Technical Specifications

Ellis Property Superfund Site, Evesham Township, Burlington County, New Jersey

Prepared for:

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SECTION 01 11 00

SUMMARY OF WORK

PART 1 GENERAL

1.1 SUMMARY

Provide all labor, materials, equipment, and incidentals necessary to accomplish the remedial action outlined in the contract documents. The remedial action includes excavation of subsurface soils impacted with volatile organic compounds (VOCs), backfilling with clean material, confirmation soil sampling, and final restoration.

1.2 SITE DESCRIPTION

The Site is a 36-acre parcel originally used as a dairy farm until 1968 when a portion of it (4-acres) was used for a drum storage and reconditioning operation. As a result of the operations, the subsurface soil became contaminated with metals, PCBs, and bis (2-ethylhexyl) phthalate, and the groundwater was contaminated with VOCs. A Record of Decision (ROD) was issued in 1992, requiring the excavation of impacted soil and installation of a groundwater collection and treatment (C&T) system. Soil was excavated in 1999 and the groundwater C&T was installed and began operating in 2000. The groundwater C&T is still in operation at the site. The effluent to the C&T discharges to the wetland. The work under this contract includes the removal of additional deeper soil (10 feet to 20 feet below ground surface) contaminated with trichloroethene (TCE) that is impacting the cleanup of the groundwater at the site.

1.3 WORK COVERED BY CONTRACT DOCUMENTS

1.3.1 Project Description

The total impacted area is approximately 45,400 square feet. The outer edges of the remaining source area will be excavated and disposed off site. The interior portion of the source area will be treated under a separate contract using in situ thermal treatment (ISTT). The work under this contract includes the excavation of 21,200 cubic yards of subsurface soils. The top 10 feet of the excavation (14,600 cy) is clean material and will be stockpiled on site for reuse. The volume of impacted material is 6,600 cubic yards and will require off site disposal. ~~In addition to excavating the exterior portion of the remaining source area, the Contractor will be responsible for obtaining a power drop for the future ISTT work which will be conducted under a separate future contract.~~

Major work items include, but are not limited to:

a. Relocating/replacing existing infrastructure for the collection trench of the groundwater treatment plant to areas outside the remedial action. Work includes relocating water and electrical piping for extraction manholes MH-1 and MH-2 and the treatment plant discharge piping around the excavation area.
b. Clearing and grubbing the excavation area and surrounding areas necessary for staging. Stripping topsoil and stockpiling on site for reuse.

c. Excavating the top 10 feet of clean soil within the excavation area and stockpiling for reuse as backfill.
d. Excavating and disposing of contaminated soil to a maximum depth of 20 feet below the original ground surface.
e. Collecting confirmatory samples for the excavation area.
f. Backfilling excavated areas with clean material from onsite stockpiled soil and imported certified clean fill.
g. Restoring the site to its original condition.
h. Installing a sheet pile wall around the southern boundary of the northern excavation area to mitigate possible recontamination of these areas during the lapse in time between completion of the excavation and implementation of the ISTT.
i. Following completion of the excavation and backfill, replace existing water piping and electrical wiring for extraction wells PW-1 and PW-2 with metal piping capable of withstanding temperatures anticipated during the future thermal treatment. Thermal treatment will be performed under a separate contract.
j. ~~Obtain the power drop for the future ISTT. The Contractor shall assume an electrical load of 6MVA will be required for ISTT when obtaining the power drop. Implementation of ISTT will be conducted under a separate contract.~~

1.3.2 Location

The Site is located at 150 Sharp Road in Evesham Township, Burlington County, New Jersey. The Site is bordered on the west by Sharp Road, the east by a wetland area and to the north by agricultural and wooded lots. A commercial property is located directly south of the property. Residential properties are located on Sharp Road directly across from the site.

1.4 OCCUPANCY OF PREMISES

Currently the Site is developed with a one-story steel building that houses the groundwater C&T system and gravel and dirt access roads used to access the monitoring wells, extraction wells, and collection trench associated with the groundwater C&T system. The location of the system is shown on the Construction Drawings.

Before work is started, the Contractor shall arrange with the Contracting Officer a sequence of procedures, means of access, and space for storage of materials and equipment.

1.5 WORK SEQUENCE

Work shall proceed in stages, as outlined in the following paragraphs, including, but not limited to the items shown and not necessarily in the sequence shown:

1.5.1 Preconstruction Work

a. Develop, submit and gain approval of all required preconstruction submittals.
b. Obtain all necessary permits to complete the remedial action.
c. Perform a geophysical survey to mark out all underground utilities. Survey should also be used to verify the location of the existing sheet pile wall along the north boundary of the project area.

d. Perform site survey to establish limits of work and verify all existing conditions.
e. ~~Contact the power company to obtain the power drop required for the future ISTT. The anticipated electrical load needed for the future ISTT is 6MVA. There are two existing circuits on Sharp Road. It is anticipated that 4MVA will be available from the 13kV service and will require the installation of a 13kV switchgear and transformers. The remaining 2 MVA is anticipated to be from the secondary service through a transformer that would be installed by PSE&G. The power drop can take up to 12 months to obtain. The Contractor shall plan accordingly to ensure this is completed in a timely manner.~~

1.5.2 Site Preparation

a. Install and/or maintain necessary site access (construction entrance), temporary facilities, utility connections, decontamination facilities, staging areas.
b. Implement environmental control measures including soil erosion and sedimentation control measures in accordance with these Construction Documents and applicable regulations.
c. Implement traffic controls in accordance with the Contractor's Traffic Control Plan.
d. Perform air monitoring according to the Contractor's Perimeter Air Monitoring Plan.
e. Clearing of trees and vegetation needed to complete the remedial action.
f. Relocate infrastructure for the groundwater C&T system to areas outside the excavation remedial action as shown on the Construction Drawings.

1.5.3 Excavation

a. Excavate and stockpile top ten feet of clean soil. The Contractor may collect pre-excavation confirmations samples if desired. The collection of pre-excavation confirmation samples is not a requirement under this contract. Post excavation confirmation samples would not be required where pre-excavation samples clearly define the limit of the excavation.
b. Excavate contaminated soil to a target depth between 15 to 20 feet below the original ground surface as shown on the Construction Drawings. Depths may be increased depending upon the results of post excavation samples.
c. Collect post excavation samples. No confirmation samples are required on the excavation sidewalls adjacent to the ISTT area. ISTT is not included in this contract and will be performed under a separate future contract.
d. Backfill excavated areas with stockpiled clean soil and certified clean fill imported from an approved offsite location.

1.5.4 Final Restoration

a. Re-grade areas to match existing grades and provide sufficient slopes to allow natural drainage and prevent ponding of water.
b. Replace existing piping to extraction wells PW-1 and PW-2 with materials that can withstand temperatures anticipated during the future ISTT.
c. Reconstruct access roads as shown on the Construction Drawings.

d. Hydroseed and mulch all disturbed areas and establish 80% coverage of seeded species. Provide one mowing after 80% coverage is obtained.
e. Install sheet pile wall along the alignment shown on the Contract Drawings.

1.6 QUALITY OF LIFE REQUIREMENTS

The Contractor shall note that the planned remedial activities at the site will impact the surrounding community. The following items would have the greatest potential to impact the quality of life of residents in the vicinity of the OU1 remedial action:

a. Air Quality
b. Noise
c. Lighting
d. Odor
e. Traffic
f. Working Hours

Minimizing impact requires consideration of how the remedial activities may affect these areas and developing criteria that will accomplish this goal. Where multiple criteria exist, the more stringent of the two criteria should be incorporated.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 GREEN REMEDIATION

a. To the extent practicable, the Contractor shall use technologies and practices that are sustainable in accordance with EPA green remediation guidance. Refer to https://www.epa.gov/sites/production/files/2016-08/documents/region_2_clean_green_policy_metrics_touchstone_practices.pdf.

-- End of Section --

SECTION 01 11 01

COMMUNITY RELATIONS PLAN

PART 1 GENERAL

1.1 SUMMARY

The Contractor is required to prepare for and participate in community relations related activities including public meetings/site visits/local briefings/public information sessions and preparing project fact sheets.

The Contractor shall prepare for and attend all activities identified in this specification section.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 COMMUNITY RELATIONS

The Contractor shall attend periodic meetings/site visits/local briefings and provide adequate effort and time to prepare for such meetings. A formal public meeting will be held at the outset of the project. There will also be at least one (1) health and safety meeting with local emergency response agencies soon after the Contractor is engaged. The Project will be explained, and the Contractor's project manager will be introduced to the public. The Contractor will be expected to attend this meeting. During the course of the project, one (1) or more additional public meetings may be held and require attendance by the Contractor.

Listed below is the Community Relations Overview for project requirements:

1. Community Relations Overview: Primary community relations responsibilities assigned by contract will be performed by the Contractor under supervision and direction of the USACE/EPA, which will develop and implement the site specific community relations program throughout the duration of the project. Upon notification to proceed, the Contractor will be called upon to assist in the presentation of the remediation scope of work to municipal, county, state and federal officials, the news media, other governmental agencies and the general public.

2. Community Relations Deliverables: The Contractor should be prepared to present and discuss technical activities involving the construction project to a lay audience at the request of the USACE and EPA upon notification to proceed. This may include, at a minimum, assisting the USACE, EPA and the Contracting Officer with the following:

    a. **Fact Sheets**: These are usually two (2) to three (3) pages long and provide information about the activities and objectives related to the project. These fact sheets may describe construction goals, emergency management procedures, health and safety procedures, test and laboratory findings, scheduling, etc.

The Contractor will prepare a draft with the assistance of the Contractor. USACE and EPA will use this information to develop a final fact sheet to be distributed publicly.

b. **Site Visits and/or Local Briefings:** These will be scheduled by the USACE or EPA as needed to present information about remedial action implementation to local officials and the public. Primary responsibility will reside with the USACE and the Contractor under EPA direction.

c. **Public Information Sessions and/or Public Meetings**: Formal public meetings may be required at this stage of the project; however, informal public information sessions using an open-house style are more common. Primary responsibility to conduct such meeting or sessions will reside EPA.

d. **Information Requests**: In general, all information requests from the public, elected officials and the media concerning the project should be referred to the EPA site manager.

e. Distribution of Materials: Printing of fact sheets, mailing of fact sheets and/or notices to community (EPA will provide mailing list), and placing display ads for public meetings in the local newspaper.

-- End of Section --

SECTION 01 11 10

SURVEYING

PART 1 GENERAL

1.1 SUMMARY

The Contractor shall provide all labor, equipment and materials required to complete all surveying activities required by the Contract Documents. Contractor shall develop and make detail surveys and measurements required for construction and site restoration, including preconstruction, post construction, and topographic surveys.

1.2 SUBMITTALS

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

SD-02 Drawings

Initial Site Drawings; G.

Submit a topographic map of site property, and utilities prior to site disturbance.

Final Excavation Drawing; G.

Submit a topographic map after completion of excavations. Drawing shall show all locations of confirmation samples and shall be completed prior to any backfilling.

Record Drawing

Record topographic maps after final grading and site restoration. Shall include locations of all existing and newly installed infrastructure and relocated underground piping for the C&T system. Refer to Section 01 78 00 CLOSEOUT SUBMITTALS for additional requirements.

Survey Maps and Notes; G

Prepare and submit a tabulated list of all monitoring wells and monuments, copies of all field books, maps showing the locations, and elevations of all monitoring wells, and all computation sheets, consisting of the designated number of the well or monument, the X and Y coordinates, and all the required elevations within 10 working days after completion of the survey.

SD-07 Certificates

Surveyor Elevation/Location Certifications; G.

Surveyor Quantities Certification; G.

SD-11 Closeout Submittals

Surveyor Field Notes Data; G.

Submit original and one copy of Surveyor's field book, calculations, and graphical layouts to the Contracting Officer upon completion of each phase of survey work. Include an accurate log of control and survey work as it progresses, all field notes, notations, and descriptions used and compiled during the field survey.

Surveyor In-Place Volume Calculations; G

1.3 QUALITY CONTROL

Maintain responsibility for all surveying performed at the site. The surveyor shall be a qualified and Registered Land Surveyor in the State of New Jersey. The surveyor shall have a minimum of two years of experience in construction surveying and layout and maintenance of record construction drawings, with a record of performing horizontal and vertical control requirements as stated in this section.

Submit Surveyor Elevation/Location Certifications verifying accuracy of survey work to the Contracting Officer. Certificates signed by the Surveyor stating that elevations and locations of site construction features are in conformance, or nonconformance, with Contract Documents shall be submitted to the Contracting Officer at the completion of each phase of work requiring services of the Surveyor.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 GENERAL

Contractor shall provide all slope stakes, batter boards, and all other working lines, elevations and cut sheets.

Provide all material required for benchmarks, control points, batter boards, grade stakes, and structure and elevation stakes.

Contractor shall be solely responsible for all locations, dimensions and levels.

Safeguard all points, stakes, grade marks, monuments and benchmarks made or established for the work. Re-establish same if disturbed.

Keep transit and leveling instruments on the site at all times and a skilled instrument person available whenever necessary for layout of the work.

Keep professional, accurate, well organized, and legible notes of all measurements and calculations.

The Contractor shall provide and/or pay for all field engineering services required for the execution of their work including, but not limited to, the following:

1. Survey work required to execute the contract scope of work. Existing survey control points are indicated on the drawings and are to be utilized to establish base data. Field monuments are to be verified for accuracy prior to start of work.
2. Civil, structural, or other professional surveying services specified or required to execute Contractor’s chosen means and methods to complete the contract scope of work.
3. The accuracy of the survey shall be maintained horizontally to 0.1 foot and vertically to 0.01 foot.
4. All final surveys must be signed, sealed, and certified by a Land Surveyor licensed in the State of New Jersey.
5. Horizontal control shall be New Jersey State Plane Coordinate System using the 1983 North American Datum: NAD83 (NA2011) EPOCH 2010.00.
6. Vertical datum shall be North American Vertical Datum (NAVD) of 1988 (GEOID 2012A)

3.2 INSPECTION

3.2.1 Existing Conditions

Verify and define the existing conditions, contours, and location of structures within the construction limits, and as defined on the Construction Drawings, for use and inclusion in the Site Operations and Excavation Plan as defined in Section 31 23 00.00.20 EXCAVATION AND FILL.

3.2.2 Work Control Points

Establish the exact location of all work site reference and survey control points prior to the start of work. All work shall be referenced to and established from the control points (shown on the Construction Drawings), re-established where necessary, and maintained throughout the life of the contract. Horizontal and vertical control points shall be referenced to the permanent control monuments to an accuracy of one part in ten thousand. Any errors or apparent discrepancies found on the Construction Drawings or Specifications shall be called to the Contracting Officer's attention for interpretation prior to proceeding with the work. The Contracting Officer must be promptly notified of any discrepancies discovered. Provide control points at each location of work using closed traverse and leveling loops. Establish, place, and replace, as required, such additional stakes, markers, and other controls as may be necessary for control, intermediate checks, and guidance of construction operations.

The Contractor shall locate, verify accuracy, and protect control points located outside the limits of excavation prior to starting site work, and preserve the permanent reference points during construction.

1. 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.
2. Make no changes or relocations without prior written notice to the Contracting Officer.
3. Report to the Contracting Officer when any reference point is lost or destroyed, or required relocation because of necessary changes in grades or locations.
4. Replace project control points that are lost or destroyed. Establish replacements based on original survey control.

The Contractor shall establish new permanent benchmarks on the project site, outside the limits of excavation, to be used as control points.

A description and elevation to the nearest one-hundreth foot shall be provided for benchmark set.

3.3 SURVEY CHECKS

Provide the Contracting Officer with survey level, tripod, rod, and measuring tape to perform survey checks of the work if requested. Provide an individual to assist Contracting Officer in performing survey checks.

3.4 RECORD TOPOGRAPHIC MAPS

Plot required survey information on a reproducible map at a scale of 1-inch = 30 feet with 1-foot elevation contours. Mapping shall conform to the National Map Accuracy Specifications and shall bear the seal of a licensed land surveyor registered in New Jersey. The map shall contain a title block with the name and address of the Contractor and the signature of the registered surveyor. Record Drawings shall include labeled contour lines, property line locations including bearings and distances, horizontal grid systems, cross-sections and details, and any field changes of elevations, dimensions, and details. Indicate locations of physical features on site including: structures, utilities, roadways, driveways, garages, and fences. Indicate on a separate drawing excavation limits and verification of sampling points. Utilize AutoCAD Version 2016 for all maps. Provide data on the share point site or by email.

3.4.1 Initial Site Drawings

Prepare topographic maps of site properties, impacted streets, and utilities. This survey shall include the site topography with one foot contours, and location of all features and structures.

3.4.2 Final Excavation Drawings

Prepare and submit within 30 days of completion of excavations a topographic map of the excavation depths. Provide in-place excavation volume and all

calculations to verify the In-Place Volume Calculations. Submit Surveyor Quantities Certification signed and sealed by the Surveyor stating the accuracy of quantities excavated.

Vertical datum shall be NAVD88 (GEOID 2012A)

3.4.3 Record Drawings

Prepare and submit within 30 days of completion of property restoration, record topographic maps showing final grading and site restoration including but not limited to the following:

- Final as-built grades
- New Groundwater extraction and monitoring wells
- Replacement of treatment system infrastructure
- Thermal well point locations

3.5 SAMPLE LOCATIONS

Prepare and submit within 10 days of completion, maps showing the location of all confirmation sample locations.

3.6 COORDINATE LIST

Compute the coordinates of each surveyed point on the New Jersey State Plane Coordinate System using the 1983 North American Datum: NAD83 (NA2011) EPOCH 2010.00.

3.7 SURVEY NOTES

Record all fieldwork in a clear, legible, and complete manner. The Field Notes shall contain a complete description of the nature and location of the new and existing points. Include a sketch of the point locations and monument witness points in the Field Notes.

3.8 SURVEY REQUIREMENTS

Establish lines and levels and locate and layout, utilizing total station instrumentation or similar means, all site features to be constructed or executed. These include, but are not limited to support zone facilities layout and areas of contamination. Re-verify layouts and volumes periodically during construction by the same means.

Prepare an As-built Survey showing final topography and the locations of all existing and newly installed structures.

3.9 UTILITIES

Scan the construction site with electromagnetic or sonic equipment and mark the surface of the ground where existing underground utilities are discovered. Additionally locate the existing sheet pile wall along the north boundary of the site. Verify the elevations of existing piping, utilities, and all type of underground obstructions not indicated or

specified to be removed but indicated or discovered during scanning in locations to be traversed. Verify elevations before installing new work closer than nearest manhole or other structure at which an adjustment in grade can be made. Record the locations and elevations of all utilities.

-- End of Section -

SECTION 01 11 50

DECONTAMINATION PLAN

PART 1 GENERAL

1.1 SUMMARY

Work under this section includes the requirements for decontamination.

1.2 SUBMITTALS

SD-01 Preconstruction Submittals

Decontamination Plan; G
Plan can be included as part of the Site Operations and Excavation Plan (Section 31 23 00.00 20)

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

Contaminated and possibly uncontaminated liquids are anticipated to be generated from decontamination of equipment and personnel working on-site. The Contractor shall dispose of liquid off site in accordance with all local, State and Federal regulations or provide temporary treatment in accordance with Section 01 57 19.00 20 TEMPORARY ENVIRONMENTAL CONTROLS.

Sampling methods and equipment shall be chosen to minimize decontamination requirements and the possibility of cross contamination. Any sampling equipment used in more than one location shall be decontaminated between locations.

The Contractor shall submit a Decontamination Plan in accordance with Section 01 33 00 - SUBMITTAL PROCEDURES. The Decontamination Plan may be submitted as part of the Site Operations and Excavation Plan. The Plan shall include the decontamination procedures for equipment and personnel working on site within contaminated areas and reference the detailed decontamination procedures for sampling equipment. At a minimum, the following items shall be addressed in the Plan:

1. Decontamination procedures for all equipment and personnel.
2. Details and drawings of decontamination stations and equipment.
3. Locations of decontamination facilities.
4. Collection and treatment/disposal procedures for all decontamination by-products.

3.2 DECONTAMINATION WATER

Water resulting from decontamination of equipment or personnel shall be collected and properly disposed of off site in accordance with applicable regulations.

3.3 DECONTAMINATION FACILITIES

The Contractor shall provide equipment decontamination stations within the Contamination Reduction Zones for removing soil from all vehicles and equipment leaving the working area. As a minimum, these stations shall include a high-pressure water wash area for equipment and vehicles. A designated clean area shall be established within the Contaminant Reduction Zone for performing equipment maintenance. This area shall be used when personnel are required to come in contact with contaminated soil, i.e., crawling under a vehicle to change engine oil. A temporary pad constructed as shown on the Construction Drawings with a HDPE 40 mil liner and overlain with a cushion geotextile and compacted gravel or equivalent shall be acceptable. Alternatively, a temporary prefabricated steel decontamination pad may be used. The pad shall be capable of handling on- and off-site vehicles without loss of integrity and shall include a sump for collection of decontamination water. All equipment within the Exclusion or Contamination Reduction Zones shall be decontaminated prior to maintenance work.

Any item taken into an Exclusion Zone must be assumed to be contaminated and must be carefully inspected and/or decontaminated before the item leaves the area. Vehicles, equipment, and materials brought into the Exclusion Zone shall remain in the Exclusion Zone until no longer necessary to the project. All construction material shall be handled and brought on-site in such a way as to minimize the potential for contaminants being brought onto the site. Separate, clearly marked parking and delivery areas shall be established in the Support Zone. All contaminated vehicles, equipment and materials shall be cleaned and decontaminated to the satisfaction of the Contracting Officer prior to leaving the site.

3.4 DECONTAMINATION OF HEAVY EQUIPMENT

The Contractor shall furnish all labor, equipment, materials, supplies, power, water and incidentals required for equipment decontamination.

Prior to performing any decontamination activities, the Contractor shall construct a temporary decontamination pad on-site.

All parts of heavy equipment which contact potentially contaminated materials shall be cleaned of all foreign matter and cleaned with a pressure washer prior to each excavation and prior to departure from the site. If required for removal of product from equipment, the Contractor shall use a non-phosphate detergent and heavy duty scrub brush.

Wastewater generated from decontamination shall be disposed off-site. The wastewater may be containerized in DOT approved 55-gallon drums. The filled drums shall be placed on pallets furnished by the Contractor and staged at an on-site location for waste characterization and off site disposal. All wastewater shall be removed from the decontamination pad at the end of each work day. Alternatively the wastewater generated may be treated with a temporary treatment system provided by the Contractor in accordance with Section 01 57 19.00 20 TEMPORARY ENVIRONMENTAL CONTROLS.

The decontamination pad shall be removed from the site and properly disposed of by the Contractor at the completion of the project.

-- End of Section --

SECTION 01 12 00

AIR MONITORING PLAN

PART 1 GENERAL

1.1 SUMMARY

Requirements for personal work zone and perimeter air monitoring.

1.2 REFERENCES

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

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA 600/4-82-060	Quality Assurance Handbook for Air Pollution Measurement Systems: Volume IV. Meteorological Instruments
EPA/625/R-96/010b	(1999) Compendium of Methods for Determination of Toxic Organic Compounds in Ambient Air (TO-15)

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

40 CFR 50	Protection of Environment, National Primary and Secondary Ambient Air Quality Standards

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)

NIOSH 94-113	(1994; 4th Ed) NIOSH Manual of Analytical Methods

1.3 SUBMITTALS

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

SD-01 Preconstruction Submittals

Air Monitoring Plan; G

The Contractor shall develop and implement an Air Monitoring Plan to address air monitoring for public and employee protection purposes. This air monitoring shall be conducted in conjunction with the air monitoring required under Section 01 35 29.13 - HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES FOR CONTAMINATED SITES for on-site personnel and worker health and safety purposes.

SD-06 Test Reports

Air Monitoring Data; G
The Contractor shall report all field data sheets relating to the perimeter air monitoring in an electronic format.

PART 2 PRODUCTS

2.1 EQUIPMENT

Monitoring of work zone airborne particulates will be conducted with a Thermo MIE pDR-100 DataRam Real Time air monitoring devices or equivalent.

Monitoring of perimeter airborne particulates will be conducted at four (4) stations using a TSI DustTrak II 8530 or equivalent equipped with a MiniRae 3000 PID monitor or equivalent. The four stations will be set up around the perimeter of the site with location biased to sensitive receptors (i.e., residences). A figure showing the proposed locations will be provided to the Contracting Officer for approval prior to commencement of construction activities.

Wind speed and wind direction will be recorded throughout excavation and sampling activities. The wind speed sensor to be used will be a Met One 014A or equivalent and the wind direction sensor to be used is a Met One 024A or equivalent. A windsock or weather vane will also be used to provide a visual indication of wind directions.

PART 3 EXECUTION

3.1 PROCEDURES

The air monitoring program will include the monitoring for particulate matter less than 10 microns in diameter (PM-10) and for volatile organic compounds (VOCs). In addition, meteorological data regarding wind speed and wind direction will be recorded during the remedial activities. A windsock or weather vane will be used to determine wind directions.

Monitoring shall be completed during all intrusive activities including but not limited to soil/waste excavation and handling, trenching, and drilling.

Prior to the initiation of intrusive activities, background concentrations of particulate matter in the ambient air will be determined by operating the sampling equipment for one day.

If the air monitoring device (or approved equivalent) malfunctions, work will stop until the malfunctioning unit is replaced.

3.1.1 Work Zone Monitoring

At a minimum, air-monitoring data received from the Thermo MIE pDR-100 DataRam Real Time air monitoring device (or approved equivalent) located within the work zone shall be taken and average readings over 15 minute intervals will be recorded. Air monitoring shall also be conducted with a photoionization detector (PID) for VOCs. Fifteen minute sampling time integrated averages will be recorded by the perimeter aerosol monitors. All air monitoring data will be available on-site daily to the Contracting Officer. This data will also be submitted with the field sampling report. The Contractor shall complete hourly checks of the air monitoring device during intrusive activities to verify action levels are not exceeded. The frequency of these checks may require increasing during intrusive activities that have the potential to generate more dust, such as excavation activities.

3.1.2 Perimeter Monitoring

Perimeter airborne particulate monitoring will be conducted with a minimum of four (4) TSI DustTrak II 8530 equipped with a MiniRae 3000 PID monitor (or approved equivalent). Readings of 100 micrograms per cubic meter (µg/m3) total particulates (average readings over 15 minute intervals) will be used as the guideline for assessing operations and implementing corrective action. Readings of 150 micrograms per cubic meter (µg/m3) for particulates and 1 ppm above background for VOCs will be used as the guideline for ceasing operations.

The purpose of the perimeter air quality-monitoring program is to confirm that the downwind air monitoring equipment is located properly and that the criterion of 150 µg dust/m3 is being met. This will be accomplished determining the ambient concentrations of particulate matter less than 10 microns in diameter (PM-10). Four (4) perimeter monitors will be utilized to determine real time PM-10 concentrations. The location of these units will be approved by the Contacting Officer.

Monitoring will be conducted 24 hours per day for the first three days of the remediation activities. The Contractor shall then evaluate the data and determine, with approval from the Contracting Officer, whether to discontinue continuous air monitoring. If continuous air monitoring is discontinued, monitoring shall be conducted continuously during all intrusive activities defined above.

Wind speed and wind direction data will be continuously recorded throughout the duration of remediation activities. The meteorological station will be located in the proximity of the site being remediated. Data recorded will be summarized on a daily basis. Each day's prevailing wind direction will be provided to the Contracting Officer. The meteorological station will be constructed and operated in accordance with EPA guidelines EPA 600/4-82-060.

a. The wind speed sensor will be calibrated when set up or on a quarterly basis in accordance with the manufacturers specifications. The wind direction sensor will be calibrated in accordance with the manufacturer's specification once per year or when the station is moved.

b. For this project, the wind speed sensor proposed is a Met One 014A or equivalent and the wind direction sensor is a Met One 024A or equivalent. The wind sensors will have the following performance characteristics:

1)	Wind direction threshold	1.0 miles per hour
2)	Wind direction accuracy	+/- 5 degrees
3)	Wind speed threshold	1.0 miles per hour
4)	Wind speed accuracy	+/- 1.5 degrees of scale

c. Data from the sensors will be recorded by a data logger capable of generating on-site summary information including the data necessary to generate hourly average wind information.

d. All field data must be recorded and be available for NJDEP personnel to review.

3.1.3 Air Monitoring Data for Laboratory Analysis

The Contractor shall collect air monitoring data for laboratory analysis of VOCs using EPA Method TO-15. Monitoring shall be conducted once per week during the duration of the remediation activities at one downwind monitoring station and the upwind perimeter monitoring station. Monitoring shall be performed over an eight hour period.

-- End of Section --

SECTION 01 13 00

DUST CONTROL

PART 1 GENERAL

1.1 SUMMARY

This section includes requirements for dust control. The Contractor shall provide all labor, equipment and materials needed to control dust generated as a result of remedial activities.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 GENERAL

The Contractor shall conduct the earthmoving and related operations in a manner that will minimize the creation of dust and odors. For the dust and any resultant odors generated, the Contractor shall implement temporary dust suppression measures.

The Contractor shall provide measures to control dust resulting from the work. Control dust at locations and in such quantities and frequencies as required preventing dust from becoming a nuisance to the surrounding area. The Contractor shall maintain all excavations, backfill areas, stockpiles, haul roads, and all other work areas within or outside the project boundaries free from excess dust to avoid causing a hazard or nuisance to others. Approved temporary methods consisting of sprinkling, approved chemical treatment, or similar methods will be permitted to control dust. Dust control shall be performed as the Work proceeds and whenever a dust nuisance or hazard occurs as specified herein and in Section 01 12 00 - AIR MONITORING PLAN.

3.2 PROCEDURES

The Contractor shall conduct his operations utilizing the information obtained from the air quality monitoring conducted in accordance with Section 01 12 00 - AIR MONITORING PLAN. Action is required to control dust when the concentration in air exceeds 100 ug/m3, as specified in Section 01 12 00 - AIR MONITORING PLAN, or when dust becomes a nuisance as determined by the Contracting Officer.

During excavation operations, the Contractor shall sample the air periodically, in accordance with the requirements of Section 01 12 00 - AIR MONITORING PLAN, to determine the dust concentration. When the dust concentration exceeds the action level, the Contractor shall reduce the concentration by changing his operations to control or minimize the production of dust. The dust may be controlled by water or non-toxic chemical spray, or similar means. The Contractor shall cease operations in the event he is unable to control the dust content of the site air.

After the site excavation has commenced, and the site soils are exposed, dust may be lifted and carried by the wind. The Contractor shall develop a plan to reduce such wind entrainment, by covering the exposed soils, or coating them to reduce the hazard.

The Contractor shall maintain the vehicles, equipment and supplies necessary for control of dust at or near the site of the work, so that minimum delay occurs when dust control operations become necessary.

The Contractor shall also comply with the short-term action level and minimize dust concentrations at the perimeter of the site, to avoid creating hazards on neighboring properties.

