipment if there are discrepancies between Daily Trucking Logs and facility weigh tickets until the discrepancy is resolved, as determined by the Contracting Officer.

K. Contractor shall verbally inform the Contracting Officer of any trucking related incident within an hour of the incident and provide any trucking related incident reporting forms to the Contracting Officer within four hours of the incident.

1.06 PERFORMANCE REQUIREMENTS:

A. General Requirements:

1. The Contractor shall provide all facilities, labor, materials, tools, equipment, transportation, supervision, and related Work necessary to complete the Work specified in this section.

2. The Contractor shall be responsible for excavation and removal of material for legal disposal. The Contractor shall excavate, manage, handle, segregate, store, load, treat, recycle, reuse, transport, discharge, and/or dispose of soils in compliance with the provisions of CT RSRs and all other applicable federal, state, and local regulations and bylaws, and the criteria of this section.

3. The Contractor shall be responsible for all material characterization, sampling and analysis.

4. The Contractor shall conduct a soil precharacterization program to precharacterize soils in place prior to excavation to allow direct loading of excavated materials. Characterization methods must comply with the requirements of the disposal facility.

5. Excavated material storage, transportation, disposal and treatment, dust and vapor control measures, field monitoring, and contingencies for materials suspected or confirmed to be contaminated are also included in the Work to be performed by the Contractor.

6. Construction workers, surrounding human populations and environmental receptors shall be protected from exposure to oil or hazardous materials during excavation activities.

B. Excavation Requirements:

1. Excavation activities shall be limited to only those actions that are necessary for completion of the project. Excavation shall be performed in a local and controlled manner, such that it does not result in exacerbation of existing contamination.

2. Excavate materials by methods that will permit observation to identify, test, and segregate excavated materials, and that will reduce the potential for mixing materials with different classifications.

3. The Contractor shall allow sufficient time for the Contracting Officer to observe the excavation and excavated materials, and shall collect representative samples for use by the Contracting Officer as directed by the Contracting Officer.

4. Excavated material removed from the project area shall be managed in compliance with the provisions of all applicable Federal, State and local laws.

5. The Contractor shall notify the Contracting Officer immediately of excavated material that is observed to be contaminated with a separate phase product, or a waste not otherwise specified that cannot be identified by field inspectors. Further excavation shall be halted until the Contractor and the Contracting Officer evaluate the situation and determine the appropriate course of action to safeguard workers, the public, and the environment.

C. Excavated Material Handling and Storage:

1. The Contractor shall implement a soil tracking system in compliance with the Soil Management Plan.

2. The Contractor shall manage materials encountered during excavation in a manner that is protective of health, safety, public welfare, and the environment.

3. The handling and storage of excavated soil material shall be within the Site boundary designated on the Drawings, according to the procedures presented herein and as directed by the Contracting Officer.

4. Excavated material stockpiles, if used, shall be covered and secured as required in this section, to minimize airborne transport of material, runoff, and saturation and seepage from precipitation. The Contractor has the option of drumming excavated material for off-site disposal.

5. The Contractor shall be responsible for scheduling and coordinating the removal of material from the Site based on the available space. It shall be the Contractor's responsibility to obtain the required chemical testing data in a timely manner consistent with the Contractor's schedule for removing excavated materials.

6. The Contractor shall perform an analytical characterization program of the material as required by the destination facility in accordance with Section 01 41 00 – Quality Assurance Project Plan/Sampling and Analysis Plan. The Contractor shall obtain a laboratory and provide all labor and materials to collect soil samples and to transport the samples to the laboratory for chemical analysis in accordance with the requirements of the contract documents. The Contractor shall provide the characterization data to the Contracting Officer.

7. Based on the characterization results and comparison to material classifications identified herein, the Contractor may elect to perform supplemental characterization testing to provide information necessary to obtain facility approval at no additional cost to the Contracting Officer.

D. Excavated Material Transport and Disposal:

1. The Contractor shall be responsible for the legal disposal of all excavated material generated during the Work.

2. All excavated material shall be transported to and disposed of at a permitted disposal facility approved by EPA for such materials. The Contracting Officer shall be notified on a daily basis of the anticipated shipping volume and the destination facility.

3. The Contractor shall evaluate the material based on the testing data and propose the destination facility and contract directly with the facility for the disposal of the material. The Contractor shall provide documentation to the Contracting Officer, with supporting analytical data and rationale, that the facility may accept the material under its governing permit(s).

4. The Contractor shall prepare signature-ready drafts of shipping documents for shipment of the material, and submit them and all supporting data to the Contracting Officer for review.

5. The Contracting Officer reserves the right to direct the Contractor to re-evaluate the destination facility determination, based on the Contracting Officer's interpretation of the excavated material characterization data, any analytical results from split samples the Contracting Officer may collect, or regulatory status of the facility. Upon approval of the destination facility and shipping papers by the Contracting Officer, the Contractor shall coordinate and make all necessary arrangements for transportation of the material to the appropriate reuse/disposal/treatment facility.

6. The Contractor shall not remove any excavated material from the Site without a shipping document signed by the Contracting Officer,

1.07 QUALITY ASSURANCE:

A. Provide in accordance with Section 01 40 00 – Quality Requirements.

B. General: The Contractor shall conform to all applicable requirements, ordinances, regulations, and laws.

C. Inspection:

1. The Contracting Officer will observe the Contractor's activities associated with the Work under this section on behalf of the EPA and will provide on-site observation of excavation operations to assess:

a. requirements for excavated material segregation, storage, and handling;

b. requirements for excavated material transportation and final destination based on observations, screening and results of chemical characterization by the Contractor;

c. Environmental controls at all excavated material storage areas.

2. All services shall be subject to inspection by the Contracting Officer. The Contracting Officer shall have the right, but not the duty, to inspect and obtain copies of all written licenses, training records, permits, and approvals issued by any government entity or agency to the Contractor, which are applicable to the performance of services under this section; to inspect and test, at its own expense, transportation vehicles or vessels, containers, and treatment facilities provided by the Contractor; and to inspect the handling, loading, storage, transportation, treatment, and disposal operations conducted by the Contractor in the performance of the Work.

3. The Contracting Officer will have the right to inspect and obtain duplicates of all samples collected by the Contractor. If requested, the Contractor shall collect and supply these samples to the Contracting Officer for analyses by the Contracting Officer's laboratory. Contractor shall resolve any discrepancies between Contractor and Engineer analytical results to the satisfaction of the Contracting Officer at no additional cost to the Contracting Officer. Actions to resolve discrepancies may include review of data or resampling and analysis at no additional cost to the Contracting Officer.

4. The Contracting Officer will be afforded free access to any facility used by the Contractor and any Subcontractors in performing the services described in this section, including offices and facilities where contract-related records are retained.

5. The Contractor is solely and exclusively responsible for the quality of all services performed under this contract. The Contracting Officer's right to conduct inspections at Contractor or Subcontractor facilities does not relieve the Contractor of this responsibility. Neither the Contracting Officer's failure to make such inspection, nor failure to discover nonconforming services, impose any liability on the Contracting Officer, shall prejudice the rights of the Contracting Officer thereafter to reject services, nor relieve the Contractor of its obligation to perform Work strictly in accordance with the contract and applicable local, State and Federal regulations.

6. The Contractor shall be responsible for all corrective actions required to address non-compliance issues discovered during inspections at no additional cost to the Contracting Officer.

1.08 PROJECT/SITE CONDITIONS:

A. Environmental sampling and analysis has been conducted throughout the project area. Subsurface soils and groundwater were sampled and analyzed as summarized in Appendix A of the Contract Documents.

B. The Contractor is responsible for determining if such information is valuable for completing the Work. No basis for claim shall result from the Contractor's failure to completely characterize any waste material.

C. Historic data in Appendix A are made available to the Contractor for information only and shall not be interpreted as a warranty of subsurface conditions.

PART 2 - PRODUCTS

2.01 DOCUMENTATION:

A. The Soil Management Plan shall identify: (a) specific plans and proposed implementation schedule for Work, including excavated material storage, erosion control, and soil transportation

and disposal, (b) contingency procedure for notification of the Contracting Officer of unexpected contamination and of modifications to the plan, and (c) proposed environmental monitoring. The Soil Management Plan shall include:

1. Proposed destination facilities.

2. Characterization data to be collected by the Contractor as needed by their disposal facilities.

3. Plan for building and removing stockpiles relative to the disposal categories identified in this section, including a location map.

4. Transport document procedures for transport from the Site to final destination. Documentation required by the destination state must be provided.

5. Soil tracking system to track all excavated soils between excavation and final disposition. The tracking system shall consist of, for each category of soil transported:

    a. Location, depth, and date of excavation

    b. Stockpile or drum identification and location, if applicable

    c. Stockpile sampling locations, if applicable

    d. Daily log sheets and field records documenting field screening and chemical characterization sampling.

6. Procedures for routine field screening and observation during excavation, including:

    a. Frequency of screening and observations

    b. Checklist for visual and olfactory observations

    c. Instructions for headspace screening

    d. Equipment and instrument requirements

B. Shipping documents for excavated materials: The Contractor shall submit the signature-ready shipping documents to Engineer for signature 14 days prior to soil or waste removal. Submittals shall be prepared in accordance with applicable regulations.

C. Excavated Material Disposal Report. The report shall include details of waste quantities, means and location of disposal and following information, as applicable:

1. Description of Work performed, including deviations from the Soil Management Plan.

2. Soil characterization data.

3. Summary of soil quantities removed and transported to each destination facility and dates of transport.

4. Certificates of final treatment/disposal signed by the responsible facility official.

D. Completed Shipping Documents:

1. Each transport document shall note the truck registration number, state of registration, driver, and date of removal.

2. Within twenty-one (21) days after final transport off-site of any material, the Contractor shall submit completed copies of the documentation related to the disposal, including but not limited to: certified disposal facility weight slips.

3. The Contractor shall submit final shipping documents to state agencies as required by state regulations of Connecticut and the destination states, with copies provided to the Contracting Officer.

2.02 MATERIALS:

A. Polyethylene plastic: Provide polyethylene plastic sheeting with a minimum thickness of 20 mil (liner) and polyethylene sheeting with a thickness of 6 mil (cover).

B. Jersey barriers and/or hay bales to segregate the Work areas and excavated material storage perimeters.

C. Granular absorbent: Provide granular absorbent such as Speedy-Dry or approved equal.

D. Furnish all drums, storage containers, packing materials, and related products, and materials required for collecting, storing and transporting hazardous materials in compliance with State, EPA, and U.S. DOT requirements.

2.03 EQUIPMENT:

A. Photoionization detector capable of calibrating to 100 parts per million by volume (ppmv) for use in field screening. Photoionization detector shall have a minimum detection limit of 1 ppmv. Calibration standard shall be suitable for known site-related contaminants.

PART 3 - EXECUTION

3.01 APPLICATION:

A. Characterization of Site Soil:

1. The Contractor shall be responsible for characterizing soil for appropriate disposal. The Contractor shall perform precharacterization of soil prior to excavation to allow load and go operations.

2. The Contractor shall be responsible for collection, transporting, and analyzing all soil samples.

3. The Contractor shall inform the Contracting Officer prior to collecting samples so that the Contracting Officer can observe the sampling locations and procedures.

4. All sampling shall be performed in accordance with Sampling and Analysis Plan prepared by the Contractor and approved by the Contracting Officer (Section 01 41 00).

5. The Contractor shall evaluate the soil based on the testing data and proposed destination facility based on the resultant classification of the material.

B. Field Screening and Observation During Excavation:

1. The Contractor shall conduct field screening of excavated materials, as it is generated, to identify gross contamination (if present) that could affect construction safety and subsequent handling of excavated materials.

2. Excavated soils shall be field-screened for the presence of oil and hazardous materials, using appropriate visual, ambient air, and jar headspace evaluations. For ambient air and jar headspace screening, a photoionization detector or suitable equivalent and calibrated daily shall be used.

3. Headspace Screening Criteria: Headspace screening will be performed whenever there are obvious visual or olfactory changes in the material or at least once every hour during the excavation or for every 50 cubic yards of material or as required to fully evaluate the soil.

   a. If headspace readings are greater than 10 ppmv, the excavated material will be segregated from other excavated materials for separate chemical characterization by laboratory analysis.

   b. If headspace readings are greater than 100 ppmv, the material will be segregated from other excavated materials for separate chemical characterization by laboratory analysis.

4. Visual and Olfactory Criteria: Excavated soils shall be monitored for visual and olfactory evidence of contamination, including, but not limited to, discoloration, texture, and odor. If material has staining or odor; or exhibits unnatural color, product, unidentified waste or other indications of contamination, the excavated material will be segregated from other excavated materials for separate chemical characterization by laboratory analysis.

C. Embedded Debris:

1. Embedded debris which exceeds size requirements of the destination facility shall be separated from soil.

2. Embedded debris shall be cleaned of loose materials and inspected for staining, odor, or evidence of contamination.

3. The Contractor shall notify the Contracting Officer of embedded debris which has evidence of contamination prior to off-site transport.

4. Embedded debris which has evidence of contamination shall be set aside for evaluation by the Contracting Officer.

5. Embedded debris shall be broken to a size to facilitate hauling and disposal.

6. All embedded debris shall be disposed of at an EPA-approved facility

7. Embedded debris that is free of evidence of contamination shall be classified as a Connecticut-Regulated Soil not containing VOCs.

D. Management of Excavated Material Storage Areas:

1. The Contractor shall coordinate with the Contracting Officer and with to identify a suitable location within the property boundary for the temporary storage of excavated material prior to transport off-site.

2. The Contractor shall store material in a manner that is protective of health, safety, public welfare, and the environment.

3. Excavated material that has been characterized and is awaiting disposal shall be segregated from uncharacterized soils and from grossly contaminated soils.

4. Stockpiling, if used, shall be done according to the following procedures:

    a. All excavated material storage shall be performed within the security of continuous construction fencing.

    b. The Contractor shall be responsible for protecting each stockpile from precipitation, stormwater runoff, and other forms of moisture.

    c. The Contractor shall place polyethylene sheeting (20 mil) on ground in excavated material stockpile area or drum storage area, with a minimum overlap of 18 inches for adjacent sheets, and overhanging the berm or containment.

    d. All stockpiles shall be shaped and graded to facilitate surface drainage. The Contractor shall take appropriate measures to prevent dust and leachate from leaving any stockpile.

    e. Place stockpiled soil on prepared surface.

    f. Cover the stockpiles at all times with polyethylene or other suitable tarp, secure the cover in place to prevent dust blow off and withstand wind and rain.

    g. Hold downs which will not tear the sheeting (i.e., tires or sand bags) shall be used approximately every 15 feet.

    h. Collect drainage water for transport and treatment in accordance with Section 02241 – Construction Water Management. Alternately, the Contractor may elect to dispose of water at an off-site facility in lieu of on-site treatment and discharge, at no additional cost to the Contracting Officer, the EPA, or the State.

    i. Minimize the contact of workers and passers-by with stockpiled material.

    j. Clearly label, mark, and classify stockpiles or drums by type, for recycling, reuse or disposal.

    k. Alternatively, excavated material shall be stored as directed in the Soil Management Plan in a manner that provides similar level of control of emissions, runoff, and leachate.

5. Based on analytical results and as approved by the Contracting Officer, the Contractor may merge or further segregate stored materials.

6. Storage shall comply with the substantive requirements of the Connecticut General Permit for Contaminated Soil and/or Sediment Management (Staging and Transfer) (Section 22a-208a(i)).

7. Under no circumstances will stored excavated material be allowed to remain in storage for longer than 45 days.

E. Transportation and Disposal of Excavated Material:

1. No excavated material shall be transported from the Site until all shipping documents are completed.

2. The Contractor shall be responsible for proper handling, loading, transportation and disposal of materials in accordance with applicable federal, state and local laws.

3. Prior to transport the Contractor shall drain all materials of free liquid. Liquids shall be collected and transported to a location designated by the Contracting Officer for treatment and disposal, in accordance with Section 02241 – Construction Water Management. Alternately, the Contractor may elect to dispose of water at an off-site facility in lieu of on-site treatment and discharge, at no additional cost to the Contracting Officer, the EPA, or the State.

4. The Contractor shall not remove excavated material from the Site without approval of the Contracting Officer.

5. The Contractor shall load and transport material to the receiving facilities in accordance with U.S. DOT, EPA, OSHA, and State regulations.

6. The Contractor shall utilize hauler(s) that are licensed in all states affected by transport.

7. The Contractor shall coordinate the schedule for truck arrivals and departures at the storage areas to meet the approved project schedule.

8. Materials shall not be delivered to any facility other than that listed on the transport document.

9. The Contractor shall be responsible for inspecting the access routes for road conditions, overhead clearance, and weight restrictions, and shall provide traffic control when needed.

10. Materials removed for disposal shall be loaded within the limits of the storage area. A tarpaulin shall cover all trucks leaving the project areas. Soil material shall be removed from truck tires within a designated decontamination area prior to leaving the storage area. The Contractor shall take all steps necessary to prevent debris and fluid from being spilled from trucks or tracked from the storage area onto local streets. Each workday or more often as conditions warrant or as directed by the Contracting Officer, the Contractor shall clean local streets of any spillage, soil, and debris.