-- End of Section --

SECTION 01 20 20

PROJECT PROGRESS MEETINGS

PART 1 GENERAL

1.1 SUMMARY

This section includes minimum requirements for conducting Project Progress Meetings during execution of the construction work. Meetings discussed in this section include:

- Pre-Work Conference
- Preconstruction Conference
- Preconstruction Quality Control Conference
- Pre-Construction Safety Conference
- Project Progress Meetings

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 Submittal Schedule; G

The Contractor shall prepare and submit the Project Submittal Schedule in accordance with paragraph entitled, "Project Progress Meetings," of this section.
A Project Submittal Schedule shall be submitted showing full coordination with the project schedule. All products and tests under each submittal number shall be prioritized and linked to the progress schedule.

SD-06 Test Reports

Monthly Progress Report; G

The Contractor shall submit a Monthly Progress Report at the first meeting of each month.

The Monthly Progress Report shall address as a minimum:

1. Progress Schedule
2. Potential Factor of Delay
3. Deficiencies
4. Material Delivery Schedule
5. Submittals
6. Health and Safety Issues
7. Field Change Orders

8. Any additional data pertinent to the progress of the work and record keeping for the project including but not limited to: volume of soil excavated, extension of excavation areas, confirmation samples collected with summary of results, amount of soil disposed off site, and areas backfilled.

Conference Meeting Minutes; G

The Contractor shall record the minutes of meetings including topics discussed, decisions made, and action items resulting from the meeting. Draft electronic meeting minutes shall be submitted to the Contracting Officer within five (5) calendar days for review and approval. After the review and approval, the Contractor shall distribute final electronic copies to each participant in the meeting and to parties affected by decisions made at the meeting.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 GENERAL

The Contractor shall schedule and administer the Pre-Construction Conference, Pre-Work Conference, Pre-Construction Quality Control Conference, Pre-Construction Safety Conference, and Project Progress Meetings as specified in Paragraphs 3.2 through 3.6 of this section.

Unless otherwise stated, meetings shall take place at the project site or via teleconference call-in. Other locations convenient to both the Contracting Officer and Contractor may be acceptable with prior approval from the Contracting Officer.

3.1.1 General Conference Meeting Requirements

The Contractor shall administer the following general requirements for the conference meetings:

1. Prepare agenda for conferences.
2. Make physical arrangements for conferences.
3. Preside at conferences.
4. Record the minutes including a detailed description of proceedings and decisions.

3.1.2 Attendance

The following persons shall attend the meetings:

- Contracting Officer or its representative
- Contractor’s Site Superintendent
- Contractor’s Project Manager
- Contractor’s Quality Control personnel

- Contractor’s Safety personnel
- Subcontractors as appropriate to the agenda
- Suppliers as appropriate to the agenda
- Others as requested by the Contracting Officer or as appropriate to the agenda.

3.2 PRE-WORK CONFERENCE

3.2.1 Meeting Time and Location

The Pre-Work Conference shall be held within 15 calendar days after issuance of Notice to Proceed (NTP).

The Preconstruction Conference shall be a teleconference unless otherwise required by the Contracting Officer. The time and date shall be selected by the Government.

3.2.2 Meeting Purpose and Objectives

The purpose of the Preconstruction Conference is to develop a mutual understanding of the Contract prior to initiation of work. The meeting will specifically address the contract clauses (Division 0), overall project schedule, and any questions the Contractor may have on the administrative or technical requirements of the contract.

The Job Superintendent, the office project manager, quality control personnel, and safety personnel of the Contractor, as well as any major subcontractor(s), will be required to attend the conference.

3.3 PRECONSTRUCTION CONFERENCE

3.3.1 Meeting Time and Location

Within 30 calendar days after the Pre-Work Conference (within 45 days after NTP and during the Work Plan review period) and prior to mobilization, a Preconstruction Conference will be held between the Contractor and Contracting Officer. The conference will take place either at the Contractor’s office or at EPA Region 2 Headquarters.

3.3.2 Meeting Purpose and Objective

The purpose of this conference is to review preconstruction submittals, safety procedures, payrolls and labor relations, environmental protection procedures, project schedules and payment, permit status, and procurement of materials.

Unless specified otherwise, at least 15 calendar days prior to the Preconstruction Conference, the Contractor shall submit 6 copies of the following for review at the Preconstruction Conference:

1. Initial Project Schedule.
2. Site Operations and Excavation Plan.
3. Contractor Quality Control Plan

4. Contractor Uniformed Procedures Quality Assurance Project Plan (UPF-QAPP)
5. Air Monitoring Plan.
6. Soil Erosion and Sediment Control Plan.
7. Decontamination Plan.
8. Accident Prevention and Site Safety and Health Plan.
9. Environmental Protection Plan.
10. Security Plan.
11. Temporary Site Facilities Layout Plan and Trailer’s Floor Plan.

These will be briefly reviewed to provide the Contracting Officer with a general understanding of the submitted documents. The Contractor's schedule, particularly for the initial startup period, will be discussed. Questions concerning the administrative requirements outlined during the Pre-Work Conference or any other aspect of the project may also be addressed.

3.4 PRECONSTRUCTION QUALITY CONTROL CONFERENCE

3.4.1 Meeting Time and Location

A Preconstruction Quality Control Conference will be held a minimum of 10 calendar days prior to mobilization at the site. The Quality Control Conference may be combined with the Preconstruction Conference if agreed upon by the Contracting Officer. The Preconstruction Quality Control Conference if held separate from the Preconstruction Meeting will be held as a teleconference. The date and time of the conference will be coordinated by the Contractor.

3.4.2 Meeting Purpose and Objectives

The purpose of this conference is to discuss the quality control procedures to be used for all on-site and off-site work, and defining the interrelationship of the Contractor's Management and the Contracting Officer’s Quality Assurance.

During this meeting the Contractor’s Quality Control (CQC) Plan will be briefly reviewed to provide the contracting Officer with a general understanding of the Contractor’s quality control procedures. The Contractor’s project schedule for the initial startup period, will be discussed along with Definable Features of Work, the inspection procedures and QC testing requirements. Questions concerning the administrative requirements outlined during the Pre-Work Conference or any other aspect of the project may also be addressed.

3.5 PRECONSTRUCTION SAFETY CONFERENCE

3.5.1 Meeting Time and Location

A Preconstruction Safety Conference will be held a minimum of 10 calendar days prior to mobilization at the site. The Preconstruction Safety Conference may be combined with the Preconstruction Conference if agreed upon by the Contracting Officer. The Preconstruction Safety Conference if held separate from the Preconstruction Meeting will be conducted as a teleconference. The date and time of the conference will be coordinated by the Contractor.

3.5.2 Meeting Purpose and Objectives

The purpose of this conference is to discuss how work will be implemented including, but not limited to, work procedures, safety considerations associated with those work procedures, heavy equipment to be used, training to operate equipment, and safety requirements, such as training and safety equipment.

3.6 PROJECT PROGRESS MEETINGS

3.6.1 Meeting Time and Location

The Contractor will be responsible for scheduling progress meetings during the course of the work. Progress meetings will generally be held as teleconference meetings although some meetings may also be conducted at the site. During work plan preparation and prior to active construction being performed at the site progress meetings will be conducted on a monthly basis. Once equipment is mobilized to the site and construction begins meetings will be held every two weeks (twice per month) unless otherwise required by the Contracting Officer.

3.6.2 Meeting Purpose and Objectives

The purpose of the progress meetings is to update the Contracting Officer on the progress of work, discuss any scheduling problems, status of submittals, field orders, change orders and other pertinent matters.

During progress meetings the Contractor shall prepared to discuss the following items, as applicable:

1. Status of permits and local approvals.
2. Revised and updated schedule to show the progress of the work and effects on the project schedule.
3. Any current test results pertaining to monitoring, backfill and the disposal of soils and liquids.
4. Contractor's daily quality control reports.
5. Proposed work for the coming week.
6. Any additional data pertinent to the progress of the work and recordkeeping for the project.
7. Discuss and finalize previous meeting minutes.
8. Contract Modifications/Field Orders.
9. Health & Safety Issues.

Following each progress meeting the Contractor will record minutes and distribute copies for comment within three working days after the meeting.

3.7 OTHER MEETINGS

Contractor shall attend special meetings which may be required or called for by Federal, State or Local authorities, utility companies, Government, Contracting Officer or any other firm, person or organization related to the project. Attendance by the Contractor shall include the Contractor's Superintendent and office manager, and major Subcontractors (if required by Contracting Officer).

Neither Government nor Contracting Officer wishes to meet solely with a subcontractor and requests for such meetings will be discouraged. If a

meeting is deemed necessary, every effort will be made to have Contractor attend. If, for some reason, circumstances do not allow such, the meeting may be held, minutes of the meeting will be sent to contractor and decisions on any major questions will be reserved until contractor has been consulted. Subcontractors may accompany contractor to meetings provided contractor notifies Contracting Officer in advance.

-- End of Section --

SECTION 01 30 00

ADMINISTRATIVE CONTROLS

PART 1 GENERAL

1.1 SUMMARY

This section includes requirements for administrative controls under this contract, including photographic documentation, video recording, supervision, and correspondence.

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

View location map; G

Preconstruction Video; G

SD-06 Test Reports

Progress pictures; G

SD-11 Closeout Submittals

Post Construction Video; G

Completion Pictures; G

1.3 VIEW LOCATION MAP

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

1.4 PROGRESS AND COMPLETION PICTURES

Photographically document site conditions prior to start of construction operations. Provide monthly, and within one month of the completion of work, digital photographs in JPEG file format showing the sequence and progress of work. Take a minimum of 20 digital photographs each week throughout the entire project from a minimum of ten views from points located by the Contracting Officer. Submit a view location sketch indicating points of view. Submit with the monthly invoice two sets of digital photographs each set on a separate CD, cumulative of all photos to date. Indicate photographs demonstrating environmental procedures. Photographs for each month shall be in a separate monthly directory and each file shall be named to indicate its location on the view location sketch. The view location sketch shall also be provided on the CD as digital file.

All file names shall include a date designator. Cross reference submittals in the appropriate daily report. Photographs shall be provided for unrestricted use by the Government.

1.5 VIDEO RECORDING

The Contractor shall provide all labor, materials and equipment to furnish color audio/video recordings of the project site to record the site features including the exterior of the treatment plant building and associated infrastructure, existing condition of the local roads that will be used to haul materials, existing conditions of the collection trench and wetland area, and any other important site features during construction. Video recordings shall be conducted before beginning any work and after completion of the work.

The Contractor shall furnish to the Contracting Officer an original and two copies of each video on DVD.

1.5.1 Video/Audio Quality

The Contracting Officer reserves the right to reject the video images because of poor quality, unintelligible audio, or uncontrolled pan or zoom. Any videotaping rejected by the Contracting Officer shall be re-taken. Under no circumstances shall construction begin until the Contracting Officer has received and accepted the preconstruction video recording.

Audio shall be recorded in a clear, professional and concise manner at the same time as the video recording and shall include the same information on the viewing screen.

1.5.2 Video/Audio Requirements

Audio/video recordings shall be provided using the most recent video technology available. Each recording shall begin with the Contracting Officer’s name, Contract name and number, Contractor’s name, date and location information such as street name, direction of travel, viewing side, etc.

Information appearing on the recording must be continuous and run simultaneously by computer-generated transparent digital information. No editing or overlaying of information at a later date will be acceptable.

Time must be accurate to within 1/10 of a second and be continuously generated. Written documentation must coincide with the information on the DVD to facilitate easy retrieval of information.

All DVDs and containers shall be provided with the following information:

a. DVD Number
b. Contract Name and Number
c. Project Site
d. Date of Taping
e. Contracting Officer’s Name
f. Location
g. Total recording time

1.6 SUPERVISION

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

1.7 PRE-WORK CONFERENCE

After award of the contract but prior to commencement of any work at the site, meet with the Contracting Officer to discuss and develop a mutual understanding relative to the administration of the value engineering and safety program, preparation of the schedule of prices or earned value report, shop drawings, and other submittals, scheduling programming, prosecution of the work, and clear expectations of the "Interim DD Form 1354" Submittal. Major subcontractors who will engage in the work shall also attend.

1.8 ELECTRONIC MAIL (E-MAIL) ADDRESS

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

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

1.9 PROJECT WEBSITE

The Contractor shall provide a project website accessible to Government personnel to serve as a central repository for operational data, project documents, reports, and additional documents as requested by the EPA.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

-- End of Section --

SECTION 01 32 01.00 10

PROJECT SCHEDULE

PART 1 GENERAL

1.1 SUMMARY

This section covers requirements for the project schedule, including submittals, staffing, phases of work/milestones, progress tracking, and schedule-related meetings.

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.

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	(1995) Administration -- Progress, Schedules, and Network Analysis Systems

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Project Scheduler Qualifications; G
Preliminary Project Schedule; G
Initial Project Schedule; G

SD-03 Product Data

Periodic Schedule Update; G

1.4 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 2-year’s 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

Not Used.

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 two 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 of mechanical/electrical/information systems layout drawings.

c. Long-lead procurement activities.

d. Submission and approval of as-built drawings.

e. Contractor's pre-final inspection.

f. Correction of punchlist from Contractor's pre-final inspection.

g. Government's pre-final inspection.

h. Correction of punchlist from Government's pre-final inspection.

i. 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*
*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 00.00 10 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(ies) starts and the predecessor activity(ies) 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 to 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 punchlist 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 punchlist 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 punchlist 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 man-hours) 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 30 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.

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 any problems, causes of change, an analysis of the schedule impact, and the plans to compensate for any problems, either current or potential, which are revealed through that analysis.

3.6 PERIODIC SCHEDULE UPDATE

3.6.1 Periodic Schedule Update Meetings

Conduct periodic schedule updates at progress status meetings for the purpose of reviewing the proposed Periodic Schedule Update and Narrative Report.

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 PROGRESS MEETINGS

Conduct progress meetings 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 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.

-- End of Section --

SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

This section covers requirements for project submittals.

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 construction 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 Safety Data Sheets (SDS) and in compliance with existing laws and regulations.

1.2 DEFINITIONS

1.2.1 Submittal Descriptions (SD)

Submittal requirements are specified in the technical sections. 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) 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, submitted prior to start of construction work.

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 serve 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.

A sample of the warranty language shall be retained when the contract requires extended product warranties.

SD-04 Samples

Physical samples from fabricated or unfabricated materials, equipment or workmanship, which illustrate the functional and aesthetic characteristics of a material or product and establish standards by which the work can be judged, shall be provided.

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

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

SD-05 Design Data

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

SD-06 Test Reports

Report signed by authorized official of testing laboratory that a material, product or system identical to the material, product or system to be provided has been tested in accord with specified requirements. (Testing must have been within three 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.
Final acceptance test and operational test procedure.

SD-07 Certificates

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

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

Confined space entry permits.

Text of posted operating instructions.

SD-08 Manufacturer's Instructions

The Manufacturer’s Instructions include the pre-printed material describing the installation of a product, system or material, including special notices and Safety Data Sheets concerning impedances, hazards and safety precautions.

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, manufacturer's help and product lines necessary to maintain and install equipment. 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, 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. Submit the following in accordance with this section.

SD-01 Preconstruction Submittals

Submittal Register; G

SD-02 Shop Drawings

Submittal register; G

SD-03 Product Data

Submittal register; G

SD-04 Samples

Submittal register; G

SD-05 Design Data

Submittal register; G

SD-06 Test Reports

Submittal register; G

SD-07 Certificates

Submittal register; G

SD-08 Manufacturer's Instructions

Submittal register; G

SD-11 Closeout Submittals

Submittal register; G

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."

1.4.2 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 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.

1.6 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.

1.6.1 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 which results in lower cost, consider submission of the variation as a Value Engineering Change Proposal (VECP).

Specifically point out variations from contract requirements in transmittal letters. Failure to point out deviations may result in the Government requiring rejection and removal of such work.

1.6.2 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, which 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.

1.6.3 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.

1.6.4 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.

1.7 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 Attachment A. This list may not be all inclusive and additional submittals may be required. Maintain a submittal register for the project in accordance with Section 01 45 00.15 10 QUALITY CONTROL SYSTEM (QCS).

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

Columns (E) & (F): Lists each submittal description (SD No. and type, e.g., SD-02 Shop Drawings) required in each specification section.

Column (H): 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 (H) 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.

1.7.1 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 (B) Activity Number: Activity number from the project schedule.

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

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

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

1.7.2 Contractor Use of Submittal Register

Update the following fields with each submittal throughout contract.

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

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

Column (O) List date of submittal transmission.

Column (Q) List date approval received.

1.7.3 Approving Authority Use of Submittal Register

Update the following fields.

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

Column (Q) List date of submittal receipt.

Column (R) through (S) List Date related to review actions.

Column (T) List date returned to Contractor.

1.7.4 Government Review Action Codes

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

"A" - "Approved as submitted"; "Completed"

"B" - "Approved, except as noted on drawings"; "Completed"

"C" - "Approved, resubmission required"; "Resubmit"

"D" - "Returned by correspondence"; "Completed"

"E" - "Disapproved (See attached)"; "Resubmit"

"F" - "Receipt acknowledged"; "Completed"

"G" - "Other (Specify)"; "Resubmit"

"X" - "Receipt acknowledged, does not comply"; "Resubmit"

1.7.5 Copies Delivered to the Government

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

1.8 SCHEDULING

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

a. Coordinate scheduling, sequencing, preparing and processing of submittals with performance of work so that work will not be delayed by submittal processing. Allow for potential resubmittal of requirements.

b. Submittals called for by the contract documents will be listed on the register. If a submittal is called for but does not pertain to the contract work, the Contractor is to include the submittal in the register and annotate it "N/A" with a brief explanation. Approval by the Contracting Officer does not relieve the Contractor of supplying

submittals required by the contract documents but which have been omitted from the register or marked "N/A."

c. Re-submit register and annotate monthly by the Contractor with actual submission and approval dates. When all items on the register have been fully approved, no further re-submittal is required.

d. Carefully control procurement operations to ensure that each individual submittal is made on or before the Contractor scheduled submittal date shown on the approved "Submittal Register."

1.9 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. Four copies of the approved submittal will be retained by the Contracting Officer and one copy of the submittal will be returned to the Contractor. If the Government performs a conformance review of other Designer of Record approved submittals, the submittals will be so identified and returned, as described above.

1.10 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 construction 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.

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

1.11 APPROVED/ACCEPTED 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.

1.12 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, upon completion of the contract. Samples not approved will also be returned to the Contractor, 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 shall replace 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.

1.13 WITHHOLDING OF PAYMENT

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

1.14 STAMPS

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

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

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

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

-- End of Section --

TITLE: Ellis Property Superfund Site
JOB NAME:
LOCATION:
CONTRACT NO:
CONTRACTOR:

SUBMITTAL REGISTER

									CONTRACTOR SCHEDULE			CONTRACTOR ACTION			APPROVING AUTHORITY					
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
Line	Act-ivity #	Trans-mittal #	Specification Section	SD #	SD Description	Item Submitted	Paragraph #	Classi-fication: GOVT or A/E Revwr	Submit	Approval Needed By	Material Needed By	Action Code	Date Of Action	Date FWD to APPR / Auth - Date RCD From CONTR	Date FWD To Other Revwr	Date RCD From Other Revwr	Action Code	Date Of Action	Mailed To CONTR/ Date RCD From APPR Authority	Remarks
1			01 11 10	2	Drawings	Initial Site Drawings	1.2	G												
2			01 11 10	2	Drawings	Final Excavation Drawing	1.2	G												
3			01 11 10	2	Drawings	Record Drawing	1.2	G												
4			01 11 10	2	Drawings	Survey Maps and Notes	1.2	G												
5			01 11 10	7	Certificates	Surveyor Elevation/ Location Certificates	1.2	G												
6			01 11 10	7	Certificates	Surveyor Quantities Certification	1.2	G												
7			01 11 10	11	Closeout Submittals	Surveyor Field Notes Data	1.2	G												
8			01 11 10	11	Closeout Submittals	Surveyor In-Place Volume Calculations	1.2	G												
9			01 11 50	1	Pre-Construction Submittals	Decontamination Plan	1.2	G												
10			01 12 00	1	Pre-Construction Submittals	Air Monitoring Plan	1.3	G												
11			01 12 00	6	Test Reports	Air Monitoring Data	1.3	G												
12			01 20 20	1	Pre-Construction Submittals	Project Submittal Schedule	1.2	G												
13			01 20 20	6	Test Reports	Monthly Progress Report	1.2	G												
14			01 20 20	6	Test Reports	Conference Meeting Minutes	1.2	G												
15			01 30 00	1	Pre-Construction Submittals	View Location Map	1.2	G												
16			01 30 00	1	Pre-Construction Submittals	Preconstruction Video	1.2	G												
17			01 30 00	6	Test Reports	Progress pictures	1.2	G												
18			01 30 00	11	Closeout Submittals	Post Construction Video	1.2	G												
19			01 30 00	11	Closeout Submittals	Completion Pictures	1.2	G												
20			01 32 01.00 10	1	Pre-Construction Submittals	Project Scheduler Qualifications	1.3	G												
21			01 32 01.00 10	1	Pre-Construction Submittals	Preliminary Project Schedule	1.3	G												
22			01 32 01.00 10	1	Pre-Construction Submittals	Initial Project Schedule	1.3	G												
23			01 32 01.00 10	3	Product Data	Periodic Schedule Update	1.3	G												
24			01 35 29.13	1	Pre-Construction Submittals	APP/ SSHP	1.4													
25			01 35 29.13	2	Shop Drawings	Work Zones	1.4	G												
26			01 35 29.13	6	Test Reports	Exposure Monitoring/ Air Sampling Program	1.4													
27			01 35 29.13	6	Test Reports	Site Control Log	1.4													
28			01 35 29.13	6	Test Reports	Employee Certificaties	1.4													
29			01 35 45.00 10	1	Pre-Construction Submittals	UFP-QAPP	1.5	G												
30			01 35 45.00 10	6	Test Reports	Chemistry Data Package	1.5													
31			01 35 45.00 10	6	Test Reports	Chemical Data Final Reports	1.5	G												
32			01 45 00.00 10	1	Pre-Construction Submittals	Contractor Quality Control (CQC) Plan	1.3	G												
33			01 50 00	1	Pre-Construction Submittals	Temporary Site Facilities Layout Plan	1.3	G												
34			01 50 00	1	Pre-Construction Submittals	Trailer's Floor Plan	1.3	G												
35			01 50 00	1	Pre-Construction Submittals	Electrical Supply and Lighting Shop Drawings	1.3	G												
36			01 50 00	1	Pre-Construction Submittals	Water Supply, Contaminated Washwater Handling and Sanitary Facilities	1.3	G												
37			01 50 00	1	Pre-Construction Submittals	Traffic Control Plan	1.3	G												
38			01 54 00	1	Pre-Construction Submittals	Site Security Plan	1.2	G												
39			01 54 00	6	Test Reports	Visitor Logs (weekly)	1.2													
40			01 57 19.00 20	1	Pre-Construction Submittals	Regulatory Notifications	1.4	G												
41			01 57 19.00 20	1	Pre-Construction Submittals	Contractor Hazardous Material Inventory Log	1.4	G												
42			01 57 19.00 20	1	Pre-Construction Submittals	Waste water treatment design calculations and schematic	1.4	G												
43			01 57 19.00 20	1	Pre-Construction Submittals	Waste water treatment system operator qualifications	1.4	G												
44			01 57 19.00 20	1	Pre-Construction Submittals	Solid Waste Management Plan and Permit	1.4	G												
45			01 57 19.00 20	1	Pre-Construction Submittals	Environmental Protection Plan	1.4	G												
46			01 57 19.00 20	6	Test Reports	Erosion and Sediment Control Inspection Reports	1.4													
47			01 57 19.00 20	6	Test Reports	Storm Water Inspection Reports for General Permit	1.4													
48			01 57 19.00 20	11	Closeout Submittals	Storm Water Pollution Prevention Plan compliance notebook	1.4	G												
49			01 57 19.00 20	11	Closeout Submittals	Hazardous Waste / Debris Management	1.4													
50			01 57 23	1	Pre-Construction Submittals	Erosion and Sediment Control Plan	1.3													
51			01 57 23	6	Test Reports	Storm Water Inspection Reports for General Permit	1.3													
52			01 57 23	7	Certificates	Mill Certificate or Affidavit	1.3													
53			01 78 00	11	Closeout Submittals	Remedial Closeout Package	1.3	G												
54			01 78 00	11	Closeout Submittals	Interim Form DD1354	1.3	G												
55			01 78 00	11	Closeout Submittals	Checklist for Form DD1354	1.3	G												
56			02 81 00	1	Pre-Construction Submittals	Waste Management Plan	1.4	G												
57			02 81 00	3	Product Data	Notices of Non-Compliance and Notices of Violation	1.4													
58			02 81 00	3	Product Data	Packaging Notifications	1.4													
59			02 81 00	6	Test Reports	Recordkeeping	1.4	G												
60			02 81 00	6	Test Reports	Spill Response	1.4													
61			02 81 00	6	Test Reports	Exception Report	1.4	G												
62			02 81 00	7	Certificates	Certification	1.4													
63			02 81 00	7	Certificates	Transportation and Disposal Coordinator	1.34	G												
64			02 81 00	7	Certificates	Training	1.4	G												
65			02 81 00	7	Certificates	EPA Offsite Policy	1.4													
66			02 81 00	7	Certificates	Certificates of Disposal	1.4													
67			02 81 00	7	Certificates	Shipping Documents and Packaginings Certification	1.4	G												
68			02 81 00	7	Certificates	Waste Minimization	1.4													
69			31 11 00	3	Product Data	Non-saleable Materials	1.2	G												
70			31 11 00	4	Samples	Herbicide	1.2													
71			31 23 00.00 20	1	Pre-Construction Submittals	Site Operations and Excavation Plan	1.4	G												
72			31 23 00.00 20	6	Test Reports	Borrow Site Testing	1.4	G												
73			31 23 00.00 20	6	Test Reports	Density tests	1.4													
74			31 23 00.00 20	6	Test Reports	Confirmation Sampling and Analysis	1.4	G												
75			31 23 00.00 20	6	Test Reports	Sampling of Stored Material	1.4	G												
76			31 23 00.00 20	6	Test Reports	Sampling Liquid	1.4	G												
77			31 23 00.00 20	7	Certificates	Clean Fill Certification	1.4													
78			31 23 00.00 20	11	Closeout Submittals	Excavation Completion Information	1.4													
79			31 41 16	1	Pre-Construction Submittals	Metal Sheet Pile Installation Work Plan	1.3	G												
80			31 41 16	2	Shop Drawings	Metal Sheet Piling	1.3	G												
81			31 41 16	3	Product Data	Driving	1.3													
82			31 41 16	3	Product Data	Pile Driving Equipment	1.3	G												
83			31 41 16	3	Product Data	Pulling and Redriving	1.3	G												
84			31 41 16	3	Product Data	Installer Qualifications	1.3	G												
85			31 41 16	3	Product Data	Interlocked Joint Strength in Tension Procedures	1.3	G												
86			31 41 16	3	Product Data	Interlock Sealant	1.3	G												
87			31 41 16	6	Test Reports	Materials Tests	1.3													
88			31 41 16	6	Test Reports	Interlocked Joint Strength in Tension test	1.3													
89			31 41 16	11	Closeout Submittals	Pile Driving Record	1.3													
90			31 41 16	11	Closeout Submittals	Post Construction Survey	1.3													
91			32 92 19	3	Product Data	Wood cellulose fiber mulch	1.4													
92			32 92 19	3	Product Data	Fertilizer	1.4													
93			32 92 19	6	Test Reports	Topsoil composition tests	1.4													
94			32 92 19	7	Certificates	State cerftification and approval for seed	1.4													

TITLE:	Ellis Property Superfund Site
JOB NAME:	
LOCATION:	
CONTRACT NO:	
CONTRACTOR:	

SUBMITTAL REGISTER

									CONTRACTOR SCHEDULE			CONTRACTOR ACTION			APPROVING AUTHORITY					
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
Line	Act-ivity #	Trans-mittal #	Specification Section	SD #	SD Description	Item Submitted	Paragraph #	Classi-fication: GOVT or A/E Revwr	Submit	Approval Needed By	Material Needed By	Action Code	Date Of Action	Date FWD to APPR / Auth - Date RCD From CONTR	Date FWD To Other Revwr	Date RCD From Other Revwr	Action Code	Date Of Action	Mailed To CONTR/ Date RCD From APPR Authority	Remarks
95			33 11 00	3	Product Data	Manufacturer's Data Sheets/ Specifications for Piping, Fittings, and backflow preventer	1.4													
96			33 11 00	5	Design Data	Design calculations for piping	1.4													
97			33 11 00	6	Test Reports	Backflow Preventer Tests	1.4	G												
98			33 11 00	6	Test Reports	Hydrostatic Test Results	1.4													
99			33 11 00	6	Test Reports	Leakage Test Results	1.4													
100			33 11 00	7	Certificates	Backflow Prevention Training Certificate	1.4													
101			33 11 00	7	Certificates	Backflow Tester Certification	1.4													
102			33 11 00	7	Certificates	Backflow Certificate	1.4													
103			33 11 00	8	Manufacturer's Instructions	Delivery, storage, and handling	1.4													
104			33 11 00	8	Manufacturer's Instructions	Installation procedures for piping	1.4													
105			33 24 13	3	Product Data	Well Decommissioning/ Abandonment Records	1.3	G												
106			33 24 13	3	Product Data	Qualifications	1.3	G												
107			33 24 13	3	Product Data	Permits	1.3	G												
108			33 71 02	2	Shop Drawings	Aluminum Conductors	1.4	G												
109			33 71 02	3	Product Data	Sealing Material	1.4													
110			33 71 02	6	Test Reports	Field Acceptance Checks and Tests	1.4	G												
111			33 71 02	6	Test Reports	Cable Installation Plan and Procedures	1.4	G												
112			33 71 02	7	Certificates	Cable splicer/terminator	1.4	G												
113			33 71 02	7	Certificates	Cable Installer Qualifications	1.4	G												

SECTION 01 35 29.13

HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES FOR CONTAMINATED SITES

PART 1 GENERAL

1.1 SUMMARY

This section provides requirements for implementing practices and procedures for working safely and in compliance with the regulations and guidelines listed below, while performing remedial activities at the Site.

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.

AMERICAN SOCIETY OF SAFETY ENGINEERS (ASSE/SAFE)

ASSE/SAFE Z359.0	(2012) Definitions and Nomenclature Used for Fall Protection and Fall Arrest
ASSE/SAFE Z359.1	(2016) The Fall Protection Code
ASSE/SAFE Z359.2	(2017) Minimum Requirements for a Comprehensive Managed Fall Protection Program
ASSE/SAFE Z359.3	(2017) Safety Requirements for Lanyards and Positioning Lanyards
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	(2011) Qualification and Verification Testing of Fall Protection Products
ASSE/SAFE Z359.11	(2014) Safety Requirements for Full Body Harnesses
ASSE/SAFE Z359.12	(2009) 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

ASTM INTERNATIONAL (ASTM)

ASTM F855	(2015) 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	(2003) Guide for Protective Grounding of Power Lines

INTERNATIONAL SAFETY EQUIPMENT ASSOCIATION (ISEA)

ANSI/ISEA Z358.1	(2009) American National Standard for Emergency Eyewash and Shower Equipment

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(2017; ERTA 1-2 2017; TIA 17-1; TIA 17-2; TIA 17-3; TIA 17-4; TIA 17-5; TIA 17-6; TIA 17-7; TIA 17-8; TIA 17-9; TIA 17-10; TIA 17-11; TIA 17-12; TIA 17-13; TIA 17-14) National Electrical Code
NFPA 70E	(2018; TIA 18-1; TIA 81-2) Standard for Electrical Safety in the Workplace

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 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 1910.147	The Control of Hazardous Energy (Lock Out/Tag Out)
29 CFR 1926	Safety and Health Regulations for Construction

29 CFR 1926.65	Hazardous Waste Operations and Emergency Response

1.3 DESCRIPTION OF WORK

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

1.4 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/Site Safety and Health Plan AAP/SSHP;

SD-02 Shop Drawings

Work Zones; G

SD-06 Test Reports

Exposure Monitoring/Air Sampling Program
Site Control Log
Employee Certificates

1.5 REGULATORY REQUIREMENTS

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

1.6 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.

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

Develop and implement a Site Safety and Health Plan and attach to the Accident Prevention Plan (APP) as an appendix (APP/SSHP). Address all occupational safety and health hazards (traditional construction as well as

contaminant-related hazards) associated with cleanup operations within the APP/SSHP. Cover each SSHP element in section 28.A.01 of EM 385-1-1 and each APP element in Appendix A of EM 385-1-1. There are overlapping elements in Section 28.A.01 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 is a dynamic document, subject to change as project operations/execution change. The APP/SSHP will require modification to address changing and previously unidentified health and safety conditions. It is the Contractor's responsibility to ensure that the APP/SSHP is updated accordingly. Submit amendments to the APP/SSHP to the COR as the APP/SSHP is updated. For long duration projects resubmit the APP/SSHP to the COR annually for review. The APP/SSHP must contain all updates.

1.7.1 Acceptance and Modifications

Prior to submittal, the APP/SSHP must be signed and dated by a Qualified Person (CIH, CHP or CSP), approved by company/corporate officers authorized to obligate the company; and also indicate occurrence by appropriate and responsible project personnel (e.g. Chief of Operations, Corporate Chief of Safety, Corporate Industrial Hygienist, project manager or superintendent, project safety professional, project QC). Submit for review 21 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 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.

1.7.2 Availability

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

1.8 SITE DESCRIPTION AND CONTAMINATION CHARACTERIZATION

1.8.1 Project/Site Conditions

Refer to the following reports and information for the site description and contamination characterization. They are located at the United States Environmental Protection Agency, Region 2 - Superfund Records Center 290 Broadway, 18th Floor, New York, NY 10007. Contact EPA to make an appointment.

1.8.1.1 CERCLA Documents

Preliminary PDI Results Report, November 2007
Focused Feasibility Study Report, June 2013

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

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

1.10 STAFF ORGANIZATION, QUALIFICATION AND RESPONSIBILITIES

1.10.1 Safety and Health Manager

Safety and Health Manager, dependent upon the contaminant related hazards on the project, shall be a Certified Industrial Hygienist (CIH), Certified Safety Professional (CSP) or Certified Health Physicist (CHP).

1.10.1.1 Additional Qualifications

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

a. A minimum of 3 years experience in developing and implementing safety and health programs at hazardous waste sites.

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

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

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

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

1.10.1.2 Responsibilities and Duties

The Safety and Health Manager shall:

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

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

c. Conduct initial site-specific training.

d. Be available for consultation during the first 3 days 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 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.

1.10.2 Additional Certified Health and Safety Support Personnel

Retain safety support from a safety professional certified by the Board of Certified Safety professionals to develop written occupational safety procedures for the APP/SSHP and, when necessary, visit the site to help implement APP/SSHP requirements.

1.10.3 Site Safety and Health Officer

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

1.10.3.1 Qualifications

The SSHO shall meet the following qualifications:

a. A minimum of 1 year experience in implementing safety and health programs at hazardous waste sites.

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

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

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

1.10.3.2 Responsibilities and Duties

The Site Safety and Health Officer shall:

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

b. Be assigned to the site on a full-time basis for the duration of field activities. The SSHO can have collateral duties in addition to Safety and Health related duties. If operations are performed during more than 1 work shift per day, a site Safety and Health Officer must be present for each shift.

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

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

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

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

g. Conduct accident investigations and prepare accident reports. Maintain OSHA Form 300 for prime and sub-contractors.

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

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

Failure to perform the above duties will result in dismissal of the SSHO and a project work stoppage. The project work stoppage will remain in effect pending approval of a suitable replacement.

1.10.4 Persons Certified in First Aid and CPR

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

1.10.5 Safety and Health Technicians

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

1.11 TRAINING

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

1.11.1 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).

1.11.2 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 28.D.03 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 or their representative involved in the project may attend.

1.11.3 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.

1.12 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

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

Level D	Hard hat, safety glasses with side shields, steel toed/steel shank and high ankle work boots

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

Provide 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. Monitor for the following gasses and vapors Volatile Organic Compounds (VOCs).

1.15 HEAT STRESS MONITORING AND MANAGEMENT

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

1.16 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 is threatened, the National Response Center, the State, and the Contracting Officer must be notified as soon as possible.

1.17 FIRE PROTECTION AND PREVENTION

The Contractor shall develop a fire prevention plan in accordance with NFPA 241 and Section 9 of EM 385-1-1. The Fire Prevention Plan shall be included in the Contractor’s SSHP and include as a minimum the following information:

1) List of major project site fire hazards;
2) Potential ignition sources;
3) Types of fire suppression equipment appropriate to control the fire;
4) Assignments of responsibilities for maintaining the fire control equipment;
5) Personnel responsible for controlling the fuel source hazards; and
6) Housekeeping procedures, including removal of waste materials.

1.18 ELECTRICAL SAFETY

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

1.18.1 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.

1.18.2 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 and Federal requirements applicable to where work is being performed.

1.18.3 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.

1.18.4 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.

1.18.5 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.

1.19 EXCAVATION AND TRENCH SAFETY

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

1.19.1 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.

1.19.2 Utility Location Verification

Physically verify underground utility locations, including utility depth, by hand digging using wood or fiberglass handled tools when any adjacent construction work is expected to come within 3 feet of the underground system.

1.19.3 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.

1.20 FALL PROTECTION

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.

1.20.1 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.

1.20.2 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.

1.20.2.1 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.

1.20.2.2 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.

1.20.3 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.

1.20.4 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.

1.20.5 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.

1.21 HAZARD COMMUNICATION PROGRAM

If there are hazardous or toxic agents (any chemical which is a physical/health hazard) are present, stored or used at the project site the Contractor shall prepare a written Hazard Communication Program in accordance with 29 CFR 1910.1200. The program shall be included in the Contractors SSHP and address the following project specific details.

1.21.1 Chemical Inventory

A list of chemicals shall be provided with:

1) Explanation of how the chemicals are to be used at the project,
2) For emergency response purposes, approximate quantities that are on site or will be on site at any one given time shall be provided for each material, and
3) A site map showing where the inventoried chemicals are stored.

The inventory and map shall be updated whenever there is a change in the chemical inventory.

1.21.2 Labeling

Procedures for assuring that containers used to store or transport hazardous or toxic chemicals around the project site are appropriately labeled to communicate the physical and health hazards associated with the agents in the containers.

1.21.3 Safety Data Sheets (SDS) Management

Procedures to ensure SDSs are maintained at the project site for each chemical, combustible dust, or product. The SDS shall meet the OSHA globally harmonized system standard.

1.21.4 Employee Information and Training

Procedures to ensure employees are trained initially and periodically when use of hazardous or toxic chemicals is altered or modified to accommodate changing on-site work procedures. Training shall be provided to employees working with or in the area of use of any potentially hazardous chemical.

1.22 ILLUMINATION

The Contractor shall provide proper illumination of work spaces and the project site. A review of lighting shall be evaluated as part of the activity hazard analysis (AHA). Minimum lighting requirements shall be in accordance with Section 7 of EM 385-1-1.

1.23 SANITATION

The Contractor shall establish and maintain hygienic sanitation provisions for the duration of the contract. Provisions for sanitation shall be discussed in the Contractors SSHP and shall include provisions for good housekeeping, toilet facilities, washing facilities, and waste disposal

1.24 SITE CONTROL MEASURES

1.24.1 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:

1.24.1.1 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.

1.24.1.2 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.

1.24.1.3 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.

1.24.2 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.

1.24.3 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.

1.24.4 Site Security

Provide site security in accordance with Section 01 54 00 - SECURITY PLAN. 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.

1.25 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.

1.25.1 Decontamination Facilities

Submit drawings showing the layout of the personnel and equipment decontamination facilities.

1.25.2 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.

1.25.3 Equipment Decontamination

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

1.25.3.1 Facilities for Equipment and Personnel

Provide an equipment 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 dry decontamination using a broom to remove dry/loose spilled materials on accessible surfaces and a steam cleaning or high pressure, low volume wash water system for use after the mud and/or site material has been cleaned from the equipment. 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.

1.25.3.2 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 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.

1.26 EMERGENCY EQUIPMENT AND FIRST AID REQUIREMENTS

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

a. First aid equipment and supplies approved by the consulting physician.

b. Emergency eyewashes and showers that comply with ANSI/ISEA Z358.1.

c. Emergency-use respirators. For escape purposes, supply 5- to 15-minute emergency escape masks.

d. Provide fire extinguishers of sufficient size and type at site facilities and in all vehicles and at any other site locations where flammable or combustible materials present a fire risk.

1.27 EMERGENCY RESPONSE AND CONTINGENCY PROCEDURES

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

a. Pre-emergency planning. Coordinate with local emergency response providers during preparation of the Emergency Response Plan. At a minimum, coordinate with local fire, rescue, hazardous materials response teams, police and emergency medical providers to assure all organizations are capable and willing to respond to and provide services for on-site emergencies. Ensure the Emergency Response Plan for the site is compatible and integrated with the local fire, rescue, medical and police security services available from local emergency response planning agencies.

b. Personnel roles, lines of authority, communications for emergencies.

c. Emergency recognition and prevention.

d. Site topography, layout, and prevailing weather conditions.

e. Criteria and procedures for site evacuation (emergency alerting procedures, employee alarm system, emergency PPE and equipment, safe distances, places of refuge, evacuation routes, site security and control).

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

g. Route maps to nearest 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.

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

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

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

(1) Name, organization, telephone number, and location of the Contractor.

(2) Name and title of the person(s) reporting.

(3) Date and time of the incident.

(4) Location of the incident, i.e., site location, facility name.

(5) Brief summary of the incident giving pertinent details including type of operation ongoing at the time of the incident.

(6) Cause of the incident, if known.

(7) Casualties (fatalities, disabling injuries).

(8) Details of any existing chemical hazard or contamination.

(9) Estimated property damage, if applicable.

(10) Nature of damage, effect on contract schedule.

(11) Action taken to ensure safety and security.

(12) Other damage or injuries sustained, public or private.

1.28 CERTIFICATE OF WORKER/VISITOR ACKNOWLEDGEMENT

A copy of a Contractor-generated certificate of worker/visitor acknowledgement must be completed and submitted for each visitor allowed to enter contamination reduction or exclusion zones, and for each employee, following the Example Certificate Of Worker/Visitor Acknowledgement at the end of this section.

1.29 INSPECTIONS

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

1.30 SAFETY AND HEALTH PHASE-OUT REPORT

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

a. Summary of the overall performance of safety and health (accidents or incidents including near misses, unusual events, lessons learned, etc.).

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

Not Used

PART 3 EXECUTION

Not Used

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 --

SECTION 01 35 45.00 10

CHEMICAL DATA QUALITY CONTROL

PART 1 GENERAL

1.1 SUMMARY

This section covers requirements for the Contractor's chemical data quality control, sampling, testing, and measurements applicable to the remedial action. This Section shall be used in the preparation of a Uniform Federal Policy for Quality Assurance Project Plan (UFP-QAPP), monitoring of subcontract laboratory performance, data validation, data reporting, and preparation of chemical data final report, as defined in this section. The UFP-QAPP shall contain the necessary technical detail and directions for all sampling and field measurements and specifies all quality assurance (QA) and quality control (QC) procedures required for planning, implementation and assessment of the remedial action.

Field measurements and laboratory analytical samples shall be collected by the Contractor and will include:

a. Post excavation sampling to verify compliance with remedial action goals;
b. Air monitoring;
c. Groundwater samples to verify permit compliance for the temporary groundwater treatment system;
d. Characterization of backfill materials; and
e. Waste characterization sampling.

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.

NEW JERSEY ADMINISTRATIVE CODE (NJAC)

NJAC 7:26D	Remediation Standards
NJAC 7:26E	Technical Requirements for Site Remediation

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 200-1-6	(1997) Environmental Quality -- Chemical Quality Assurance for HTRW Projects

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA 240/B-06/001	(2006) Guidance on Systematic Planning Using the Data Quality Objectives Process
EPA 540/P-87/001	(1987) A Compendium of Superfund Field Operations Methods
EPA 540-R-014-013	(2015) Sampler's Guide: Contract Laboratory Program Guidance for Field Samplers

EPA 540-R-10-011	(2010) USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review
EPA 540-R-08-01	USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review
EPA 402-B-04-001A	(2004) Multi-Agency Radiological Laboratory Analytical Protocols Manual(MARLAP) Part I: Chapters 1 - 9, Appendices A - E, (Volume I)
EPA SW-846	(Third Edition; Update IV) Test Methods for Evaluating Solid Waste: Physical/Chemical Methods

Intergovernmental Data Quality Task Force (IDQTF)

IDQTF	(2012) Uniform Federal Policy for Quality Assurance Project Plans. Optimized UFP-QAPP Worksheets

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

40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 268	Land Disposal Restrictions
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
49 CFR 178	Specifications for Packagings

1.3 ACRONYMS

The definition of acronyms used by the Contractor that pertain to chemical data quality control shall be clearly defined for all contract related products and communications.

1.4 CHEMISTRY REQUIREMENTS

Chemical Data Quality Control (CDQC) shall be as defined by EM 200-1-6 for detail technical guidance on CDQC.

1.4.1 Data Quality Objectives (DQO)

1.4.1.1 Project Objective

The EPA issued a Record of Decision (ROD) Amendment in September 2013. The ROD Amendment required the excavation and off-site disposal of TCE

contaminated soil in the residual source area along with implementation of in-situ treatment where appropriate to complement the excavation. The purpose for this project is the implement the excavation and off-site disposal portion of the remedy.

1.4.1.2 Sampling Objectives

Samples shall be acquired and analyzed in such a manner that the resulting data meets and supports data use requirements. Both definitive and field screening data are anticipated for this project, as defined by the USEPA Guidance for Systematic Planning (EPA 240/B-06/001) and the USACE Chemical QA for HTRW Projects (EM 200-1-6). Field screening quality data shall be generated for health and safety purposes which can be used to identify media or samples that may be subject to further analysis. Definitive level quality data shall be used to confirm limits of contamination; characterize waste; demonstrate imported backfill quality; and verify that the treated water meets discharge limits for surface water. Definitive quality data shall be acquired, documented, verified and reported to ensure that the specified data quality indicators' (DQIs) (precision, accuracy, completeness, comparability and representativeness) measurement performance requirements are achieved. Sampling objectives will be discussed in detail to ensure that the data obtained will be of sufficient quality and quantity to meet the DQOs. The sampling objectives to be contained in the Contractor's UFP-QAPP shall include specific disposal facility requirements for sampling, analysis and reporting.

a) Confirmatory analytical samples: Confirmation samples shall be analyzed for VOCs. The analytical results obtained by the Contractor should be sufficient to document that the limits of excavation have been achieved as described in Section 31 23 00.00 20 EXCAVATION AND FILL and the Drawings.

b) Waste disposal characterization samples (solid): Waste disposal characterization samples from excavated soil shall be analyzed in accordance with disposal facility sampling requirements. The analytical results obtained by the Contractor shall be sufficient to address any and all requirements of the selected disposal facility.

c) Waste disposal characterization samples (water): Waste disposal characterization samples from dewatering and decontamination operations. The analytical results obtained by the Contractor shall be sufficient to address any and all requirements of the selected disposal facility.

d) Samples of imported backfill from each offsite source shall be collected and analyzed for the parameters listed in Table 1. Sample data shall be sufficient to demonstrate that backfill materials do not contain contaminants that are hazardous to human health or the environment or exceed limits established for the site. Material delivered to the site shall meet the definition provided in NJAC 7:26E -1.8. The Contractor shall compare sample data against available site background data and/or NJAC 7:26D, NJDEP Soil Cleanup Standard. The data will be compared to the most stringent NJDEP soil cleanup standard, which will be the lowest value for each listed compound from either Table 1A-Residential Direct Contact Health Based Criteria and Soil Remediation Standards (mg/kg) or Table 1B-Non-Residential Direct Health Based Criteria and Soil Remediation Standards (mg/kg), where those numbers are not below background or method detection limits. No

backfill shall be brought to the site without written approval from the Contracting Officer.

e) Performance samples from the temporary on-site water treatment system used to treatment dewatering and decontamination fluids, shall be collected and analyzed to monitor treatment plant performance and refine operating procedures as described in Sections 01 35 45.00 10 CHEMICAL DATA QUALITY CONTROL AND 01 57 19.00 20 TEMPORARY ENVIRONMENTAL CONTROLS. Compliance samples (Table 1) shall be collected and analyzed to monitor the effectiveness of the treatment and compliance with the applicable permit limits. The sampling objectives to be contained in the contractor's UFP-QAPP shall include effluent limits for all compounds required under applicable permit equivalency.

1.4.1.3 Chemical DQO

Chemical data shall be acquired, documented, verified and reported in a manner that assures that the precision, accuracy, and completeness requirements provided in Table 2 are achieved. The UFP-QAPP shall comply with the DQO process requirements as specified in EPA 240/B-06/001.

1.4.2 Sampling, Analysis, and Measurement

The requirements that are listed in the following subsections shall be included in the UFP-QAPP.

1.4.2.1 Waste Disposal Characterization Samples

a. Samples from excess soil excavated during construction shall be collected and analyzed in accordance with Contractor's approved disposal facility requirements. Samples shall be analyzed for waste characteristics to determine handling, transportation and disposal requirements. The number and volume of samples are determined by disposal facility. The analytes are listed in Table 1. The Contractor shall ensure that all the disposal facility requirements are met prior to shipment of the waste.

b. Samples from water treatment activities shall be collected and analyzed in accordance with Contractor's approved disposal requirements. Samples shall be analyzed for waste characteristics to determine handling, transportation and disposal requirements. The minimum required analytes are listed in Table 1. The Contractor shall ensure that all the disposal facility requirements are met prior to shipment of the waste.

c. Material shipping manifesting shall be in accordance with 40 CFR 26, 40 CFR 262, 40 CFR 268, 49 CFR 172, and 49 CFR 178. Manifesting samples shall be collected and analyzed according to Table 1.

1.4.2.2 Fill Material Samples

a. Backfill material samples are to be collected at a frequency stated in Section 31 23 00.00 20 EXCAVATION AND FILL. Analytical methods are included in Tables 1 and 2.

b. Sample data shall be sufficient to demonstrate that backfill materials meet the definition of clean fill per NJAC 7:26E-1.8. The criteria for

backfill to be free of radiological contamination shall be in accordance with NJAC 7:28 Subchapter 12 and is listed below:

1) Radium (Ra-226) less than 3 picoCuries per gram (pCi/g) (assuming background level of 1 pCi/g).
2) Gamma Radiation Exposure Rate equivalent to 15 millirem/year or less than 1.7 microRoentgen per hour (uR/hr).

1.4.2.3 Confirmatory Analytical Samples

Confirmatory Analytical Samples are to be collected and analyzed for VOCs in order to verify the cleanup objective of 1 mg/kg of Trichloroethene (TCE) is met.

1.5 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

Uniform Federal Policy Quality Assurance Project Plan; G

SD-06 Test Reports

Chemistry Data Package

Chemical Data Final Reports; G,

1.6 QUALITY ASSURANCE (QA) / QUALITY CONTROL (QC) ELEMENTS

Follow the QA/QC elements necessary to monitor and ensure the quality of chemical data produced.

1.6.1 Analytical Testing Laboratory

1.6.1.1 General

a. The Contractor shall comply with the Superfund Field and Analytical Services Teaming Advisory Committee (FASTAC) policy in selecting and implementing analytical services for this project. This policy requires use of the tiered decision tree for procuring Superfund analytical services for all non-time critical data collection projects. The decision tree is as follows:

1) Tier 1: EPA Region II Division of Environmental Science and Assessment (DESA) Laboratory including Environmental Services Assessment Team (ESAT) support.

2) Tier 2: National Analytical Services Contract Laboratories Program (CLP).

3) Tier 3: Region Specific Analytical Services (SAS) Contract laboratories.

4) Tier 4: Contractor, Interagency Agreement (IAGs) and Field Contractor Subcontract laboratories.

b. For this project, all data are time critical so a subcontracted lab (i.e., Tier 4) will be used, however, the Contractor shall comply with the following parts of the FASTAC policy.

1) The Contractor shall submit the Analytical Service Request Form (ARF) to EPA Regional Sample Control Center (RSCC) a minimum of two weeks prior to mobilization of the sampling event. The Contractor shall include in the ARF the proposed analytical subcontract laboratory to be used.

2) The ARF shall be submitted to the EPA Region 2 Hazardous Waste Support Branch (HWSB) Sharepoint site. The selected subcontract laboratory shall be approved by the EPA Remedial Project Manager (RPM) and USACE. The Contractor shall provide justification for use of a subcontract laboratory to the EPA RPM along with the ARF indicating the required analyses, turnaround times, special requests, etc. The subcontract laboratory shall meet the certification requirements listed in paragraph 1.6.1.3.

1.6.1.2 Subcontracted Laboratory Analytical Requirements

The Contractor shall provide chemical analyses for all parameters by methods specified in the project specification or UFP-QAPP to achieve the project DQO.

1.6.1.3 Subcontract Laboratory Certification

Environmental laboratory services are to be provided only by laboratories compliant with the most recently published version of the National Environmental Laboratory Accreditation Program (NELAP) accreditation for all appropriate fields-of-testing and certified by the State of New Jersey. Before testing services can be performed by the laboratory, the Contractor shall verify the candidate laboratory's acceptability by reviewing their certifications. NELAP accreditation information is to be provided annually. The laboratory shall notify the Government immediately of change in status of laboratory operations that may affect on-going compliance with these requirements. The USACE/EPA may, at any time, conduct audits (including requests for pertinent data or information) that support an environmental laboratory's self-declaration of compliance with this policy. If the USACE/EPA finds the laboratory is in non-compliance; the Contractor shall utilize alternate, compliant laboratory services until such time as compliance is again demonstrated. Before performing environmental testing, the laboratory shall have access to the approved UFP-QAPP.

1.6.1.4 Subcontract Laboratory Performance

The Contractor shall provide oversight to ensure continued acceptable analytical performance and shall establish a procedure to address data deficiencies noted by review and/or quality control sample results. The Contractor shall provide and implement a mechanism for providing analytical laboratories with the UFP-QAPP, for monitoring analytical performance and for ensuring corrective action procedures are implemented.

1.6.2 Documentation of Sample Collection and Analysis

The Contractor shall submit a trip report to the EPA RSCC within seven days of collection of the final sample in a CLP Case for samples analyzed by a CLP laboratory. The trip report shall include sample locations, dates of collection and shipment, identification of QC samples, and names of laboratories to which samples were submitted. The trip report shall be submitted via the EPA Region 2 HWSB Sharepoint site.

1.6.3 Documentation of Sample Collection and Analysis

The Contractor shall be responsible for the independent data review of the entire primary data set.

1.6.4 Contractor QC Sample Collection and Analysis

Quality control samples shall be collected and analyzed by the Contractor in accordance with EPA's Contract Laboratory Program Guidance for Field Samplers (EPA 540-R-014-013) and other guidance documents and the Contractor's approved UFP-QAPP. Quality control samples shall be collected as described in the Contractor's approved UFP-QAPP. The following summarizes the minimum QC sampling requirements:

1. Field duplicates shall be collected at a rate of at least one per every 20 samples to assess the overall precision of the field sampling technique.

2. One trip blank shall be included with each daily shipment that contains aqueous samples collected for VOC analysis to verify the presence or absence of cross contamination in VOC samples during handling and shipment from the field to the laboratory.

3. One field (equipment/rinsate) blank shall be collected at a frequency of one per decontamination event, not to exceed one per day, for each equipment type and for each sample matrix to assess the effectiveness of equipment decontamination.

4. One cooler temperature indicator or "temperature blank" will be placed in each cooler containing samples (solid and aqueous) for analysis to verify that samples have been maintained at 0 to 6 degrees C (32 to 42.8 degrees F).

5. One matrix spike/spike duplicate or matrix duplicate (MS/MSD or MD) will be collected at a rate of least one per every 20 samples to demonstrate the accuracy of laboratory analysis.

1.6.5 Data Validation

1. The Contractor shall validate analytical data for samples analyzed by the Contractor's subcontract laboratory. The inorganic and organic data shall be evaluated in accordance with EPA Contract Laboratory Program National Functional Guidelines (Inorganic - EPA 540-R-10-011 and Organic - EPA 540-R-08-01). Radionuclide data shall be evaluated in accordance with Multi-Agency Radiological Laboratory Analytical Protocols Manual (MARLAP) Chapter 8, Section 8.5 (EPA 402-B-04-001A). Items listed below shall be assessed as part of the data validation. The data validation criteria shall be consistent with project DQOs and

discussed in the approved UFP-QAPP. The Contractor shall prepare a data validation report, which shall include a summary of the independent data reviewer's findings. The summary shall consist of a table listing each QC result outside of established criteria, the established criteria, and the validation actions. Comments shall be included on how these data affect the validity of analytical results of the samples including data qualifiers used. The data validation report shall include, but not be limited to, the following parameters:

a. Data completeness.
b. Method blank and field blanks.
c. Holding time including sample integrity.
d. Surrogate recovery.
e. Instrument calibration.
f. Matrix spike.
g. Continuing calibration verification.
h. Laboratory and field duplicate results.
i. Laboratory control samples.
j. Verification of sample results.

2. The Contractor shall have the laboratory data validated by an organization independent of the organization generating the data.

1.6.6 Analytical Data

1. Hard Copy: The chemistry data packages shall be re-produced and provided to the Government no later than 4 weeks after receipt of the analytical data package from the subcontract laboratory. The chemistry data package shall contain information to demonstrate that the project's DQOs have been fulfilled.

2. Electronic Data Deliverables:

   a. All laboratory data shall be submitted by the Contractor to EPA in the Staged Electronic Data Deliverable (SEDD) format. Details on the SEDD format are provided in the SEDD Version 5.2 (or most recent version) specification located at: https://www.epa.gov/clp/staged-electronic-data-deliverable-sedd

   b. The Contractor shall prepare and submit to EPA a final EDD for all final sampling results prepared in accordance with the procedures and requirements set forth in the Comprehensive EDD Specification Manual (current edition) and as described at the following website: https://www.epa.gov/superfund/region-2-superfund-electronic-data-submission.

   c. The Contractor shall provide the Government with a copy of the transmittal letter for all EDD submissions, identifying what data were provided in the EDD. The Contractor shall also provide the Government with a copy of the notice from EPA that the EDD submittal was successfully uploaded.

1.7 QUALIFICATIONS

1.7.1 Chemical Quality Control Officer

As a minimum, the Contractor's Chemical Quality Control Officer shall have: a Bachelor's Degree (B.A. or B.S.) degree in Chemistry; three years of experience with Hazardous Toxic and Radioactive Waste (HTRW) Quality Control including hazardous waste manifesting.

The Chemical Quality Control Officer shall ensure that all chemistry related objectives including responsibilities for DQO definitions, sampling and analysis, project requirements for data documentation and validation, and final project reports are attained. The Chemical Quality Control officer need not be present onsite during routine sampling, but shall be available for consultation with Government and Contractor personnel.

1.7.2 Project Chemist

As a minimum, the Contractor's Project Chemist shall have: a Bachelor's Degree (B.A. or B.S.)degree in Chemistry; three years of experience related to investigations, studies, design and remedial actions at HTRW sites; three field seasons experience in calibrating and operating various field monitoring devices; and three years of experience in the operation of an HTRW commercial laboratory with standard analytical chemistry methods common for analyzing soil, water, air and other materials for chemical contamination assessment, including data for hazardous waste manifesting. The Chemist shall be available for consultation with the Contractor's personnel and Government personnel. The Chemist should have general knowledge of remedial process chemistry, fate and transport of organics and inorganics, knowledge of chemical quality control, experience with ADR.NET validation software and staged electronic data deliverables. The Chemist shall be experienced in the sampling and analysis of toxic/hazardous chemicals and radiological contamination in environmental matrices. The Chemist will be required to have advanced expertise (senior level) in chemical data quality management of environmental analytical data. The project chemist shall ensure that all chemistry related goals of the program are attained.

1.7.3 Environmental Sampler

As a minimum, the Contractor's Environmental Sampler shall have: a Bachelor's Degree (B.A. or B.S.) degree in Chemistry, Environmental Science, Engineering, Geology, Hydrology, or a related field; three years of experience in the development and preparation of SAP and work plans; one year of experience in and knowledge of EPA methods for collecting environmental and hazardous waste samples; one year of experience in operation of field screening equipment (e.g., PID, FID). The Environmental Sampler shall collect all onsite samples and perform all field screening tests. The Environmental Sampler shall review the sampling results, and provide recommendations for the Contractor's sampling program. The Environmental Sampler shall be onsite during excavation and stockpiling operations involving contaminated soil.

1.8 COORDINATION MEETING

After the preconstruction conference, before any sampling or testing, the Contractor and the Contracting Officer will meet at the construction site to discuss the CQC Plan and the UFP-QAPP. The coordination meeting will be simultaneous to any CQC coordination meeting required in Section 01 45 00.00 10 CONTRACTOR QUALITY CONTROL unless otherwise indicated or directed. A list of definable features that involve chemical measurements shall be

agreed upon. At a minimum, each matrix (soil, water, air, etc.) shall be a definable work feature. Management of the chemical data quality system including project DQO, project submittals, chemical data documentation, chemical data assessment, required sampling and analysis protocols, and minimum data reporting requirements shall be agreed upon. The meeting will serve to establish an interrelationship between the Contractor's chemical data quality management and Government chemical quality assurance requirements. Minutes of the meeting will be documented by the Contractor and shall be signed by both the Contractor and the Government. The minutes will include any or all unresolved chemical issues along with the conditions for resolution and will become a part of the contract file. There may be occasions when additional conferences may be called by either party to reconfirm mutual understandings, and/or to address deficiencies in the CQC system, or procedures that may require corrective action by the Contractor.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

Provide chemical sample acquisition, sample analysis, instrumental measurements of chemical parameters for chemical data quality control. An effective chemical data quality control system shall be established that meets the requirements for the chemical measurement DQO applicable to the Project. The system shall cover chemical measurements pertaining to and required for Contractor and subcontractor produced chemical data. Control field screening, sampling, and testing in conjunction with remedial activities to meet all DQO; minimize the amount of excavated material requiring temporary storage; prevent dilution of contaminated soils with clean soils; and ensure completion of work within the required time.