F. Handling of Characteristic Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations (if applicable).

1. The Contractor shall prepare hazardous waste manifest(s) identifying the EPA Region 1 as the generator. Engineer shall sign the manifests as an agent for the EPA prior to transport and disposal of hazardous wastes. The Contractor shall track and distribute all copies of the manifest to the appropriate agencies and the Contracting Officer. The Contractor shall provide a copy of the manifest for review by the Contracting Officer prior to scheduling waste pick-up.

2. The Contractor shall provide for the safe transportation of all hazardous waste materials for proper final disposal at a licensed facility.

3. Disposal Facility Requirements:

   a. The Contractor shall furnish to the Contracting Officer, no less than three weeks prior to disposal, the names, locations, EPA/RCRA ID numbers, facility contacts, and documentation that the facilities will accept the waste, for at least two eligible disposal facilities. The Contractor shall designate one disposal facility as the primary facility and the other as the alternate facility should project conditions require the use of a back-up facility. Any additional costs if an alternate facility is used shall not be incurred by the Contracting Officer.

   b. The final disposal facilities shall be approved by EPA prior to removal of any hazardous wastes. Coordination of this approval shall be conducted by Engineer.

   c. Contractor-selected disposal facilities shall be established, fully operational, and in full compliance with all applicable federal, state and local regulations. The Contractor shall document that the disposal locations proposed have all certifications and permits as required by local, State, and Federal regulatory agencies to receive and dispose of hazardous materials or wastes, including tank, drums and tank and drum contents.

   d. The Contractor shall obtain approvals or letters of intent and facility information for the disposal facilities and/or recycle facilities selected to receive wastes. The Contractor shall furnish such documents to the Contracting Officer no less than one week prior to disposal. The facilities information shall include the following:

      (1) The disposal facilities shall provide written confirmation that they are permitted to accept and will accept the hazardous waste of the general quality and quantity described by these specifications.

      (2) The disposal facilities shall provide a listing of all permits, licenses, letters of approval, and other authorizations to operate that they hold, pertaining to the receipt and management of the waste specified in these specifications.

4. Transportation Requirements:

   a. Before offering hazardous waste for transportation off-site, the Contractor shall package that waste in compliance with applicable regulations of the Department of Transportation (DOT), 49 CFR Parts 173, 178, and 179.

   b. Before offering hazardous waste for transportation off-site, the Contractor shall label each package in compliance with the applicable regulations of the DOT, 49 CFR Part 172, as may be amended from time to time.

   c. Before transporting hazardous waste off-site, the Contractor shall placard, or offer the initial transporter the appropriate placards, in compliance with regulations of the DOT, 49 CFR Part 172, as may be amended from time to time.

   d. The Contractor shall transport material off-site for final disposal to the disposal facility approved by the EPA and Engineer.

e. The Contractor shall transport material from the Site to the disposal facilities in accordance with all DOT, EPA, state, local, and other applicable regulations.

f. The Contractor and/or transporter(s) shall be licensed in all states affected by transport.

g. The Contractor shall be responsible for ensuring that all containers are labeled and sealed properly and that spillage does not occur during transport.

h. The Contractor shall maintain complete control of the transport of waste and in case of a spill, shall be responsible for all clean-up.

i. The vehicle which is used for the transport of hazardous waste shall bear all markings, including placards, required by any federal or state statute or regulation.

j. The Contractor shall have in place:

(1) Current registration with DOT via the Hazardous Materials Certificate of Registration;

(2) Insurance coverage based on type of waste/vehicle;

(3) DOT safety rating;

(4) Results of state inspections of terminals which usually address level of maintenance and the general condition of the company's equipment;

(5) Verification that Contractor keeps transportation manifests on file for three years from the date of transport, including emergency telephone numbers;

(6) Name and address of all hazardous waste transporters; and

(7) EPA identification number and expiration date.

5. Vehicle for off-site transport of hazardous waste must be DOT approved and must display the proper DOT placard. Such vehicles must also conform with appropriate State(s), local, Federal hazardous materials requirements and/or other relevant transportation requirements.

G. Spill Responsibility:

1. The Contractor is solely responsible for any and all spills or leaks of hazardous materials during the performance of the Work which occur as a result of or are contributed to by the actions of its agents, employees, or Subcontractors. The Contractor agrees to clean up such spills or leaks to the satisfaction of the Contracting Officer and in a manner that complies with applicable Federal, State and local laws and regulations.

END OF SECTION

SECTION 02130

DECONTAMINATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Summary

B. Submittals

C. Decontamination Facilities

D. Decontamination of Vehicles and Equipment

E. Personnel Decontamination

F. Decontamination Methods

G. Management of Decontamination Residuals

1.02 SUMMARY:

A. This section covers the decontamination of personnel and equipment as they move from the Exclusion or Work Zones into the Support Zones of the Site.

B. Related Sections:

1. 01 35 26 – Governmental Safety Requirements and 03 25 29.13 – Health, Safety and Emergency Response Procedures for Contaminated Sites

2. Section 01 50 00 – Temporary Construction Facilities and Controls

3. Section 02120 – Transportation of Off-site Disposal Materials

1.03 SUBMITTALS:

A. Submit prior to mobilization, for the Contracting Officer's review, decontamination procedures as part of the Contractor's APP/SSHP specified in Section 01 35 26 – Governmental Safety Requirements and 01 35 29.13 – Health, Safety and Emergency Response Procedures for Contaminated Sites. Provide the following information:

1. Size and location of truck decontamination area, alternatively the number and location(s) of wheel wash stations.

2. Decontamination methods and equipment.

3. Procedures to prevent cross-contamination of clean areas.

4. Methods and procedures to minimize worker contact with contaminants during removal of personal protective equipment (PPE).

5. Procedures for inspection and decontamination of vehicles leaving the Site.

6. Procedures for disposal of personal PPE.

7. Procedures for the collection, treatment, and disposal of all decontamination water and residuals.

8. Procedures for minimizing generation of wastewater.

PART 2 - PRODUCTS - (NOT USED)

PART 3 - EXECUTION

3.01 DECONTAMINATION FACILITIES:

A. Construct and maintain decontamination facilities and wheel wash stations as described in Section 01 50 00 Temporary Construction Facilities and Controls and in the Contracting Officer-approved Technical Execution Plan.

3.02 DECONTAMINATION OF VEHICLES AND EQUIPMENT:

A. Contractor shall inspect and decontaminate all vehicles and equipment that have entered the Exclusion Zones prior to exiting the Exclusion Zone. All decontamination shall take place in the Decontamination Zone as specified in Section 01 50 00.

B. Decontamination shall include removal of soil and residues from the chassis (which includes undercarriage, suspension, and tires and wheels) and other parts of the vehicle known to have contamination or visually appearing to be contaminated.

C. Contractor shall take care while decontaminating vehicles to avoid contaminating personnel, other parts of the vehicle or equipment, or the surroundings. Personnel involved in vehicle and equipment decontamination shall be dressed in the appropriate level of PPE as determined by the APP/SSHP. All personnel shall follow all applicable safety procedures specified in Section 01 35 26 –Governmental Safety Requirements and 01 35 29.13 – Health, Safety and Emergency Response Procedures for Contaminated Sites.

D. Inspect and decontaminate haul trucks after loading and before the haul trucks exit the Exclusion Zone.

E. Maintain a Vehicle Inspection Log to document that all trucks and equipment leaving the Site have been properly inspected and decontaminated prior to operating on public streets to ensure that tailgates are secured and tarps in place.

3.03 PERSONNEL DECONTAMINATION:

A. Ensure that personnel who have entered the Exclusion Zone perform decontamination as required in Section 01 35 26 Governmental Safety Requirements and 01 35 29.13 – Health, Safety and Emergency Response Procedures for Contaminated Sites prior to exiting the Decontamination Zone.

3.04 DECONTAMINATION METHODS:

A. Physical decontamination techniques shall include, but are not limited to, brushing and spraying with a pressure washer.

B. Brushing shall consist of removal of loose materials with the use of a broom and/or brushes.

C. A pressure washer shall be used to provide application of water of sufficient pressure, residence time, and agitation to remove soil and contaminated residuals from surfaces.

D. Surfactants and detergents must be approved by the Contracting Officer prior to use in decontamination operations.

E. All equipment decontamination procedures shall be performed in a decontamination facility as specified in Section 01 50 00 – Temporary Construction Facilities and Controls.

F. Overspray barriers shall be provided on each side of the decontamination area to prevent contamination of adjacent areas.

G. Manage decontamination residuals, including water, soil, residues, used PPE, and other materials removed during decontamination as specified in subsection 3.05.

3.05 MANAGEMENT OF DECONTAMINATION RESIDUALS:

A. Collect decontamination liquid, pump to on-site water storage tanks and manage water as specified in Section 02120.

B. Dewater and collect decontamination solids. Maintain dewatered decontamination solids with impacted soil for landfill disposal, as specified in Section 02120.

C. Manage contaminated PPE with impacted soil for landfill disposal.

END OF SECTION

SECTION 02160

EXCAVATION SUPPORT SYSTEMS

PART 1 - GENERAL

1.01 SCOPE OF WORK:

A. Design, furnish and install excavation support systems as required to maintain lateral support, prevent loss of ground, limit soil movements to acceptable limits and protect from damage existing and proposed improvements including, but not limited to, pipelines, utilities, structures, roadways, sidewalks, and other facilities.

B. Install excavation support systems at the excavation limits as indicated on the Contract Drawings, and as Contractor determines to be necessary to achieve the vertical limits of excavation within each excavation area.

C. The requirement of sheeting left in place in areas indicated on the drawings does not relieve the Contractor from the responsibility of furnishing and installing proper temporary excavation support systems in other areas.

D. Common types of excavation support system include, but are not limited to, singular or multiple stages comprised of cantilevered or internally braced soldier piles and lagging, steel sheetpile wall, timber sheetpile wall, trench box, or combinations thereof. Trench box temporary excavation support system is only acceptable for pipe or utility trench excavations. Temporary unsupported open cut excavation with stable sloping sides is allowed where applicable.

E. Wherever the word "sheeting" is used in this section or on the contract drawings, it shall be in reference to any type of excavation support system specified except trench box.

F. Construction of the excavation support systems shall not disturb the existing structures. Damage to such structures shall be repaired by the Contractor at no additional cost to the Contracting Officer or the EPA.

G. Adjacent structures are those that bear upon soils above the proposed excavation depth and within a distance equal to twice the total depth of the excavation away from the closest edge of the excavation. Monitor and protect adjacent structures as specified.

H. Vibration monitoring for excavation support systems will be performed by Contractor’s vibration consultant and monitoring firm. Vibration due to Contractor’s operations shall not exceed specified limits in 1.05 F.

I. Construction operations not to exceed noise limits in compliance with State and Federal (OSHA) regulations.

J. The Contractor shall bear the entire cost and responsibility of correcting any failure, damages, subsidence, upheaval or cave-ins as a result of improper installation, maintenance or design of the excavation support systems. The Contractor shall pay for all claims, costs and damages that arise as a result of the work performed at no additional cost to the EPA or the Contracting Officer.

1.02 RELATED SECTIONS:

A. Section 01 33 00 – Submittal Procedures

B. Section 01 35 26 – Governmental Safety Requirements and 01 35 29.13 – Health, Safety and Emergency Response Procedures for Contaminated Sites.

C. Section 02240 - Dewatering

D. Section 02250 – Underpinning

E. Section 02260 – Excavation

F. Section 02300 – Backfill and Grading

1.03 REFERENCES:

A. American Society for Testing and Materials

1. A36/A36M-08: Standard Specification for Carbon Structural Steel

2. A328/A328-07: Standard Specification for Steel Sheet Piling

3. A416/A416-06: Standard Specification for Strand Steel, Uncoated Seven-Wire for Prestressed Concrete

4. A722/A722-07: Standard Specification for Uncoated High-Strength Steel Bars for Prestressing Concrete

5. A615/A615-09b: Standard Specifications for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement

B. American Wood-Preservers Association (AWPA) Standards.

C. American Welding Society (AWS) Code: D1.1/D1.1M:2008.

D. Federal Standard, FS TT-W-571: Wood Preservation and Treating Practices.

E. Occupational Safety and Health Administration (OSHA) Standards and Regulations contained in 29 CFR 1926 Subpart P - Excavations, Trenching and Shoring.

F. American Concrete Institute (ACI):

1. ACI 304: Measuring, Mixing, Transporting & Placing Concrete.

2. ACI 318-08: Building Code Required for Structural Concrete and Commentary

1.04 SUBMITTALS:

A. Submit the following in accordance with Section 01 33 00 – Submittal Procedures:

1. Submit the following qualifications four (4) weeks prior to the construction:

a. Qualifications of independent vibration consulting and monitoring firm as specified in Paragraph 1.05 E.

b. Qualifications of Contractor's excavation support system designer as specified in Paragraph 1.05 H.

c. Qualifications of Contractor's excavation support system installer as specified in Paragraph 1.05 I.

d. Qualifications of Contractor's independent tieback testing laboratory as specified in Paragraph 1.05 J, if a tieback system is utilized.

e. Qualifications of Contractor's excavation support system installation supervisor as specified in Paragraph 1.05 K.

f. Qualifications of vacuum excavation subcontractor as specified in Paragraph 1.05 G, if DMPs for utilities are utilized.

2. Excavation Support Plan. Submit an Excavation Support Plan stamped and signed by a Connecticut Registered Professional Engineer at least two weeks prior to start of the construction. Do not submit design calculations. The review will be only for the information of the Contracting Officer and third parties for an overall understanding of the project relating to access, maintenance of existing facilities and proper utilization of the site. The Contractor shall remain responsible for the adequacy and safety of the means, methods and sequencing of construction. The plan shall include the following items as a minimum:

a. Proposed excavation support system(s), details, location, layout, depths, extent of different types of support relative to existing features and permanent structures, and methods and sequence of installation and removal.

b. Certificate of Design: Attached at the end of this Section.

c. A list of all design assumptions, including safety factors used for the excavation support system(s) and all lateral pressures used for each system, and whether the systems are temporary or to be left in place.

d. Requirements of dewatering during the construction.

e. Minimum lateral distance from the edge of the excavation support system for use for vehicles, construction equipment, and stockpiled construction and excavated materials.

f. List of equipment used for installing the excavation support systems.

g. Monitoring schedule, installation procedures and location plans for vibration/noise monitoring and geotechnical instrumentation (deformation monitoring points) to monitor ground, excavation support system and adjacent structures during the entire construction period. Include thresholds for vertical, horizontal, differential, and tile movement to be verified by the Contracting Officer

3. Construction Contingency Plan. Submit a Construction Contingency Plan specifying the methods and procedures to maintain excavation support system stability if the allowable movement of the adjacent ground and adjacent structures is exceeded.

4. Monitoring data within one (1) day of data collection from vibration and noise recording equipment, deformation monitoring points and offset lines. Data shall include:

   a. Horizontal and vertical movements of geotechnical instruments.

   b. New movements since the initial readings of the geotechnical instruments.

   c. Weekly summary in tabular and graphic form at the end of each week.

   d. A schematic plan of excavation and/or relevant construction activities at the time of monitoring.

5. For excavation support systems left in place, submit the following as-built information prior to backfilling and covering the excavation support systems:

   a. Survey locations of the excavation support systems, including coordinates of the ends and points of change in direction.

   b. Type of excavation support system.

   c. Elevations of top and bottom of the excavation support systems left in place.

1.05 PERFORMANCE REQUIREMENTS:

A. Conform to the requirements of the OSHA Standards and Interpretations: "29 CFR 1926 Subpart P - Excavation, Trenching, and Shoring", and all other applicable laws, regulations, rules, and codes.

B. The Contractor shall make every effort to minimize noises caused by his operations. Equipment shall be equipped with silencers or mufflers designed to operate with the least possible noise in compliance with State and Federal (OSHA) regulations.

C. A Competent Person in accordance with OSHA 29 CFR 1926, Subpart P shall be present at all times during excavation activities. Name and qualifications of the Competent Person shall be included in the Site Specific Health and Safety Plan (SSHP).

D. Retain the services of an independent vibration consulting firm with the following in-house personnel to conduct the following vibration and noise monitoring requirements:

1. Preparing, reviewing and signing of monitoring plans and daily reports, and overseeing of the monitoring and interpretation of the vibration data shall be performed by personnel with the following qualifications:

   a. Be a State of Connecticut Registered Professional Engineer.

   b. Have a minimum of five (5) years experience in the vibration consulting field.

   c. Have successfully completed at least five (5) projects with vibration-inducing construction operations, pile driving, and noise levels equal to or more severe than those to be encountered.

2. Assist Contractor in selecting pile driving equipment which will generate the lowest vibration and noise levels.

3. Installation, monitoring and interpretation of monitoring equipment shall be performed by personnel with the following qualifications:

   a. Have at least three (3) years of experience in the operation of monitoring equipment proposed for use and interpretation of records produced by such equipment.

   b. Have installed, operated, monitored and interpreted equipment and records on at least three (3) projects with vibration-inducing construction operations, pile driving, and noise levels equal to or more severe than those to be encountered.