3.2 CONTRACTOR QUALITY CONTROL PLAN

3.2.1 Additional Requirements

In addition to the quality control requirements specified in Section 01 45 00.00 10 CONTRACTOR QUALITY CONTROL, the CQC Plan shall incorporate the qualifications, authority and responsibilities of all chemical quality management and support personnel. Chemical measurements including sampling and/or chemical parameter measurement will not be permitted to begin until after production and acceptance of the CQC Plan, and Government approval of the UFP-QAPP.

3.2.2 Chemistry Elements of the CQC Plan

To cover contract related chemical measurements by the Contractor and all subcontractors, the CQC Plan shall include the following as a minimum.

3.2.2.1 Qualifications

Names, education, experience qualifications, authorities, and decision-making responsibilities of all chemical quality management and support personnel. The CQC Plan shall contain a copy of a letter from the project

QC manager designating and authorizing a Chemical Quality Control Officer and chemical quality control organization staff.

3.2.2.2 Authority and Responsibility

A diagram, flow chart, or figure clearly depicting the chemical data quality management and support staff and the authority and responsibility of each for chemical sampling and analysis, procedures for corrective actions, deliverables and submittals, deviations and changes, chemical quality documentation, data validation, minimum data reporting requirements, and DQO for chemical parameter measurement by the Contractor and subcontractors. The contents of this section of the CQC Plan shall be included in the applicable "Project Organization" elements of the UFP-QAPP.

3.3 UNIFORM FEDERAL POLICY QUALITY ASSURANCE PROJECT PLAN

The UFP-QAPP shall describe all chemical parameter measurements for all phases of the remedial action. The Contractor must provide sufficient detail for the project team to obtain data that meets the data quality objectives of the project. The Contractor's developed QAPP shall be in accordance with the UFP-QAPP Manuals referenced in Subpart 1.2 and shall be in the Optimized UFP-QAPP Worksheet format (IDQTF, 2012).

3.3.1 General

The UFP-QAPP shall describe all chemical parameter measurements for all phases of the remedial action. The Contractor must provide sufficient detail for the project team to obtain data that meets the data quality objectives of the project. The Contractor's developed QAPP shall be in accordance with the UFP-QAPP Manuals referenced in Subpart 1.2 and shall be in the Optimized UFP-QAPP Worksheet format (IDQTF, 2012).

3.3.2 Level of Detail

The UFP-QAPP shall contain necessary technical detail and direction such that field and laboratory personnel understand all sampling and field measurement requirements. It shall document all aspects of the project, planning, implementation, assessment, corrective actions and reconciliation of completed tasks with documented planned objectives. It shall contain sufficient direction and detail that onsite personnel can perform all onsite activities required to attain project DQOs, including: collection of samples for offsite chemical analysis, shipment of samples for offsite analyses, and performance of onsite instrumental parameter measurements, data documentation and reporting requirements. The level of detail in the UFP QAPP shall be such that any technically-competent personnel unfamiliar with the Site can follow the plan and perform all required work. It shall contain sufficient direction and detail that analytical laboratory personnel understand the analytical methods required and the project required reporting limits, project data validation and reporting requirements.

3.3.3 Appendices

The Appendices of the UFP-QAPP shall contain all Contractor standard forms, project figures and tables, and SOPs, and all references pertaining to the project requirements included in the UFP-QAPP relating to project DQOs, standard and non-standard measurement method, equivalency data, U.S. Government and regional agency guidance and regulatory documents, existing

site related documents, and other contract related chemical analysis documents. Reference to all applicable SOPs from EPA 540/P-87/001, Compendium of Superfund Field Operations Methods, or Contractor SOPs, where applicable, shall be included.

3.3.4 Content

The UFP-QAPP shall cover, at minimum, the following topics and meet the requirements of the UFP-QAPP Manual:

1. Distribution List.
2. Title and Approval Page.
3. Project Description.
4. Introduction including, Summary of Scope and Objectives, Site History and Contaminants.
5. Existing Site Data Summary-Evaluation of Secondary Data and Use Limitations.
6. Project Description/Problem Definition/ Site Specific Analysis Problems.
7. Project Objectives/Systematic Planning Documentation/Data Quality Objectives.
8. Sampling Design and Rationale.
9. Scope and Objectives.
10. Project Schedule and Timelines.
11. Project Organization and Responsibility.
12. Personnel Responsibilities, Qualifications and Special Training Requirements.
13. Field Activities and Procedures (SOPs).
14. Field and Laboratory QC Samples.
15. Sampling Procedures and Container/Preservation Requirements.
16. Sample Custody, Chain-of-Custody/Sample Documentation.
17. Sample Handling/ Identification.
18. Field Logbooks and Contents; Documentation Procedures.
19. Sample Packaging and Shipping.
20. Equipment Decontamination.
21. Contractor Quality Control.
22. Daily Quality Control Reports.
23. Field Quality Control and Corrective Actions.
24. Sampling Apparatus and Field Instrumentation.
25. Data Quality Objectives and Measurement Performance Criteria.
26. Sample Custody and Holding Times.
27. Analytical Procedures.
28. Reference Limits and Evaluation of Quantization Limit Goals.
29. Laboratory Calibration Procedures and Frequency.
30. Internal QC Checks.
31. Calculation of Data Quality Indicators.
32. Laboratory Corrective Actions.
33. Data Reduction, Review, Validation and Reporting.
34. Laboratory Reporting Requirements.
35. Preventive Maintenance (Field and Laboratory).
36. Performance and System Audits.
37. QC Reports to Management.
38. Appendices.

3.3.5 Table of Contents

The UFP-QAPP shall include a table of contents; crosswalk showing that all UFP-QAPP elements have been addressed; definitions, acronyms, references pertaining to the project, and other related chemical analysis documents such as the data validation SOP for parameters not included in the National Functional Guidelines.

3.3.6 Packing and Shipping

The following procedures shall be followed for sample packing and shipment: Samplers (EPA 540-R-014-013), January 2011.

3.3.7 Regulatory Requirements

All Department of Transportation (DOT) regulations 40 CFR 261, 106 to 179 shall be followed regarding shipment of the samples.

3.4 CHEMISTRY DATA PACKAGE

The chemistry data package shall contain information to demonstrate that the project's DQO have been fulfilled. Content of a data package is defined in EM 200-1-6. The chemistry data package shall be produced and provided to the Government monthly. The QA function will compare QA sample results to corresponding primary sample results, will assess the Contractor's compliance with the UFP-QAPP, and will recommend corrective action as necessary.

3.5 CONTROL OF CHEMICAL DATA QUALITY

3.5.1 General

Contractor chemical data quality control ensures that a quality control program is in place that assures sampling and analytical activities and the resulting chemical parameter measurement data comply with the DQO and the requirements of the UFP-QAPP. Utilize the three-phase control system that includes a preparatory, initial and follow-up phase for each definable feature of work. The Contractor's three-phase chemical data control process shall ensure that data reporting requirements are achieved and shall be implemented according to Section 01 45 00.00 10 CONTRACTOR QUALITY CONTROL. When possible, the three-phase chemical data control process shall be combined with that under Section 01 45 00.00 10 CONTRACTOR QUALITY CONTROL.

3.5.2 Three Phase Chemical Data Control Process

1. The preparatory phase shall include a review of the specification, UFP-QAPP, and all relevant SOPs for the chemical parameter measurement and/or chemical sample acquisition and shipment. It shall include a physical examination of all required forms, materials and equipment to ensure conformance with the UFP-QAPP and that all materials are on site. It shall include a demonstration of sampling procedures by the Contractor's field sampling personnel.

2. The initial phase shall be performed at the initiation of each definable feature of work by the CQC Representative to confirm compliance with the UFP-QAPP, including: instrument calibration, operation and performance checks, sample acquisition, labeling, and shipment in accordance with required SOPs, sampling equipment decontamination, and completion of all required documentation.

3. The follow up phase shall require daily inspections to ensure compliance with the UFP-QAPP.

3.6 ANALYTICAL TESTING LABORATORIES

If DESA or CLP cannot accommodate the analyses, Contractor shall propose the analytical laboratories to be used for the primary samples analyses. Laboratory validation requirements shall be in accordance with paragraph Paragraph 1.6.6 Data Validation. The Contractor may utilize its own laboratory or utilize subcontract laboratories to achieve the primary required sample analyses.

3.6.1 Laboratory Analytical Requirements

Provide the specified chemical analyses by the Contractor's laboratory and /or by subcontractor's laboratory. Provide chemical analyses to achieve the project DQO for all parameters by the methods in the UFP-QAPP. To give the USACE programs the greatest flexibility in the execution of its projects, the EPA SW-846 methods are generally the methods employed for the analytical testing of environmental samples. These methods are flexible and shall be adapted to individual project-specific requirements.

3.6.2 Laboratory Performance

Monitor and ensure continued acceptable analytical performance and establish a procedure to address data deficiencies noted by review and/or quality assurance sample results. Provide and implement a mechanism for providing analytical labs with the UFP-QAPP, for monitoring the lab's performance and for performing corrective action procedures. Acquire analytical services with additional USACE and State of New Jersey validated laboratories in the event a project lab loses its validation status during the project.

3.7 CHEMICAL DATA FINAL REPORT

The Chemical Data Final Report (CDFR) shall be produced including a summary of quality control practices employed and all chemical parameter measurement activities after project completion. As a minimum, the CDFR shall contain the following:

A. Summary of project scope and description.

B. Summary of any deviations from the UFP-QAPP or the design chemical parameter measurement specifications.

C. Summary of chemical parameter measurements performed as contingent measurements.

D. Summary discussion of resulting data including achieving data reporting requirements.

E. Summary of data usability and achievement of project specific DQO based on the results of validation and verification.

F. Presentation and evaluation of the data to include an overall assessment on the quality of the data for each method and matrix.

G. Internal QC data generated during the project, including tabular summaries correlating sample identifiers with all blank, matrix spikes, surrogates, duplicates, laboratory control samples, and batch identifiers.

H. A list of the affected sample results for each analyte (indexed by method and matrix) including the appropriate data qualifier flag (J, B, R, etc.), where sample results are negatively impacted by adverse quality control criteria.

I. Comparison of the USACE QA samples to the corresponding project sample data analyzed by the Subcontract laboratory.

J. Summary of field and laboratory oversight activities, providing a discussion of the reliability of the data, QC problems encountered, and a summary of the evaluation of data quality for each analysis and matrix as indicated by the laboratory QC data and any other relevant findings.

K. Conclusions and recommendations.

L. Appendices containing the chemistry data packages for all subcontract laboratory data and validation reports.

3.8 NOTIFICATION OF NON-COMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. Take immediate corrective action after receipt of such notice.

3.9 SUPPLEMENTARY INFORMATION

The supplements listed below, prior to "End of Section," are provided in Appendix A: Supplementary Information.

1. Table 1: Analytical Methods for Chemical Parameters.
2. Table 2: General Data Quality Objectives for Chemical Parameters.

-- End of Section –

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Table 1. Analytical Methods for Chemical Parameters

Data Use	Media	Parameter	Method		CLP SOW
			Prep/Extraction	Analysis	
Waste Characterization	Solid	TCLP VOCs	SW1311	SW8260	SOW SOM02.4
		TCLP SVOCs	SW1311	SW8270	SOW SOM02.4
		TCLP Metals	SW1311	SW6010, SW7470	SOW ISM02.4
		Corrosivity	See Analytical Method	SW9045	NA
		Ignitability		Pensky Martens	NA
	Water	TCL VOCs	SW5030	SW8260	SOW SOM02.4
		TCL SVOCs	SW3510, SW3520	SW8270	SOW SOM02.4
		TAL Metals (total and dissolved)	SW3010	SW6010/SW6020, SW7470	SOW ISM02.4
		pH	See Analytical Method	SW9045	NA
Imported Backfill	Solid	PCBs	SW3541, SW3550	SW8082	SOW SOM02.4
		TCL VOCs	SW5035	SW8260	SOW SOM02.4
		TCL SVOCs	SW3550	SW8270	SOW SOM02.4
		TAL Metals	SW3050	SW6010, SW7471	SOW ISM02.4
		Cyanide	See Analytical Method	SW9012	SOW ISM02.4
		TCL Pesticides	SW3550	SW8081	SOW SOM02.4
		Radium (Ra-226)	NA	SM7500RaB or equivalent	NA
		Gamma Radiation	NA	DOE-GA-01-R or equivalent	NA
Confirmation Samples	Solid	TCL VOCs	SW5035	SW8260	SOW SOM02.4
Perimeter Air Monitoring	Air	VOCs	See Analytical Method	EPA TO-15	NA

Notes:
NA = Not Applicable
TCL = Target compound list
TAL = Target analyte list
TCLP = Toxicity characteristic leaching procedure
PCBs = polychlorinated biphenyls
VOCs = Volatile organic compounds
SVOCs = Semi-Volatile organic compounds

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Table 2. Data Quality Objectives for Chemical Parameter

Data Use	Media	Parameter	Precision (RPD)				Accuracy			Completeness
			Field Duplicate	Laboratory Duplicate	LCS/LCD	MS/MSD	Surrogate Recoveries	LCS Recoveries	MS/MSD Recoveries	
Waste Characterization	Solid	TCLP VOCs	<50%	NA	<30%	NA	<35%		NA	>90%
		TCLP SVOCs	<50%	NA	<30%	NA	<35%		NA	>90%
		TCLP Metals	<50%	NA	<30%	NA	NA	20%	NA	>90%
		Corrosivity	<50%	<50%	<30%	NA	NA		NA	>90%
		Ignitability	<50%	<50%	<30%	NA	NA		NA	>90%
	Water	TCL VOCs	<40%	NA	<30%	NA	<35%		NA	>90%
		TCL SVOCs	<40%	NA	<30%	NA	<35%		NA	>90%
		TAL Metals (total and dissolved)	<40%	NA	<30%	NA	NA	20%	NA	>90%
		pH	<40%	NA	NA	NA	NA		NA	>90%
Imported Backfill	Solid	PCBs	<40%	NA	<30%	NA	<35%		NA	>90%
		TCL VOCs	<50%	NA	<30%	NA	<35%		NA	>90%
		TCL SVOCs	<50%	NA	<30%	NA	<35%		NA	>90%
		TAL Metals	<50%	NA	<30%	NA	NA	20%	NA	>90%
		Cyanide	<50%	NA	<30%	NA	NA	20%	NA	>90%
		TCL Pesticides	<50%	NA	<30%	NA	<35%		NA	>90%
		Radium (Ra-226)	<50%	<40%	<30%	NA	NA		NA	>90%
		Gamma Radiation	<50%	<40%	<30%	NA	<35%		NA	>90%
Confirmation Samples	Solid	TCL VOCs	<50%	NA	<30%	NA	<35%		NA	>90%
Perimeter Air Monitoring	Solid	VOCs	<50%	NA	<30%	NA	<35%		NA	>90%

Notes:
NA = Not Applicable
TCL = Target compound list
TAL = Target analyte list
TCLP = Toxicity characteristic leaching procedure
PCBs = polychlorinated biphenyls
VOCs = Volatile organic compounds
SVOCs = Semi-Volatile organic compounds
LCS/LCSD = laboratory control sample/laboratory control sample duplicate
MS/MSD = Matrix spike/matrix spike duplicate

SECTION 01 42 00

SOURCES FOR REFERENCE PUBLICATIONS

PART 1 GENERAL

1.1 SUMMARY

This section covers sources for reference publications and acronyms.

1.2 REFERENCES

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

1.3 ORDERING INFORMATION

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

AMERICAN WATER WORKS ASSOCIATION (AWWA)
6666 West Quincy Avenue
Denver, CO 80235
Ph: 800-926-7337
Fax: 303-347-0804
E-mail: smorrison@awwa.org
Internet: http://www.awwa.org
Fax: 202-638-4833
E-mail: info@aabc.com
Internet: http://www.aabchq.com

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

FORESTRY SUPPLIERS INC. (FSUP)
205 West Rankin Street
P.O. Box 8397
Jackson, MS 39284-8397
Ph: 800-752-8460
Fax: 601-292-0165
E-mail: cs@forestry-suppliers.com
Internet: http://www.forestry-suppliers.com

GEOLOGICAL SOCIETY OF AMERICA (GeoSA)
P.O. Box 9140
Boulder, CO 80301-9140
Ph: 303-447-2020
Fax: 303-357-1070
E-mail: gsaservice@geosociety.org
Internet: http://www.geosociety.org

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

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
1 Batterymarch Park
Quincy, MA 02169-7471
Ph: 617-770-3000 or 800-344-3555
Fax: 617-770-0700
E-mail: webmaster@nfpa.org
Internet: http://www.nfpa.org

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)
Mail Stop C-34
4676 Columbia Parkway
Cincinnati, OH 45226
Ph: 513-533-8611
Fax: 513-533-8285
E-mail: nioshdocket@cdc.gov
Internet: http://www.cdc.gov/nchs/products.htm

NSF INTERNATIONAL (NSF)
789 North Dixboro Road
P.O. Box 130140
Ann Arbor, MI 48113-0140
Ph: 734-769-8010 or 800-NSF-MARK
Fax: 734-769-0109
E-mail: info@nsf.org
Internet: http://www.nsf.org

U.S. ARMY CORPS OF ENGINEERS (USACE)
Order CRD-C DOCUMENTS from:
Headquarters Points of Contact
441 G Street NW
Washington, DC 20314-1000
Ph: 202-761-0011

E-mail: hq-publicaffairs@.usace.army.mil
Internet: http://www.wes.army.mil/SL/MTC/handbook.htm

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

U.S. DEPARTMENT OF AGRICULTURE (USDA)
Order AMS Publications from:
AGRICULTURAL MARKETING SERVICE (AMS)
Seed Regulatory and Testing Branch
801 Summit Crossing Place, Suite C
Gastonia, NC 28054-2193
Ph: 704-810-8871
Fax: 704-852-4189
E-mail: seed.ams@usda.gov
Internet: http://www.ams.usda.gov/lsg/seed.htm

Order Other Publications from:
U.S. Department of Agriculture, Rural Utilities Service
14th and Independence Avenue, SW, Room 4028-S
Washington, DC 20250
Ph: 202-720-2791
Fax: 202-720-2166
Internet: http://www.usda.gov/rus

U.S. DEPARTMENT OF DEFENSE (DOD)
Order DOD Documents from:
Room 3A750-The Pentagon
1400 Defense Pentagon
Washington, DC 20301-1400
Ph: 703-571-3343
FAX: 215-697-1462
E-mail: pia@hq.afis.asd.mil
Internet: http://www.dod.gov
Obtain Military Specifications, Standards and Related Publications from:
Acquisition Streamlining and Standardization Information System (ASSIST)
Department of Defense Single Stock Point (DODSSP)
Document Automation and Production Service (DAPS)
Building 4/D
700 Robbins Avenue
Philadelphia, PA 19111-5094
Ph: 215-697-6396 - for account/password issues
Internet: http://assist.daps.dla.mil/online/start/; account registration required
Obtain Unified Facilities Criteria (UFC) from:

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Washington, DC 20004
Ph: 202-272-0167
for Fax and E-mail see below
Internet: http://www.epa.gov
--- Some EPA documents are available only from:
National Technical Information Service (NTIS)
5301 Shawnee Road
Alexandria, VA 22312
Ph: 703-605-6050 or 1-688-584-8332
Fax: 703-605-6900
E-mail: info@ntis.gov
Internet: http://www.ntis.gov

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)
8601 Adelphi Road
College Park, MD 20740-6001
Ph: 866-272-6272
Fax: 301-837-0483
E-mail: contactcenter@gpo.gov
Internet: http://www.archives.gov
Order documents from:
Superintendent of Documents
U.S. Government Printing Office (GPO)
732 North Capitol Street, NW
Washington, DC 20401
Ph: 202-512-1800
Fax: 202-512-2104
E-mail: contactcenter@gpo.gov
Internet: http://www.gpoaccess.gov

New Jersey Department of Environmental Protection (NJDEP)
700 Rockport Rd, Hackettstown, NJ 07840
Ph: 908-852-3461
Internet: http://www.nj.gov/dep/

1.4 ACRONYMS

AASHTO	American Association of State Highway and Transportation Officials
ANSETS	Analytical Service Tracking System
ANSI	American National Standards Institute
APP	Accident Prevention Plan
ASR	Analytical Service Request
ASTM	American Society for Testing and Materials
AWWA	American Water Works Association
bgs	below ground surface
bhp	Brake horsepower
BMP	Best Management Practices
CBR	California Bearing Ratio
CCE	calcium carbonate equivalent
C&D	Construction and Demolition
CDFR	Chemical Data Final Report
CDQC	Chemical Data Quality Control
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CHP	Certified Health Professional
CIH	Certified Industrial Hygienist
CLIN	Contract Line Item Number
CLP	Contract Laboratory Program
COC	contaminants of concern
CPM	Critical Path Method
CPR	cardiopulmonary resuscitation
CQC	Contractor Quality Control
CRZ	Contamination Reduction Zone
CSP	Certified Safety Professional
C&T	Collection & treatment
DCQCR	Daily Chemical Quality Control Reports
DESA	Division of Environmental Science & Assessment
DFW	Definable Feature of Work
DO	dissolved oxygen
DoD	Department of Defense
DOR	Designer of Record
DOT	Department of Transportation
DQO	Data Quality Objectives
EDD	Electronic Data Deliverable
EPA	Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
EPH	Extractable Petrolum Hydrocarbons
EPO	Environmental Protection Officer
EPP	Environmental Protection Plan
ERH	Electrical Resistive Heating

ERP	Emergency Response Plan
EZ	Exclusion Zone
FAR	Federal Acquisition Regulation
FASTAC	Field and Analytical Services Teaming Advisory Committee
FHWA	Federal Highway Administration
FID	Flame Ionization Detector
FSP	Field Sampling Plan
FSUP	Forestry Supplies Inc.
GeoSA	Geological Society of America
GFE	Government Furnished Equipment
g/min/sf	gallon / minute / square feet
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HDPE	high density polyethylene
hr	hour
HTRW	Hazardous, Toxic and Radioactive Waste
HW	Hazardous Waste
IAGs	Interagency Agreements
ICC	International Code Council
ICE	internal combustion engine
IEC	Installation Environmental Coordinator
ISEA	International Safety Equipment Association
ISTT	In Situ Thermal Treatment
lb	pound
Mg/L	Milligrams per liter
mg/m3	Milligrams per cubic meter
MJ	mechanical joint
mm	millimeter
MUTCD	Manual of Uniform Traffic Control Devices
NAD83	North American Datum 1983
NARA	National Archives and Records Administration
NAS	Network Analysis
NAVD	North American Vertical Datum
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NIOSH	National Institute for Occupational Safety and Health
NIST	National Institute for Standards and Technology
N.J.A.C.	New Jersey Administrative Code
NJDEP	New Jersey Department of Environmental Conservation
NPDES	National Pollution Discharge Elimination System
NPL	National Priorities List

NSF	National Sanitation Foundation
NTP	Notice to Proceed
NTU	Nephelometric turbidity unit
OD	Original Durations
O&M	Operation & Maintenance
OPA	Oil Pollution Act
ORP	Oxidation-reduction potential
OSHA	Occupational Safety and Health Administration
OSWER	Office of Solid Waste and Emergency Response
PCBs	Polychlorinated Biphenyls
PDM	Precedence Diagram Method
PE	polyethylene
PID	Photo-ionization Detector
PM	Particulate Matter
POC	point of contact
PPE	Personal Protective Equipment
psi	pound per square inch
psig	pound per square inch gage
PTFP	polytetrafluoroethylene
PVC	polyvinyl chloride
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
QCS	Quality Control System
RCRA	Resource Conservation and Recovery Act
RFI	Request for Information
RMS	Resident Management System
ROD	Record of Decision
RSCC	Regional Sample Control Coordinator
RSPA	Research and Special Programs Administration
SAP	Sampling and Analysis Plan
SAS	Specific Analytical Services
SCD	Soil Conservation District
SD	Submittal Descriptions
SDEF	Standard Data Exchange Format
SDR	Standard Dimension Ratio
SDS	Safety Data Sheet
SHM	Safety and Health Manager
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
SVC	Schedule Variance Control
SWPPP	Storm Water Pollution Prevention Plan
SZ	Support Zone
TAL	Target Analyte List
TAT	turn around time
TCE	trichloroethene

TCH	Thermal Conductive Heating
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TDC	Transportation and Disposal Coordinator
TSD	Treatment, Storage and Disposal
UL	Underwriters Laboratory
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USC	United States Code
USDA	United States Department of Agriculture
USGS	United States Geological Survey
ug/L	Micrograms per liter
µg/m3	micrograms per cubic meter
UV	ultra violet
VECP	Value Engineering Change Proposal
VOCs	Volatile Organic Compounds
WHM	Waste Hazardous Material

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not used

-- End of Section --

SECTION 01 45 00.00 10

QUALITY CONTROL

PART 1 GENERAL

1.1 SUMMARY

This section covers requirements for the Contractor Quality Control (CQC) Plan preparation, review, and approval. The Contractor is responsible for implementing the quality control procedures in accordance with the approved CQC Plan.

1.2 REFERENCES

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

ASTM INTERNATIONAL (ASTM)

ASTM D3740	(2012a) Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
ASTM E329	(2014a) Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Contractor Quality Control (CQC) Plan; G

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 consists 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 QUALITY CONTROL PLAN

Submit no later than 30 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 15 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. 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.

e. 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.)

f. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation.

g. Procedures for tracking construction deficiencies from identification through acceptable corrective action. Establish verification procedures that identified deficiencies have been corrected.

h. Reporting procedures, including proposed reporting formats.

i. 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, meet with the Contracting Officer and discuss the Contractor's quality control system. Submit the CQC Plan a minimum of 10 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 must be a graduate engineer, or a graduate of construction management, with a minimum of 4 years construction experience on construction similar to this contract. 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 must be assigned as System Manager but may have duties as project superintendent in addition to quality control. 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 CQC Personnel

In addition to CQC personnel specified elsewhere in the contract, provide as part of the CQC organization specialized personnel to assist the CQC System Manager for civil and environmental. These individuals may be employees of the prime or subcontractor; be responsible to the CQC System Manager; be physically present at the construction site during work on their areas of responsibility; have the necessary education and/or experience in accordance with the experience matrix listed herein. These individuals may perform other duties but must be allowed sufficient time to perform their assigned quality control duties as described in the Quality Control Plan. A single person may cover more than one area provided that they are qualified to perform QC activities in each designated and that workload allows.

Experience Matrix	
Area	Qualifications
Civil	Graduate Civil Engineer or Construction Manager with 2 years experience in the type of work being performed on this project or technician with 5 years related experience
Mechanical	Graduate Mechanical Engineer with 2 years experience or person 5 years of experience supervising mechanical features of work in the field with a construction company
Electrical	Graduate Electrical Engineer with 2 years related experience or person 5 years of experience supervising electrical features of work in the field with a construction company
Structural	Graduate Civil Engineer (with Structural Track or Focus) or Construction Manager with 2 years experience or person 5 years of experience supervising structural features of work in the field with a construction company
Environmental	Graduate Environmental Engineer with 3 years experience
Submittals	Submittal Clerk with 1 year experience
Concrete, Pavements and Soils	Materials Technician with 2 years experience for the appropriate area

3.4.4 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.

3.5 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 36 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 36 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

The listing of validated testing laboratories is available at http://gsl.erdc.usace.army.mil/SL/MTC/.

3.7.2.1 Capability Check

The Government reserves the right to check laboratory equipment in the proposed laboratory for compliance with the standards set forth in the contract specifications and to check the laboratory technician's testing procedures and techniques. Laboratories utilized for testing soils, concrete, asphalt, and steel must meet criteria detailed in ASTM D3740 and ASTM E329.

3.7.2.2 Capability Recheck

If the selected laboratory fails the capability check, the Contractor will be responsible for recheck of the laboratory or the checking of a subsequently selected laboratory.

3.7.3 Onsite Laboratory

The Government reserves the right to utilize the Contractor's control testing laboratory and equipment to make assurance tests, and to check the Contractor's testing procedures, techniques, and test results.

3.8 COMPLETION INSPECTION

3.8.1 Punch-Out Inspection

Conduct an inspection of the work by the CQC Manager near the end of the work, or any increment of the work established by a time stated in the SPECIAL CONTRACT REQUIREMENTS Clause, "Commencement, Prosecution, and Completion of Work," or by the specifications. Prepare and include in the CQC documentation a punchlist 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. Make a second inspection the CQC System Manager or staff 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 must 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 must 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 may 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.

3.9 DOCUMENTATION

Maintain current records providing factual evidence that required quality control activities and/or 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. Contractor/subcontractor and their area of responsibility.

b. Operating plant/equipment with hours worked, idle, or down for repair.

c. Work performed each day, giving location, description, and by whom.

d. Test and/or control activities performed with results and references to specifications/drawings requirements. Identify the control phase (Preparatory, Initial, and 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/or specifications.

k. Contractor's verification statement.

Indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. Cover both conforming and deficient features and include a statement that equipment and materials incorporated in the work and workmanship comply with the contract. Furnish the original and one copy of these records in report form to the Government daily within 48 hours after the date covered by the report, except that reports need not be submitted for days on which no work is performed. As a minimum, prepare and submit one report for every seven days of no work and on the last day of a no work period. All calendar days must be accounted for throughout the life of the contract. The first report following a day of no work will be for that day only. Reports must be signed and dated by the CQC System Manager. Include copies of test reports and copies of reports prepared by all subordinate quality control personnel within the CQC System Manager Report.

3.10 SAMPLE FORMS

Sample forms enclosed at the end of this section.

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.

-- End of Section --

SECTION 01 45 00.15 10

QUALITY CONTROL SYSTEM (QCS)

PART 1 GENERAL

1.1 SUMMARY

The Government will use the Resident Management System (RMS) for Windows to assist in its monitoring and administration of this contract. The Contractor accesses the system using the USACE-furnished Contractor Mode of RMS. The joint Government-Contractor use of RMS facilitates electronic exchange of information and overall management of the contract. The Contractor accesses RMS to record, maintain, input, track, and electronically share information with the Government throughout the contract period in the following areas:

- Administration
- Finances
- Quality Control
- Submittal Monitoring
- Scheduling
- Closeout
- Import/Export of Data

1.2 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 and Health Requirements Manual
ER 415-1-10	(2010) Contractor Submittal Procedures

1.3 CONTRACT ADMINISTRATION

The Government will use the Resident Management System (RMS) for Windows to assist in its monitoring and administration of this contract. The Contractor accesses the system using the USACE-furnished Contractor Mode of RMS, also referred to as QCS. The joint Government-Contractor use of RMS facilitates electronic exchange of information and overall management of the contract. The Contractor accesses RMS to record, maintain, input, track, and electronically share information with the Government throughout the contract period in the following areas:

Administration
Finances
Quality Control
Submittal Monitoring
Scheduling
Closeout
Import/Export of Data

1.4 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.

1.4.1 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; and Section 01 45 00.00 10 QUALITY CONTROL.

1.5 QCS (RMS) SOFTWARE

QCS is a Windows-based program that can be run on a Windows-based PC meeting the requirements as specified in paragraph SYSTEM REQUIREMENTS. Download, install and be able to utilize the latest version of the RMS software 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 (http://rmsdocumentation.com). 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.