E. Monitor vibrations by measuring the peak particle velocities in three orthogonal directions in the vicinity of work. The Peak Vector Sum (PVS) of the three orthogonal particle velocity measurements taken at the same time shall meet the following requirements, or those requirements of the Federal, State, or local authority, whichever is most stringent:

Type of Concrete	Age of Concrete, hrs	PVS, in/sec
Mass Concrete (footings, mats, slab on grade, fill concrete, etc.)	0-11 11 and over	1.0 2.0
Concrete structures (walls, columns, elevated slabs, etc.)	0-11 11-24 24 and over	0.5 1.0 2.0
Existing structure and utility	-	Warning and stop work levels to be determined by the Contractor's Engineer with approval by Contracting Officer

F. If utilizing deformation monitoring points (DMPs) for utilities, vacuum excavation shall be performed by subcontractor having five (5) years of experience in non-destructive vacuum excavation methods for utilities.

G. Prepare design, including calculations and drawings, under the direction of a Professional Engineer registered in the state of Connecticut and having the following qualifications:

1. Not less than ten (10) years experience in the design of specific excavation support systems to be used.

2. Completed not less than five (5) successful excavation support system projects of equal type, size, and complexity within the last five (5) years.

H. Excavation Support System Installer's Qualifications:

1. Not less than three (3) years experience in the installation of similar types and equal complexity as the proposed system.

2. Completed not less than three (3) successful excavation support systems of similar type and equal complexity as the proposed system.

I. If utilizing a tieback system, employ an independent testing laboratory to test the tieback system with the following qualifications:

1. Be accredited by the American Association of State Highway and Transportation Officials (AASHTO) Accreditation Program.

2. Employ personnel conducting testing who are trained in the methods and procedures to test and monitor tieback systems of similar type and equal complexity, as the proposed system.

3. Have not less than five (5) years experience in testing of tieback systems of similar type and equal complexity as the proposed system.

4. Have successfully tested at least three (3) tieback systems of similar type and equal complexity as the proposed system.

J. Install all excavation support systems under the supervision of a supervisor having the following qualifications:

1. Not less than five (5) years experience in installation of systems of similar type and equal complexity as the proposed system.

2. Completed at least five (5) successful excavation support systems of similar type and equal complexity as the proposed system.

K. All welding shall be performed in accordance with AWS D1.1/D1.1M:2008.

1.06 DESIGN CRITERIA:

A. Design of excavation support systems shall meet the following minimum requirements:

1. Support systems shall be designed for earth pressures, hydrostatic pressure, equipment, temporary stockpiles, construction loads, roadways, buildings, and other surcharge loads.

2. Design a bracing system to provide sufficient reaction to maintain stability.

3. Limit movement of ground adjacent to the excavation support system to be within the allowable ground deformation as specified in Section 3.02.

4. Design the embedment depth below bottom of excavation to minimize lateral and vertical earth movements and provide bottom stability. Toe of braced excavation support systems shall not be less than 5 feet below the bottom of the excavation.

5. Design excavation support systems to withstand an additional 2 feet of excavation below proposed bottom of excavation without redesign except for the addition of lagging and/or bracing.

1.07 DELIVERY, STORAGE AND HANDLING:

A. Store sheeting and bracing materials to prevent sagging which would produce permanent deformation. Keep concentrated loads which occur during stacking or lifting below the level which would produce permanent deformation of the material.

1.08 PROJECT/SITE CONDITIONS:

A. Subsurface Conditions: Refer to Appendix A of the Contract Documents.

PART 2 - PRODUCTS

2.01 MATERIALS:

A. Structural Steel: All soldier piles, wales, rakers, struts, wedges, plates, waterstop and accessory steel shapes shall conform to ASTM A36/A36M-08.

B. Steel Sheet Piling: ASTM A328/A328-07, continuous interlocking type.

C. Timber Lagging Left in Place: Pressure treated per appropriate AWPA standards.

D. Tieback Tendons: Tieback tendons shall be high strength steel wire strand cables conforming to ASTM A416/A416-06, or bars conforming to ASTM A722/A722-07. Splicing of individual cables shall not be permitted.

E. Raker Ties: ASTM A615/A615-09b Grade 60.

F. Cement Grout Materials And Admixtures For Tieback Anchorages: Grout cube strength shall be a minimum 3500 psi at 7 days and 5000 psi at 28 days.

G. Concrete:

1. Concrete work shall conform to the standard specifications for structural concrete (ACI 301) and the buildings code requirements for structural concrete (ACI 318-08).

2. Ready Mixed Concrete: Use ready-mixed concrete secured from a batching or mixing plant conforming to ASTM C94/C94M-09a, capable of developing specified characteristics, and being placed without segregation.

3. Use 3,000 psi concrete for all concrete having a water cement ratio not to exceed 0.53.

4. Secure, for every part of work, concrete of homogeneous structure having required strength, watertightness, and durability. Give careful attention to selection of materials, mixtures, transporting to discharge locations, placing, spading, vibrating, and curing.

5. Use the 3/4 inch coarse aggregate size for all concrete, unless otherwise indicated or specified.

H. Tamping tools adapted for backfilling voids after removal of the excavation support system.

I. Where necessary, provide specific trench box sizes for each pipe and utility excavation with structural capacity of retaining soil types as described in OSHA's 29 CFR Part 1926 Subpart P.

2.02 EQUIPMENT:

A. A vibratory hammer shall be utilized for driving the sheet piling providing that such operations do not exceed vibration/noise requirements of the specifications. Impact hammer shall be utilized when vibratory hammer is unable to drive sheet piling to required depth and/or unable to meet vibration requirements. Impact hammer shall also meet noise requirement.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. Installation of the excavation support systems shall not commence until the related earth excavation and construction water management submittals have been reviewed by the Contracting Officer with all Contracting Officer's comments satisfactorily addressed.

B. Install excavation support systems in accordance with the Excavation Support Plan.

C. If utilizing a tieback system, all performance and proof tests shall be conducted in the presence of the Contracting Officer. Testing performed without the Contracting Officer present will not be accepted. Repeat testing in the Contracting Officer's presence at no additional cost to the Contractor Officer or the EPA.

D. Do not drive sheeting within 100 feet of concrete less than seven (7) days old.

E. Carry out program of excavation support in such a manner as to prevent undermining or disturbing foundations of existing structures of work ongoing or previously completed.

F. Bottom of the trench box excavation support system shall be above the pipe invert prior to installing the pipe.

G. Install and read geotechnical instrumentation in accordance with the Excavation Support Plan. Notify the Contracting Officer immediately if any geotechnical instrumentation is damaged. Repair or replace damaged geotechnical instrumentation at the sole option of the Contracting Officer and at no additional cost to the Contracting Officer or the EPA.

H. Continuously monitor movements of the ground adjacent to excavation support systems and adjacent structures. In events of the measured movements approaching or exceeding the allowable movements, take immediate steps to arrest further movement by revising procedures such as providing supplementary bracing, filling voids behind the trench box, supporting utilities or other measures (Construction Contingency Plan) as required.

I. Notify utility owners if existing utilities interfere with the excavation support system. Modify the existing utility with the utility owner's permission or have the utility owner make the modifications at no additional cost to Contracting Officer or the EPA.

3.02 GROUND DEFORMATION ADJACENT TO EXCAVATION SUPPORT SYSTEMS:

A. Allowable Vertical (heave/settlement) and Lateral Movements: 0.5 inch maximum lateral or vertical deflection for underpinning the existing structure, and 1 inch maximum for other types of excavation support systems at any location behind the excavation support system.

B. Monitoring personnel shall use a procedure for reading and recording geotechnical instrumentation data which compares the current reading to the last reading during data collection to eliminate spurious readings.

C. Plot the observed ground deformation readings versus time. Annotate the plots with construction loading and excavation events having an impact on the readings. Evaluate plots by means of secondary rate-of-change plots to provide early warning of accelerating ground movements.

D. Notify the Contracting Officer when the allowable ground deformation is exceeded.

E. Implement Construction Contingency Plan under direction of the excavation support system designer and the Contracting Officer.

3.03 REMOVAL OF EARTH RETENTION SYSTEM:

A. Sheeting shall be left in place whenever a structure or utility is located within the zone of influence of the sheeting. The zone of influence is defined by 1H:1V inclined line starting at the toe of the sheeting and drawn upward and behind the sheeting.

B. Remove the temporary excavation support system without endangering the adjacent structures, utilities, or property. Immediately backfill all voids left or caused by withdrawal of temporary excavation support systems with road gravel, per Section 02316 – Fill and Backfill, by tamping with tools specifically adapted for that purpose.

C. When tiebacks are used, release tension in tiebacks as the excavation is backfilled. Do not leave tensioned tieback in place at the completion of the Work.

D. The excavation support system left-in-place shall be cut-off a minimum of 2 feet below the bottom of the next higher foundation level or a minimum of 5 feet below finished grade.

E. Conduct survey of the locations and final cut-off elevations of the excavation support systems left in place.

3.04 CONTRACT CLOSEOUT:

A. Provide in accordance with .

END OF SECTION

CERTIFICATE OF DESIGN

The undersigned hereby certifies that he/she is a Professional Engineer registered in the state of _____ and that he/she has been employed by (Name of Contractor) _____ to design _____ in accordance with Specifications Section _____ for the (Name of Project) _____ The undersigned further certifies that he/she has performed similar designs previously and has performed the design of the _____; that said design is in conformance with all applicable local, state, and federal codes, rules, and regulations and professional practice standards; that his/her signature and Professional Engineer (P.E.) Stamp have been affixed to all calculations and drawings used in, and resulting from, the design; and that the use of that stamp signifies the responsibility of the undersigned for that design.

The undersigned hereby certifies that he/she has Professional Liability Insurance with limits of $1,000,000.00 and a Certificate of Insurance is attached.

The undersigned hereby agrees to make all original design drawings and calculations available to the EPA and the Contracting Officer within seven (7) days following written request therefore by the Contracting Officer and/or the EPA.

_____	_____
P.E. Name	Contractor's Name
_____	_____
Signature	Signature
_____	_____
Title	Title
_____	_____
Address	Address

SECTION 02165

VIBRATION AND SETTLEMENT MONITORING

PART 1 - GENERAL

1.01 SUMMARY:

A. The Contractor shall retain an independent Structural Monitoring Firm (Monitoring Consultant) to perform building condition surveys, building movement monitoring, and vibration monitoring during all the Contractor's intrusive activities (e.g., demolition, excavation, support of excavation installation, dewatering, backfill).

B. The Structural Monitoring Firm will complete the following:

1. Prepare a Structural Monitoring Plan detailing the monitoring activities conducted to ensure the DMC's facilities are not damaged during the Work as described in Section 1.04.

2. Conduct pre and post conditions structural inspections of all DMC facilities adjacent to the Work.

3. Monitor building movement during intrusive activities with geotechnical instruments including prisms mounted to the building and surveyed with a Robotic Total Station (RTS), tiltmeters mounted to the building, and crack gauges placed on cracks in the building wall observed during the pre-condition structural survey.

4. Monitor ground vibrations during all construction activities

5. Provide the required notifications when monitoring thresholds are exceeded

6. Prepare a Baseline Monitoring Report, weekly summary reports and a final Structural Monitoring Report when the Work is complete.

1.02 RELATED SECTIONS:

A. Section 01 35 26 – Governmental Safety Requirements and 01 35 29.13 – Health, Safety and Emergency Response Procedures for Contaminated Sites.

B. Section 01 39 00 – Pre- and Post-Construction Surveys

C. Section 02250 – Underpinning

D. Section 02260 – Excavation

E. Section 02160 – Excavation Support Systems

1.03 REFERENCES:

A. Association of Swiss Highway Professionals, 1992. "Effects of Vibration on Construction," Committee VSS 272, Swiss Standards SN640-312a, Zurich, Switzerland. April 1992.

B. Federal Transit Administration, 2006. "Transit Noise and Vibration Impact Assessment," FTA-VA-90- 1003-06, U.S. Department of Transportation, Washington, DC. May 2006.

C. Jones & Stokes. 2004. “Transportation-and construction-induced vibration guidance manual,” J&S 02-039, Sacramento, CA. Prepared for California Department of Transportation, Noise, Vibration, and Hazardous Waste Management Office, Sacramento, CA. June, 2004.

D. Nicholls, H.R., Johnson, C.F., and Duvall, W. I., 1971. “Blasting Vibrations And Their Effects on Structures,” U.S. Bureau of Mines Bulletin 656, 1971.

E. Seed, H.B., 1979. "Soil Liquefaction and Cyclic Mobility Evaluation for Level Ground During Earthquakes," J. Geotech. Eng Div., ASCE pg. 201-255, vol. 105, no. GT2. 1979.

F. Veyera, G.E., and Charlie, 1987. "Liquefaction of Shock Loaded Saturated Sand," Chapter in Soil Dynamics and Liquefaction, Ed. by A.S. Cakmak, Developments in Geotechnical Engineering, No. 42, Elsevier. 1987.

1.04 SUBMITTALS:

A. Submit the following in accordance with Section 01 33 00 – Submittal Procedures:

1. Submit the Qualifications of the independent Structural Monitoring Firm as specified in Paragraph 1.05 four (4) weeks prior to the construction:

2. Submit a Structural Monitoring Plan two (2) weeks prior to start of intrusive activities. The Structural Monitoring Plan shall include the following items as a minimum:

a. Monitoring schedule

b. Type, number, location, and installation procedures for all monitoring equipment (e.g., RTS, prisms, tiltmeters, crack meters, vibration seismographs).

c. Pre\Post condition structural inspection procedures.

d. Monitoring procedures and frequency for building movement and vibration monitoring (including background\baseline monitoring) duration and frequency.

e. Proposed thresholds (warning and stop work levels) for building movement (tiltmeter rotation, crack gauge movement, prisms) and ground vibration. The proposed thresholds are subject to the Contracting Officer’s approval.

f. Notification and alert requirements when monitoring thresholds are exceeded.

g. Procedures for collecting, storing and reporting the monitoring data.

h. Procedures for maintaining a web site where real-time data is logged, including access instructions for the Contracting Officer.

3. Submit a Baseline Monitoring Report prior to the start of construction that includes:

a. The pre-condition structural inspection results, including still photos and/or videos of the inspected areas.

b. Background prism and tilt meter readings including tracking of ambient temperature readings.

c. Background vibration monitoring results

4. Monitoring data within one (1) day of data collection from vibration and noise recording equipment, deformation monitoring points and offset lines. Data shall include:

   a. Horizontal and vertical movements of geotechnical instruments.

   b. New movements since the initial readings of the geotechnical instruments.

   c. Vibration levels

   d. Weekly summary in tabular and graphic form at the end of each week.

   e. A schematic plan of excavation and/or relevant construction activities at the time of monitoring.

5. A Final Structural Monitoring Report that documents that includes:

   a. A summary of the monitoring data collected.

   b. A summary of all threshold exceedances and a description of the response actions taken.

   c. The post-condition structural inspection results including still photos and/or videos of the inspected areas.

1.05 PERFORMANCE REQUIREMENTS:

A. The Monitoring Consultant shall provide personnel to prepare, review and sign the monitoring plans and daily reports, and oversee the monitoring and interpretation of the structural monitoring data with the following qualifications:

   1. Be a State of Connecticut Registered Professional Engineer.

   2. Have a minimum of five (5) years' experience in the structural monitoring field.

   3. Have successfully completed at least five (5) projects of similar scope with structural monitoring of excavation directly adjacent to a building and underpinning building foundations.

B. Installation, monitoring and interpretation of monitoring equipment shall be performed by personnel with the following qualifications:

   1. Have at least three (3) years of experience in the operation of monitoring equipment proposed for use and interpretation of records produced by such equipment.

   2. Have installed, operated, monitored and interpreted equipment and records on at least three (3) projects with projects of similar scope with structural monitoring of excavation directly adjacent to a building and underpinning building foundations.

   3. A Connecticut Registered Professional Land Surveyor shall certify all data collected with the RTS.

C. The Monitoring Consultant shall establish monitoring thresholds in the Structural Monitoring Plan. The thresholds shall incorporate the maximum values for building movement provided in

Specification Section 02260 – Excavation and the maximum vibration levels in Specification Section 02160 – Excavation Support Systems.

PART 2 - PRODUCTS

2.01 MATERIALS (NOT USED)

2.02 EQUIPMENT:

A. The RTS shall be capable of reading the coordinates with accuracy to the nearest 0.01 feet shall be utilized for the surveys.

B. The tiltmeters shall be biaxal (RTS Instruments MEMS tiltmeter or equivalent)

C. Acceptable vibration monitoring seismographs include Instantel Minimate Pro, Micromate, or their equivalents

PART 3 - EXECUTION

3.01 PRE- AND POST CONDITIONS STRUCTURAL INSPECTIONS

A. An existing conditions inspection of the existing building and its facilities, as well as the surrounding buildings and structures will also be performed by the monitoring consultant prior to the start of remedial construction activities. The goal is to document the condition of the property and any structures that are on it prior to the start of work on the site. For properties where access agreements are in place, a survey of this nature is typically conducted on the accessible interior and exterior portion of the structures on the property. Still photographs or video recordings may be taken in some places to document pre-existing damage to structures such as cracks, settlement, subsidence, corrosion, or water damage. Defects that should be monitored during construction will be noted and crack monitors or other instruments will be installed prior to the start of construction where deemed appropriate. The surveys will be documented through notes, photographs, and video to establish the pre-construction conditions.

B. At the end of construction, a similar set of structure assessment photographs and videos will be taken for comparison. Post-construction photographs will be compared with the initial pre-construction photographs to establish the growth of pre-existing cracks or the onset of new cracks, if any.

C. Pre- and post- construction surveys shall be completed in accordance with Section 01 39 00.

3.02 BUILDING MOVEMENT MONITORING

A. Crack gauges will be installed at cracks identified in the pre-condition structural inspection.

B. Approximately 20 to 30 prisms and 3 tiltmeters will be installed by the Monitoring Consultant with assistance from the Remedial Contractor on structures (including the DMC main building) around the work area including within the influence zone of excavation. The exact prism locations will be determined by the Contracting Officer, Monitoring Consultant, and Remediation Contractor before the work begins. Prism locations may be modified as the work progresses. Prisms will also be installed by the Monitoring Consultant with assistance from the Remedial Contractor.

C. Background prisms will be installed at a minimum of five reference locations outside the limits and potential influence of the work. Recordings from these prisms will be used to ensure that the RTS has not moved out of level or alignment. Periodic surveys of these prisms by a Professional Land Surveyor will also be conducted to supplement the automated system.

D. The RTS will be mounted in a secure location with an optimal line of site, on a surface with limited potential for thermal deformation. Ambient temperature will be regularly recorded at the RTS during its operation. Approximately one (1) to two (2) weeks of background measurements will be taken before the work begins to establish baseline conditions at the prism locations.

E. Crack monitor (or strain gauge) measurements will be collected daily or at least twice a week during construction activities. More frequent crack monitoring may be conducted at the discretion of the Contracting Officer.

F. Monitoring prisms will be surveyed at a regular interval (approximately every half hour) for the duration of intrusive activities.

G. Tiltmeters shall record inclination or rotation of the building wall on a continuous basis during intrusive activities

H. Tiltmeter data shall be logged in real time on a website accessible by the Contracting Officer.

3.03 VIBRATION MONITORING

A. Develop a layout for the vibration monitoring equipment and a schedule for vibration monitoring. The equipment layout will involve placing vibration monitoring units equipped with geophones capable of triaxial displacement measurements next to and within buildings and/or structures adjacent to the construction areas. The monitoring units will be installed and secured on firm subgrade and/or attached to the building floor at locations, where they will be undisturbed. The layout and schedule will depend on the contractor's proposed construction sequence.

B. Perform continuous vibration monitoring during each of the construction phases to adequately document the ground-borne vibration from the construction activities. American Association of State Highway and Transportation Officials (AASHTO) R-8-96 uses USBM published vibration damage research and establishes a PPV of 2 inches per second (in/s) at a frequency of 40 Hz or higher as the "structural damage threshold limit." PPV limits will be developed that will be used as "warning action limits" and "stop work action limits. These limits will be used as threshold values for the vibration mitigation plan during the construction activities. Vibration levels will be monitored to detect construction operations that cause vibrations above the recommended vibration action limits. Limits will be determined by the Contractor's Engineer and approved by the Contracting Officer.

C. The vibration monitoring will be performed continuously by the Monitoring Consultant from the start to end of each construction work shift. At the end of each shift, data will be reviewed, and a summary report will be submitted.

D. Vibration data shall be logged in real time on a website accessible by the Contracting Officer.

3.04 STRUCTURAL MONITORING PROCEDURES AND NOTIFICATIONS:

A. Initiation of the vibration and settlement monitoring program shall not commence until the related plan and pre-construction surveys have been reviewed by the Contracting Officer with all Contracting Officer's comments satisfactorily addressed.

B. Carry out monitoring program in such a manner as to prevent disturbance to construction work.

C. Inspect monitoring equipment daily (at a minimum) to ensure it is working properly.

D. Notify the Contracting Officer immediately if any geotechnical instrumentation is disturbed or damaged. Reset, repair or replace disturbed or damaged geotechnical instrumentation at the sole option of the Contracting Officer and at no additional cost to the Contracting Officer or the EPA.

E. Continuously monitor movements of the ground adjacent to excavation support systems and adjacent structures.

F. If the monitoring thresholds are exceeded (note that this limit may be revised after the pre-construction survey is completed) the Monitoring Consultant will immediately notify the Contracting Officer and Contractor.

G. The Contractor and Monitoring Consultant shall adjust work practices or stop work as required in response to threshold exceedances. All exceedances and resulting response shall be documented.

END OF SECTION

CERTIFICATE OF DESIGN

The undersigned hereby certifies that he/she is a Professional Engineer registered in the state of __Connecticut_____ and that he/she has been employed by (Name of Contractor) _____ to design _____ in accordance with Specifications Section _____ for the (Name of Project) _____ The undersigned further certifies that he/she has performed similar designs previously and has performed the design of the _____; that said design is in conformance with all applicable local, state, and federal codes, rules, and regulations and professional practice standards; that his/her signature and Professional Engineer (P.E.) Stamp have been affixed to all calculations and drawings used in, and resulting from, the design; and that the use of that stamp signifies the responsibility of the undersigned for that design.

The undersigned hereby certifies that he/she has Professional Liability Insurance with limits of $1,000,000.00 and a Certificate of Insurance is attached.

The undersigned hereby agrees to make all original design drawings and calculations available to the EPA and the Contracting Officer within seven (7) days following written request therefore by the Contracting Officer and/or the EPA.

_____	_____
P.E. Name	Contractor's Name
_____	_____
Signature	Signature
_____	_____
Title	Title
_____	_____
Address	Address

SECTION 02240

DEWATERING

PART 1 - GENERAL

1.01 SECTION INCLUDES:

A. Summary

B. Project Conditions

C. Submittals

D. Sequencing and Scheduling

E. Quality Control

F. Dewatering Equipment

G. Dewatering-General

H. Quality Control

I. Sampling and Analysis

1.02 SUMMARY:

A. This Specification covers Work required to control and collect surface water, stormwater, and groundwater in disturbed areas and from excavated soil. The goal of the dewatering activities in the excavation area is to pre-drain and continually dewater the excavation utilizing sumps or a wellpoint vacuum extraction system. The collected water shall be treated using the on-site water treatment plant to be provided and operated by the Contractor as part of this Project. Contractor shall select a dewatering design and operation within the water treatment capacity constraints. Once excavation dewatering begin, they are to continue for 24 hours per day and be able to dewater the steady state recharge to the prescribed elevations for the full duration of the excavation and backfill activities.

1.03 PROJECT CONDITIONS:

A. The Contractor shall be required to design, furnish, install, operate and remove a dewatering system to allow excavation to the depths shown on the Drawings. The system should be designed to keep groundwater levels at least 2 feet below active excavation and demolition activities. The Contractor shall size the dewatering perimeter and sequence excavation and dewatering so that groundwater drawdown can be achieved across the entire open excavation area. As part of dewatering, the Contractor shall also divert stormwater from all active storm sewer pipes that enter the excavation. The Contractor shall collect this stormwater upstream of excavation activities and discharge it back into the storm sewer pipes downstream from the Work as shown on the Drawings.

B. The water to be controlled by the dewatering system is groundwater and surface water generated by dewatering of the active excavation area. The water from the active excavation area or water in contact with exposed impacted soils may contain chlorinated and non-

chlorinated volatile organic compounds (VOCs). This water will be segregated and pumped to a treatment system prior to discharge in accordance with Specifications Section 02245 – Construction Water Treatment. The design of the system shall be provided in the Contractor's Technical Execution Plan (TEP).

C. In addition to ground water and surface water control, the Contractor shall be responsible for diversion of the network of storm sewers that flow through the site. Storm water conveyed in these pipes is not to require treatment and shall be diverted to and from the locations indicated on the Drawings. Contractor shall effectively divert all water from the storm sewers to eliminate subsurface storm water infiltration into the excavation, including potential additional localized diversion to intercept storm water as necessary.

D. Contractor shall be responsible for diverting any remaining stormwater not captured in the stormwater drain diversions from entering excavation areas as run-on and shall erect and maintain sloping, berms, and sediment and erosion controls around excavations to minimize contact water generated.

1.04 SUBMITTALS:

A. The Contractor shall provide the following submittals, in accordance with the requirements of Section 01 33 00 Submittal Procedures.

B. Dewatering Plan. Contractor shall submit a plan at least 2 weeks prior to mobilization that details the principal components of the system and contains a narrative dealing with the installation, operation and maintenance and removal of the dewatering system.

1. The Plan shall detail excavation, backfill, and dewatering sequence that achieves the required drawdowns without exceeding the volumetric discharge limits on the Construction Water Treatment System. The Plan shall include the resume of the dedicated Dewatering Superintendent and a description of his duties.

2. The Contractor is to visit the site, be aware of its restrictions, review the sub-surface and geotechnical information. The Contractor shall submit a detailed dewatering design to the Contracting Officer. The design should contain drawings of the proposed dewatering system. The design shall include a monitoring program so as to demonstrate compliance with these specifications.

C. The Contractor shall submit daily progress reports to the Contracting Officer containing piezometer readings, pumping quantities, vacuum gauge readings and a narrative detailing any problems which may develop and the proposed remedy.

D. Contractor shall be responsible for daily adjustments and tuning of the wellpoint system to optimize the dewatering effort. The adjustments shall be performed by the onsite dewatering superintendent. All adjustments shall be documented in the daily report and brought to the attention of the Contracting Officer.

E. Provide weekly Dewatering Logs summarizing the following information at a minimum:

1. Quantity of groundwater and surface water pumped to the construction water treatment system during the week, in gallons with totalizing flow meters.

2. Condition of the dewatering system.

3. Any zones that are or were not operating, and localized dewatering.

4. Weekly rainfall measured at the Site.

5. A summary of stormwater diversion activities.

6. Weekly record of water levels within each excavation area.

1.05 SEQUENCING AND SCHEDULING:

A. Dewater in conjunction with water treatment, excavation, and restoration work as needed to complete the excavation and backfill work.

B. Coordinate and schedule the dewatering work in a manner that minimizes the quantity of water pumped while not affecting the excavation and restoration schedule.

PART 2 - PRODUCTS

2.01 DEWATERING EQUIPMENT:

A. The Contractor shall furnish, install and operate pumping equipment of sufficient capacities to meet the requirements for the removal of groundwater and surface water from work areas and diversion of stormwater and surface water around the Work as necessary to complete the excavation and backfilling work.

B. Contractor shall keep on hand, or have immediate access to, additional pumps of sufficient capacity to maintain dewatering and stormwater diversion activities during any pump breakdown, maintenance, or in case of flooding.

C. Contractor shall utilize sound enclosures for any generators used to power dewatering equipment. If a generator is used, it must be whisper quiet.

D. Contractor shall provide sufficient suction and discharge hose or piping for transferring pumped liquids without causing erosion, sedimentation, or other adverse consequences.

E. Contractor shall provide freeze protection for all dewatering hoses, piping, and pumping equipment necessary to execute the work throughout the winter months, including but not limited to: insulation, heat wraps, heaters, and/or enclosures. Freeze protection chemicals or solutions shall not be used on site without prior approval of the Contracting Officer.

F. Equipment for dewatering may be new or used, but shall be suitable for the Work and be maintained in good condition.

G. Contractor shall repair or replace damaged pumps, piping, hoses, tanks, and all other dewatering equipment and materials within four working hours if damaged. Damage includes any pump and power failures, leaks, breaks, clogs or other conditions that adversely affect the dewatering system or release contaminated water.

H. Contractor shall keep on hand, or have immediate access to, spare components to provide reasonably for any breakdown.

I. All dewatering and stormwater diversion equipment shall remain the property of Contractor and shall be decontaminated in accordance with Specifications Section 02130 – Decontamination and removed from the Project site at the completion of the Work.

J. Contractor shall provide wells, well points, sumps, pumps, or other equipment subject to approval by the Contracting Officer, as necessary to allow Work to be performed in the dry.

PART 3 - EXECUTION

3.01 DEWATERING-GENERAL:

A. Contractor shall furnish, at a minimum, all labor, materials, and equipment, and perform all operations required to design furnish, install, test, pump, measure, and maintain the excavation dewatering equipment and water storage systems, including the storage tank, ditches, dikes, sandbags, wells, wellpoints, sumps, electric power supply and distribution as required to dewater the excavations so that the remediation work can be conducted under controlled conditions. Contractor shall demobilize and decontaminate all dewatering equipment and materials after completing the excavation and backfill work.

B. The Contractor shall provide a dedicated Dewatering Superintendent whose sole responsibility is to oversee all dewatering activities and coordinate dewatering and stormwater diversion activities with excavation, backfill, and water treatment operations. The Dewatering Superintendent shall be on the Project Site when dewatering is taking place during excavation.

C. It is the intent of these specifications that the ground water levels at this site be lowered to a point at least 2 feet below the bottom of the maximum excavation. The dewatering system design will be prepared by a person or firm experienced in work of this nature.

D. The dewatering system shall consist of a wellpoint vacuum extraction system capable of dewatering the excavation. Internal sumps may be used in addition to the wellpoint system to aid in localized dewatering if dewatering system monitoring indicates sufficient drawdown but water remains present in limited areas of the excavation. Where sumps are utilized, Contractor shall implement appropriate methods to limit transport of suspended solids into the water treatment system, including but not limited to gravel, weirs, geotextile, slotted pipe or well materials, and additional bag or sand filters.

E. Contractor shall be required to install a sand pack around well points. Contractor shall be responsible for repair or replacement of any wellpoint or piezometer where siltation or reduction of wellpoint screens openings has occurred. Construction Manager shall be notified immediately of any problematic wellpoints and Contractor shall clear or replace within 24 hours of discovery.

F. Dewatering, excavation, and backfill shall be coordinated so that the volumes of water generated during dewatering can be treated and discharged without exceeding the treatment system discharge limits.

G. The dewatering and stormwater diversion systems design should have redundant features such as adequate standby pumping capacity, valves and piping so that damage to or failure of a principle component of the system will not result in failure of the entire system.

H. Components of the dewatering system such as the individual wells and wellpoints should be tested immediately after their installation so as to verify design assumptions and demonstrate yields without suspended solids.

I. Conduct localized dewatering in work areas as necessary to perform excavation and restoration work.

J. Grade the excavation area using run-on/runoff controls including but not limited to slopes, berms and sumps in conjunction with the dewatering systems to channel water away from the immediate work areas to minimize dewatering and prevent undue impediments to soil inspection and excavation progress. Any grading measures shall prevent stormwater from leaving the Project Site.

K. Prevent any impacted water from contacting soils, or water outside of the active excavation area. If environmental contamination results from the Contractor's failure to control impacted water, remove the contamination, to the satisfaction of the Construction Manager, at no additional cost. Divert surface water away from stockpiles, excavations, and all other impacted materials.

L. After the excavation is completed and inspected by the Contracting Officer, backfilling may proceed with the water levels maintained at least 2 ft below the backfill level until final grades are achieved.

M. Install, operate, and remove the dewatering systems in accordance with applicable federal, state, county, and local Laws and Regulations, Permits and generally accepted industry practices.

N. Safety of personnel, and protection of off-site facilities and designated on-site facilities during dewatering Work, shall be solely the Contractor's responsibility.

O. Weather and site conditions shall be monitored 24 hours per day and seven days per week and dewatering conducted at any time to prevent impacted water runoff from the site.

3.02 QUALITY CONTROL:

A. Establish, maintain, and document quality control, in a form acceptable to the Contracting Officer, for all groundwater and surface water control systems, including monitoring equipment. Quality control documentation by the Contractor is required to assure compliance with regulatory requirements. Detailed records of quality control shall be kept by the Contractor for all dewatering operations.

B. Dewatering performance shall meet the following requirements:

1. Dewatering area shall be minimized to the extent necessary to conduct the Work.

2. Groundwater levels shall be monitored and recorded on a regular basis from piezometers. At a minimum, one piezometer is to be located every 50 linear feet along the excavation perimeter and additionally at any locations where internal sectioning of the dewatering system occurs.

3. Daily dewatering flows shall be recorded.

4. Tuning of the dewatering system by trained personnel and documentation of adjustments made to maximize dewatering system efficiency is required on a daily basis. A log sheet will be developed by the contractor and submitted for approval.

5. Dewater excavations to the extent practical to remove soils and pass the paint filter test and complete backfilling and compaction.

6. All tar, oils, or other by-product like material shall be pumped and temporarily stored in on-site drums. The material should be solidified, managed, and properly disposed.

7. All water collected shall be treated in accordance with Specifications Section 02245 – Construction Water Treatment.

3.03 SAMPLING AND ANALYSES:

A. Water sampling and analysis shall be performed by the Contractor in accordance with Specifications Section 02245 – Construction Water Treatment.

END OF SECTION

SECTION 02245

CONSTRUCTION WATER TREATMENT

PART 1 - GENERAL

1.01 SECTION INCLUDES:

A. Summary

B. Submittals

C. Project Conditions

D. Primary Water Treatment Equipment

E. Water Treatment System Controls

F. Water Treatment – General

G. Sequencing and Scheduling

H. Disposal of Other Residuals

I. Sampling and Chemical Analysis

J. Discharge Limits

1.02 SUMMARY:

A. This section includes treatment and discharge of impacted water collected during dewatering, decontamination, and other operations, which is referred to collectively as “Construction Water”.

B. The Contractor shall provide a water treatment system capable of treating water generated during construction dewatering (described in Specification Section 02240 – Dewatering) to the effluent standards required to comply with the intent of the Connecticut General Permit for the Discharge of Groundwater Remediation Wastewater Directly to Surface Water and any other applicable State and Federal discharge permits, prior to discharge to an on-site storm drain.