Prior to the Pre-Construction Conference the Contractor shall be responsible to download, install and use the latest version of the QCS software from the USACE RMS website. Upon specific justification and request by the Contractor, the USACE can provide QCS on a CD-ROM. Any program updates of QCS will be made available to the Contractor via the USACE RMS website as they become available.

1.6 SYSTEM REQUIREMENTS

The following is the recommended system configuration to run the QCS for full utilization of all features for all types and sizes of contracts. Smaller, less complicated, projects may not require the configuration levels described below. Required configuration also noted below.

Recommended RMS System Requirements	
Hardware	
Windows-based PC	1.7 GHz i3; AMD A6 3650 GHz or higher processor (REQUIRED)
RAM	8 GB

Hard drive disk	100 GB space for sole use by RMS system
Monitor	Screen resolution 1366 x 768
Mouse or other pointing device	
Windows compatible printer	Laser printer must have 4 MB+ of RAM
Connection to the Internet	minimum 4 Mbs per user
Software	
MS Windows	Windows 7 x 64 bit (RMS requires 64 bit O/S) or newer (REQUIRED)
Word Processing software	Viewer for MS Word 2013, MS Excel 2013 or newer (REQUIRED)
E-mail	MAPI compatible (REQUIRED)
Virus protection software	Regularly upgraded with all issued Manufacturer's updates and is able to detect most zero day viruses (REQUIRED)

1.7 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.

1.8 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:

1.8.1 Administration

1.8.1.1 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.

1.8.1.2 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.

1.8.1.3 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".

1.8.1.4 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.

1.8.1.5 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.

1.8.1.6 Request For Information (RFI)

Create and track all Requests For Information (RFI) in the RMS Administration Module for Government review and response.

1.8.2 Finances

1.8.2.1 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.

1.8.2.2 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.

1.8.3 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.

1.8.3.1 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.

1.8.3.2 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.

1.8.3.3 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.

1.8.3.4 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.

1.8.3.5 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 and as required by any other applicable Federal, State, or local agencies.

1.8.3.6 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.

1.8.3.7 Activity Hazard Analysis

Import activity hazard analysis electronic document files into the RMS QC Module utilizing the document package manager.

1.8.4 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.

1.8.5 Schedule

Enter and update the contract project schedule in RMS by either manually entering all schedule data or by importing the Standard Data Exchange Format (SDEF) file, based on the requirements in Section 01 32 01.00 10 PROJECT SCHEDULE. The Contractor shall be responsible for ensuring the SDEF is in the format required to upload the data to the RMS module. The updated schedule data shall be included with each pay request submitted by the Contractor.

1.8.6 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.

1.9 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.

1.10 DATA SUBMISSION VIA CD-ROM

The USACE-preferred method for the Contractor’s submission of QCS data is by using the USACE SFTP repository built into QCS export function. Other data should be submitted using e-mail with file attachment(s). For locations where this is not feasible, the Contracting Officer may permit use of CD-ROMs for data transfer. Data on the CDs shall be exported using the QCS built-in export function. If used, CD-ROMs will be submitted in accordance with the following:

1.10.1 File Medium

The Contractor shall submit required data on CD-ROMs in English conforming to industry standards used in the United States.

1.10.2 CD-ROM Labels

The Contractor shall affix a permanent exterior label to each CD-ROM submitted. The label shall indicate in English the QCS file name, full contract number, contract name, project location, data date, and name and telephone number of person responsible for the data.

1.10.3 File Names

The files will be automatically named by the QCS software. The naming convention established by the QCS software shall not be altered in any way by the Contractor.

1.11 MONTHLY COORDINATION MEETING

The Contractor shall update the QCS database each workday. At least monthly, the Contractor shall generate and submit an export file to the USACE with a schedule update and progress payment request. As required in Contract Clause “Payments”, at least one week prior to submittal, the Contractor shall meet with the Contracting Officer to review the planned progress payment data submission for errors and omissions. The Contractor shall make all required corrections prior to the Contracting Officer’s acceptance of the export file and progress payment request. Payment requests accompanied by incomplete or incorrect data submittals will be returned. The USACE will not process progress payments until an ACCEPTABLE QCS EXPORT FILE IS RECEIVED.

1.12 NOTIFICATION OF NONCOMPLIANCE

Take corrective action within 7 calendar days after receipt of notice of RMS non-compliance by the Contracting Officer. The QCS Module shall be completed to the satisfaction of the Contracting Officer prior to any contract payment (except for Bonds and Insurance, as approved by the Contracting Officer).

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

-- End of Section --

SECTION 01 50 00

TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 SUMMARY

The Contractor shall provide all materials, equipment and labor necessary to set up the temporary construction facilities, controls, and staging areas for materials and equipment. The Contractor shall use the on-site areas designated on the plan for staging and equipment and materials.

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 70	(2008; TIA 08-1) National Electrical Code

U.S. FEDERAL HIGHWAY ADMINISTRATION (FHWA)

MUTCD	(2000) Manual of Uniform Traffic Control Devices

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for 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

Temporary Site Facilities Layout Plan; G

Prior to the start of work, submit a plan showing the locations and dimensions of temporary facilities (including layouts and details, equipment and material storage area (onsite and offsite), and access and haul routes, avenues of ingress/egress to the fenced area and details of the fence installation. Identify any areas which may have to be graveled to prevent the tracking of mud. Indicate if the use of a supplemental or other staging area is desired, and show the locations of safety and construction fences, site trailers, construction entrances, trash dumpsters, temporary sanitary facilities, and worker parking areas. Plan can be included as part of the Site Operations and Excavation Plan (Section 31 23 00.00 20)

Trailer's Floor Plan; G
Electrical Supply and Lighting Shop Drawings; G
Water Supply, Contaminated Wash Water Handling and Sanitary Facilities; G

Traffic Control Plan; G
Submit a plan showing the proposed haul routes, access routes, loading areas, truck idling areas, and traffic controls. Plan can be included as part of the Site Operations and Excavation Plan (Section 31 23 00.00 20)

1.4 TEMPORARY SITE FACILITIES LAYOUT PLAN

The Contractor shall prepare a Temporary Site Facilities Layout Plan and a Trailer's Floor Plan and submit it to the Contracting Officer for approval at least 14 calendar days prior to the Pre-Work Conference and no later than 30 days after the Notice to Proceed. The Temporary Site Facilities Layout Plan shall indicate the proposed location and dimensions of any area to be fenced and used by the Contractor, the number of trailers to be used, avenues of ingress/egress to the fenced area and details of the fence installation. Any areas which may have to be graveled to prevent the tracking of mud shall also be identified. The Contractor shall also indicate if the use of a supplemental or other staging area is desired. The facilities shall consist of the following:

a. USACE Field Office (60 feet x 12 feet)
b. Safety, Security, Communications and Contractor's Offices
c. Emergency Medical Facility
d. Personal Hygiene and Decontamination Facilities
e. Equipment Storage and Lunch Areas
f. On-Site Contaminated Equipment Areas
g. Parking Area
h. Outdoor Lighting within the designated support zone to ensure adequate visibility after dark

PART 2 PRODUCTS

2.1 TEMPORARY SIGNAGE

2.1.1 Bulletin Board

Immediately upon beginning of work, provide a weatherproof glass-covered bulletin board not less than 36 by 48 inches in size for displaying the Equal Employment Opportunity poster, a copy of the wage decision contained in the contract, Wage Rate Information poster, and other information approved by the Contracting Officer. Locate the bulletin board at the project site in a conspicuous place easily accessible to all employees, as approved by the Contracting Officer.

2.1.2 Project and Safety Signs

The requirements for the signs, their content, and location are as shown on the drawings. Erect signs within 15 days after receipt of the Notice to Proceed. Erect the data required by the safety sign daily, with light colored metallic or non-metallic numerals.

2.2 TEMPORARY TRAFFIC CONTROL

2.2.1 Haul Roads

Construct access and haul roads necessary for proper prosecution of the work under this contract. Construct with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic are being avoided. Provide necessary lighting, signs, barricades, and distinctive markings for the safe movement of traffic. The method of dust control, although optional, must be adequate to ensure safe operation at all times. Location, grade, width, and alignment of construction and hauling roads are subject to approval by the Contracting Officer. Lighting must be adequate to assure full and clear visibility for full width of haul road and work areas during any night work operations.

2.2.2 Barricades

Erect and maintain temporary barricades to limit public access to hazardous areas. 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, barricades will be required. Securely place barricades clearly visible with adequate illumination to provide sufficient visual warning of the hazard during both day and night.

2.2.3 Fencing

Provide fencing around the perimeter of the site to control access by unauthorized people. Fencing must be installed to be able to restrain a force of at least 250 pounds against it.

2.2.4 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.

PART 3 EXECUTION

3.1 EMPLOYEE PARKING

Employee parking will be provided onsite (as shown on Drawing C-03). Contractor employee parking must not interfere with existing and established parking requirements of the existing groundwater treatment system operation.

3.2 AVAILABILITY AND USE OF UTILITY SERVICES

3.2.1 Temporary Utilities

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

3.2.2 Payment for Utility Services

The Contractor shall be responsible for providing all utilities to the site necessary to do the work. The Contractor shall be responsible for the operation of all systems, including maintenance, to assure that necessary services are provided. The Contractor shall be responsible for all telephone charges. All electric power shall be purchased directly by the Contractor. The Contractor is required to coordinate, maintain, and pay for all required

utilities available to the Contractor from existing outlets and supplies, as specified in the contract. Unless otherwise provided in the contract, the amount of each utility service consumed shall be charged to or paid for by the Contractor. The Contractor shall submit for review Electrical Supply and Lighting Shop Drawings and Water Supply, Contaminated Wash Water Handling and Sanitary Facilities source points, layout locations, fixtures, materials and methods of disposal. The Contractor shall verify whether existing utility lines are available for the Contractor to tie into. Any extension, connection, or alteration needed for temporary power will be performed by the Contractor and coordinated with the utility company and NJDEP. All modifications to existing utilities for temporary construction facilities and existing temporary utilities will be removed at the completion of the project by the Contractor.

3.2.3 Electrical

The Contractor shall make the necessary arrangements with the appropriate power authority for service and shall be responsible for installation, maintenance and shutoff costs for onsite power connections. All power service lines shall be removed prior to project closeout.

3.2.4 Sanitation

The Contractor is responsible for providing or arranging for a potable water supply for any water to be used on the site during the duration of the Contract. If a new tap for water supply is required the Contractor shall provide a backflow preventer in accordance with Section 33 11 00 WATER DISTRIBUTION. The Contractor shall provide and maintain within the construction area a minimum of two field-type sanitary facilities approved by the Contracting Officer. Government toilet facilities will not be available to Contractor's personnel.

3.2.5 Telephone

The Contractor shall make arrangements and pay all costs for telephone facilities desired. The Contractor shall make the necessary arrangements with the local telephone company to install equipment and services to meet site requirements and shall be responsible for all related installation service and shutoff costs.

3.2.6 Fire Protection

Provide temporary fire protection equipment for the protection of personnel and property during construction. Remove debris and flammable materials monthly to minimize potential hazards.

3.3 TRAFFIC PROVISIONS

3.3.1 Maintenance of Traffic

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

to the worksite provided requirements of the highway authority have been met.

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

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

3.3.2 Protection of Traffic

Maintain and protect traffic on all affected roads during the construction period except as otherwise specifically directed by the Contracting Officer. Measures for the protection and diversion of traffic, including the provision of watchmen and flagmen, erection of barricades, placing of lights around and in front of equipment the work, and the erection and maintenance of adequate warning, danger, and direction signs, will be as required by the state and local authorities having jurisdiction. Protect the traveling public from damage to person and property. Minimize the interference with public traffic on roads selected for hauling material to and from the site. Investigate the adequacy of existing roads and their allowable load limit. The Contractor shall ensure vehicles exiting the site are not tracking mud or soil offsite or onto public roads. Equipment coming into contact with contaminated soil shall be decontaminated prior to leaving the site. Contractor is responsible for the repair of any damage to roads caused by construction operations.

3.3.3 Rush Hour Restrictions

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

3.3.4 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.

3.4 CONTRACTOR'S TEMPORARY FACILITIES

3.4.1 Safety

Protect the integrity of any installed safety systems or personnel safety devices. If entrance into systems serving safety devices is required, the Contractor must 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.

3.4.2 Site Area

Construct a temporary 8 foot high chain link fence around the site. Include plastic strip inserts, colored, so that visibility through the fence is

obstructed. Fence posts may be driven, in lieu of concrete bases, where soil conditions permit. Do not place or store Trailers, materials, or equipment outside the fenced area unless such trailers, materials, or equipment are assigned a separate and distinct storage area by the Contracting Officer away from the vicinity of the construction site but within the installation boundaries. Trailers, equipment, or materials must not be open to public view with the exception of those items which are in support of ongoing work on any given day. Do not stockpile materials outside the fence in preparation for the next day's work. Park mobile equipment, such as tractors, wheeled lifting equipment, cranes, trucks, and like equipment, within the fenced area at the end of each work day.

3.4.3 Supplemental Storage Area

Upon Contractor's request, the Contracting Officer will designate another or supplemental area for the Contractor's use and storage of trailers, equipment, and materials. This area may not be in close proximity of the construction site but will be within the installation boundaries. Fencing of materials or equipment will not be required at this site; however, the Contractor is responsible for cleanliness and orderliness of the area used and for the security of any material or equipment stored in this area. Utilities will not be provided to this area by the Government.

3.4.4 Appearance of Trailers

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 installation property.

3.4.5 Maintenance of Storage Area

Keep fencing in a state of good repair and proper alignment. Grassed or unpaved areas, which are not established roadways, will be covered with a layer of gravel as necessary to prevent rutting and the tracking of mud onto paved or established roadways, should the Contractor elect to traverse them with construction equipment or other vehicles; gravel gradation will be at the Contractor's discretion. Mow and maintain grass located within the boundaries of the construction site for the duration of the project. Grass and vegetation along fences, buildings, under trailers, and in areas not accessible to mowers will be edged or trimmed neatly.

3.4.6 Security Provisions

Provide adequate outside security lighting at the Contractor's temporary facilities. The Contractor will be responsible for the security of its own equipment; in addition, the Contractor will notify the appropriate law enforcement agency requesting periodic security checks of the temporary project field office.

3.4.7 Weather Protection of Temporary Facilities and Stored Materials

Take necessary precautions to ensure that roof openings and other critical openings in the building are monitored carefully. Take immediate actions required to seal off such openings when rain or other detrimental weather is imminent, and at the end of each workday. Ensure that the openings are

completely sealed off to protect materials and equipment in the building from damage.

3.4.7.1 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.

3.5 GOVERNMENT FIELD OFFICE

All structures other than storage sheds installed under this section shall be provided with, as a minimum, the following services:

3.5.1 U.S. Army Corps of Engineers (USACE) Field Office

The Contractor shall furnish at the job site, prior to the start of work, a field office for the use by USACE representatives for the duration of the contract. Field office and contents will remain the property of the Contractor. The exact location will be designated by the Contracting Officer. The building or trailer shall be well constructed and properly ventilated and shall contain a closet, door and windows which shall be capable of being locked, four (4) chairs, one (1) plan rack and drawing board, two (2) desks, and one (1) two-drawer filing cabinet. The Contractor shall also provide adequate electric lighting, minimum 6 duplex electrical receptacles, drinking water, heat, air conditioning, janitorial services and maintenance services. In addition the Contractor shall make arrangements and pay connection fees and monthly usage for electrical and 4-line telephone service, one dedicated to fax, one dedicated to internet service and two dedicated to voice. The field office shall be removed from the project site when and as directed by the Contracting Officer.

Contractor shall supply toner cartridges for printers and copiers; paper, paper towels, cups and miscellaneous supplies for the trailers for the duration of the contract. In addition to the above, the Contractor shall provide the following computers and office equipment, and other items for use by the USACE during the contract.

3.5.1.1 Internet Connection

The Contractor shall make arrangements and pay all connection costs and fees for WiFi equivalent to 4G (or better) internet service to the field office. These services shall be arranged for the entire contract duration. The field office shall be removed from the project site when and as directed by the Contracting Officer.

3.5.1.2 Printers

The Contractor shall provide two Hewlett Packard LaserJet printers with scanning capabilities.

3.5.1.3 Telephone

The Contractor shall provide four 2-line phones with conferencing and speaker phone capabilities compatible with phone service. Telephones shall be installed on each of the two desks, the secretarial desk and the conference table.

3.5.1.4 First Aid Kit

The Contractor shall provide a first aid kit. As a minimum the kit shall include antiseptic kit, eyewash solution, bandages, insect sting medication, aspirin and acetaminophen, and coldpack.

3.5.1.5 Fire Extinguisher

The Contractor shall provide a fire extinguisher of the type as required for a trailer the same size as office.

3.6 SAFETY, SECURITY, COMMUNICATIONS, AND CONTRACTOR'S OFFICES

3.6.1 Safety, Security, and Communications Offices

A partitioned area shall be provided for safety, security and communications personnel, having a minimum floor space of 196 square feet. This area shall contain, as a minimum, the following equipment:

a. Two office desks with lockable drawers, and three office chairs.
b. Two telephones having a circuit separate from all others on site.
c. One office table measuring 3 feet by 8 feet.
d. Two lockable, four drawer filing cabinets.
e. A minimum of two windows providing visibility of the site.
f. One base and six portable two-way radios. All sets shall be intrinsically safe, capable of transmitting to and receiving from any other set, at any point within the Ellis Property Site. All portable units shall be rechargeable, and shall be capable of operating continuously without recharge for three hours.

3.6.2 Contractor's Offices

a. The Contractor shall furnish at the job site, prior to start of work, a 60 feet by 12 feet field office trailer for use by the Contractor for the duration of the Contract.

3.6 EMERGENCY MEDICAL FACILITY

The emergency medical facility shall consist of an area having a minimum floor space of 96 square feet. The facilities shall contain, as a minimum, the following equipment and supplies:

a. Two stretchers.
b. One set of crutches.
c. Two self-contained air respiratory devices.
d. One cot.
e. Three blankets.
f. First aid medications appropriate for the initial treatment of burns, abrasions, fractures, and ingestion or dermal contact with on-site hazardous waste.

3.7 EQUIPMENT STORAGE/LUNCH AREA

The Contractor shall provide a separate uncontaminated lunch area of sufficient size for all Contractor personnel on site. Such an area may be combined with Equipment Storage in one facility, as specified below. The Contractor shall furnish all the furniture required in the lunch room to accommodate the maximum number of Contractor personnel working on any single day.

A separate or partitioned equipment storage area shall also be provided and shall have access through a lockable door. The area for equipment storage shall not be less than 96 square feet. Sufficient shelving shall be installed for storage and inventory control of small items. In addition, this area shall contain one 4-drawer lockable filing cabinet and a wooden lockable locker sufficient for the storage of surveying and testing instruments.

3.8 ON-SITE CONTAMINATED EQUIPMENT AREA

The Contractor shall provide an on-site contaminated equipment storage area at the entrance point to each Contamination Reduction Zone facility area (lined with polyethylene).

Each contaminated equipment storage area shall include but not necessarily be limited to the following:

a. Boot rack for washing and storage.
b. Drums for the disposal of protective clothing.
c. A 10 foot by 10 foot temporary structure for the storage of contaminated materials with equipment used daily.
d. Emergency eyewash and shower and fire extinguisher.

3.9 ACCESS ROADS AND PARKING AREAS

Existing grass or paved areas and existing access roads at the site shall be designated by the USACE for the Contractor's access and parking; review requirements with USACE prior to moving onto the site.

Upon completion of construction at the site, the Contractor shall remove all temporary construction facilities erected in parking or staging areas, and patch existing surfaces to match adjacent undisturbed surfaces.

3.10 OUTDOOR LIGHTING

The Contractor shall determine the extent of existing outdoor lighting within the Support Zone. If there is no lighting or existing lighting does not meet the requirements below, the Contractor shall furnish and install a complete operating outdoor lighting system throughout the designated Support Zone.

The lighting system shall include wood-pole-mounted 400-watt high pressure sodium luminaries supported on 4-foot steel arms with 30-foot mounting height above grade. Provide one pole at or adjacent to the Support Zone.

The system shall include all equipment and materials (such as transformers and circuit protective devices) and conductors.

3.11 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. Materials resulting from demolition activities which are salvageable shall be stored within the fenced area described above or at the supplemental storage area. Stored material not in trailers, whether new or salvaged, shall be neatly stacked when stored.

3.12 RESTORATION OF STORAGE AREA

Upon completion of the project and after removal of trailers, materials, and equipment from within the fenced area, the fence shall be removed and will become the property of the Contractor. Areas used by the Contractor for the storage of equipment or material, or other use, shall be restored to the original or better condition. Gravel used to traverse grassed areas shall be removed and the area restored to its original condition, including top soil and seeding as necessary.

3.13 ELECTRICAL WORK

All work shall be performed by experienced electricians under the general supervision and control of a State, Township, or County licensed electrician with verifiable credentials. Proof of licensing of supervising electricians shall be provided to the Contracting Officer. The licensed electrical contractor shall verify in writing to the Contracting Officer that unlicensed electrical technician(s) is/are familiar with the applicable code requirements and have received safety and health training on the hazards involved.

3.14 DECONTAMINATION STATION

The Contractor shall be responsible for constructing a decontamination pad.

a. The decontamination station shall be equipped with a drain system and holding tank on a properly graded area that has no deleterious material.
b. Dimensions of the pad shall be adequate to contain wash waters and debris from the largest vehicle to be used at this site.
c. Prior to constructing the pad the Contractor shall obtain and analyze one soil sample at a depth between 0-6" in the area sited for construction of the pad.
d. Upon dismantling the pad one soil sample at a depth between 0-6" in the area shall be obtained and analyzed.
e. Water collected during decontamination operations shall be collected and disposed of or treated.

3.15 REMOVAL OF TEMPORARY FACILITIES AND SERVICES

Unless requested by the USACE, all temporary facilities shall be removed when the need has ended, or when replaced by the authorized use of the permanent facility. The Contractor shall repair damaged work, clean exposed surfaces and replace work, which cannot be satisfactorily repaired. The Contractor shall remove all materials contaminated with oil, asphalt or other materials, which might impair the growth of plant materials or lawns.

The Contractor shall repair or replace street paving, curbs and sidewalks at temporary entrances.

-- End of Section --

SECTION 01 54 00

SECURITY PLAN

PART 1 GENERAL

1.1 SUMMARY

The Contractor shall provide site security measures for protecting the work site, equipment and the general public by restricting site access to authorized personnel and equipment and providing full-time security presence during non-working hours.

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

Site Security Plan; G

The Contractor shall prepare and submit, for approval by the Contracting Officer, a Site Security Plan, which will present the Contractor's procedures for protecting the work site and equipment and the general public by restricting site access to authorized personnel and equipment. Plan can be included as part of the Site Operations and Excavation Plan (Section 31 23 00.00 20)

The Security Plan shall address as a minimum:

1) Number of Security Personnel
2) Personnel Duties
3) Personnel Names and Qualifications (as required)
4) Description of Proposed Daily Security Operations
5) Description of Security Check Procedures
6) Descriptions of how the following security breaches shall be handled:
   a) Unauthorized personnel on the site (i.e., vandals, trespassers)
   b) Site Boundary Security if penetrable (i.e., broken site fence, broken gates)
   c) Unauthorized personnel attempting to gain access to the site (i.e., television or newspaper media, public interest groups)
7) Description of Standard Operating Procedures for Responses to Emergency Situations (i.e., contingencies, telephone numbers, radio frequencies, and call signs)

SD-06 Test Reports
Copies of Visitor Log (weekly)

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 GENERAL

The Contractor shall supply uniformed guard service to patrol the site during non-work hours, seven days a week as stipulated. The Contractor shall supply the State, the Contracting Officer, and the security guards each with two (2) two-way radios as stipulated.

3.2 ENTRANCE CONTROL

Physical control of all persons and vehicles entering and leaving the project site shall be provided by the Contractor. The Contractor shall exclude from the site personnel not authorized to enter the site without prior approval from the Contracting Officer. The Contractor shall comply, at a minimum, with the following requirements.

1. Entrance Procedure: Require display of proper identification by each person and require personnel to sign the visitor log upon entering the site and to sign out when leaving. Maintain visitor log, which shall include name, affiliation, date and purpose of visit. Submit weekly to Contracting Officer copies of visitor log.

2. Visitors: No visitors will be allowed on site without the prior approval of the Contracting Officer. Visitors shall not be left unescorted. The Contractor will only escort individuals with the approval of the Contracting Officer On-Site Coordinator.

3.3 SITE CONTROL

The Contractor shall maintain control of the site and shall be responsible for security at the site.

1. General: The Contractor shall provide sufficient security personnel to accomplish the work outlined in the specifications. The Contracting Officer shall have the right of approval and rejection of the security personnel assigned to the project site at any time during Contractor activities. Security personnel must have access to a telephone 24 hours a day.

2. Site-Specific Training: The Contractor shall ensure that all security personnel shall have received the training.

Security Fence: The Contractor shall furnish and install security fencing and appurtenances around the site to provide security.

Security Personnel: The Contractor shall employ uniformed guard service to provide one watch person at the site. The security staff shall be on duty from the date the temporary trailers are occupied and/or invasive work begins until the Contractor has achieved substantial completion or until the Contracting Officer determines security is no longer required. Duties of the security personnel shall include the following:

- Maintain presence of at least one watch person on site during all non-working hours, seven days a week, including holidays.
- Conducting an hourly tour of the site. The site tour shall include walking along the exterior of the perimeter fence to inspect it for any damage or evidence of unauthorized access. If there is any evidence of a breach or attempted breach the guard shall then inspect the interior of the site for any unauthorized access;
- Maintain a log of all security checks. The logs shall contain date, time, any problems noted, and Contractor personnel notified of any problems. The log shall be kept on site and made available for inspection by the Contracting Officer.
- Report problems noted to the Contractor and expeditiously correct any problems noted. Any problems shall be reported to the Contracting Officer in writing within 24 hours of occurrence along with any corrective actions taken.

Security Emergencies: The Contractor shall conduct coordination visits as directed by the Contracting Officer with local law and emergency medical service officials (i.e., local police/sheriff, State police, emergency medical corps units, fire department, and utility emergency teams) to map out contingency plans for emergency situations. The Contractor shall prepare and update a list of emergency points of contact and telephone numbers at the site for use by security personnel and others.

-- End of Section --

SECTION 01 57 19.00 20

TEMPORARY ENVIRONMENTAL CONTROLS

PART 1 GENERAL

1.1 SUMMARY

This section covers requirements for environmental controls and protection, including preparation of the Environmental Protection Plan, environmental permitting, land/water/air/biological resources, chemical materials management, waste disposal, and historical, archeological, and cultural resources.

1.2 REFERENCES

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

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA 530/F-93/004	(1993; Rev O; Updates I, II, IIA, IIB, and III) Test Methods for Evaluating Solid Waste (Vol IA, IB, IC, and II) (SW-846)

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

29 CFR 1910.120	Hazardous Waste Operations and Emergency Response
40 CFR 241	Guidelines for Disposal of Solid Waste
40 CFR 243	Guidelines for the Storage and Collection of Residential, Commercial, and Institutional Solid Waste
40 CFR 258	Subtitle D Landfill Requirements
40 CFR 260	Hazardous Waste Management System: General
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 263	Standards Applicable to Transporters of Hazardous Waste
40 CFR 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

40 CFR 265	Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 266	Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities
40 CFR 268	Land Disposal Restrictions
40 CFR 270	EPA Administered Permit Programs: The Hazardous Waste Permit Program
40 CFR 271	Requirements for Authorization of State Hazardous Waste Programs
40 CFR 272	Approved State Hazardous Waste Management Programs
40 CFR 273	Standards for Universal Waste Management
40 CFR 279	Standards for the Management of Used Oil
40 CFR 300	National Oil and Hazardous Substances Pollution Contingency Plan
40 CFR 355	Emergency Planning and Notification
40 CFR 372-SUBPART D	Specific Toxic Chemical Listings
40 CFR 60	Standards of Performance for New Stationary Sources
40 CFR 63	National Emission Standards for Hazardous Air Pollutants for Source Categories
49 CFR 171	General Information, Regulations, and Definitions
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
49 CFR 173	Shippers - General Requirements for Shipments and Packaging
49 CFR 178	Specifications for Packaging

1.3 DEFINITIONS

1.3.1 Sediment

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

1.3.2 Solid Waste

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

a. Green waste: The vegetative matter from landscaping, land clearing and grubbing, including, but not limited to, grass, bushes, scrubs, small trees and saplings, tree stumps and plant roots. Marketable trees, grasses and plants that are indicated to remain, be relocated, or be re-used are not included.

b. Surplus soil: Existing soil that is in excess of what is required for this work, including aggregates intended, but not used, for on-site mixing of concrete, mortars and paving. Contaminated soil meeting the definition of hazardous material or hazardous waste is not included.

c. Debris: Non-hazardous solid material generated during the construction, demolition, or renovation of a structure which exceeds 2.5 inch particle size, that is: a manufactured object; plant or animal matter; or natural geologic material (e.g., cobbles and boulders), broken or removed concrete, masonry, and rock asphalt paving; ceramics; roofing paper and shingles. Inert materials that may or may not be reinforced with or contain ferrous wire, rods, accessories and weldments. A mixture of debris and other material such as soil or sludge is also subject to regulation as debris if the mixture is comprised primarily of debris by volume, based on visual inspection.

d. Wood: Dimension and non-dimension lumber, plywood, chipboard, hardboard. Treated and/or painted wood that meets the definition of lead contaminated or lead based contaminated paint is not included.

e. Scrap metal: Scrap and excess ferrous and non-ferrous metals such as reinforcing steel, structural shapes, pipe and wire that are recovered or collected and disposed of as scrap. Scrap metal meeting the definition of hazardous material or hazardous waste is not included.

f. Paint cans: Metal cans that are empty of paints, solvents, thinners and adhesives. If permitted by the paint can label, a thin dry film may remain in the can.

g. Recyclables: Materials, equipment and assemblies such as doors, windows, door and window frames, plumbing fixtures, glazing and mirrors that are recovered and sold as recyclable. Metal meeting the definition of lead contaminated or lead based paint contaminated may not be included as recyclable if sold to a scrap metal company. Paint cans may not be included as recyclable if sold to a scrap metal company.

h. Hazardous Waste: By definition, to be a hazardous waste a material must first meet the definition of a solid waste. Hazardous waste and hazardous debris are special cases of solid waste. They have additional regulatory controls and must be handled separately. They are thus defined separately in this document.

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

1.3.3 Hazardous Debris

As defined in Solid Waste paragraph, debris that contains listed hazardous waste (either on the debris surface, or in its interstices, such as pore structure) per 40 CFR 261; or debris that exhibits a characteristic of hazardous waste per 40 CFR 261.

1.3.4 Chemical Wastes

This includes salts, acids, alkalizes, herbicides, pesticides, and organic chemicals.

1.3.5 Garbage

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

1.3.6 Hazardous Waste

Any discarded material, liquid, solid, or gas, which meets the definition of hazardous material or is designated hazardous waste by the Environmental Protection Agency or State Hazardous Control Authority as defined in 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, 40 CFR 265, 40 CFR 266, 40 CFR 268, 40 CFR 270, 40 CFR 271, 40 CFR 272, 40 CFR 273, 40 CFR 279, and 40 CFR 280.