C. The Contractor may, at no additional cost to the Contracting Officer, elect to transport and dispose of water at an off-site facility in lieu of on-site treatment and discharge.

1.03 SUBMITTALS:

A. The Contractor shall provide the following submittals, in accordance with the requirements of Section 01 33 00 Submittal Procedures.

B. Construction Water Management Plan. Plan which shall include:

1. Description of water treatment system (WTS), equipment (including size and capacity), processes and monitoring. The system shall include components to store Construction Water prior to treatment, to treat the Construction Water to meet applicable effluent limits,

and to store the treated Construction Water while it is sampled and tested prior to discharge.

2. Contractor shall submit an Operation & Maintenance Plan with their design of the WTS to include regular maintenance, daily operating procedures and recording of performance parameters, logs, and record keeping.

3. Calculation and support documentation for treatment system design, component selection and sizing.

4. Description of the coordination with the dewatering system.

5. Any proposed alterations from the minimum required system shown in the Drawings.

6. Description of sampling and laboratory analyses as required to meet the intent of the discharge permit.

C. Contractor shall submit to the Contracting Officer for review all analytical test results for effluent water samples and shall not discharge any treated water until approved by the Contracting Officer.

D. Prior to project closeout, Contractor shall submit to the Contracting Officer a report of treatment system operation including dates of operation, results of testing, average pumping rate, in gallons per minute (gpm), and total volume discharged.

1.04 PROJECT CONDITIONS:

A. Excavation dewatering, described in Specifications Section 02240 – Dewatering, will generate water impacted with chlorinated and non-chlorinated volatile organic compounds (VOCs) and particulate matter. Available historical groundwater data are included in Appendix A of the Contract Documents.

B. Contractor shall provide and maintain a water treatment system that is capable of treating and discharging water in accordance with the intent of the Connecticut General Permit for the Discharge of Groundwater Remediation Wastewater Directly to Surface Water and any other applicable State and Federal discharge permits and the Specifications.

C. Contractor shall maintain Daily Discharge Volume Logs obtained from a continuously totalizing water meter, hours of treatment system operation (gallons treated), and other pertinent data for the Contracting Officer's verification and approval, in accordance with the discharge permit. Contractor's Daily Report of water treatment activities shall be in a format acceptable to the Contracting Officer and shall include the results of daily system inspections.

D. Contractor shall obtain all necessary permits and state licenses for activities not carried out on-site, including but not limited to the transport and disposal of hazardous materials to off-site facilities. Contractor is responsible for meeting the intent of any discharge permit for activities conducted on-site.

E. Minimum requirements for a water treatment system have been provided in the Drawings. The Contractor is responsible for the final Design and performance of the WTS.

PART 2 - PRODUCTS

2.01 PRIMARY WATER TREATMENT EQUIPMENT:

A. Contractor shall provide a system capable of performing the following unit process functions:

1. Separation and recovery of DNAPL products recovered with the water.

2. Influent water storage.

3. Removal of suspended solids by gravity separation and filtration.

4. Removal of VOCs.

5. Effluent water storage and discharge flow metering.

B. Contractor shall choose the type and size of equipment and components needed to accomplish the functions designated.

C. The water treatment system(s) shall be designed to handle the maximum flow rate of 100 gallons per minute.

D. Contractor shall connect to the storm drain located on-site as indicated on the Drawings. Contractor shall provide all materials, labor, traffic control, permits, roadwork and all other work for connecting the discharge to the water treatment system as shown on the Drawings.

E. Contractor shall furnish a discharge pump with sufficient flows and pressures to achieve the maximum discharge rate of 100 gallons per minute

F. Contractor shall provide a standby generator with sufficient capacity to provide power to the water treatment system and dewatering operations in the case of hard line electrical outage. Equipment wiring shall be such that dewatering and treatment may continue without interruption or minor interruption in the event of a power outage.

G. Contractor shall utilize sound enclosures for any backup or primary generators used to power water treatment equipment.

H. Contractor shall provide freeze protection for all water treatment system equipment, piping, and pipe connections to allow for operation through the winter months, including but not limited to: insulation, enclosures, heaters, heat tapes, and circulation pumps.

I. The materials and equipment used for the water treatment system may be new or used but must be suitable for the work and be maintained in good condition.

J. Contractor shall keep on hand, or have immediate access to, spare components to provide reasonably for any breakdown.

K. All water treatment and storage equipment shall remain the property of the Contractor and shall be properly decontaminated prior to removal from the site at the completion of the Work as specified in Specifications Section 02130– Decontamination.

L. Contractor shall provide and maintain at all times a flow meter to record water discharged to the discharge system. The flow meter shall record instantaneous and totalized flow.

M. Contractor shall provide sampling ports for collecting samples in accordance with the discharge permit.

N. Contractor shall provide adequate freeze protection for the operations and protection of all water treatment equipment.

O. Contractor shall provide all necessary safety equipment and personnel protective equipment for safe handling of contaminated water and water treatment chemicals.

2.02 WATER TREATMENT SYSTEM CONTROLS:

A. Contractor shall provide adequate system controls to permit unattended operation with occasional operator checks for monitoring and adjustments, however a contractor representative must be on site during all times of system operation.

B. The Contractor shall provide a notification system, such as pressure gages, to alert an operator if the system experiences conditions that will potentially cause the treatment system to shutdown or cause a malfunction that would result in an exceedance of the discharge criteria.

C. Contractor shall provide high-level alarms on tanks to prevent overflow conditions. Alarms may cause automatic actions to relieve the condition or may warn the operator.

D. If an upset condition occurs, which may result in a release or nonconformance with the discharge permit, Contractor shall immediately suspend operation and notify the Contracting Officer.

PART 3 - EXECUTION

3.01 WATER TREATMENT – GENERAL:

A. Contractor shall furnish all labor, materials and equipment, and perform all operations required to design, furnish, install, test, operate, and maintain the water treatment equipment, including: storage tanks, pumps, process equipment, water treatment chemicals, water meters, process controls, operator alarms, dikes, sandbags, electric power supply and distribution, and domestic water supply and distribution, as required to treat the collected water.

B. Contractor shall place equipment at the location designated on the Drawings. In as much as possible, equipment should be located in a permanent location for each phase of the project.

C. Contractor shall arrange components and provide means to contain any spills or overflows from the treatment process within the site.

D. Contractor shall provide spill containment for any water treatment chemicals used on the site.

E. Contractor shall establish, maintain and document quality control, as required in Specifications Section 01 33 00– Submittal Procedures.

F. The Contracting Officer may specify and require additional records from the Contractor as needed to satisfy project requirements.

3.02 SEQUENCING AND SCHEDULING:

A. Contractor shall conduct water treatment activities in conjunction and coordination with decontamination, excavation, dewatering and backfilling Work. Contractor shall be responsible for coordinating water treatment with all other site activities.

B. The Contractor shall provide a water treatment system with the treatment and storage capacity to manage water from dewatering operations without causing construction delays.

3.03 DISPOSAL OF OTHER RESIDUALS:

A. Contractor shall manage and dispose of settled solids, collected NAPL, and spent filtration and GAC adsorption media in accordance with all transportation laws and regulations and the receiving facility requirements.

3.04 SAMPLING AND CHEMICAL ANALYSIS:

A. All sampling and laboratory analyses as required to comply with the intent of the discharge permit shall be performed by the Contractor and shall be in accordance with Section 01 41 00 – Assurance Project Plan/Sampling and Analysis Plan.

B. No Construction Water shall be discharged until the Contractor has demonstrated that it meets regulatory requirements. In the event that stored water does not meet discharge criteria, it shall be re-treated to meet discharge criteria and re-tested prior to discharge.

END OF SECTION

SECTION 02250

UNDERPINNING

PART 1 - GENERAL

1.01 DESCRIPTION:

A. Design, furnish and install underpinning systems as required to transfer the existing foundation loads to the underlying, dense, and stable soils and prevent settlement and damage to the existing structures/pipeline during excavation.

B. Common types of underpinning systems include, but not limited to, pit or pier underpinning and pile underpinning. Underpinning for the existing structure shall be able to support a minimal structural load of 12.0 kips per linear foot along the strip footing.

C. The Contractor shall bear the entire cost and responsibility of correcting any failure, damages or subsidence, as a result of improper installation, maintenance or design of the underpinning systems. The Contractor shall pay for all claims, costs and damages that arises as a result of the work performed at no additional cost to the EPA or the Contracting Officer.

1.02 RELATED WORK:

A. Section 01 35 26 – Governmental Safety Requirements and 01 35 29.13 – Health, Safety and Emergency Response Procedures for Contaminated Sites.

B. Section 01 39 00 – Pre- and Post-Construction Surveys

C. Section 02160 - Excavation Support Systems

D. Section 02165 - Vibration and Settlement Monitoring

E. Section 02260 - Excavation

F. Section 02300 - Backfill and Grading

1.03 REFERENCES:

A. State of Connecticut, Trenching and Shoring CTOSHA Regulations.

B. FMWA-RD-75-128, Lateral Support Systems and Underpinning.

1.04 DEFINITIONS:

A. Shoring: Sheets or plates of steel, concrete or other materials in compression or bending, used for temporary support of excavations, formwork, or unsafe structures.

B. Sheeting: A line of steel sheet piles driven into the ground to protect subgrade operations.

C. Underpinning: New foundation which directly transmits existing structure foundation/pipeline loads to a lower bearing elevation or strata, and which preserves the structures being underpinned.

D. Support: Facilities required to prevent movement of existing structures until the completion of the underpinning.

E. Restoration: Reconstruction by repair or replacement of portions of structures removed or altered by underpinning and support operations.

F. Threshold Movement Value: Threshold vertical and lateral movement to be provided by Contractor. Contingency plan should be implemented if movement exceed the threshold limit.

G. Allowable Movement Value: Maximum allowable vertical and lateral movements as specified. Remedial action plan shall be implemented by the Contractor when the allowable movement value is exceeded.

1.05 QUALITY ASSURANCE:

A. Contractors Underpinning Design Engineer shall have 10 years experience including work of a similar nature and shall be a CT registered Professional Engineer.

B. Sample shop drawings of an underpinning project prepared, stamped, and signed by the Contractor's CT registered Civil Engineer shall be submitted along with Contractor's Underpinning Design Engineer's qualifications.

1.06 SUBMITTALS:

A. Submit the following in accordance with Section 01 33 00 – Submittal Procedures:

1. Underpinning Program Work Plan: Prepare and submit a written schedule and procedure, along with detailed drawings, of the proposed excavations, shoring, and underpinning work to the Contracting Officer. Submit procedures, methods, and materials lists for restoration of site.

2. Shop Drawings: Submit Shop Drawings, indicating method, staging, and necessary details for construction of underpinning and support for each structure/pipeline on which work is to be performed. Submit threshold movement value. Submit procedure for detection and monitoring of movement. Submit a contingency plan if movement or settlement exceeds the threshold movement value. Allowable movement shall be in accordance with Section 02165 – Vibration and Settlement Monitoring.

B. P.E. Certification Form: Refer to Section 01 33 00 – Submittal Procedures.

D. Submit as-built location, elevation, and installation record sheets within 5 days of installing each instrument to the Contracting Officer.

E. Submit records of instrumentation readings as specified in Article 3.02 herein.

D. Submit as-built location, elevation, and installation record sheets within 5 days of installing each instrument to the Contracting Officer.

E. Submit records of instrumentation readings as specified in Article 3.02 herein.

1.07 SITE CONDITIONS:

A. Access: Notify the Contracting Officer at least 10 days in advance of the date on which the Contractor requires access to the structures/pipelines which are to be underpinned, supported, and restored.

B. Maintenance of Services: Locate, protect, support, and maintain uninterrupted all utilities, equipment, and services within the limits of the underpinning work, or relocate same as indicated or required.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT:

A. Requirements: The Contractor shall furnish all materials, tools, equipment, facilities, and services as required for providing the necessary shoring and underpinning work and facilities.

PART 3 - EXECUTION

3.01 DETECTION OF MOVEMENT:

A. Monitor in accordance with Section 02165 - Vibration Monitoring and Settlement Monitoring.

3.02 FILL AND BACKFILL:

A. Provide common fill and backfill in accordance with applicable requirements of Section 02300 Backfill and Grading, after completion of the underpinning.

3.03 TEMPORARY UTILITY SUPPORTS:

A. Where necessary, install temporary supports to support adjacent utilities affected by and during the underpinning and restoration work.

3.04 RESTORATION:

A. Restore existing pipelines to conditions equivalent to those existing prior to the start of underpinning work, including repair of any settlement-related damage.

B. Any and all damages occurred to the existing structures/pipelines as a result of the contractor’s activities shall be repaired to the Owner’s satisfaction at no additional cost to the Owner.

3.05 CONTRACT CLOSEOUT:

A. Provide in accordance with Section 01 78 00 – Closeout Submittals.

END OF SECTION

SECTION 02260

EXCAVATION

PART 1 - GENERAL

1.01 SECTION INCLUDES:

A. Summary

B. References

C. Quality Control

D. Project Conditions

E. Submittals

F. Excavation Requirements

G. Sequencing and Scheduling

H. Materials

I. Preparation

J. Excavation

K. Trench Box Utilization

L. Sloping and Benching

1.02 SUMMARY:

A. Section includes excavation and handling of materials being removed, as shown on the Drawings.

B. Excavation is to be conducted in two phases as shown on the Drawings in order to minimize impacts to the DMC manufacturing facility, which will remain in operation throughout the Work.

C. This Section specifies Work to provide temporary excavation supports and engineering controls in support of the excavation activities.

1.03 REFERENCES:

A. OSHA 29 CFR 1926 Subpart P – Excavations.

1.04 QUALITY CONTROL:

A. Contractor's Land Surveyor shall stake excavation boundaries indicated on the Drawings and perform initial survey as specified in Specifications Section 01720 – Surveying.

B. Contractor shall perform surveying to record elevations during the course of the excavation Work. During performance of the Work, Contractor shall employ all equipment necessary for control of excavation depths, lines, and grades within required tolerances.

C. Verification of final excavation horizontal limits and depths shall be accomplished by survey provided by Contractor's Land Surveyor and in a manner that is mutually acceptable to the Contractor and the Contracting Officer. During the progress of Work, the Contractor shall provide survey data as the excavation progresses that consist of the following:

1. Horizontal limits of completed excavation in sufficient detail to determine limits of the material removed.

2. Vertical limits of excavation consisting of top of final grade or excavation limit in sufficient detail to verify contour elevations and to establish the progress of the completed Work.

D. Contractor personnel and equipment shall meet the training standards and requirements of OSHA 29 CFR 1926: Subpart P-Excavations.

1.05 PROJECT CONDITIONS:

A. Excavation will occur in at an active manufacturing facility in a mixed commercial - residential neighborhood. Noise, dust, and vapors must be controlled accordingly and as described in the Contract Documents.

B. Multiple subsurface utility lines and structures will be encountered in the excavation area and are to be protected or temporarily relocated during excavation and backfill work. Should the Contractor opt to relocate utilities, Contractor shall remove, relocate, and reinstall utilities within the area of excavation, while maintaining functionality of the building.

C. Contractor shall provide a temporary source of power to the DMC Manufacturing Facility during execution of the excavation work and shall replace permanent utility lines upon completion of the work, as required by Specifications Section 02000 – Temporary Electric Service and Line Replacement.

D. Excavation will be in granular soils and groundwater will be encountered during excavation.

E. Contractor shall provide materials, and install all necessary controls required for stability of the excavation and to protect adjacent structures.

1.06 SUBMITTALS:

A. Contractor shall prepare and submit an Excavation Plan in accordance with the procedures set forth in Specifications Section 01 33 00 – Submittal Procedures.

1. The Excavation Plan will document the Contractor's proposed procedures for managing the excavation dewatering, staging, tracking, and stockpiling the excavated soil and backfill.

1.07 EXCAVATION REQUIREMENTS:

A. The Contractor shall lay out the Work and excavate soil to the horizontal and vertical limits of excavation with allowances for stable slopes or use of excavation support.

B. Contractor shall erect and maintain temporary construction fencing as shown on the drawings and as specified in Specifications Section 01500 – Mobilization and Temporary Facilities and deemed necessary by the Construction Manager around open excavations to provide any other necessary safety precautions to safely secure the site both during and after Work hours.

C. The Contractor is responsible for excavation slope stability. Excavation Work shall be in compliance with applicable OSHA Regulations. The Construction Manager shall have the authority to address concerns or stop Work regarding excavation slope or shoring stability. The Contractor shall immediately notify the Construction Manager if slope sidewall instability is noticed.

D. Work shall be performed in a manner that does not disturb or damage existing structures, utilities, monitoring wells, or other facilities not indicated to be removed, unless the removal of such items is shown on the Drawings. Damaged facilities shall be repaired or replaced at the Contractor's expense as determined by the Contracting Officer.

E. Contractor shall maintain a written record of daily progress of the excavation, including all survey observations and data, and submit a copy to the Contracting Officer at the Weekly Progress Meetings, or as otherwise requested by the Contracting Officer.