1.3.7 Hazardous Materials

Hazardous materials as defined in 49 CFR 171 and listed in 49 CFR 172.

Hazardous material is any material that:

a. Is regulated as a hazardous material per 49 CFR 173, or

b. Requires a Safety Data Sheet (SDS) per 29 CFR 1910.120, or

c. During end use, treatment, handling, packaging, storage, transpiration, or disposal meets or has components that meet or have potential to meet the definition of a hazardous waste as defined by 40 CFR 261 Subparts A, B, C, or D.

Designation of a material by this definition, when separately regulated or controlled by other instructions or directives, does not eliminate the need for adherence to that hazard-specific guidance which takes precedence over this instruction for "control" purposes. Such material include ammunition, weapons, explosive actuated devices, propellants, pyrotechnics, chemical and biological warfare materials, medical and pharmaceutical supplies, medical waste and infectious materials, bulk fuels, radioactive materials, and other materials such as asbestos, mercury, and polychlorinated biphenyls (PCBs).

Nonetheless, the exposure may occur incident to manufacture, storage, use and demilitarization of these items.

1.3.8 Waste Hazardous Material (WHM)

Any waste material which because of its quantity, concentration, or physical, chemical, or infectious characteristics may pose a substantial hazard to human health or the environment and which has been so designated. Used oil not containing any hazardous waste, as defined above, falls under this definition.

1.3.9 Oily Waste

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

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

a. It is not prohibited in other state regulations or local ordinances.

b. The amount generated is "de minimus" (a small amount).

c. It is the result of minor leaks or spills resulting from normal process operations.

d. All free-flowing oil has been removed to the practical extent possible.

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

1.3.10 Regulated Waste

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

1.3.11 Universal Waste

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

1.3.12 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.

1.3.13 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.

1.3.14 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.

1.3.15 Land Application for Discharge Water

The term "Land Application" for discharge water implies that the Contractor must 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" must occur. Land Application must be in compliance with all applicable Federal, State, and local laws and regulations.

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 Pre-Construction Submittals

Regulatory Notifications; G

Contractor Hazardous Material Inventory Log; G

Wastewater treatment design calculations and schematic; G

Wastewater treatment system operator qualifications; G

Solid Waste Management Plan and Permit; G

Environmental Protection Plan; G

SD-06 Test Reports

Erosion and Sediment Control Inspection Reports

Storm Water Inspection Reports for General Permit

SD-11 Closeout Submittals

Some of the records listed below are also required as part of other submittals. For the "Records" submittal, maintain on-site a separate three-ring Environmental Records binder and submit at the completion of the project. Make separate parts to the Binder corresponding to each of the applicable sub items listed below.

Storm Water Pollution Prevention Plan compliance notebook; G

Hazardous Waste/Debris Management

1.5 ENVIRONMENTAL PROTECTION REQUIREMENTS

The Contractor shall 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 must be protected during the entire duration of this contract. The Contractor shall comply with all applicable environmental Federal, State and local laws and regulations. Any delays resulting from failure to comply with the environmental laws and regulations will be the Contractor’s responsibility.

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

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

1.6 QUALITY ASSURANCE

1.6.1 Preconstruction Survey

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

1.6.2 Regulatory Notifications

The Contractor is responsible for all regulatory notification requirements in accordance with Federal, state and local regulations. Submit copies of all regulatory notifications to the Contracting Officer prior to commencement of work activities. Typically, regulatory notifications must be provided for the following (this listing is not all inclusive): demolition, renovation, NPDES defined site work, remediation of controlled substances (asbestos, hazardous waste, lead paint).

1.6.3 Environmental Brief

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

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

1.6.4 Environmental Manager

Appoint in writing an Environmental Manager for the project site. The Environmental Manager will be directly responsible for coordinating contractor compliance with Federal, state, local, and station requirements. The Environmental Manager will ensure compliance with Hazardous Waste Program requirements (including hazardous waste handling, storage, manifesting, and disposal); implement the Environmental Protection Plan; ensure that all environmental permits are obtained, maintained, and closed out; ensure compliance with Storm Water Program Management requirements; ensure compliance with Hazardous Materials (storage, handling, and reporting) requirements; and coordinate any remediation of regulated substances (lead, asbestos, PCB transformers). This can be a collateral position; however, the person in this position must be trained to adequately accomplish the following duties: ensure waste segregation and storage compatibility requirements are met; inspect and manage Satellite Accumulation areas; ensure only authorized personnel add wastes to containers; ensure all Contractor personnel are trained in 40 CFR requirements in accordance with their position requirements; coordinate removal of waste containers; and maintain the Environmental Records binder and required documentation, including environmental permits compliance and close-out.

1.7 ENVIRONMENTAL PROTECTION PLAN (EPP)

Prior to initiating any work on site, meet with the Contracting Officer to discuss the proposed Environmental Protection Plan and develop a mutual understanding relative to the details of environmental protection, including measures for protecting natural resources, required reports, and other measures to be taken. Submit the Environmental Protection Plan in the following format and include the elements specified below.

a. Description of the Environmental Protection Plan

(1) General overview and purpose

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

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

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

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

(e) Emergency contact information contact information (office phone number, cell phone number, and e-mail address).

(2) General site information

(3) A letter signed by an officer of the firm appointing the Environmental Manager and stating that he/she is responsible for managing and implementing the Environmental Program as described in this Contract. Include in this letter the Environmental Manager's authority to direct the removal and replacement of non-conforming work.

b. Management of Natural Resources

(1) Land resources

(2) Tree protection

(3) Replacement of damaged landscape features

(4) Temporary construction

(5) Stream crossings

(6) Fish and wildlife resources

(7) Wetland areas

c. Storm Water Management and Control

(1) Ground cover

(2) Erodible soils

(3) Temporary measures

(a) Mechanical retardation and control of runoff

(b) Vegetation and mulch

(4) Effective selection, implementation and maintenance of Best Management Practices (BMPs)

d. Protection of the Environment from Waste Derived from Contractor Operations

(1) Control and disposal of solid and sanitary waste

(2) Control and disposal of hazardous waste (Hazardous Waste Management Section)

This item will consist of the management procedures for all hazardous waste to be generated. The elements of those procedures will coincide with the Activity Hazardous Waste Management Plan. A copy of the Activity Hazardous Waste Management Plan will be provided by the Contracting Officer. As a minimum, include the following:

(a) Procedures to be employed to ensure a written waste determination is made for appropriate wastes which are to be generated;

(b) Sampling/analysis plan;

(c) Methods of hazardous waste accumulation/storage (i.e., in tanks and/or containers);

(d) Management procedures for storage, labeling, transportation, and disposal of waste (treatment of waste is not allowed unless specifically noted);

(e) Management procedures and regulatory documentation ensuring disposal of hazardous waste complies with Land Disposal Restrictions (40 CFR 268);

(f) Management procedures for recyclable hazardous materials such as lead-acid batteries, used oil, and the like;

(g) Used oil management procedures in accordance with 40 CFR 279;

(h) Pollution prevention\hazardous waste minimization procedures;

(i) Plans for the disposal of hazardous waste by permitted facilities;

(j) Procedures to be employed to ensure all required employee training records are maintained.

e. Prevention of Releases to the Environment

(1) Procedures to prevent releases to the environment

(2) Notifications in the event of a release to the environment

f. Regulatory Notification and Permits

List what notifications and permit applications must be made. Some permits require up to 90 days to obtain. Demonstrate that those permits have been obtained or applied for by including copies of all applicable, environmental permits. The Plan will not be approved until all permits have been obtained.

g. Clean Air Act Compliance

(1) Identify air pollution generating equipment or processes that may require Federal, state, or local permits under the Clean Air Act.

(2) Identify portable and stationary internal combustion engines (ICE's) that will be supplied, utilized or serviced. Address compliance with 40 CFR 60 Subpart IIII, 40 CFR 63 Subpart ZZZZ, and local regulations as applicable. At minimum, include the make, model, serial number, manufacture date, size (engine bhp), and EPA emission certification status of each engine.

(3) Identify planned air pollution generating processes and management control measures (including but not limited to spray painting, abrasive blasting, demolition, material handling, fugitive dust, and fugitive emissions).

1.7.1 Environmental Protection Plan Review

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

1.7.2 Licenses and Permits

The following permits will be obtained by the Contractor:

a. Burlington County Soil Conservation District Erosion Control Permit
b. NJDEP General SPDES Permit for Discharges Associated with Construction Activity
c. NJDEP Freshwater Wetlands Permit
d. NJ well drilling/abandonment permits
e. Wastewater discharge permits required to operate and discharge any temporary water treatment system.
f. Construction/building permit

As a part of the quality control plan, which is required by Section 01 45 00.00 10 QUALITY CONTROL, provide a sub item containing the name, appropriate professional registration or license number, address, and telephone number of the professionals or other qualified persons who will be performing the inspections and certifications for each permit.

1.8 HAZARDOUS, TOXIC AND RADIOACTIVE WASTE (HTRW) PERIMETER AIR MONITORING

For the protection of public health, monitor and control contaminant emissions to the air from HTRW remedial action area sources to minimize short term risks that might be posed to the community during implementation of the remedial alternative in accordance with the Section 01 12 00 – AIR MONITORING PLAN.

1.9 SUBCONTRACTORS

The Contractor shall ensure compliance with this section by subcontractors.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 PROTECTION OF NATURAL RESOURCES

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

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

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

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

The Contracting Officer's approval is required before any equipment will be permitted to ford live streams. In areas where frequent crossings are required, install temporary culverts or bridges. Obtain Contracting Officer's approval prior to installation. Remove temporary culverts or bridges upon completion of work, and repair the area to its original condition unless otherwise required by the Contracting Officer.

3.1.1 Erosion and Sediment Control Measures

3.1.1.1 Burn off

Burn off of the ground cover is not permitted.

3.1.1.2 Protection of Erodible Soils

Immediately finish the earthwork brought to a final grade, as indicated or specified. Immediately protect the side slopes and back slopes upon

completion of rough grading. Plan and conduct earthwork to minimize the duration of exposure of unprotected soils.

3.1.1.3 Temporary Protection of Erodible Soils

Use the following methods to prevent erosion and control sedimentation:

a. Mechanical Retardation and Control of Runoff

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

b. Vegetation and Mulch

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

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

3.1.2 Erosion and Sediment Control Inspection Reports

Note erosion control inspection reports may be compiled as part of a stormwater pollution prevention plan inspection reports if applicable.

3.1.2.1 Stormwater Construction General Permit Request for Authorization and Storm Water Pollution Prevention Plan

The Contractor shall follow the Storm Water Pollution Prevention Plan (SWPPP) prepared for the project. Maintain an approved copy of the SWPPP at the construction on-site office, and continually update as regulations require, reflecting current site conditions.

The Contractor shall prepare and submit a Registration Statement as a co-permittee with the Construction Officer, and provide the permit fee to the responsible state agency before any land disturbing activities begin. File for permit coverage on behalf of both the Construction Officer and themselves, and file a Notice of Termination once construction is complete and the site is stabilized with a final sustainable cover.

Under the terms and conditions of the permit, the Contractor may be required to install, inspect, maintain best management practices (BMPs), and submit stormwater BMP inspection reports and stormwater pollution prevention plan inspection reports. Ensure construction operations and management are constantly in compliance with the terms and conditions of the general permit for storm water discharges from construction activities.

3.1.2.2 Storm Water Pollution Prevention Plan Compliance Notebook

Create and maintain a three-ring binder of documents that demonstrate compliance with the Stormwater Construction Activity permit. The binder shall include a copy of the permit Registration Statement, proof of permit fee payment, SWPPP and SWPPP update amendments, inspection reports, copies of correspondence with the Burlington County SCD and NJDEP and a copy of the permit Notice of Termination. At the completion of the project the notebook shall become the property of the Government. Provide the compliance notebook to Contracting Officer. Provide an advance copy of the Registration Statement to the Contracting Officer immediately after the form is presented to the permitting agency.

3.1.3 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 unless otherwise indicated. For construction activities immediately adjacent to impaired surface waters, the Contractor must be capable of quantifying sediment or pollutant loading to that surface water when required by State or Federally issued Clean Water Act permits.

3.1.3.1 Dewatering Operations

Construction operations for dewatering will be controlled at all times to maintain compliance with existing State water quality standards and designated uses of the surface water body. Comply with the State of New Jersey water quality standards.

3.1.3.2 Wetlands

Do not enter, disturb, destroy, or allow discharge of contaminants into any wetlands except as authorized herein. Authorization to enter specific wetlands identified will not relieve the Contractor from any obligation to protect other wetlands within, adjacent to, or in the vicinity of the construction site and associated boundaries.

3.2 HISTORICAL AND ARCHAEOLOGICAL RESOURCES

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

Resources covered by this paragraph include but are not limited to: any human skeletal remains or burials; artifacts; shell, midden, bone, charcoal, or other deposits; rock or coral alignments, pavings, wall, or other constructed features; and any indication of agricultural or other human activities. Upon such discovery or find, immediately notify the Contracting Officer so that the appropriate authorities may be notified and a determination made as to their significance and what, if any, special disposition of the finds should be made. Cease all activities that may result in impact to or the destruction of these resources. Secure the area and prevent employees or other persons from trespassing on, removing, or otherwise disturbing such resources.

3.3 SOLID WASTE MANAGEMENT PLAN AND PERMIT

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

3.3.1 Solid Waste Management Report

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

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

3.3.2 Control and Management of Solid Wastes

Pick up solid wastes, and place in covered containers which are regularly emptied. Do not prepare or cook food on the project site. Prevent contamination of the site or other areas when handling and disposing of wastes. At project completion, leave the areas clean. Recycling is encouraged and can be coordinated with the Contracting Officer and the activity recycling coordinator. Remove all solid waste (including non-hazardous debris) from Government property and dispose off-site at an approved landfill. Solid waste disposal off-site must comply with most stringent local, state, and Federal requirements including 40 CFR 241, 40 CFR 243, and 40 CFR 258.

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

3.3.2.1 Disposal Documentation for Hazardous and Regulated Waste

Manifest, pack, ship and dispose of hazardous or toxic waste and universal waste that is generated as a result of construction in accordance with the generating facilities generator status under the Recourse Conservation and Recovery Act. Contact the Contracting Officer for the facility RCRA identification number that is to be used on each manifest.

Submit a copy of the applicable EPA and or state permit(s), manifest(s), or license(s) for transportation, treatment, storage, and disposal of hazardous and regulated waste by permitted facilities. Hazardous or toxic waste manifest must be reviewed, signed, and approved by the USACE before the Contractor may ship waste.

3.4 WASTE DETERMINATION DOCUMENTATION

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

3.5 POLLUTION PREVENTION/HAZARDOUS WASTE MINIMIZATION

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

3.6 WASTE HAZARDOUS MATERIAL (WHM)/HAZARDOUS WASTE (HW) MATERIALS PROHIBITION

No waste hazardous material or hazardous waste shall be disposed of on government property. No hazardous material shall be brought onto government property that does not directly relate to requirements for the performance of this Contract. The government is not responsible for disposal of Contractor's waste material brought on the job site and not required in the performance of this Contract. The intent of this provision is to dispose of that waste identified as waste hazardous material/hazardous waste as defined herein that was generated as part of this Contract and existed within the boundary of the Contract limits and not brought in from offsite by the Contractor. Incidental materials used to support the Contract including, but not limited to aerosol cans, waste paint, cleaning solvents, contaminated brushes, rags, clothing, etc., are the responsibility of the Contractor. The list is illustrative rather than inclusive. The Contractor is not authorized to discharge any materials to sanitary sewer, storm drain, or to the river or conduct waste treatment or disposal on government property without written approval of the Contracting Officer.

3.7 HAZARDOUS MATERIAL MANAGEMENT

Include hazardous material control procedures in the Safety Plan. Address procedures and proper handling of hazardous materials, including the

appropriate transportation requirements. No hazardous material shall be brought onto government property that does not directly relate to requirements for the performance of this Contract. Submit a SDS and estimated quantities to be used for each hazardous material to the Contracting Officer prior to bringing the material on base. Typical materials requiring SDS and quantity reporting include, but are not limited to, oil and latex based painting and caulking products, solvents, adhesives, aerosol, and petroleum products. Ensure that hazardous materials are utilized in a manner that will minimize the amount of hazardous waste that is generated. Ensure that all containers of hazardous materials have NFPA labels or their equivalent. Certify that all hazardous materials removed from the site are hazardous materials and do not meet the definition of hazardous waste per 40 CFR 261.

3.7.1 Contractor Hazardous Material Inventory Log

Submit the "Contractor Hazardous Material Inventory Log"(found at: http://www.wbdg.org/ccb/NAVGRAPH/graphtoc.pdf), which provides information required by (EPCRA Sections 312 and 313) along with corresponding Safety Data Sheets (SDS), to the Contracting Officer at the start and at the end of construction (30 days from final acceptance), and update no later than January 31 of each calendar year during the life of the Contract. Keep copies of the SDS for hazardous materials on site at all times. At the end of the project, provide the Contracting Officer with copies of all of these SDS, and the maximum quantity of each material that was present at the site at any one time, the dates the material was present, the amount of each material that was used during the project, and how the material was used.

Documentation for any spills/releases, environmental reports or off-site transfers may be requested by the Contracting Officer.

3.8 PETROLEUM PRODUCTS AND REFUELING

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

3.8.1 Oily and Hazardous Substances

Prevent oil or hazardous substances from entering the ground, drainage areas, or navigable waters. In accordance with 40 CFR 112, surround all temporary fuel oil or petroleum storage tanks with a temporary berm or containment of sufficient size and strength to contain the contents of the tanks, plus 10 percent freeboard for precipitation. The berm will be impervious to oil for 72 hours and be constructed so that any discharge will not permeate, drain, infiltrate, or otherwise escape before cleanup occurs. Provide general secondary containment for oil transfer operations as required by 40 CFR 112.7.

3.8.2 Inadvertent Discovery of Petroleum Contaminated Soil or Hazardous Wastes

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

3.9 FUEL TANKS

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

3.10 RELEASES/SPILLS OF OIL AND HAZARDOUS SUBSTANCES

Exercise due diligence to prevent, contain, and respond to spills of hazardous material, hazardous substances, hazardous waste, sewage, regulated gas, petroleum, lubrication oil, and other substances regulated by environmental law. Maintain spill cleanup equipment and materials at the work site. In the event of a spill, take prompt, effective action to stop, contain, curtail, or otherwise limit the amount, duration, and severity of the spill/release. In the event of any releases of oil and hazardous substances, chemicals, or gases; immediately (within 15 minutes) notify the NJDEP Hotline at 1-977-WARN DEP (1-877-927-6337).

The Contractor is responsible for verbal and written notifications as required by the Federal 40 CFR 355, state, and local regulations. Spill response will be in accordance with 40 CFR 300 and applicable state and local regulations. Provide copies of the written notification and documentation that a verbal notification was made within 20 days.

Maintain spill cleanup equipment and materials at the work site. Clean up all hazardous and non-hazardous (WHM) waste spills.

3.11 CONTROL AND MANAGEMENT OF HAZARDOUS WASTES

3.11.1 Facility Hazardous Waste Generator Status

Comply with all provisions of Federal, state and local regulatory requirements applicable to the Site's generator status regarding training and storage, handling, and disposal of all construction derived wastes.

3.11.2 Hazardous Waste/Debris Management

Identify all construction activities which will generate hazardous waste/debris. Provide a documented waste determination for all resultant waste streams. Hazardous waste/debris will be identified, labeled, handled, stored, and disposed of in accordance with all Federal, state, and local regulations including 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, 40 CFR 265, 40 CFR 266, and 40 CFR 268.

Hazardous waste will also be managed in accordance with the approved Hazardous Waste Management Section of the Environmental Protection Plan.

Store hazardous wastes in approved containers in accordance with 49 CFR 173 and 49 CFR 178. Hazardous waste generated within the confines of Government facilities will be identified as being generated by the Government.

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. Spills of hazardous or toxic materials must be immediately reported to the Contracting Officer. Cleanup due to spills are the Contractor's responsibility. The disposition of Contractor generated hazardous waste and excess hazardous materials are the Contractor's responsibility.

Prior to removal of any hazardous waste from Government property, all hazardous waste manifests must be signed by activity personnel from the Station Environmental Office. No hazardous waste must be brought onto Government property. Provide to the Contracting Officer a copy of waste determination documentation for any solid waste streams that have any potential to be hazardous waste or contain any chemical constituents listed in 40 CFR 372-SUBPART D. For hazardous wastes spills, verbally notify the Contracting Officer immediately.

3.11.2.1 Regulated Waste Storage/Satellite Accumulation/90 Day Storage Areas

If the work requires the temporary storage/collection of regulated or hazardous wastes, the Contractor will request the establishment of a Regulated Waste Storage Area, a Satellite Accumulation Area, or a 90-Day Storage Area at the point of generation. The Contractor must submit a request in writing to the Contracting Officer providing the following information:

Contract Number	[_____]
Contractor	[_____]
Haz/Waste or Regulated Waste POC	[_____]
Phone Number	[_____]
Type of Waste	[_____]
Source of Waste	[_____]
Emergency POC	[_____]
Phone Number	[_____]
Location of the Site	[_____]

(Attach Site Plan to the Request)

Attach a waste determination form. Allow ten working days for processing this request. The designated area where waste is being stored shall be barricaded and a sign identifying as follows:

"DANGER - UNAUTHORIZED PERSONNEL KEEP OUT"

3.11.2.2 Sampling and Analysis of Hazardous Waste (HW)

a. Waste Sampling

Sample waste in accordance with EPA 530/F-93/004. Each sampled drum or container will be clearly marked with the Contractor's identification number and cross referenced to the chemical analysis performed.

b. Laboratory Analysis

Follow the analytical procedure and methods in accordance with the 40 CFR 261. The Contractor will provide all analytical results and reports performed to the Contracting Officer.

c. Analysis Type

Identify waste hazardous material/hazardous waste by analyzing for the following properties as a minimum: ignitability, corrosiveness, total chlorides, BTU value, PCBs, TCLP for volatile organic compounds (VOCs).

3.11.2.3 Hazardous Waste Disposal

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.

No hazardous, toxic, or universal waste shall be disposed or hazardous material abandoned on government property. Unless otherwise noted in this Contract, the government is not responsible for disposal of Contractor generated waste material. The disposal of incidental materials used to accomplish the work including, but not limited to aerosol cans, waste paint, cleaning solvents, contaminated brushes, rags, clothing, etc. are the responsibility of the Contractor. The list is illustrative rather than inclusive.

The Contractor is not authorized to discharge any materials to sanitary sewer, storm drain, or water way or conduct waste treatment or disposal on government property without written approval of the Contracting Officer.

Control of stored waste, packaging, sampling, analysis, and disposal will be determined by the details in the Contract. The requirements for jobs in the following paragraphs will be used as the guidelines for disposal of any hazardous waste generated.

a. Responsibilities for Contractor's Disposal

Contractor responsibilities include any generation of WHM/HW requiring Contractor disposal of solid waste or liquid.

(1) Provide all service necessary for the final treatment/disposal of the hazardous material/waste in accordance with all local, state and Federal laws and regulations, and the terms and conditions of the Contract within sixty (60) days after the materials have been generated. These services will include all necessary personnel, labor, transportation, packaging, detailed analysis (if required for disposal, and/or transportation, including manifesting or completing waste profile sheets, equipment, and the compilation of all documentation is required).

(2) Contain all waste in accordance with 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, 40 CFR 265, 40 CFR 266, 40 CFR 268, 40 CFR 270, 40 CFR 272, 40 CFR 273, 40 CFR 279, 40 CFR 280, and 40 CFR 761.

(3) Obtain a representative sample of the material generated for each job done to provide waste stream determination.

(4) Analyze each sample taken and providing analytical results to the Contracting Officer. Provide two copies of the results.

(5) Determine the DOT proper shipping names for all waste (each container requiring disposal) and will demonstrate how this determination is developed and supported by the sampling and analysis requirements contained herein to the Contracting Officer.

Contractor Disposal Turn-In Requirements

For any waste hazardous materials or hazardous waste generated which requires the Contractor to dispose of, the following conditions must be complied with in order to be acceptable for disposal:

(1) Drums compatible with waste contents and drums meet DOT requirements for 49 CFR 173 for transportation of materials.

(2) Drums banded to wooden pallets. No more than three (3) 55 gallon drums to a pallet, or two (2) 85 gallon over packs.

(3) Band using 1-1/4 inch minimum band on upper third of drum.

(4) Recovery materials label (provided by Code 106.321) located in middle of drum, filled out to indicate actual volume of material, name of material manufacturer, other vendor information as available.

(5) Always have three (3) to five (5) inches of empty space above volume of material. This space is called 'outage.'

3.11.2.4 Universal Waste/e-Waste Management

Universal waste including but not limited to some mercury containing building products such florescent lamps, mercury vapor lamps, high pressure sodium lamps, CRTs, batteries, aerosol paint containers, electrical equipment containing PCBs, and consumed electronic devices, shall be managed in accordance with applicable environmental law and installation instructions.

3.12 DUST CONTROL

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

Maintain excavations, stockpiles, haul roads, permanent and temporary access roads, spoil areas, borrow areas, and other work 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 nuisance.

3.13 NOISE

Keep Construction activities under surveillance and control to minimize environment damage by noise. Comply with the provisions of OSHA, New Jersey, and Evesham Township.

Make the maximum use of low-noise emission products, as certified by the EPA. Blasting or use of explosives will not be permitted. No noise is permitted between the hours of 6 pm to 7 am.

3.14 ODORS

Odors from construction activities must be controlled at all times. The odors must be in compliance with State regulations and/or local ordinances and may not constitute a health hazard.

Burning is prohibited on the project site, unless approved by the Contracting Officer.

3.15 CONTROL AND MANAGEMENT OF WASTEWATERS

The Contractor shall provide a temporary water treatment system to treat wastewaters generated during construction. The Contractor shall be responsible for the design, installation and operation of any temporary wastewater treatment system in accordance with all local, State and Federal regulations. The Contractor will be responsible for obtaining all approval and permits necessary to operate the treatment system.

Prior to installing and operating a system the Contractor shall provide design calculations and schematic of the proposed treatment system equipment and layout to the Contracting Officer for approval. The Contractor shall also supply properly licensed operators as necessary for the wastewater treatment system operations, based on the treatment plant complexity rating as defined by NJDEP. Qualifications of the operator shall be submitted to the Contracting Officer for approval.

Wastewater shall be treated to meet the applicable surface water discharge permit requirements specified in the NJDEP SPDES permit obtained by the Contractor.

3.16 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.

3.17 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 must be controlled to protect adjacent areas.

3.18 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.

3.19 TRAINING OF CONTRACTOR PERSONNEL

The Contractor's personnel must 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 must 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, vegetative covers, and instruments required for monitoring purposes to ensure adequate and continuous environmental protection/pollution control; anticipated hazardous or toxic chemicals or wastes, and other regulated contaminants; recognition and protection of archaeological sites, artifacts, wetlands, and endangered species and their habitat that are known to be in the area.

3.20 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 such as haul roads, work area, structures, foundations of temporary structures, stockpiles of excess or waste materials, and other vestiges of construction prior to final acceptance of the work. The disturbed area must be graded, filled and the entire area seeded unless otherwise indicated.

-- End of Section --

SECTION 01 57 23

TEMPORARY STORM WATER POLLUTION CONTROL

PART 1 GENERAL

1.1 SUMMARY

The work consists of implementing the storm water pollution prevention measures to prevent sediment from entering streams or water bodies as specified in this Section in conformance with the requirements of Section 01 57 20.00 20 TEMPORARY ENVIRONMENTAL CONTROLS, and the requirements of the National Pollutant Discharge Elimination System (NPDES).

1.2 REFERENCES

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

ASTM INTERNATIONAL (ASTM)

ASTM D4439	(2014) Geosynthetics
ASTM D4491	(1999a; R 2014; E 2014) Water Permeability of Geotextiles by Permittivity
ASTM D4533	(2011) Trapezoid Tearing Strength of Geotextiles
ASTM D4632/D4632M	(2008; R 2013; E 2013; E 2014) Grab Breaking Load and Elongation of Geotextiles
ASTM D4751	(2012) Determining Apparent Opening Size of a Geotextile
ASTM D4873	(2002; R 2009) Identification, Storage, and Handling of Geosynthetic Rolls and Samples

1.3 SUBMITTALS

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

SD-01 Preconstruction Submittals

Erosion and Sediment Control Plan

SD-06 Test Reports

Storm Water Inspection Reports for General Permit

SD-07 Certificates

Mill Certificate or Affidavit

1.4 DELIVERY, STORAGE, AND HANDLING

Identify, store and handle filter fabric in accordance with ASTM D4873.

PART 2 PRODUCTS

2.1 COMPONENTS FOR SILT FENCES

2.1.1 Filter Fabric

Provide geotextile that complies with the requirements of ASTM D4439, and consists 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 contains stabilizers and/or inhibitors added to the base plastic to make the filaments resistant to deterioration due to ultraviolet and heat exposure. Provide synthetic filter fabric that contains ultraviolet ray inhibitors and stabilizers to assure a minimum of six months of expected usable construction life at a temperature range of 0 to 120 degrees F. The filter fabric shall be a minimum of 70 gram and shall meet the following requirements:

FILTER FABRIC FOR SILT SCREEN FENCE		
PHYSICAL PROPERTY	TEST PROCEDURE	STRENGTH REQUIREMENT
Grab Tensile Elongation (percent)	ASTM D4632/D4632M	100 lbs. min. 30 percent max.
Trapezoid Tear	ASTM D4533	55 lbs. min.
Permittivity	ASTM D4491	0.2 sec-1
AOS (U.S. Std Sieve)	ASTM D4751	20-100
UV Resistance	ASTM D-4355	%Retained @500 hrs: 70% minimum

2.1.2 Silt Fence Stakes and Posts

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 by 2 inches when oak is used and 4 by 4 inches when pine is used, and 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/linear foot and a minimum length of 5 feet.

2.1.3 Mill Certificate or Affidavit

Provide a mill certificate or affidavit attesting that the fabric and factory seams meet chemical, physical, and manufacturing requirements specified above. Specify in the mill certificate or affidavit the actual Minimum Average Roll Values and identify the fabric supplied by roll identification numbers. Submit a mill certificate or affidavit signed by a legally authorized official from the company manufacturing the filter fabric.

2.1.4 Wire Mesh

Wire mesh shall be a minimum 14 gauge welded steel wire mesh, 4” square openings.

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 Bahia, Bermuda, etc., furnished in air dry condition. Provide bales with a standard cross section of 14 by 18 inches. Wire-bound or string-tie all bales. 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 by 2 inches in cross section and 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/linear foot and a minimum length of 3 feet.

PART 3 EXECUTION

3.1 EROSION AND SEDIMENT CONTROLS

The controls and measures required of the Contractor are described below.