F. The Contractor shall comply with Occupational Safety and Health Act Regulations (29 CFR 1926.651):

1. These regulations include but are not limited to specific excavation requirements including the following:

    a. Removal of surface encumbrances.

    b. Determination of underground installations.

    c. Providing access and egress.

    d. Protection of nearby structures.

    e. Preventing exposure to vehicular traffic.

    f. Preventing exposure to falling loads.

    g. Providing a warning system for mobile equipment.

    h. Preventing exposures to hazardous atmospheres.

    i. Preventing hazards associated with water accumulation.

    j. Protection of employees from loose rock or soil.

    k. Inspections.

2. The Contractor shall be responsible for meeting requirements for excavation protection in OSHA 29 CFR 1926.652, including providing a "competent person" to classify soils and verify that the excavation slopes shown on the Drawings are protective of worker safety.

G. Contractor shall control dust emission, vapors, and odors during excavation activities in accordance with the requirements of Specifications Section 02150.

H. Contractor shall conduct field screening and visual observation during excavation activities in accordance with the requirements of Specifications Section 02120.

I. Contractor shall protect all existing structures outside the limits of excavation areas. If Contractor damages any structures, Contractor shall repair or replace the damaged structure to the original construction standards at Contractor's own expense without reimbursement.

J. Contractor shall notify all utility companies and locate all underground utilities prior to starting excavation Work. Contractor shall be responsible for protection of utilities. If Contractor damages any utilities, Contractor shall repair or replace the damaged utility to the original construction standards at Contractor's own expense without reimbursement.

K. The Contractor shall sequence and stage excavation operations as specified in the Technical Execution Plan submitted in accordance with Specifications Section 01 33 00 – Submittal Procedures to meet the following requirements:

1. Minimize the amount of water generated by excavation dewatering described in Specifications Section 02240 – Dewatering.

2. Balance the rate of excavation with the rates of on-site material management and off-site transportation operations described in Specifications Sections 02120 – Off-site Transportation and Disposal to ensure sufficient capacity for stockpiling and transportation.

1.08 SEQUENCING AND SCHEDULING:

A. Contractor shall conduct excavation in accordance with the milestones set forth in Section 01 32 01 – Project Schedule.

B. The Work will be sequenced so that Phase 01 and Phase 02 are completed separately. This will limit the impacts of construction-related traffic on daily manufacturing operations and also maximize the amount of parking that will be open to the workers during excavation activities.

C. Contractor shall conduct underpinning installation and excavation support installation and removal activities in coordination with Backfill and Grading Work specified in Specifications Section 02300 – Backfill and Grading.

D. Contractor shall locate underpinning systems, excavation support and controls in accordance with the limits of excavation shown on the Drawings.

E. Contractor shall coordinate the installation of excavation supports and controls with the installation and operation of excavation dewatering systems described in Specifications Section 02240 – Dewatering.

PART 2 - PRODUCTS

2.01 MATERIALS:

A. Material and equipment are not specified herein, but shall be furnished as deemed necessary by Contractor. Contractor shall furnish and install all materials necessary for excavation support and controls. The materials and equipment used for excavation support and controls may be new or used but must be suitable for the Work and be maintained in good condition.

B. All temporary excavation support and controls shall remain the property of the Contractor. All temporary excavation support and controls materials shall be decontaminated and removed from the project site at the completion of the Work.

PART 3 - EXECUTION

3.01 PREPARATION:

A. The Contractor shall comply with the requirements of the utility owners for protection of underground utilities.

B. The Contractor shall install underpinning systems as specified in Specifications Section 02250 Underpinning.

C. The Contractor shall erect and maintain temporary construction fencing around excavations and provide other necessary site controls and safety measures as specified in Section 01 50 00 – Temporary Construction Facilities and Controls.

3.02 EXCAVATION:

A. Excavation:

1. The Contractor shall excavate soil and other material from the existing grade elevations and extents shown on the Drawings. All dewatering and other support systems shall be able to extend to those depths as shown on the Drawings.

2. The Contractor shall excavate using the equipment and procedures described in the Technical Execution Plan submitted as specified in Specifications Section 01330 – Submittal Procedures.

3. Excavated material shall be loaded directly into trucks, or placed directly in the excavated material stockpile area.

3.03 SLOPING AND BENCHING:

A. Excavation slopes and benches shall conform to OSHA requirements at all times.

B. Sloping or benching for excavations greater than four feet deep shall be in accordance with the Drawings, unless alternative slopes are deemed appropriate due to site conditions as determined by the Contractor's Competent Person and the Construction Manager.

C. Contractor shall provide written documentation in Contractor's Daily Report for sloping and benching, including acceptable grades and dimensions, soil types, and soil conditions.

D. Contractor shall inspect excavations daily to verify stability of slopes, benches, and excavation support systems.

END OF SECTION

SECTION 02300

BACKFILLING AND GRADING

PART 1 – GENERAL

1.01 SECTION INCLUDES:

A. Summary

B. References

C. Submittals

D. Quality Control

E. Project Conditions

F. Common Fill

G. Bank or Crushed Gravel

H. Surveying

I. Preparation

J. Placement of Backfill

K. Site Grading and Restoration

L. Maintenance

1.02 SUMMARY:

A. The Contractor shall provide all materials, equipment, and labor to place and compact backfill and grade to the final elevations in accordance with this section and the Drawings.

1.03 REFERENCES:

A. American Society for Testing and Materials (ASTM):

1. ASTM D 1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (Modified Proctor).

2. ASTM D 2487, Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).

3. ASTM D 2922, Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods.

4. ASTM D 3017, Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

B. State of Connecticut Regulations of Department of Energy and Environmental Protection; Concerning Remediation Standards:

1. CTDEEP Section 22a-133k-2, Standards for Soil Remediation.

C. Connecticut Department of Transportation (CT DOT)

1. Section M.02

1.04 SUBMITTALS:

A. Submit in accordance with Section 01 33 00 – Submittal Procedures.

B. Test Reports. Contractor shall submit written documentation showing conformance of the materials and constructed work with the Specifications within five days after test results are obtained.

C. Test Reports. For backfill, Contractor shall submit written certification, signed by the material supplier, stating that the material meets or exceeds the specified requirements. Information shall be submitted to Construction Manager for review and approval no less than fourteen calendar days prior to scheduled delivery of specified material to the Project Site.

D. List of Backfill Sources. Contractor shall identify primary and backup backfill borrow sources in the Contracting Officer.

1.05 QUALITY CONTROL:

A. Contractor shall submit samples of imported common backfill material for chemical analyses as specified in Section 01 41 00 QUALITY ASSURANCE PROJECT PLAN/SAMPLING AND ANALYSIS PLAN. At least one representative composite sample shall be submitted per 2,000 cubic yards for each borrow source in no case sooner than 10 weeks prior to plan to use onsite. If samples are submitted outside of these lead times, Contractor may be responsible for expedited laboratory turnaround costs. For each borrow sources with virgin fill material. If virgin material is not available, any fill used must comply with the definition of “Natural Soil” as defined in CT RSR 22a-133k-2(h)(4). The analytical results shall be provided to the Contracting Officer along with certifications that the materials obtained are free of organic and inorganic contaminants above CT RSR criteria. Each borrow source shall be subject to review and approval by USEPA and CTDEEP prior to importing backfill material onsite.

B. Contractor shall retain the services of a Connecticut State Department of Transportation (DOT) approved soils testing laboratory to document conformance of material type and compaction of backfill and paving materials with the Specifications.

1.06 PROJECT CONDITIONS:

A. Work shall be performed in a manner that does not disturb existing utilities, structures, or other facilities not indicated to be removed within the project limits.

PART 2 – PRODUCTS

2.01 COMMON FILL:

A. Common Backfill (bank run gravel or equivalent) shall be hard, durable sand and gravel, and shall be free from ice and snow, roots, sod, rubbish, and any other deleterious or organic matter. It shall conform to the following gradation requirements:

Sieve Size	Percent Passing
3-inch	100
2-inch	90-100
1-inch	70-90
No.4	80-30
No. 200	0-15

2.02 BANK OR CRUSHED GRAVEL:

A. Bank or crushed gravel shall consist of sound, tough, durable particles of crushed or uncrushed gravel, free from soft, thin, elongated or laminated pieces and vegetable or other deleterious substances. It shall be hard and durable enough to resist weathering, traffic abrasion and crushing. It shall be subject to testing for soundness in accordance with CT DOT Article M.02.06 when directed by the Director of Research and Materials. It shall meet Grading "B" and the requirement indicated in Article M.02:

Sieve Size	Percent Passing
5inch	100
3.5	90-100
1.5 inch	55-95
0.25 inch	25-60
No. 10	15-45
No. 40	5-25
No. 100	0-10
No. 200	0-5

2.03 ZERO VALENT IRON

B. Zero valent iron (ZVI) backfill shall consist of aggregate consisting of greater than 85% iron and generally free from grease and oil, moisture and any other deleterious or organic matter. It shall conform to the following gradation requirements:

Sieve Size	Percent Passing
No. 4	100
No. 8	90-100
No. 16	75-90
No. 30	25-45
No. 50	0-10
No. 100	0-5

PART 3 – EXECUTION

3.01 SURVEYING:

A. The Contractor shall survey the final surface elevation of each layer of completed backfill with a Connecticut Registered Land Surveyor for payment quantity and as-built purposes. Final thickness of placed backfill shall vary no more than 5% from the specified thickness.

3.02 PREPARATION:

A. Backfilling shall not proceed until the Construction Manager has approved the completion of excavation in each area of the Project Site and Contractor has completed and submitted the as-built survey.

B. Backfilling shall not be done when the ground or backfill is frozen or too wet to compact as determined by the Contracting Officer. The Contractor shall continue to dewater the excavations as necessary to allow backfilling to be completed.

3.03 STORAGE:

A. The ZVI aggregate should be kept dry at all times. Bulk bags storage bags should be stored in a dry environment. If stored outside, the bulk bags must remain under tarp.

3.04 PLACEMENT OF BACKFILL:

A. Granular backfill shall be placed in uniform loose lifts not exceeding eight (8) inches in thickness and compacted to a minimum of 95 percent of the material's maximum dry density, and within 3% of optimum moisture as determined by the Standard Proctor (ASTM D 698).

B. The initial backfill lift may exceed eight (8) inches only if approved by the Contracting Office.

C. Contractor shall provide field compaction tests for each lift and at a minimum of one per every 1,000 square feet.

D. Contractor shall place gravel (AASHTO #67 stone or equivalent) in the excavation abutting the main building as indicated on Drawing C-16 and as specified by the Resident Contracting Officer. Gravel will not be compacted with vibratory roller to insure there is no damage to the building walls or foundation. Compaction will occur on the first backfill lift placed after gravel layer.

E. For ZVI backfill to be placed as indicated on the Drawings, Contractor shall blend backfill with ZVI aggregate (minimum of 10 percent ZVI aggregate) ex-situ prior to backfill.

3.05 SITE GRADING AND RESTORATION:

A. Contractor shall grade areas to the contours indicated on the Drawings. The soil surface shall be shaped to provide a smooth transition to existing grade at the limits of the disturbed areas.

B. Contractor shall shape and compact fill with uniform levels or slopes between points where elevations are shown on the Drawings, or between such points and existing grades.

C. Contractor shall smooth the finished surfaces for general site grading within tolerance of two inches above or below the required elevation. If storm water ponding occurs Contractor shall re-grade areas to ensure compliance with Drawings as required by Contracting Officer.

D. Contractor shall grade areas adjacent to structures to achieve drainage away from the structures and to prevent ponding.

3.06 MAINTENANCE:

A. Contractor shall protect newly graded areas from traffic and erosion. The Work shall be sequenced to minimize disturbance of completed areas.

B. Where completed areas are disturbed by subsequent project operations or adverse weather, fill and reshape eroded areas until acceptance of the Work.

END OF SECTION

SECTION 02480

LANDSCAPING

PART 1 - GENERAL

1.01 DESCRIPTION:

A. Provide loaming, fertilizing, seeding, planting and related work as indicated and specified for the DMC property and for the 215 Main St residential parcel.

B. Preserve or replace in-kind existing plantings as directed by the Contracting Officer. In particular, Contractor shall preserve shrubs and trees with trunk diameter greater than 2-inches. Plants that cannot be preserved shall be replaced.

1.02 RELATED SECTIONS

A. Section 01 40 00 - Quality Control

B. Section 01 33 00 – Submittal Procedures

C. Section 02300 – Backfilling and Grading

1.03 REFERENCES:

A. American National Standards Institute (ANSI)

1. American Standard for Nursery Stock, Z60.1-2004.

B. Agricultural Marketing Service (AMS)

1. AMS-01 (Amended thru: Aug 1988) Federal Seed Act Regulations (Part 201-202)

C. American Society for Testing and Materials (ASTM)

1. D 2974-07a Standard Test Methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils

2. D 4972-1 (2007) Standard Test Method for pH of Soils

D. Commercial Item Descriptions (CID)

1. CID A-A-1909 (Basic; Notice 1) Fertilizer

E. United States Department of Agriculture

1. Soil Taxonomy, A Basic System of Soil Classification for Making and Interpreting Soil Surveys, second edition.

1.04 DEFINITIONS

A. Weeds: Include Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel, and Brome Grass.

1.05 SUBMITTALS:

A. Submit the following in accordance with Section 01 33 00 – Submittal Procedures:

1. Certify, invoice or order plants for each shipment for hardiness in USDA Zone 6, grown in latitude north of Washington D.C., free of disease and insect pests. Submit certificates to Contracting Officer.

2. Prior to placement of any mulch, deposit, at a location on site suitable to Contracting Officer, 1/2 cu. yd. sample of mulch for examination. After mulch sample is reviewed by the Contracting Officer, provide mulch conforming to accepted sample.

3. Submit to Contracting Officer a sample of proposed soil separator mat and manufacturer's specification for mat.

4. Submit with seed, certificates concerning seed mixture, purity, germinating value, and crop year identification.

5. Submit test samples of loam to a certified soils consultant to determine fertilizer and lime requirements and return two copies of results for implementation.

6. Submit list of plant material to be used and source.

7. Prior to end of maintenance period, furnish two copies of written maintenance, instructions for maintenance and care of installed plants and lawn areas.

8. Contractor shall provide the source of potable water to be used for watering, including the name of the company or other entity from which water will be obtained. No water is available at the Site.

1.06 QUALITY ASSURANCE:

A. Provide in accordance with Section 01 40 00 – Quality Control and as specified.

B. Ability to Deliver:

1. Investigate sources of supply and make assurances that plants will be supplied as indicated in Schedule of Plant Material in sizes, variety and quality noted and specified before submitting bid.

2. Failure to take this precaution will not relieve responsibility for furnishing and installing plant material in accordance with Contract requirements and without additional expense to the EPA or the Contracting Officer.

C. Inspection:

1. Upon delivery and before planting, Contracting Officer will inspect plants.

2. Inspection and approval by Contracting Officer of plants is for quality, size and variety only and in no way impairs the right of rejection for failure to meet other requirements during progress of work.

D. General:

1. Provide only nursery grown plants having been transplanted at least once and growing in a nursery for at least two years.

2. Allow Contracting Officer to determine fitness of any plant.

3. Provide container grown stock in containers long enough for root system to develop sufficiently to hold soil together firm and whole when removed from container. Use no plants loose in the container.

4. Check plant material prior to commencing of planting operations. Plant no material prior to inspection by Contracting Officer. Notify Contracting Officer at least 48 hours in advance of all planned planting operations and identify specific material and its location.

5. Furnish suitable quantities of water, hose and appurtenances.

6. Use loam, having prior vegetative growth that did not contain toxic amounts of either acid or alkaline elements.

7. Begin maintenance immediately after each portion of lawn is seeded and continue for minimum of 45 days.

8. Repair or replace seeded areas, plants, shrubs, and trees which, in judgment of Contracting Officer, have not survived and grown in a satisfactory manner, for a period of one calendar year after date of installation, and acceptance.

9. Provide as specified seedings or plantings replacements of the same type and size as specified.

10. Dry loam test samples to constant weight at temperature of 230 deg. F, plus or minus 9 degrees.

1.07 DELIVERY, STORAGE AND HANDLING:

A. Preparation for Delivery:

1. Balled and Burlapped (B & B) Plants:

a. Dig and prepare for shipment in manner that will not damage roots, branches, shape, and future development of plant.

b. B & B Plants: Originate from soil which will hold a good ball and be wrapped with burlap or similar approved material, bound with twine or cord in such manner as to hold balls firm and intact.

c. Ball Sizes: Not less than standard established by the American Association of Nurserymen for B & B stock.

B. Delivery:

1. Deliver fertilizer to site in original unopened containers bearing manufacturer's guaranteed chemical analysis, name, trade name, trademark, and conformance to state law.

2. Delivery plants with legible identification labels:

a. Label trees, evergreens, shrubs, and ground cover with waterproof labels which will remain legible for at least 60-days.

b. Label with correct plant name and size as indicated in Plant List.

3. Protect plants during delivery to prevent damage to roots or desiccation of leaves.

4. Notify Contracting Officer of delivery schedule in advance so plant material may be inspected at jobsite.

C. Storage:

1. Store plants in ground or other acceptable media if not to be planted within 4-hrs.

2. Protect roots of plant material from drying or other possible injury.

3. Water plants as necessary until planted.

D. Handling:

1. Do not drop plants.

2. Do not pick up container or B & B plants by stem or trunks.

1.08 JOB CONDITIONS:

A. It is the intent of this specification that existing trees within grading and seeding limits, not disturbed by excavation/remediation operations, be saved and protected, except where specified to be removed. Clear trees required to be removed only after approval by Contracting Officer. Contracting Officer directs variations required in grading on the job.

B. Planting Seasons:

1. Recommended Spring Planting Season: From time soil can be satisfactorily worked until following dates at end of planting season:

a. Evergreens - May 1.

b. Trees and Shrubs - May 15.

c. Lawns - May 15.

2. Recommended Fall Planting Season: Commence and terminate at time listed below:

a. Evergreens - August 20 to September 30.

b. Trees and Shrubs - From dormancy to November 30.

c. Lawns - August 1 to October 1.

C. Perform actual planting only when weather and soil conditions are suitable in accordance with locally accepted practice.

D. Protection:

1. Protect seeded and planted areas against damage by trespass and other causes.

2. Protect work until accepted.

3. Replace, repair, restake, or replant as directed by Contracting Officer, and at own expense, seeding or planting which is damaged.

4. If planting is done after lawn preparation, protect lawn areas, repair damage resulting from planting operations.

E. Wherever landscape work must be executed in conjunction with construction of other work, arrange a schedule of procedure that will permit execution of landscape work as specified.

1.09 WARRANTY:

A. Guarantee new plant material through one full calendar year from the date of the plantings installation.

1. Guarantee plants replaced under this for one full calendar year from date of replacement.

2. Repair damage to plants or lawns during plant replacement.

B. Guarantee lawn areas for duration of one full calendar year after seeding is determined to be alive and in satisfactory growth.

1. For purpose of establishing an acceptable standard, scattered bare spots, none of which is larger than 1 sq. ft. will be allowed up to a maximum of 3% of lawn area.

PART 2 - PRODUCTS

2.01 PLANTS:

A. Provide plants in accordance with ANSI Standard for Nursery Stock, Designation Z60.1-2004.

B. Plant Material: Vigorous, healthy, well-formed upper growth and dense, fibrous and large root system, and free of insect or mechanical damage. Grown under climatic conditions similar to those in project locality.

C. Plants, except those specified as container grown, balled in burlap with root ball formed of firm earth from original and undisturbed soil.

1. Ball width, depth and lacing as specified in SCHEDULE OF PLANT MATERIAL. Do not accept balled and burlapped plants with broken or loose balls, or of "manufactured" earth or peat humus.

2.02 BONE MEAL:

A. Commercial raw bone meal, finely ground and containing a minimum of 1 percent nitrogen and 18 percent phosphoric acid.

2.03 STAKES:

A. Wood stakes, minimum of 2-in. by 2-in. square and 8 feet in length, of uniform size, straight, reasonably free from knots, treated with wood preservative and painted green.

2.04 WIRE:

A. Two strands No. 14-gage galvanized soft ferrous wire, twisted, for tree guying.

2.05 HOSE COLLAR:

A. Good quality reinforced rubber hose of minimum 1/2-in. inside diameter and green in color, for protecting tree bark from supporting wires.

2.06 TREE WRAP:

A. Quality, heavy, waterproof crepe paper manufactured for this purpose. Width of material not less than 6 inches, and wrapped from bottom with minimum 2 in. overlap.

2.07 ANTIDESICCANT:

A. Acceptable antidesiccant emulsion which provides a film over plant surfaces permeable enough to permit transpiration.

B. Applied to evergreen trees, shrubs and all deciduous plant material. Application made prior to transportation from nursery if deciduous trees are leafed out at time of digging. The rate and method of application shall be in accordance with the manufacturer's recommendations.

2.08 MULCH:

A. Shredded pine bark free of wood chips, stones, branches or other deleterious material. Bark shredded in strips not larger than 3 inches in any dimension and aged for period of not less than six months after removal from original logs.

2.09 METAL EDGE STRIPS AND STEEL STAKES:

A. 1/4-in. by 5-inch steel plate edge strips, painted green.

B. 16-in. tapered steel stakes.

2.10 MAT:

A. Landscape fabric consisting of 3 ounce non-woven permanent mat, polypropylene material. Bonded on one side to permit water, fertilizer and air to pass through and so as to allow soil and roots to breathe.

2.11 LOAM:

A. Fertile, friable, natural topsoil typical of locality, without admixture of subsoil, refuse or other foreign materials, and obtained from well-drained arable site. Mixture of sand, silt and clay particles in equal proportions. Free of stumps, roots, heavy or stiff clay, stones larger than 1 inch in diameter, lumps, coarse sand, noxious weeds, sticks, brush or other deleterious matter.

B. Not less than 4 percent nor more than 20 percent organic matter as determined by loss on ignition of oven-dried samples.

2.12 LIME, FERTILIZER AND SEED:

A. Ground agricultural limestone containing not less than 85 percent of total carbonates.

B. Commercial type, uniform in composition, free flowing, conforming to state and federal laws, and at least 50 percent of nitrogen derived from natural organic sources of ureaform and containing following percentages by weight: Nitrogen 10 percent, Phosphorus 10 percent, Potash 10 percent.

C. Turf grass seed, inside perimeter fence, clean, high in germinating value and latest year's crop mixture as follows:

Name	Minimum proportion by weight	Percent purity	Percent germination
Kentucky bluegrass	20%	87%	85%
Merion Kentucky bluegrass	20%	87%	85%
Red Chewings Fescue	45%	98%	85%
Manhattan rye	15%	98%	90%

D. Weeds shall not exceed 0.25 percent. Wet, moldy, or otherwise damaged seed shall be rejected.

2.13 SOD:

A. Established, nursery grown Kentucky or Merion Bluegrass sod, vigorous, well rooted, healthy turf, free from disease, insect pests, weeds, other grasses, stones, and any other harmful or deleterious matter.

B. Sod harvested by machine at uniform soil thickness of approximately 1 inch but not less than 3/4 of an inch. Measurement for thickness excludes top growth and thatch. Prevent tearing, breaking, drying or any other damage.

2.14 PEAT MOSS:

A. Shredded, loose, substantially free of mineral and waste matters.

B. Minimum organic matter by weight on a dry basis: 80 percent.

PART 3 - EXECUTION

3.01 PLANTING PITS:

A. Excavate with vertical sides and in accordance with following requirements:

1. Excavate tree pits to minimum of 2 feet greater in diameter than root ball of tree and sufficiently deep to allow for 1-foot thick layer of planting soil mixture below root ball.

2. Plant shrubs in pits 12 inches greater in width than diameter of root ball or container and minimum of 18 inches deep below finished grade, or as necessary to properly set plant at finished grade.

B. Adjust depth of planting beds and pits to provide minimum of 8 inches of planting soil mixtures under roots of all plants.

C. Set plants in center of pits, plumb and straight and at level that top of root ball is 1 inch lower than surrounding finished grade after settlement.

D. Compact topsoil mixture thoroughly around base of root ball to fill all voids, when plant material is set. Cut all burlap and lacing and remove from top 1/3 of root ball. Do not pull burlap from under any root ball. Backfill tree and shrub pits halfway with planting soil mixture and thoroughly puddle before backfilling tree or shrub pit. Water tree or shrub, again, when each backfill operation is complete.

3.02 PLANTING SOIL MIXTURE:

A. Thoroughly mix all loam used in backfilling planting pits, with peat moss at rate of 2 parts loam to 1 part peat moss, to obtain required planting soil mixture.

3.03 BONE MEAL:

A. Add bone meal to planting mixture used for backfilling tree and shrub pits in following amounts:

	Quantity (lb)	Plant size
Shrubs*	¾	all
Minor trees	1	3'-4' hgt.
	1-1/2	4'-5' hgt.
	2	5'-6' hgt.
	3	6'-8' hgt.
	5	8'-10' hgt.
	7	10'-12' hgt.
Major trees	5	2-1/2" to 3" cal.
	7	3" to 4-1/2" cal.

*Do not apply bone meal to rhododendrons and azaleas

3.04 PLANTING:

A. Thoroughly compact topsoil planting mixture around root balls and water. Immediately after plant pit is backfilled, form a shallow saucer slightly larger than pit with ridge of soil to facilitate and contain watering. After planting, cultivate soil in all shrub beds between shrub pits. Grub out sod or other growth and remove from bed area. Rake bed area smooth and neat and outline. Mulch all tree pits and shrub beds with a minimum of 3 inches of shredded pine bark mulch as indicated on drawings. Do not use admixture of wood chips in mulch.

3.05 SECURING AND PROTECTING:

A. Install tree guying and staking as indicated in details.

B. Install hose collars for protecting tree bark.

3.06 PRUNING:

A. Prune each tree and shrub in accordance with American Association of Nurserymen standards to preserve natural form and character of plant.

B. Remove all dead wood, suckers and broken or badly bruised branches. In addition, remove 1/4 to 1/3 of remaining wood. Do all pruning with clean, sharp tools by workmen thoroughly familiar with this type of work. Paint cuts in excess of 1 inch in diameter with acceptable tree paint. Cover all exposed cambium, as well as other exposed living tissue, with paint. Do not remove leaders.

C. Apply antidesiccant to all evergreen trees and shrubs and to all deciduous plant materials which are leafed out at time of planting. Follow manufacturer's recommendations regarding rate and method of application.

3.07 BARK MULCH SURFACES:

A. Mulch, with shredded pine bark, all tree pits, shrub pits and beds, and all areas planted with ground cover, immediately after planting operations are completed.

1. For tree and shrub pits and beds, provide a minimum 3 in. of mulch.

2. For ground cover beds, provide a minimum 2 in. of mulch.

B. Limit mulching for trees and individual shrubs to pit area inside of saucer and for shrub, tree and ground cover beds and panels planted with multiple trees. Define limits of beds in turf areas or where no building wall or curb exists by installed metal edging as indicated.

3.08 LOAM:

A. Spread loam on areas to be seeded, to required 6-in. depth, fine grade and compact.

3.09 LIME, FERTILIZER AND SEEDING:

A. Apply lime by mechanical means at rate of 50 pounds per 1,000 sq. ft.

B. Apply fertilizer at rate of 50 pounds per 1,000 sq. ft.

C. Remove weeds or replace loam and reestablish finish grades, if any delays in seeding lawn areas and weeds grow on surface or loam is washed out prior to sowing seed and without additional compensation. Sow seed at rate of 4 pounds per 1,000 sq. ft. on calm day, by mechanical

means. Do not "Hydro-Seed" unless otherwise permitted or required by Contracting Officer. Sow one-half of seed in one direction, and other half at right angles to original direction. Rake seed lightly into loam, to depth of not more than 1/4 inch and compact by means of an acceptable lawn roller weighing 100 to 150 pounds per linear foot of width.

D. Water lawn areas adequately at time of sowing and daily thereafter with fine spray, and continue throughout maintenance and protection period.

E. Loam, lime, fertilize and seed required areas outside of perimeter same as lawn areas. Apply seed at rate of 80 pounds per acre. Rake seed lightly, after sowing, into top 1/4 in. of loam, and compact by suitable rollers weighing 100 to 150 pounds per linear foot of width.

3.10 SOD:

A. Install sod not more than 48 hours after cutting. Provide lime, fertilizer, etc, preparation for sod same as stated above for seed.

3.11 CLEAN-UP:

A. Remove soil or similar material which has been brought onto paved areas, keeping these areas clean.

B. Upon completion of planting, remove excess soil, stones and debris which has not previously been cleaned up and legally dispose of off-site.

C. Prepare lawns and planting areas for final inspection.

D. Protect slopes and embankments against erosion until work is accepted. Repair eroded portions of seeded or sodded areas by refilling, resodding, remulching and reseeding as required by condition and to satisfaction of Contracting Officer. Protection may be by installation of sod strips or other methods.

3.12 MAINTENANCE - SEEDED AREAS AND PLANTING:

A. Maintain lawn areas and other seed areas at maximum height of 2-1/2 inches by mowing at least three times. Weed thoroughly once and maintained until time of final acceptance. Reseed and refertilize with original mixtures, watering or whatever is necessary to establish over entire area of lawn and other seeded areas a close stand of grasses specified, and reasonably free of weeds and undesirable coarse native grasses.

B. Begin maintenance immediately after each planting and continue until final acceptance of work. Water, mulch, weed, prune, spray, fertilize, cultivate and otherwise maintain and protect all plants.

C. Reset settled plants to proper grade and position, and restore planting saucers and remove dead material. Tighten and repair guys. Correct defective work as soon as possible within guarantee period.

3.16 CONTRACT CLOSEOUT:

A. Provide in accordance with Section 01 78 00 – Closeout Submittals.

END OF SECTION

SECTION 02520

MONITORING WELL PRESERVATION, BACKFILLING, AND REPLACEMENT

PART 1 – GENERAL

1.01 SCOPE OF WORK

A. Preservation: Monitoring wells that are not within the excavation footprint shall not be damaged or disturbed by the Contractor's activities at the site. Any such wells that are damaged shall be replaced by the Contractor. Particular attention is to be paid to preservation of existing monitoring well OW-20-09 (adjacent to the west side of the warehouse and close to the edge of the excavation footprint). Since this well is required for long-term monitoring in the post-remediation period, preservation is greatly preferred over replacement.

B. Backfilling: Monitoring wells within the excavation footprint shall be backfilled with bentonite prior to starting excavation, so that if they are broken off as soil around them is removed, contaminated soil does not fall into the casing and screen that remain below the excavation.

C. Replacement: Monitoring wells OW-3-08 and OW-8R-08, which are within the excavation footprint, shall be replaced with new wells with the same diameter, depth, and screened interval as the original wells after all excavation, backfilling, and associated work are complete.

1.02 RELATED SECTIONS

A. Section 01 35 26 – Governmental Safety Requirements and 01 35 29.13 – Health, Safety and Emergency Response Procedures for Contaminated Sites

B. Section 01 33 00 – Submittal Procedures

1.03 REFERENCES

A. Connecticut Department of Consumer Protection, Well Drilling Licenses and Scopes of Work.

B. State of Connecticut, Regulations of Connecticut State Agencies.

1.04 SUBMITTALS

A. As-built details for the two new monitoring wells that are constructed to replace OW-3-08 and OW-8R-08 and for any other new monitoring wells that are required to replace wells that are disturbed or damaged as a result of the Contractor's activities.

B. Submit well completion reports as required by the State. Submit copies of all reports and permit to the Contracting Officer within 30 days of completion

1.05 PERFORMANCE REQUIREMENTS

A. Comply with requirements of the State of Connecticut for monitoring well installation. Wells must be constructed by person(s) registered/licensed to install monitoring wells, and in accordance with all applicable sections of the Regulations of Connecticut State Agencies including, but not limited to, Sections 19-13-B51a through 19-13-B51m, and Sections 25-128-35, 25-128-58b, and 25-128-60b.

PART 2 – PRODUCTS

2.01 MATERIALS:

A. Sand: Clean, subangular to rounded quartz sand at least 99.0% SiO2 by weight sized for use with screens with 0.010-inch slots. To ensure freedom from organic impurities, loss on ignition (L.O.I.) should not exceed 0.1%.

B. Well Screen: 5- or 10-foot length of flush-jointed, threaded, 2-inch inside diameter, schedule 40, NSF-pw polyvinylchloride pipe with .010-inch slots. Screen is to be capped at lower end. Three slots are to be spaced at 120-degree intervals along the pipe circumference, with each slot 90 degrees in width. Vertical slot spacing will be .25 inches or less.

C. Casing: Flush jointed, threaded, Schedule 40, 2-inch inside diameter, polyvinylchloride, NSF-pw pipe.

D. Bentonite: Chips, pellets, or granules of bentonite, maximum 3/8-inch diameter.

E. Flushmount Casing/Vault: Minimum 8-inch diameter, traffic resistant, watertight, steel manhole with nominal 12-inch long galvannealed skirt. Well shall be secured with a 2-inch diameter gasket security plug.

F. Concrete: A fine aggregate and cement premix blended with clean, potable water to form a thick concrete slurry.

PART 3 – EXECUTION

3.01 PERMITS/GENERAL

A. Obtain State and Local permits for monitoring well installation.

3.02 MONITORING WELL PRESERVATION

A. Maintain the integrity of all monitoring wells outside the excavation footprint - see Design Sheets C-9, C-10, and C-11. Any well that is disturbed or damaged by the Contractor's work activities shall be replaced with a new well in accordance with this specification. The depth and screened interval of any damaged well that must be replaced will be provided by the Resident.

B. The Contracting Officer's representative shall be present at all times during soil excavation around existing monitoring well OW-20-09. Prior to soil excavation, each well shall be re-fitted with a locking well cap and lock.

3.03 MONITORING WELL BACKFILLING

A. Backfill monitoring wells within the excavation footprint with bentonite, from the bottom of the well to within 5 feet of the ground surface, at least 3 days prior to starting excavation.

B. Use a product and a method of placement that prevent voids in bentonite fill, due to bridging of materials in the casing or other problem.

B. Fill each well with clean potable water at least once per day until water level does not drop or until excavation begins, to ensure that bentonite is completely hydrated.

3.04 INSTALLATION OF NEW MONITORING WELLS:

A. Drill minimum 4-inch ID borehole to required depth for well installation using hollow stem augers or casing. The depths of wells OW-3-08 and OW-8R-08, which must be replaced, are 13 and 17 feet, respectively.