3.1.1 Stabilization Practices

The stabilization practices to be implemented include temporary seeding, mulching, and erosion control mats. On the daily CQC Report, record the dates when the major grading activities occur, (e.g., clearing and grubbing, excavation, and grading); 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 14 DAYS, initiate stabilization practices as soon as practicable in any portion of the site where construction activities have temporarily or permanently ceased.

3.1.1.1 Unsuitable Conditions

Where the initiation of stabilization measures by the fourteenth day after construction activity temporarily or permanently ceases or is precluded by unsuitable conditions caused by the weather, initiate stabilization practices as soon as practicable after conditions become suitable.

3.1.1.2 No Activity for Less Than 14 Days

When the total time period in which construction activity is temporarily ceased on a portion of the site is 14 days minimum, stabilization practices shall be initiated on that portion of the site.

3.1.1.3 Burnoff

Burnoff of the ground cover is not permitted.

3.1.1.4 Protection of Erodible Soils

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

3.1.2 Erosion, Sediment and Stormwater Control

a. Submit Storm Water Inspection Reports for General Permit to the Contracting Officer once every 7 calendar days and within 24 hours of a storm event that produces 0.5 inch or more of rain.

3.1.3 Structural Practices

Implement structural practices to divert flows from exposed soils, temporarily store flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Implement structural practices in a timely manner, during the construction process, to minimize erosion and sediment runoff. Location and details of installation and construction are shown on the drawings.

3.1.3.1 Silt Fences

Provide silt fences as a temporary structural practice to minimize erosion and sediment runoff. Properly install silt fences 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., clearing and grubbing, excavation, embankment, and grading). Install silt fences in the locations indicated on the drawings. Obtain approval from the Contracting Officer prior to final removal of silt fence barriers.

3.1.3.2 Straw Bales

Provide bales of straw as a temporary structural practice to minimize erosion and sediment runoff. If bales are used, properly place the bales to effectively retain sediment immediately after completing each phase of work (e.g., clearing and grubbing, excavation, embankment, and grading) in each independent runoff area (e.g., after clearing and grubbing in a area between a ridge and drain, place the bales as work progresses, remove/replace/ relocate the bales as needed for work to progress in the drainage area). Show on the drawings areas where straw bales are to be used. The Contracting Officer will approve the final removal of straw bale barriers. Provide rows of bales of straw 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.

3.1.3.3 Diversion Dikes

Build diversion dikes with a maximum channel slope of 2 percent and adequately compacted to prevent failure. The minimum height measured from the top of the dike to the bottom of the channel shall be 18 inches. The minimum base width shall be 6 feet and the minimum top width shall be 2 feet. Ensure that the diversion dikes are not damaged by construction operations or traffic. Locate diversion dikes where shown on the drawings.

3.1.4 Vegetation and Mulch

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

b. Seeding: Provide new seeding where ground is disturbed. Include topsoil or nutriment during the seeding operation necessary to establish a suitable stand of grass. The seeding operation will be as specified in Section 32 92 19 SEEDING.

3.2 INSTALLATION OF SILT FENCES

Extend silt fences a minimum of 16 inches above the ground surface without exceeding 34 inches above the ground surface. Provide filter fabric from a continuous roll cut to the length of the barrier to avoid the use of joints. When joints are unavoidable, splice together filter fabric at a support post, with a minimum 6 inch overlap, and securely sealed. Excavate trench approximately 4 inches wide and 4 inches deep on the upslope side of the location of the silt fence. The 4 by 4 inch trench shall be backfilled and the soil compacted over the filter fabric. Remove silt fences upon approval by the Contracting Officer.

3.3 INSTALLATION OF STRAW BALES

Place the straw bales in a single row, lengthwise on the contour, with ends of adjacent bales tightly abutting one another. Install straw bales 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. Entrench and backfill the barrier. Excavate a trench 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), backfill the excavated soil against the barrier. Conform the backfill soil with the ground level on the downhill side and build up to 4 inches against the uphill side of the barrier. Scatter loose straw over the area immediately uphill from a straw bale barrier to increase barrier efficiency. Securely anchor each bale by at least two stakes driven through the bale. Drive the first stake or steel post in each bale toward the previously laid bale to force the bales together. Drive stakes or steel pickets a minimum 18 inches deep into the ground to securely anchor the bales.

3.4 FIELD QUALITY CONTROL

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. Use the following procedures to maintain the protective measures.

3.4.1 Silt Fence Maintenance

Inspect the silt fences in accordance with paragraph, titled "Inspections," of this section. Any required repairs shall be made promptly. Pay close attention 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, replace the fabric promptly. Remove sediment deposits when deposits reach one-third of the height of the barrier. Remove a silt fence when it is no longer required. 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 in accordance with Section 32 92 19 SEEDING.

3.4.2 Straw Bale Maintenance

Inspect straw bale barriers in accordance with paragraph, titled "Inspections." Pay close attention to the repair of damaged bales, end runs and undercutting beneath bales. Accomplish necessary repairs to barriers or replacement of bales in a promptly manner. Remove sediment deposits when deposits reach one-half of the height of the barrier. At the each end of each row turn bales uphill when used to retain sediment. Remove a straw bale barrier when it is no longer required. The immediate area occupied by the bales and any sediment deposits shall be shaped to an acceptable grade. Seed the areas disturbed by this shaping in accordance with Section 32 92 19 SEEDING.

3.4.3 Diversion Dike Maintenance

Inspect diversion dikes in accordance with paragraph, titled "Inspections," of this section. Pay close attention to the repair of damaged diversion dikes and accomplish necessary repairs promptly. When diversion dikes are no longer required, shape to an acceptable grade. Seed the areas disturbed by this shaping in accordance with Section 32 92 19 SEEDING.

3.5 INSPECTIONS

3.5.1 General

Inspect disturbed areas of the construction site, areas that have not been finally stabilized used for storage of materials exposed to precipitation, 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. Conduct inspections at least once every month where sites have been finally stabilized.

3.5.2 Inspections Details

Inspect disturbed areas and areas used for material storage that are exposed to precipitation for evidence of, or the potential for, pollutants entering

the drainage system. Observe erosion and sediment control measures identified in the Storm Water Pollution Prevention Plan to ensure that they are operating correctly. Inspect discharge locations or points to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters. Inspect locations where vehicles exit the site for evidence of offsite sediment tracking.

3.5.3 Inspection Reports

For each inspection conducted, 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. Furnish the report 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.

-- End of Section --

SECTION 01 78 00

CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.1 SUMMARY

This section provides the requirements for the Remedial Closeout Package that will be required to be submitted at project completion. The closeout package shall also contain administrative records for substantial completion and for final acceptance of the work.

1.2 REFERENCES

U.S. Environmental Protection Agency (EPA)

OSWER Directive 9320.2-22	(2011) Close Out Procedures for National Priorities List Sites

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-11 Closeout Submittals

Remedial Closeout Package; G

Interim Form DD1354; G

Checklist for Form DD1354; G

1.4 REMEDIAL CLOSEOUT PACKAGE

The Contractor shall provide the following documentation as part of the remedial closeout package in addition to other items that are specified elsewhere by the contract specifications.

- Construction schedule and progress records
- As-built drawings (Record drawings)
- Contract Work Plans
- Decontamination certifications
- Waste disposal data
- Records of all site work including but not limited to excavation volumes and limits, backfill volumes and origin documentation, topsoil volumes, site restoration, etc.
- Water Treatment and Discharge Reports
- Modifications to the Contract – Project Change Orders (PCOs)
- Contracting Officer’s Directives
- Analytical Sample Results
- Final inspection and certification
- Daily and monthly field reports

- Site photographs and videos
- Safety and accident documentation and reports
- Air monitoring data and reports
- Chain-of-custody documentation
- Other items as may be required by the Contracting Officer or by other specification sections not specifically listed above

1.5 PROJECT RECORD DOCUMENTS

1.5.1 Record Drawings

Record Drawings show the 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. The final CAD record drawings must consist of one set of electronic CAD drawing files in the specified format, 2 sets of prints, and one set of the approved working Record drawings.

1.5.1.1 Government Furnished Materials

One set of electronic CADD files in the specified software and format revised to reflect all bid amendments will be provided by the Government at the pre-construction conference for projects requiring CADD file record drawings.

1.5.1.2 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 as-built marked drawings current on a weekly basis and at least one set available on the jobsite at all times. Changes from the contract plans which are made in the work or additional information which might be uncovered in the course of construction must be accurately and neatly recorded as they occur by means of details and notes. Prepare final record (as-built) drawings after the completion of each definable feature of work as listed in the Contractor Quality Control Plan (Foundations, Utilities, Structural Steel, etc., as appropriate for the Project). The working as-built marked prints and final record (as-built) drawings will be jointly reviewed for accuracy and completeness by the Contracting Officer and the Contractor prior to submission of each monthly pay estimate. Show on the working and final record drawings the following minimum information:

a. The actual location, kinds and sizes of all sub-surface utility lines. In order that the location of these lines and appurtenances may be determined in the event the surface openings or indicators become covered over or obscured, show by offset dimensions to two permanently fixed surface features the end of each run including each change in direction on the record drawings. Locate valves, splice boxes and similar appurtenances by dimensioning along the utility run from a reference point. Also record the average depth below the surface of each run.

b. The location and dimensions of any changes within the building structure.

c. 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 as-built prints.

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. 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.

1.5.1.3 Drawing Preparation

Modify the record drawings as may be necessary to correctly show the features of the Project as it has been constructed by bringing the contract set into agreement with approved working as-built prints, and adding such additional drawings as may be necessary. These working as-built marked prints must be neat, legible, and accurate. These drawings are part of the

permanent records of this Project and must be returned to the Contracting Officer after approval by the Government. Any drawings damaged or lost by the Contractor must be satisfactorily replaced by the Contractor.

1.5.1.4 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 must 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 must be identical to that used on the Contract drawings. Accomplish additions and corrections to the Contract drawings using CADD files. The Contractor will be furnished "as-designed" drawings in AutoCad Release [2011 or later]. The electronic files will be supplied on optical disk. Provide all program files and hardware necessary to prepare final record drawings. 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 "RECORD DRAWINGS / AS-BUILT CONDITIONS" 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 "Record" drawing denoting no revisions on the sheet or "Revised Record" denoting one or more revisions. Date original Contract drawings in the revision block.

d. Within ten days after Government approval of all of the working record drawings for a phase of work, prepare the final CADD record drawings for that phase of work and submit two sets of blue-lined prints of these drawings for Government review and approval. The Government will promptly return one set of prints annotated with any necessary corrections. Within seven days revise the CADD files accordingly and submit one set of final prints for the completed phase of work to the Government. Within ten days of

substantial completion of all phases of work, submit the final record drawing package for the entire project. Submit one set of electronic files on optical disk, two sets of blue-line prints and one set of the approved working record drawings. They must 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 are 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 marked prints as specified will be cause for withholding any payment due the Contractor under this Contract. Approval and acceptance of final record drawings must be accomplished before final payment is made to the Contractor.

1.5.2 As-Built Record of Equipment and Materials

Furnish two copies of preliminary record of equipment and materials used on the Project 15 days prior to final inspection. This preliminary submittal will be reviewed and returned five days after final inspection with Government comments. Submit two sets of final record of equipment and materials ten days after final inspection. Key the designations to the related area depicted on the contract drawings. List the following data:

RECORD OF DESIGNATED EQUIPMENT AND MATERIALS DATA				
Description	Specification Section	Manufacturer and Catalog, Model, and Serial Number	Composition and Size	Where Used

1.5.3 Final Approved Shop Drawings

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

1.5.4 Construction Contract Specifications

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

1.5.5 Real Property Equipment

Furnish a list of installed equipment furnished under this Contract. Include all information usually listed on manufacturer's name plate. In the "EQUIPMENT-IN-PLACE LIST" include, as applicable, the following for each piece of equipment installed: description of item, location (by room number), model number, serial number, capacity, name and address of manufacturer, name and address of equipment supplier, condition, spare parts

list, manufacturer's catalog, and warranty. Furnish a draft list at time of transfer. Furnish the final list 30 days after transfer of the completed facility.

1.6 SPARE PARTS DATA

Submit two copies of the Spare Parts Data list.

a. Indicate manufacturer's name, part number, nomenclature, and stock level required for maintenance and repair. List those items that may be standard to the normal maintenance of the system.

b. Supply two items of each part for spare parts inventory. Provision of spare parts does not relieve the Contractor of responsibilities listed under the contract guarantee provisions.

1.7 PREVENTATIVE MAINTENANCE

Submit Preventative Maintenance, Condition Monitoring (Predictive Testing) and Inspection schedules with instructions that state when systems should be retested.

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

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

1.8 CERTIFICATION OF EPA DESIGNATED ITEMS

Submit the Certification of EPA Designated Items as required by FAR 52.223-9, "Certification and Estimate of Percentage of Recovered Material Content for EPA Designated Items." Include on the certification form the following information: project name, project number, Contractor name, license number, Contractor address, and certification. The certification will read as follows and be signed and dated by the Contractor. "I hereby certify the information provided herein is accurate and that the requisition/procurement of all materials listed on this form comply with current EPA standards for recycled/recovered materials content. The following exemptions may apply to the non-procurement of recycled/recovered content materials: 1) The product does not meet appropriate performance standards; 2) The product is not available within a reasonable time frame; 3) The product is not available competitively (from two or more sources); 4) The product is only available at an unreasonable price (compared with a comparable non-recycled content product)."

1.9 CLEANUP

Leave premises "broom clean." Clean interior and exterior glass surfaces exposed to view; remove temporary labels, stains and foreign substances; polish transparent and glossy surfaces; vacuum carpeted and soft surfaces. Clean equipment and fixtures to a sanitary condition. Replace 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.

1.10 REAL PROPERTY RECORD

Near the completion of Project, but a minimum of 60 days prior to final acceptance of the work, complete and submit an accounting of all installed property with Interim Form DD1354 "Transfer and Acceptance of Military Real Property." Include any additional assets/improvements/alterations from the Draft DD Form 1354. Contact the Contracting Officer for any project specific information necessary to complete the DD Form 1354. Refer to UFC 1-300-08 for instruction on completing the DD Form 1354. For information purposes, a blank DD Form 1354 (fill-able) in ADOBE (PDF) may be obtained at the following web site:
http://www.dtic.mil/whs/directives/infomgt/forms/eforms/dd1354.pdf

Submit the completed Checklist for Form DD1354 of Installed Building Equipment items. Attach this list to the updated DD Form 1354.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 REMEDIAL CLOSEOUT PACKAGE

Submit the Remedial Closeout Package for all work under this contract within 30 days of Final Acceptance Certification.

3.2 FINAL ACCEPTANCE

Upon completion of work, submit to the Contracting Officer written notification that Contract Documents and approved plans have been reviewed, work has been inspected for compliance with Contract Documents and approved plans, work has been completed in accordance with Contract Documents and approved plans, deficiencies listed with Certificate of Substantial Completion have been corrected, and work is complete and ready for final inspection. Should the Contracting Officer find work incomplete, he will promptly provide written notification, listing observed deficiencies.

Remedy the deficiencies and send a second request for certification of Final Completion. This procedure will continue until such time when the Contracting Officer is satisfied with such repairs and corrections. When the Contracting Officer finds work is complete, he will consider closeout submittals, and a Final Acceptance Certification will be issued. When the Final Acceptance Certification is received, submit the final invoice for final payment.

-- End of Section --

SECTION 02 81 00

TRANSPORTATION AND DISPOSAL

PART 1 GENERAL

1.1 SUMMARY

This section covers the characterization, management, transportation, and disposal of waste, including requirements for staging, labeling, documentation, and spill response.

1.2 REFERENCES

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

U.S. ARMY CORPS OF ENGINEERS (USACE)

EP 415-1-266	(2000) Resident Engineer Management Guide (REMG) for Hazardous, Toxic, and Radioactive Waste (HTRW) Projects

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

40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 263	Standards Applicable to Transporters of Hazardous Waste
40 CFR 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 265	Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 266	Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities
40 CFR 268	Land Disposal Restrictions
40 CFR 270	EPA Administered Permit Programs: The Hazardous Waste Permit Program
40 CFR 300	National Oil and Hazardous Substances Pollution Contingency Plan

40 CFR 302	Designation, Reportable Quantities, and Notification
49 CFR 107	Hazardous Materials Program Procedures
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
49 CFR 173	Shippers - General Requirements for Shipments and Packagings
49 CFR 178	Specifications for Packagings

1.3 DEFINITIONS

1.3.1 Hazardous Material

A substance or material which has been determined by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and which has been so designated pursuant to the Hazardous Materials Transportation Act, 49 U.S.C. Appendix Section 1801 et seq. The term includes materials designated as hazardous materials under the provisions of 49 CFR 172, Sections .101 and .102 and materials which meet the defining criteria for hazard classes and divisions in 49 CFR 173. EPA designated hazardous wastes are also hazardous materials.

1.3.2 Hazardous Waste

A waste which meets criteria established in RCRA or specified by the EPA in 40 CFR 261 or which has been designated as hazardous by a RCRA authorized state program.

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

Waste Management Plan; G

Plan shall be submitted 30 days after Notice to Proceed. This plan can be included in the Site Operations and Excavation Work Plan required under Section 31 23 00.00 20.

SD-03 Product Data

Notices of Non-Compliance and Notices of Violation
Packaging Notifications

SD-06 Test Reports

Recordkeeping; G
Spill Response
Exception Report; G

SD-07 Certificates

Certification
Transportation and Disposal Coordinator; G
Training; G
EPA Offsite Policy
Certificates of Disposal
Shipping Documents and Packagings Certification; G
Waste Minimization

1.5 QUALITY ASSURANCE

1.5.1 Transportation and Disposal Coordinator

Designate, by position and title, one person to act as the Transportation and Disposal Coordinator (TDC) for this contract. The TDC shall serve as the single point of contact for all environmental regulatory matters and shall have overall responsibility for total environmental compliance at the site including, but not limited to, accurate identification and classification of hazardous waste and hazardous materials; determination of proper shipping names; identification of marking, labeling, packaging and placarding requirements; completion of waste profiles, hazardous waste manifests, bills of lading, exception and discrepancy reports; and all other environmental documentation. The TDC shall have, at a minimum, one year of specialized experience in the management and transportation of hazardous waste and have been Department of Transportation certified under 49 CFR 172, Subpart H.

1.5.2 Training

The Contractor's hazardous materials employees shall be trained, tested, and certified to safely and effectively carry out their assigned duties in accordance with Section 01 35 29.13 HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES FOR CONTAMINATED SITES. The Contractor's employees transporting hazardous materials or preparing hazardous materials for transportation, including samples, shall be trained, tested, and certified in accordance with 49 CFR 172, Subpart H, including security awareness and any applicable security plans. If shipment of hazardous materials by air is required, such as for sample shipments, the Contractor's hazardous material employees shall also be trained on IATA DGR. Contractor employees making determinations that shipments do not constitute DOT regulated hazardous materials shall also be trained, tested, and certified in accordance with 49 CFR 172, Subpart H.

1.5.3 Certification

The Contractor and/or sub-Contractors transporting hazardous materials shall possess a current certificate of registration issued by the Research and Special Programs Administration (RSPA), U.S. Department of Transportation, when required by 49 CFR 107, Subpart G. Submit copies of the certificates or written statements certifying exemption from these requirements.

1.5.4 Laws and Regulations Requirements

Work shall meet or exceed the minimum requirements established by Federal, State, and Local laws and regulations which are applicable. These requirements are amended frequently and compliance with amendments is required as they become effective. In the event that compliance exceeds the scope of work or conflicts with specific requirements of the contract, notify the Contracting Officer immediately.

PART 2 PRODUCTS

2.1 MATERIALS

Provide all the materials required for the packaging, labeling, marking, placarding and transportation of hazardous wastes and hazardous materials in conformance with Department of Transportation standards and N.J.A.C. 16:49 and EP 415-1-266. Details in this specification shall not be construed as establishing the limits of the Contractor's responsibility.

2.1.1 Packagings

Provide bulk and non-bulk containers for packaging hazardous materials/wastes consistent with the authorizations referenced in the Hazardous Materials Table in 49 CFR 172, Section .101, Column 8. Bulk and non-bulk packaging shall meet the corresponding specifications in 49 CFR 173 referenced in the Hazardous Materials Table, 49 CFR 172, Section .101. Each packaging shall conform to the general packaging requirements of Subpart B of 49 CFR 173, to the requirements of 49 CFR 178 at the specified packing group performance level, to the requirements of special provisions of column 7 of the Hazardous Materials Table in 49 CFR 172, Section .101, and shall be compatible with the material to be packaged as required by 40 CFR 262. Also provide other packaging related materials such as materials used to cushion or fill voids in overpacked containers, etc. Sorbent materials shall not be capable of reacting dangerously with, being decomposed by, or being ignited by the hazardous materials being packaged. Additionally, sorbents used to treat free liquids to be disposed of in landfills shall be non-biodegradable as specified in 40 CFR 264, Section .314. In addition, packaging notifications will be provided to the Government in accordance with 49 CFR 172, Section .178.2(c) regarding type and dimensions of closures, including gaskets, needed to satisfy performance test requirements.

2.1.2 Markings

Provide markings for each hazardous material/waste package, freight container, and transport vehicle consistent with the requirements of 49 CFR 172, Subpart D and 40 CFR 262, Section .32 (for hazardous waste). Markings shall be capable of withstanding, without deterioration or substantial color change, a 180 day exposure to conditions reasonably expected to be encountered during container storage and transportation.

2.1.3 Labeling

Provide primary and subsidiary labels for hazardous materials/wastes consistent with the requirements in the Hazardous Materials Table in 49 CFR 172, Section 101, Column 6. Labels shall meet design specifications required by 49 CFR 172, Subpart E including size, shape, color, printing, and symbol requirements. Labels shall be durable and weather resistant and

capable of withstanding, without deterioration or substantial color change, a 180 day exposure to conditions reasonably expected to be encountered during container storage and transportation.

2.1.4 Placards

For each offsite shipment of hazardous material/waste, provide primary and subsidiary placards consistent with the requirements of 49 CFR 172, Subpart F. Placards shall be provided for each side and each end of bulk packaging, freight containers, transport vehicles, and rail cars requiring such placarding. Placards may be plastic, metal, or other material capable of withstanding, without deterioration, a 30 day exposure to open weather conditions and shall meet design requirements specified in 49 CFR 172, Subpart F.

2.1.5 Spill Response Materials

Provide spill response materials including, but not limited to, containers, adsorbent, shovels, and personal protective equipment. Spill response materials shall be available at all times in which hazardous materials/wastes are being handled or transported. Spill response materials shall be compatible with the type of material being handled.

2.2 EQUIPMENT AND TOOLS

Provide miscellaneous equipment and tools necessary to handle hazardous materials and hazardous wastes in a safe and environmentally sound manner.

PART 3 EXECUTION

3.1 ONSITE WASTE MANAGEMENT

These paragraphs apply to Government owned waste only. Contractors are prohibited by 10 U.S.C. 2692 from storing Contractor owned waste onsite for any length of time. The Contractor is responsible for ensuring compliance with all Federal, State and Local waste laws and regulations and shall verify those requirements when preparing reports, waste shipment records, hazardous waste manifests, or other documents. Identify hazardous wastes using criteria set forth in 40 CFR 261 or all applicable state and local laws, regulations, and ordinances. When accumulating hazardous waste onsite, comply with generator requirements in 40 CFR 262 and any applicable state or local law or regulations. Onsite accumulation times shall be restricted to applicable time frames referenced in 40 CFR 262, Section .34 and any applicable state or local law or regulation. Accumulation start dates shall commence when waste is first generated (i.e., containerized or otherwise collected for discard). Only use containers in good condition and compatible with the waste to be stored. Ensure containers are closed except when adding or removing waste, and immediately mark all hazardous waste containers with the words "hazardous waste" and other information required by 40 CFR 262, Section .32 and any applicable state or local law or regulation as soon as the waste is containerized. An additional marking shall be placed on containers of "unknowns" designating the date sampled, and the suspected hazard. Inspect containers for signs of deterioration and for responding to any spills or leaks. Inspect all hazardous waste areas weekly and provide written documentation of the inspection. Include date and time of inspection, name of individual conducting the inspection, problems noted, and corrective actions taken on the inspection logs.

3.1.1 Hazardous Waste Classification

Identify, in consultation with the Contracting Officer, all waste codes applicable to each hazardous waste stream based on requirements in 40 CFR 261 or any applicable state or local law or regulation. Also identify all applicable treatment standards in 40 CFR 268 and state land disposal restrictions and make a determination as to whether or not the waste meets or exceeds the standards. Waste profiles, analyses, classification and treatment standards information shall be submitted to Contracting Officer for review and approval.

3.1.2 Waste Management Plan

Prepare a plan detailing the manner in which wastes will be managed and describing the types and volumes of wastes anticipated to be managed as well as the management practices to be utilized. The plan shall identify the method to be used to ensure accurate piece counts and/or weights of shipments; shall identify waste minimization methods; shall propose facilities to be utilized for treatment, storage, and/or disposal; shall identify areas onsite where wastes are to be handled; and shall identify whether transfer facilities are to be utilized; and if so, how the wastes will be tracked to ultimate disposal. Submit the plan prior to start of work. Written documentation of weekly waste inspections shall be submitted on a monthly basis.

3.2 OFFSITE WASTE MANAGEMENT

For hazardous waste, use RCRA Subtitle C permitted facilities which meet the requirements of 40 CFR 264 or facilities operating under interim status which meet the requirements of 40 CFR 265. For non-hazardous waste, use RCRA Subtitle D permitted facilities. Offsite treatment, storage, and/or disposal facilities with significant RCRA violations or compliance problems (such as facilities known to be releasing chemical constituents into ground water, surface water, soil, or air) shall not be used. Submit Notices of Non-Compliance and Notices of Violation by a Federal, State, or Local regulatory agency issued to the Contractor in relation to any work performed under this contract. Immediately provide copies of such notices to the Contracting Officer. Also furnish all relevant documents regarding the incident and any information requested by the Contracting Officer, and coordinate its response to the notice with the Contracting Officer or the designated representative prior to submission to the notifying authority. Also furnish a copy to the Contracting Officer of all documents submitted to the regulatory authority, including the final reply to the notice, and all other materials, until the matter is resolved.

3.2.1 Treatment, Storage, and/or Disposal Facility and Transporter

Provide the Contracting Officer with EPA ID numbers, names, locations, and telephone numbers of TSD facilities and transporters. This information shall be contained in the Waste Management Plan and shall be approved by the Contracting Officer.

3.2.2 Status of the Facility

Facilities receiving hazardous waste shall be permitted in accordance with 40 CFR 270 or operating under interim status in accordance with 40 CFR 265

requirements, or permitted by a state authorized by the Environmental Protection Agency to administer the RCRA permit program. Facilities receiving non-hazardous waste shall be permitted in accordance with 40 CFR 258. Additionally, prior to using a TSD Facility, contact the EPA Regional Offsite Coordinator specified in 40 CFR 300, Section .440, to determine the facility's status, and document all information necessary to satisfy the requirements of the EPA Offsite policy and submit this information to the Contracting Officer.

3.2.3 Shipping Documents and Packagings Certification

Prior to shipment of any hazardous material offsite and a minimum of 14 days prior to anticipated pickup, provide for review written certification to the Contracting Officer that hazardous materials have been properly packaged, labeled, and marked in accordance with Department of Transportation and EPA requirements. Furnish designated disposal facility packaging assurances by the not later than 35 days after acceptance of the shipment. The Contractor's TDC shall also provide written certification regarding waste minimization efforts documenting that efforts have been taken to reduce the volume and toxicity of waste to the degree economically practicable and that the method of treatment, storage, or disposal selected minimizes threats to human health and the environment.

3.2.4 Transportation

Prior to conducting hazardous materials activities, the Contractor responsible for pre-transportation activities shall either certify to the Government that a Security Plan is in place, which meets the requirements of 49 CFR 172, Subpart I, or in the event that the types or amounts of hazardous materials are excluded from the security planning requirements, a written statement to that effect detailing the basis for the exception. Use manifests for transporting hazardous wastes as required by 40 CFR 263 or any applicable state or local law or regulation. Transportation shall comply with all requirements in the Department of Transportation referenced regulations in the 49 CFR series. Prepare hazardous waste manifests for each shipment of hazardous waste shipped offsite. Manifests shall be completed using instructions in 40 CFR 262, Subpart B, and any applicable state or local law or regulation. Submit manifests and waste profiles to Contracting Officer for review and approval. Prepare land disposal restriction notifications as required by 40 CFR 268 or any applicable state or local law or regulation for each shipment of hazardous waste. Submit notifications with the manifest to the Contracting Officer for review and approval.

3.2.5 Treatment and Disposal of Hazardous Wastes

The hazardous waste shall be transported to an approved hazardous waste treatment, storage, or disposal facility within 90 days of the accumulation start date. Ship hazardous wastes only to facilities which are properly permitted to accept the hazardous waste or operating under interim status. Ensure wastes are treated to meet land disposal treatment standards in 40 CFR 268 prior to land disposal. Propose TSD facilities via submission of the Hazardous Waste Management Plan, subject to the approval of the Contracting Officer. Submit Certificates of Disposal documenting the ultimate disposal, destruction or placement of hazardous wastes and CERCLA remediation waste, within 180 days of initial shipment. Receipt of these certificates will be required for final payment.

3.3 OBTAINING EPA ID NUMBERS

Complete EPA Form 8700-12, Notification of Hazardous Waste Activity, and submit to the Contracting Officer for review and approval. Allow a minimum of 30 days for processing the application and assigning the EPA ID number. Shipment shall be made not earlier than one week after receipt of the EPA ID number.

3.4 WASTE MINIMIZATION

Minimize the generation of waste to the maximum extent practicable and take all necessary precautions to avoid mixing clean and contaminated wastes. Identify and evaluate recycling and reclamation options as alternatives to land disposal. Requirements of 40 CFR 266 shall apply to: hazardous wastes recycled in a manner constituting disposal; hazardous waste burned for energy recovery; lead-acid battery recycling; and hazardous wastes with economically recoverable precious metals. Submit written certification that waste minimization efforts have been undertaken to reduce the volume and toxicity of waste to the degree economically practicable and that the method of treatment, storage, or disposal selected minimizes threats to human health and the environment.

3.5 RECORDKEEPING

Maintain adequate records to support information provided to the Contracting Officer regarding exception reports, annual reports, and biennial reports; and maintain bills of lading for a minimum of 375 days from the date of shipment or any longer period required by any applicable law or regulation or any other provision of this contract. Submit information necessary to file state annual or EPA biennial reports for all hazardous waste transported, treated, stored, or disposed of under this contract. Do not forward these data directly to the regulatory agency but to the Contracting Officer at the specified time. The submittal shall contain all the information necessary for filing of the formal reports in the form and format required by the governing Federal or State regulatory agency. A cover letter shall accompany the data to include the contract number, contractor name, and project location. In the event that a manifest copy documenting receipt of hazardous waste at the treatment storage and disposal facility is not received within 35 days of shipment initiation, or that a manifest copy documenting receipt of PCB waste at the designated facility is not received within 35 days of shipment initiation, prepare and submit an exception report to the Contracting Officer within 37 days of shipment initiation.