B. Place well screen and riser in borehole. The screened intervals for wells OW-3-08 and OW-8R-08, which must be replaced, are 3 to 13 feet and 7 to 17 feet, respectively.

C. Place sand pack in annulus around well screen, to 6 inches above top of well screen in replacement well for OW-3-08 and to 2 feet above top of well screen in replacement well for OW-8R-08. Remove casing or augers as annulus is filled such that borehole does collapse, and well is not lifted above required depth.

D. Place a layer of bentonite in the annulus from the top of the sand pack to 2 feet below ground surface. In OW-3-08 and in any other well in which the bentonite layer is above the groundwater level, use bentonite granules and hydrate them with clean potable water before placing additional materials.

E. Backfill the annulus with sand from the top of the bentonite to 6 inches above the bottom of the flushmount protective vault/casing.

F. Install flushmount protective casing/vault (after or during placement of sand) flush with ground surface.

A. Place concrete around protective casing/vault so that it completely fills remaining annulus.

END OF SECTION

SECTION 02740

BITUMINOUS CONCRETE PAVING

PART 1 - GENERAL

1.01 DESCRIPTION:

A. Provide flexible paving as indicated and in compliance with Contract Documents.

1. Scope includes:

a. Aggregate base course.

b. Asphalt concrete pavement.

1.02 REFERENCES:

A. Connecticut Department of Transportation (ConnDOT):

1. ConnDOT Specifications: State of Connecticut Department of Transportation, Form 818, Standard Specifications for Roads, Bridges and Incidental Construction, 2020 Edition, as amended and supplemented.

B. American Association of State Highway and Transportation Officials (AASHTO):

1. M147: Standard Specification for Materials for Aggregate and Soil-Aggregate Subbase, Base, and Surface Courses.

2. M226: Standard Specification for Viscosity-Graded Asphalt Cement.

3. M320: Standard Specification for Performance-Graded Asphalt Binder.

4. T89: Standard Method of Test for Determining the Liquid Limit of Soils.

5. T90: Standard Method of Test for Determining the Plastic Limit and Plasticity Index of Soils.

6. T99: Standard Method of Test for Moisture-Density Relations of Soils Using a 5.5-lb Rammer and a 12-in. Drop.

7. T104: Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate.

C. American Society for Testing and Materials International (ASTM):

1. C125: Standard Terminology Relating to Concrete and Concrete Aggregates.

2. D242: Standard Specification for Mineral Filler For Bituminous Paving Mixtures.

3. D946: Standard Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction

4. D977: Standard Specification for Emulsified Asphalt.

5. D2027: Standard Specification for Cutback Asphalt (Medium-Curing Type).

6. D3381/D3381M: Standard Specification for Viscosity-Graded Asphalt Cement for Use in Pavement Construction.

7. D6373: Standard Specification for Performance Graded Asphalt Binder.

1.03 DEFINITIONS:

A. Gravel: Coarse aggregate resulting from natural disintegration and abrasion of rock or processing of weakly bound conglomerate.

B. Crushed Gravel: The product resulting from the artificial crushing of gravel with substantially all fragments having at least one face resulting from fracture.

C. Crushed Stone: The product resulting from the artificial crushing of rocks, boulders, or large cobblestones, substantially all faces of which have resulted from the crushing operation.

1.04 SUBMITTALS:

A. Submit the following shop drawings in accordance with Section 01 33 00 – Submittal Procedures.

1. Base course testing results.

2. Haul route, procedures, and schedule of operation times.

1.05 QUALITY ASSURANCE:

A. Comply with the requirements specified in Section 01 40 00 – Quality Control.

B. Codes and Standards: Comply with CTDOT Specifications 2020 Edition as amended.

1.06 DELIVERY STORAGE AND HANDLING:

A. Transport bituminous mixtures in covered trucks whenever:

1. Rainy weather, or

2. Air temperature is less than 60 degrees F.

B. Adjust weight, type, capacity, haul routes, and method of operation of hauling vehicles so that:

1. No damage results to existing streets, subgrade or base course, and

2. Noise and air pollution levels are not noticeably increased along selected haul route.

C. Haul routes through residential areas shall be avoided.

D. Submit haul route, procedures for transport, and schedule of operation times to Owner for acceptance.

1.07 PROJECT CONDITIONS:

A. Weather Limitations: Apply prime and tack coats when ambient temperature is above 50 degrees F, and when temperature has not been below 35 degrees F for 12 hours immediately prior to application. Do not apply when base is wet or contains an excess of moisture.

B. Place asphalt concrete surface course when atmospheric temperature is above 40 degrees F, and when base is dry. Place binder course when air temperature is above 30 degrees F, and rising.

PART 2 - PRODUCTS

2.01 GENERAL:

A. All materials shall conform to the requirements of “State of Connecticut Department of Transportation Standard Specification for Roads, Bridges and Incidental Construction Form 818”, including supplemental specifications (hereinafter referred to as the “State Specifications”) and as specified herein.

2.02 CALCIUM CHLORIDE

A. Calcium Chloride shall conform to the requirements of Section 9.42 of the State Specifications.

2.03 BASE COURSE:

A. Gravel base course shall conform to the requirements of Section M.02.06 of the State Specifications, Grading “B” of the State Specifications. The maximum size of stone in the gravel shall be 3 inches.

B. Processed aggregate base course shall conform to the requirements of Section M.05.01 of the State Specifications except that recycled or reclaimed materials shall not be utilized.

2.04 BITUMINOUS CONCRETE PAVEMENT

A. The base, binder, and top courses for bituminous concrete pavement shall conform to the requirements of Section M.04 of the State Specifications as shown in the drawings.

B. The general composition limits of materials, which makes up the Job Mix Formula, shall conform to columns entitled “S0.5” as listed in Table M.04.03-4 of Section M.04.03 of the State Specifications. No bituminous concrete pavement shall be placed until the Contracting Officer approves the job mix formula.

2.05 TACK COAT

A. Tack Coat shall conform to the requirements of Section M.05.02 of the State Specifications.

2.06 CONCRETE SIDEWALKS

A. Cement concrete for walks shall be of 4,000 psi compressive strength at 28 days, and shall conform to Section M.03.01 (class "C" concrete) of the State Specifications and to the Concrete sections of the specifications contained herein.

B. Welded steel wire fabric shall meet AASHTO-M55 and shall have a minimum end-lap of six inches except where expansion joints occur. Mesh shall be 6 inches by 6 inches, W2.9 by W2.9 welded wire fabric.

C. Pre-molded expansion joint filler shall meet AASHTO-M153 thickness and widths required for the expansion joint widths.

2.07 PARKING AND ROADWAY MARKINGS

A. Paint for parking and roadway markings shall be a white and/or yellow reflectorized, fast drying paint, conforming to Section M.07.22 of the State Specifications.

PART 3 - EXECUTION

3.01 EXAMINATION:

A. Check subgrade as to soundness, outline, and contour.

3.02 DUST CONTROL

A. Calcium chloride shall be applied to control dust. No calcium chloride will be allowed where runoff will enter water bodies or wetlands.

B. Calcium chloride shall be uniformly applied at the rate of 1-1/2 pounds per square yard.

3.03 SUBGRADE PREPARATION:

A. Scrape down subgrade bumps and irregularities to obtain smooth, even surface.

B. Proof roll as specified in Section 02300

C. Remove and replace soft or spongy areas as specified in Section 02300.

D. The Contractor shall raise all Owner drain and sewer manhole frames and covers, catch basin frames and grates and gate boxes to the established grades before paving is applied.

E. Prior to submitting his bid, the Contractor shall contact the other utilities so as to gain their requirements concerning any possible adjustment of gate boxes and other such structures. If the utility wishes the Contractor to raise these boxes it shall be in accordance with the utilities requirements. If the utility wishes to adjust their own gate boxes the Contractor shall give the utility adequate notice of his paving schedule.

3.04 PAVEMENT PREPARATION:

A. Remove loose material from compacted base course immediately before applying herbicide treatment or prime coat.

B. If base course becomes rutted, loose or uneven due delays in placing subsequent courses then proof roll prepared surface to check for unstable areas. Provide additional compaction or remove unstable areas, backfill and compact. Do not begin paving work until deficient areas have been re-graded and corrected and are ready to receive paving.

3.05 COMMERCIAL DRIVEWAYS AND PARKING AREAS

A. Where excavation occurred through existing bituminous concrete paved commercial driveways and parking areas, the areas shall be resurfaced with a 2-1/2- inch binder course (min to match existing pavement thickness of bituminous concrete followed by a 1-1/2 inch top course over the full width of the excavation. The limits of the overlay course shall be as defined by the Contracting Officer.

3.06 LEVELING COURSE

A. Where specified or directed by the Contracting Officer, the Contractor shall install a leveling course of bituminous concrete to the depths as required and as approved by the Contracting Officer. The leveling course shall be installed utilizing bituminous material as specified above for a top course.

3.07 PERMANENT SURFACING

A. Permanent resurfacing shall not be started before May 15th for trenching completed by January 15th. If the trenching is completed after January 15th, permanent resurfacing cannot be completed until May 15th of the next calendar year.

B. Overlay Pavement Method

1. After the trenches have been completely consolidated and when directed by the Contracting Officer, the Contractor shall carefully remove the temporary surfacing and foundation gravel base to such a depth as required to receive the permanent bituminous concrete and overlay. The existing pavement shall be saw cut back a minimum of 12” on each side of the trench. The pavement surrounding and including the excavation shall be milled to a depth of 2-in. and shall extend a minimum of 10 ft. beyond the edges of the original trench line, from the centerline to the curb as specified. The edges of abutting bituminous concrete surfacing shall be painted with an emulsion to ensure a satisfactory, watertight bond between the two materials.

2. After placement of a tack coat, permanent bituminous concrete pavement shall then be laid in a top or finished course as indicated on the Contract Drawings. Each course shall be completely rolled and compacted to form a smooth dense surface. The finished surface elevation of the top course shall allow for the overlay pavement. Construction requirements for placement of bituminous concrete surfacing shall conform to the applicable requirements of Section 4.06 of the State Specifications and as herein specified.

3. Permanent bituminous concrete pavement overlay surfacing shall be applied in locations indicated on the Contract Drawings. Milling shall be provided around existing castings of catch basin and other structures to provide smooth transition of new bituminous overlay to existing frame grades. Milling shall be performed as required to maintain a 6” curb reveal or as defined by the Contracting Officer. The placement of bituminous concrete surfacing shall conform to the applicable requirements of Section 4.06 of the State Specifications and as herein specified. Permanent bituminous overlay pavement shall be laid in one course with a depth as shown on the Contract Drawings. The bituminous concrete shall be thoroughly rolled and compacted to form a smooth dense surface. The limits of the wearing (top) course shall be as defined by the Contracting Officer.

C. Permanent Bituminous Concrete Pavement

1. After the trenches have been completely consolidated and when directed by the Contracting Officer, the Contractor shall carefully remove the temporary surfacing and foundation gravel base to such a depth as required to receive the permanent bituminous concrete. The existing pavement shall be saw cut back a minimum of 12" on each side of the trench. The edges of abutting bituminous concrete surfacing shall be painted with an emulsion to ensure a satisfactory, watertight bond between the two materials.

2. Permanent bituminous concrete surfacing shall then be laid in 2 courses consisting of a base or binder course and a top or finished course. The depth of each course shall be as indicated on the Contract Drawings. Each course shall be completely rolled and compacted to form a smooth dense surface. The finished surface elevation of the top course shall match those adjoining undisturbed existing paved surfaces. Construction requirements for placement of bituminous concrete surfacing shall conform to the applicable requirements of Section 4.06 of the State Specifications and as herein specified.

D. The Contractor shall furnish and install the materials of the type necessary to reshape the road shoulders so that the new pavement meets the elevation of the existing ground surface.

3.08 GRAVEL BASE COURSE

A. Construction requirements for gravel base course shall conform to the requirements for gravel fill in SECTION 02300.

B. Material as previously specified shall be placed and compacted to the required thickness for the particular application. The moisture content of material may have to be adjusted to obtain the specified compaction. Refer to the SECTION 02300 for specific compaction requirements. After compaction, all base course placement for pavements shall be as indicated on the drawings.

3.09 BITUMINOUS CONCRETE PAVEMENT

A. Construction requirements for bituminous concrete pavement shall conform to Section 4.06.03 of the State Specifications.

B. Material for proposed bituminous concrete roadway shall be spread on the prepared gravel base course to the compacted thickness indicated on the drawings. If there has been an appreciable lag in time between installing bituminous concrete courses, or if the binder course has been used extensively during construction, the Contracting Officer shall determine whether tack coat and/or cleaning will be required.

C. In areas indicated for proposed bituminous concrete resurfacing, the Contractor shall thoroughly clean and repair the existing pavement to the satisfaction of the Contracting Officer. Upon securing approval, the Contractor shall apply a tack coat as specified and shall place a bituminous concrete mix to a minimum depth as shown on the Contract Drawings in an approved manner.

3.10 CEMENT CONCRETE SIDEWALKS

A. Construction requirements for cement concrete walks shall conform to the requirement of Section 9.21.03 of the State Specifications, and meet special color requirements in the Durham

Center Historic District. Where possible, new utilities shall be installed by soil piercing method to avoid disturbance of concrete walks in the Durham Center Historic District.

B. Walks shall be sloped as indicated on drawings and slightly adjust grades at intersections.

C. Concrete walk sections shall be one-course construction and of thickness, widths, and lengths shown on drawings.

D. The concrete shall be tamped and screened true to grade and section.

E. Expansion joints shall be 1/2 inch expansion joints, with pre-molded fillers here shown on the drawings and at walk junctions and intersections, at top and bottom of steps, and where walks abut building, platforms, or other fixed structures. Expansion joints shall extend full depth of concrete. Pre-molded filler shall extend to within 3/8 inch of the walk surfaces.

F. Control joints shall be located as shown on the drawings; depth and width as required.

G. Finish cement concrete walks shall be finished according to Section 9.21 of the State Specifications. A final medium broom finish shall be applied as indicated on the drawings.

3.11 BITUMINOUS CONCRETE CURBING

A. Construction requirements for bituminous concrete curing shall conform to the requirement of Section 8.15.03 of the State Specifications.

3.12 PARKING STALL LINES AND ROADWAY MARKINGS

A. Parking stall lines and roadway markings shall be painted on non-windy days using whatever methods are necessary to prevent overspray from discoloring pavement. Lines shall be white, 4 inches in width. Painting, in general, shall conform to Section 12.10.03 of the State Specifications.

3.13 REPLACEMENT OF REMOVED CURBS, WALKS, FENCES, STONE WALLS AND OTHER SIMILAR ITEMS

A. All existing curbs, walks, fences, stone walls and other similar items removed for the construction of the sanitary sewer, services, connections, water and/or storm drain lines shall be replaced in a manner equal or better than their original condition.

3.14 ROLLING:

A. General: Begin rolling when mixture will bear roller weight without excessive displacement. Compact mixture with hot hand tampers or vibrating plate compactors in areas inaccessible to rollers.

B. Breakdown Rolling: Accomplish breakdown or initial rolling immediately following rolling of joints and outside edge. Check surface after breakdown rolling, and repair displaced areas by loosening and filling, if required, with hot material.

C. Second Rolling: Follow breakdown rolling as soon as possible, while mixture is hot. Continue second rolling until mixture has been thoroughly compacted.

D. Finish Rolling: Perform finish rolling while mixture is still warm enough for removal of roller marks. Continue rolling until roller marks are eliminated and course has attained maximum density.

E. Patching: Remove and replace paving areas mixed with foreign materials and defective areas. Cut-out such areas and fill with fresh, hot asphalt concrete. Compact by rolling to maximum surface density and smoothness.

3.15 FIELD QUALITY CONTROL:

A. Base Course Testing:

1. Optimum Moisture Content and Maximum Density: Comply with AASHTO T99, Method C, with replacement of fraction of aggregate retained on 3/4 inch sieve. Replace with No. 4 to 3/4 inch material.

B. Pavement Testing:

1. General: Test in-place asphalt concrete courses for compliance with requirements for thickness and surface smoothness. Repair or remove and replace unacceptable paving.

2. Thickness Tolerances: In-place compacted thickness will not be acceptable if exceeding following allowable variation from required thickness:

a. Base Course Thickness: Less than 1/4-inches, plus or minus.

b. Surface Course Thickness: Less than 1/4-inches, plus or minus.

3. Surface Smoothness Tolerances: Test finished surface of each asphalt concrete course for smoothness, using 10-foot straightedge applied parallel with, and at right angles to centerline of paved area. Surfaces will not be acceptable if exceeding following tolerances for smoothness.

a. Binder Course: 1/4-inches.

b. Surface Course: 1/8-inches.

c. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template, 1/4 inches.

d. Profile and Section: Variation from true shall not exceed +/- 3/8-inches.

3.16 PROTECTION:

A. After final rolling:

1. Do not permit vehicular traffic on pavement until it has cooled and hardened.

2. Protect paving from traffic until mixture has cooled enough not to become marked.

3.17 CLOSEOUT ACTIVITIES:

A. Provide in accordance with Section 01 78 00 – Closeout Submittals.

END OF SECTION

APPENDIX A

HISTORICAL INFORMATION

APPENDIX B

SAP TEMPLATE