3.6 SPILL RESPONSE

In the event of a spill or release of a hazardous substance (as designated in 40 CFR 302), or pollutant or contaminant, or oil (as governed by the Oil Pollution Act (OPA), 33 U.S.C. 2701 et seq.), notify the Contracting Officer immediately. Any direction from the Contracting Officer concerning a spill or release shall not be considered a change under the contract. If the spill exceeds a reporting threshold, follow the pre-established procedures for immediate reporting to the Contracting Officer. Comply with all applicable requirements of Federal, State, or Local laws or regulations regarding any spill incident.

3.7 EMERGENCY CONTACTS

The Contractor is responsible for complying with the emergency contact provisions in 49 CFR 172, Section 604. Whenever the Contractor ships hazardous materials, they shall provide a 24–hour emergency response contact and phone number of a person knowledgeable about the hazardous materials being shipped and who has comprehensive emergency response and incident mitigation information for that material, or has immediate access to a person who possesses such knowledge and information. The phone shall be monitored on a 24-hour basis at all times when the hazardous materials are in transportation, including during storage incidental to transportation. Ensure that information regarding this emergency contact and phone number are placed on all hazardous material shipping documents. Designate an emergency coordinator and post the following information at areas in which hazardous wastes are managed:

a. The name of the emergency coordinator.

b. Phone number through which the emergency coordinator can be contacted on a 24-hour basis.

c. The telephone number of the local fire department.

d. The location of fire extinguishers and spill control materials.

Attachment A SAMPLE OFF-SITE POLICY CERTIFICATION MEMO	
Project/Contract #:	
Waste Stream:	
Primary TSD Facility, EPA ID # and Location:	
Alter. TSD Facility, EPA ID # and Location:	
EPA Region	Contact
II	(212) 637-4130
EPA representative contacted:	
EPA representative phone number:	
Date contacted:	
Comment:	
The above EPA representative was contacted on _____. As of that date the above sites were considered acceptable in accordance with the Off-Site Policy in 40 CFR 300.440.	
Date:	Signature:
Phone number:	

-- End of Section --

SECTION 31 11 00

CLEARING AND GRUBBING

PART 1 GENERAL

1.1 SUMMARY

This section covers clearing and grubbing. The Contractor shall provide all labor, equipment and materials necessary to clear and grub the areas proposed for work.

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

Nonsaleable Materials; G

SD-04 Samples

Herbicide

1.3 DELIVERY, STORAGE, AND HANDLING

Deliver materials to store at the site, and handle in a manner which will maintain the materials in their original manufactured or fabricated condition until ready for use.

PART 2 PRODUCTS

2.1 HERBICIDE

Comply with Federal Insecticide, Fungicide, and Rodenticide Act (Title 7 U.S.C. Section 136) for requirements on Contractor's licensing, certification and record keeping. Contact the command Pest Control Coordinator prior to starting work. Submit samples in cans with manufacturer's label.

PART 3 EXECUTION

3.1 PROTECTION

3.1.1 Roads and Walks

Keep roads and walks free of dirt and debris at all times.

3.1.2 Trees, Shrubs, and Existing Facilities

Protect trees and vegetation to be left standing from damage incident to clearing, grubbing, and construction operations by the erection of barriers or by such other means as the circumstances require.

3.1.3 Utility Lines

Protect existing utility lines that are indicated to remain from damage. Notify the Contracting Officer immediately of damage to or an encounter with an unknown existing utility line. The Contractor is responsible for the repairs of damage to existing utility lines that are indicated or made known to the Contractor prior to start of clearing and grubbing operations. When utility lines which are to be removed are encountered within the area of operations, notify the Contracting Officer in ample time to minimize interruption of the service. Refer to Section 01 30 00, ADMINISTRATIVE CONTROLS and Section 01 57 19.00 20, TEMPORARY ENVIRONMENTAL CONTROLS for additional utility protection.

3.2 CLEARING

Clearing shall consist of the felling, trimming, and cutting of trees into sections and the satisfactory disposal of the trees and other vegetation designated for removal, including downed timber, snags, brush, and rubbish occurring within the areas to be cleared. Clearing shall also include the removal and disposal of structures that obtrude, encroach upon, or otherwise obstruct the work. Trees, stumps, roots, brush, and other vegetation in areas to be cleared shall be cut off flush with or below the original ground surface, except such trees and vegetation as may be indicated or directed to be left standing.

3.3 TREE REMOVAL

Where indicated or directed, trees and stumps that are designated as trees shall be removed from areas outside those areas designated for clearing and grubbing. This work shall include the felling of such trees and the removal of their stumps and roots as specified in paragraph GRUBBING. Trees shall be disposed of as specified in paragraph DISPOSAL OF MATERIALS.

3.4 PRUNING

Trim trees designated to be left standing within the cleared areas of dead branches 1-1/2 inches or more in diameter; and trim branches to heights and in a manner as indicated. Neatly cut limbs and branches to be trimmed close to the bole of the tree or main branches.

3.5 GRUBBING

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

3.6 DISPOSAL OF MATERIALS

Cleared vegetation will be chipped and spread on the site outside the project limits of the remedial action or transported off site for disposal.

-- End of Section --

SECTION 31 23 00.00 20

EXCAVATION AND FILL

PART 1 GENERAL

1.1 SUMMARY

This section includes requirements for completing the excavation and includes but is not necessarily limited to soils handling, dewatering, excavated material reuse, imported clean backfill, grading, and compaction.

1.2 REFERENCES

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

ASTM INTERNATIONAL (ASTM)

ASTM C33	(2018) Standard Specification for Concrete Aggregates
ASTM C136	(2006) Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM D1140	(2000; R 2006) Amount of Material in Soils Finer than the No. 200 (75-micrometer) Sieve
ASTM D1556	(2007) Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D1557	(2012) Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3) (2700 kN-m/m3)
ASTM D2216	(2010) Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
ASTM D2321	(2014; E 2014) Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
ASTM D2487	(2011) Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D4318	(2010; E 2014) Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D6938	(2010) Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

ASTM D698	(2012; E 2014) Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/cu. ft. (600 kN-m/cu. m.))

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2008; Errata 2011) Safety and Health Requirements Manual

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

29 CFR 1926	Safety and Health Regulations for Construction
40 CFR 302	Designation, Reportable Quantities, and Notification

New Jersey Department of Environmental Protection (NJDEP)

NJAC 7:28	Subchapter 12 Soil Remediation Standards for Radioactive Materials
NJAC 7:26D	Remediation Standards
NJAC 7:26E	Technical Requirements for Site Remediation

1.3 DESCRIPTION OF WORK

The work consists of excavation and temporary storage of approximately 6,600 cubic yards of contaminated material and 14,600 cubic yards of clean material. Approximate locations and depth of contaminated material are shown on the Construction Drawings. The top 10 feet of soil is assumed to be clean and can be used as backfill material. The remaining backfill material must be obtained from an approved off site source. Groundwater is approximately five to ten feet below the pre-excavation ground surface. Dewatering of the excavation beneath the groundwater table is required. Collection of confirmatory samples is required once the target excavation depths are achieved. Required sampling and chemical analysis shall be conducted in accordance with Section 01 35 45.00 10 CHEMICAL DATA QUALITY CONTROL.

1.3.1 Scheduling

Notify the Contracting Officer 15 calendar days prior to the start of excavation of contaminated material.

1.3.2 Work Plan

Submit a Site Operations and Excavation Work Plan within 30 calendar days after notice to proceed. No work at the site, with the exception of site inspections and surveys, shall be performed until the Work Plan is approved. Allow 21 calendar days in the schedule for the Contracting Officer review. At a minimum, the Work Plan shall include:

a. Schedule of activities: Provide a schedule for all activities. This schedule should include a phasing plan and sequence of events for all construction activities required to complete the work.

b. Method of excavation and equipment to be used.

c. Shoring or side-wall slopes proposed.

d. Dewatering / stormwater management plan: Provide a plan for how the open excavations will be maintained free of storm water and/or groundwater during the excavation work. The plan shall discuss the methods that will be used to divert, collect, treat and/or dispose of groundwater and stormwater. Plan shall include a discussion of how work will proceed in order to minimize the time that excavations are kept open.

e. Storage methods and locations for liquid and solid contaminated material.

f. Borrow sources and haul routes.

g. Decontamination procedures.

h. Spill contingency plan.

i. Traffic Plan: Provide a plan for controlling traffic along Sharp Run Road.

j. Waste Management Plan: Provide a plan for waste storage, segregation and characterization sampling.

k. Equipment Decontamination: The Contractor shall provide a description and plan showing where the decontamination station shall be set up and used.

l. Means and methods for protecting existing underground utilities.

1.3.3 Other Submittal Requirements

Submit separate cross-sections of each area before and after excavation and after backfilling, test results within 21 calendar days of work completion at the site.

1.3.4 Closeout Submittal Requirements

Submit Excavation Completion Information within 21 calendar days of work completion at the site. Excavation Completion Information will include the following minimum information:

a. A cover letter signed by a responsible company official certifying that all services involved have been performed in accordance with the terms and conditions of the contract documents and regulatory requirements.

b. Data including, but not limited to, the following:

(1) field screening readings;

(2) quantity of materials removed from each area of contamination;

(3) quantity of water/product removed during dewatering;

(4) sampling locations and sampling methods;

(5) sample collection data such as time of collection and method of preservation;

(6) sample chain-of-custody forms; and

(7) source and analytical results of backfill.

c. Copies of all chemical and physical test results.

d. Copies of all manifests and land disposal restriction notifications.

e. Copies of all certifications of final disposal signed by the responsible disposal facility official.

f. Waste profile sheets.

g. Scale drawings showing limits of each excavation, limits of contamination, known underground utilities within 50 feet of excavation, sample locations, and sample identification numbers. On-site stockpile, storage, treatment, loading, and disposal areas shall also be shown on the drawings.

h. Progress Photographs. Color photographs shall be used to document progress of the work. A minimum of four views of the site showing the location of the area of contamination, entrance/exit road, and any other notable site conditions shall be taken before work begins. After work has been started, activities at each work location shall be photographically recorded daily. Photographs shall be digital and shall include:

(1) Soil removal and sampling.

(2) Dewatering operations.

(3) Unanticipated events such as spills and the discovery of additional contaminated material.

(4) Contaminated material/water storage, handling, treatment, and transport.

(5) Site or task-specific employee respiratory and personal protection.

(6) Fill placement and grading.

(7) Post-construction photographs. After completion of work at each site, take a minimum of four views of each excavation site.

Digital photographs shall be provided in a power point presentation format with the following information:

Project Name:	Direction of View:

Location:	Date/Time:
Photograph No.:	Description of View:

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

Site Operations and Excavation Plan (Work Plan); G

The Contractor shall prepare and submit to the Contracting Officer for review and approval an Excavation Work Plan within 30 calendar days of Notice to Proceed. No excavation work shall be performed until the Excavation Work Plan is approved.

SD-06 Test Reports

Borrow Site Testing; G

Submit analytical sample results on all backfill material as discussed in this section.

Submit sieve analysis results on all granular materials.

Submit proctor test results.

Density tests

Submit copies of all laboratory and field test reports within 24 hours of the completion of the test.

Confirmation Sampling and Analysis; G

Sampling of Stored Material; G

Sampling Liquid; G

SD-07 Certificates

Clean Fill Certification

SD-11 Closeout Submittals

Excavation Completion Information

1.5 REGULATORY REQUIREMENTS

1.5.1 Permits and Licenses

Obtain required federal, state, and local permits for excavation and storage of contaminated material.

1.5.2 Air Emissions

Air emissions shall be monitored and controlled in accordance with Sections 01 57 19.00 20 TEMPORARY ENVIRONMENTAL CONTROLS and 01 12 00 AIR MONITORING PLAN.

1.6 REQUIREMENTS FOR BORROW SOURCE

Soils brought in from off site for use as backfill shall be tested in accordance with Section 01 35 45.00 10 CHEMICAL DATA QUALITY CONTROL. In addition provide one radiochemical analysis for each borrow source. Radiological testing shall be completed for Ra226 and Gamma Radiation Exposure. Radiological testing shall include an initial analysis and second analysis 21 days following the initial. All testing results from both analyses shall be received and submitted to the Contracting Officer prior to bringing any backfill material on site. Results for radiological testing shall meet the applicable NJDEP Unrestricted Use Standards published at N.J.A.C. 7:28 Subchapter 12.

Backfill shall not contain concentrations of analytes above the New Jersey Residential Direct Contact soil remediation standard provided as Table 1A of N.J.A.C. 7:26D-7.5.

Provide borrow site testing at the frequency of one test per 2,500 cubic yards of material per source. Additional tests shall be performed as requested by the Contracting Officer. Do not bring material onsite until test results and source have been approved by the Contracting Officer.

1.7 QUALITY CONTROL

1.7.1 Utilities

Movement of construction machinery and equipment over pipes and utilities during construction shall be at the Contractor's risk. The Contractor shall verify the location of all utilities prior to beginning any work. Take necessary precautions to protect existing utilities that are to remain from damage due to any construction activity. All utilities exposed during the remedial activities shall be properly supported. For work immediately adjacent to or for excavations exposing a utility or other buried obstruction, excavate by hand. Start hand excavation on each side of the indicated obstruction and continue until the obstruction is uncovered or until clearance for the new grade is assured. Support uncovered lines or other existing work affected by the contract excavation until approval for backfill is granted by the Contracting Officer. Report damage to utility lines or subsurface construction immediately to the Contracting Officer.

PART 2 PRODUCTS

2.1 SOIL MATERIALS

2.1.1 Satisfactory Materials

Any materials classified by ASTM D2487 as GW, GP, GM, GP-GM, GW-GM, GC, GP-GC, GM-GC, SW, SP, free of debris, roots, wood, scrap material, vegetation,

refuse, soft unsound particles, and frozen, deleterious, or objectionable materials. Unless specified otherwise, the maximum particle diameter shall be one-half the lift thickness at the intended location.

2.1.2 Unsatisfactory Materials

Materials which do not comply with the requirements for satisfactory materials. Unsatisfactory materials also include man-made fills, trash, refuse, or backfills from previous construction. Unsatisfactory material also includes material classified as satisfactory which contains root and other organic matter, frozen material, and stones larger than 6 inches. The Contracting Officer shall be notified of any contaminated materials.

2.1.3 Cohesionless and Cohesive Materials

Cohesionless materials include materials classified in ASTM D2487 as GW, GP, SW, and SP. Cohesive materials include materials classified as GC, SC, ML, CL, MH, and CH. Materials classified as GM, GP-GM, GW-GM, SW-SM, SP-SM, and SM shall be identified as cohesionless only when the fines are nonplastic (plasticity index equals zero). Materials classified as GM and SM will be identified as cohesive only when the fines have a plasticity index greater than zero.

2.1.4 Expansive Soils

Soils that have a plasticity index equal to or greater than 12 when tested in accordance with ASTM D4318.

2.1.5 Backfill and Fill Material

Backfill and fill material shall be comprised of satisfactory material with a maximum ASTM D4318 liquid limit of 35, maximum ASTM D4318 plasticity index of 12, and a maximum of 25 percent by weight passing ASTM D1140, No. 200 sieve.

2.1.6 Topsoil

Provide as specified in Section 32 92 19 SEEDING.

2.2 UTILITY BEDDING MATERIAL

Except as specified otherwise in the individual piping section, provide bedding for buried piping in accordance with AWWA C600, Type 4, except as specified herein. Backfill to top of pipe shall be compacted to 95 percent of ASTM D698 maximum density. Plastic piping shall have bedding to spring line of pipe. Provide ASTM D2321 materials as follows:

a. Class I: Angular, 0.25 to 1.5 inches, graded stone, including a number of fill materials that have regional significance such as coral, slag, cinders, crushed stone, and crushed shells.

b. Class II: Coarse sands and gravels with maximum particle size of 1.5 inches, including various graded sands and gravels containing small percentages of fines, generally granular and non-cohesive, either wet or dry. Soil Types GW, GP, SW, and SP are included in this class as specified in ASTM D2487.

2.3 BORROW

Obtain borrow materials required in excess of those furnished from excavations from sources outside of Government property. Prior to bringing borrow material on site collect and analyze analytical samples per the requirements of 1.6 of this specification section.

2.4 CRUSHED STONE

Material to be used for construction of final access roads and parking areas. Stone shall be ¾ inch clean crushed stone meeting NJDOT #57 stone.

2.5 STONE

Material to be used for construction access roads, stabilized construction entrances, and decontamination pads shall meet the requirements as specified in this section. Stone shall be clean crushed angular stone proper size and gradation. Stone size shall be between 1-2 inches meeting ASTM C-33, size No. 3.

PART 3 EXECUTION

3.1 GENERAL

Contractor shall verify all existing conditions before beginning excavations. Notify the Contracting Officer within 24 hours, and before excavation, if contaminated material is discovered that has not been previously identified or if other discrepancies between data provided and actual field conditions are discovered.

3.2 PROTECTION

3.2.1 Drainage and Dewatering

Provide for the collection and disposal of surface and subsurface water encountered during construction.

Water generated during excavation activities will be disposed off site or treated using a temporary water treatment system provided by the Contractor in accordance with Section 01 57 19.00 20 TEMPORARY ENVIRONMENTAL CONTROLS.

3.2.1.1 Drainage

Surface water shall be diverted to prevent entry into the excavation. Dewatering shall be limited to that necessary to assure adequate access, a safe excavation, prevent the spread of contamination, and to ensure that compaction requirements can be met.

So that construction operations progress successfully, completely drain construction site during periods of construction to keep soil materials sufficiently dry. The Contractor shall throughout construction grade the construction area to provide positive surface water runoff away from the construction activity and/or provide temporary ditches, dikes, swales, and other drainage features and equipment as required to maintain dry soils, prevent erosion and undermining of foundations. When unsuitable working platforms for equipment operation and unsuitable soil support for subsequent construction features develop, remove unsuitable material and provide new

soil material as specified herein. It is the responsibility of the Contractor to assess the soil and ground water conditions presented by the plans and specifications and to employ necessary measures to permit construction to proceed. Excavated slopes and backfill surfaces shall be protected to prevent erosion and sloughing. Excavation shall be performed so that the site, the area immediately surrounding the site, and the area affecting operations at the site shall be continually and effectively drained.

3.2.1.2 Dewatering

Groundwater flowing toward or into excavations shall be controlled to prevent sloughing of excavation slopes and walls, boils, uplift and heave in the excavation and to eliminate interference with orderly progress of construction. French drains, sumps, ditches or trenches will not be permitted within three feet of the foundation of any structure, except with specific written approval, and after specific contractual provisions for restoration of the foundation area have been made. Control measures shall be taken by the time the excavation reaches the water level in order to maintain the integrity of the in situ material.

Operate dewatering system continuously until construction work below existing water levels is complete. Submit performance records weekly.

3.2.2 Underground Utilities

No excavation shall be performed until site utilities have been field located. Location of the existing utilities indicated is approximate. Take the necessary precautions to ensure no damage occurs to existing structures and utilities. Utilities encountered that were not previously shown or otherwise located shall not be disturbed without approval from the Contracting Officer.

The Contractor shall physically verify the location and elevation of the existing utilities indicated prior to starting construction. The Contractor shall scan the construction site with electromagnetic and sonic equipment and mark the surface of the ground where existing underground utilities are discovered.

3.2.3 Machinery and Equipment

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

3.3 SURFACE PREPARATION

3.3.1 Clearing and Grubbing

Unless indicated otherwise, remove trees, stumps, logs, shrubs, brush and vegetation and other items that would interfere with construction operations within the clearing limits. Remove stumps entirely. Grub out matted roots and roots over 2 inches in diameter to at least 18 inches below existing surface.

3.3.2 Stripping

Strip suitable topsoil from the site where excavation or grading is indicated and stockpile separately from other excavated material. Material unsuitable for use as topsoil shall be stockpiled and used for backfilling. Locate topsoil so that the material can be used readily for the finished grading. Where sufficient existing topsoil conforming to the material requirements is not available on site, provide borrow materials suitable for use as topsoil. Protect topsoil and keep in segregated piles until needed.

3.3.3 Unsuitable Material

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

3.4 EXCAVATION

Excavate to contours, elevation, and dimensions indicated. Material excavated from the top ten feet of the excavation area will be stockpiled for reuse. Excavate soil disturbed or weakened by Contractor's operations, soils softened or made unsuitable for subsequent construction due to exposure to weather. Excavations below indicated depths will not be permitted except with prior approval from the Contracting Officer.

Excavation shall be performed in a manner that will limit the potential for contaminated material to be mixed with uncontaminated.

All equipment used for earthmoving operations shall be in good working condition. Any equipment having visible oil or hydraulic leaks shall be immediately removed from the site and shall not be permitted back unless properly repaired. Any soil contaminated as a result of an oil/hydraulic oil leak or spill shall be removed and disposed of at an off-site facility permitted to accept the waste.

The tracking of any soil onto public roads is prohibited. Any tracking shall be immediately cleaned by the Contractor.. The Contractor shall take precautions by putting in place procedures to ensure soil is removed from tires of equipment and vehicles prior to leaving the site.

3.4.1 Contaminated Soil

Areas of contamination shall be excavated to the depth and extent shown on the Construction Drawings and not more than 0.33 ft beyond the depth and extent shown on the Construction Drawings unless confirmatory sample results indicate additional excavation is necessary to meet the 1 mg/kg TCE cleanup level. The Contractor shall obtain approval from the Contracting Officer prior to proceeding with excavation beyond the initial limits shown on the Construction Drawings. Excavation shall be performed in a manner that will limit spills and the potential for contaminated material to be mixed with uncontaminated material.

Excavations of contaminated materials shall be completed during dry weather, unless otherwise directed by the Contracting Officer. Excavations shall not be conducted in standing water.

Excavations shall be phased such that no more than 20,000 sf of open excavations exist at any one time.

3.4.2 Pipe Trenches

Excavate to the dimension indicated, and grade the bottom of the trenches to provide uniform support for each section of pipe after pipe bedding placement. Tamp if necessary to provide a firm pipe bed. Recesses shall be excavated to accommodate bells and joints so that pipe will be uniformly supported for the entire length. Rock, where encountered, shall be excavated to a depth of at least six inches below the bottom of the pipe.

3.5 CONTAMINATED MATERIAL STORAGE

Materials that are not directly loaded into trucks for offsite disposal shall be placed in temporary storage immediately after excavation. The following paragraphs describe acceptable methods of material storage. Storage units shall be in good condition and constructed of materials that are compatible with the material or liquid to be stored. If multiple storage units are required, each unit shall be clearly labeled with an identification number and a written log shall be kept to track the source of contaminated material in each temporary storage unit.

3.5.1 Stockpiles

Stockpiles shall be constructed to isolate stored contaminated material from the environment. The maximum stockpile size shall be 1,000 cubic yards. Stockpiles shall be constructed to include:

a. Berms shall be constructed surrounding the stockpile. A chemically resistant geomembrane liner free of holes and other damage will be used. Non-reinforced geomembrane liners shall have a minimum thickness of 30 mils. Scrim reinforced geomembrane liners shall have a minimum weight of 40 lbs/1000 square feet. The ground surface on which the geomembrane is to be placed shall be free of rocks greater than 0.5 inches in diameter and any other object which could damage the membrane.

b. Geomembrane cover free of holes or other damage to prevent precipitation from entering the stockpile. Non-reinforced geomembrane covers shall have a minimum thickness of 10 mils. Scrim reinforced geomembrane covers shall have a minimum weight of 26 lbs/1000 square feet. The cover material shall be extended over the berms and anchored or ballasted to prevent it from being removed or damaged by wind.

c. Berms surrounding the stockpile, a minimum of 12 inches in height. Vehicle access points shall also be bermed.

d. The liner system shall be sloped to allow collection of leachate. Storage and removal of liquid which collects in the stockpile, in accordance with paragraph Liquid Storage.

3.5.2 Roll-Off Units

Roll-off units used to temporarily store contaminated material shall be water tight. A cover shall be placed over the units to prevent precipitation from contacting the stored material. The units shall be located as shown in the Contractor's Work Plan. Liquid which collects

inside the units shall be removed and stored in accordance with paragraph Liquid Storage.

3.5.3 Liquid Storage

Liquid collected from excavations and stockpiles shall be temporarily stored in 21,000 gallon frac tanks. Liquid storage containers shall be water-tight. Secondary containment is required for water recovered from excavations and stockpiles. Secondary containment shall have a minimum capacity of 110% of the tank volume unless otherwise approved by the Contracting Officer.

3.6 SAMPLING AND ANALYSIS

3.6.1 Post Excavation Sampling

The Contracting Officer shall be present to inspect the removal of contaminated material from the site. After all material suspected of being contaminated has been removed, the excavation shall be examined for evidence of contamination. If the excavation appears to be free of contamination, field analysis shall be used to determine the presence of trichloroethene (TCE) contamination using a photoionization detector (PID). Excavation of additional material shall be as directed by the Contracting Officer. After all suspected contaminated material is removed, confirmation samples shall be collected and analyzed for the following contaminants:

Chemical Parameter	Action Level
Trichloroethene	1 mg/kg

Samples shall be collected at a frequency of one per 900 square feet from the bottom and three samples per 30 linear feet of the outer sidewall (along the limit of the remedial action) or as directed by the Contracting Officer. Sidewall samples will not be required along the interior of the excavation areas that border the ISTT areas. Sidewall samples shall be collected at the top, middle and bottom of the impacted zone. Middle samples shall be biased to the location with the greatest contamination based on visual or PID readings. If no contamination is evident, the sample will be collected at the midpoint of depth where the greatest contamination was observed based on sample results collected during the pre-design investigation. Based on test results, additional excavation which may be required to remove material which is contaminated above action levels. Additional excavation shall be subject to approval by the Contracting Officer. Locations of samples shall be marked in the field and documented on the as-built drawings.

3.6.2 Sampling of Stored Material

Samples of stored material shall be collected at a frequency directed by the Contracting Officer and/or the Disposal facility.

Documentation of all analyses performed shall be furnished to the Contracting Officer. Additional sampling and analyses to the extent required by the approved offsite treatment, storage or disposal (TSD) facility shall be the responsibility of the Contractor.

3.6.3 Sampling Liquid

Liquid collected from excavations and decontamination facilities shall be sampled at a frequency of one sample per container or as required by the Disposal Facility.

3.6.4 Sampling Beneath Storage Units

Samples from beneath each storage unit shall be collected prior to construction of and after removal of the storage unit. Samples shall be collected at a frequency of one per each 900 square feet from a depth interval of 0 to 0.5 feet and shall be tested for the following:

Chemical Parameter	Action Level
Trichloroethene	1 mg/kg

Based on test results, soil, which has become contaminated above action levels, shall be removed. Contaminated material which is removed from beneath the storage unit shall be handled in accordance with paragraph Sampling of Stored Material. As directed by the Contracting Officer, additional sampling and testing shall be performed to verify areas of contamination found beneath stockpiles have been cleaned up to below action levels.

3.7 BACKFILLING

3.7.1 Confirmation Test Results

Excavations shall be backfilled immediately after all contaminated materials have been removed and confirmation test results have been approved.

Do not backfill until soil analytical results have been received showing that the remaining soils have a trichloroethene (TCE) concentration less than 1 mg/kg and approval to backfill has been obtained by the Contracting Officer.

3.7.2 Backfill

Backfill shall not begin until the excavation or construction below the finished grade has been tested, approved, surveyed, and the excavations have been cleaned of all trash and debris.

Backfill shall conform to the specified lines, grades, sections, and elevations shown on the Contract Drawings making due allowances for settlement of the material and for the placing of topsoil. Grading tolerances shall be plus or minus 0.1 feet for all exposed surfaces of backfill unless otherwise indicated on the Contract Drawings. Grading shall not create swales or areas where ponding of water will occur. The fill surface must be made smooth and free from ruts or indentations at the end of any working day when significant precipitation is forecast. Place in 12 inch lifts (uncompacted thickness). Compact the areas not accessible to rollers or compactors with mechanical hand tampers. Aerate material excessively moistened by rain to satisfactory moisture content.

Use satisfactory materials meeting the requirements for backfill and fill materials. Place in 12 inch lifts (uncompacted thickness). Compact the areas not accessible to rollers or compactors with mechanical hand tampers. Aerate material excessively moistened by rain to satisfactory moisture content.

Do not place backfill on saturated or frozen surfaces. Remove and dispose of unsuitable materials from the site as directed by the Contracting Officer.

3.7.3 Borrow

Where satisfactory materials are not available in sufficient quantity from required excavations, approved borrow materials shall be obtained as specified herein.

3.7.4 Compaction

Determine in-place density of existing subgrade; if required density exists, no compaction of existing subgrade will be required. Compact the areas to 95 percent of its maximum dry density. Maintain moisture content of backfill materials within -1 percent to +3 percent of optimum to attain required compaction density. Tests and analysis of fill material shall be in accordance with ASTM D698.

3.8 FINISH OPERATIONS

3.8.1 Grading

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

3.8.2 Protection of Surfaces

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

3.9 DISPOSITION OF SURPLUS MATERIAL

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

3.10 FIELD QUALITY CONTROL

3.10.1 Sampling

Take the number and size of samples required to perform the following tests.

3.10.2 Testing

Perform one of each of the following tests for each material used. Provide additional tests for each source change.

3.10.2.1 Fill and Backfill Material Testing

Test fill and backfill material in accordance with ASTM C136 for conformance to ASTM D2487 gradation limits; ASTM D1140 for material finer than the No. 200 sieve; ASTM D4318 for liquid limit and for plastic limit; ASTM D698 for moisture density relations, as applicable.

3.10.2.2 Density Tests

Test density in accordance with ASTM D1556, or ASTM D6938. When ASTM D6938 density tests are used, verify density test results by performing an ASTM D1556 density test at a location already ASTM D6938 tested as specified herein. Test each lift at randomly selected locations every 2,500 square feet. Include density test results in daily report.

Bedding and backfill in trenches: One test per 100 linear feet in each lift.

3.10.2.3 Moisture Content Tests

Test moisture content in accordance with ASTM D6938. Include moisture content test results in daily report.

3.11 DISPOSAL REQUIREMENTS

Offsite disposal of contaminated material shall be in accordance with Section 02 81 00 TRANSPORTATION AND DISPOSAL.

-- End of Section --

SECTION 31 41 16

SHEET PILING

PART 1 GENERAL

1.1 SUMMARY

The Contractor shall provide all labor, materials, and equipment necessary to install sheet piling shown on the drawings for the purpose of reducing the flow of contaminated groundwater into the newly remediated areas.

The Contractor shall install sheet piling following completion of the excavation, along the perimeter of the excavation area at the alignment shown on the contract drawings. Sheet piling shall be installed a minimum of five feet below the final excavated bottom of the excavation. Interlocks of sheet piling shall be sealed to provide a bulk hydraulic conductivity of $1x10^{-8}$ m/sec or less.

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Sheet Piling Installation Work Plan; G

SD-02 Shop Drawings

Sheet Piling; G

SD-03 Product Data

Pile Driving Equipment; G
Pulling and Redriving; G
Installer Qualifications; G
Bulk Hydraulic Conductivity Data; G
Sheet Pile Composition and Material Properties; G

SD-11 Closeout Submittals

Pile Driving Record
Post Construction Survey

1.4 QUALITY ASSURANCE

1.4.1 Material Certificates

For each shipment, submit certificates identified with specific lots prior to installing piling. Include in the identification data piling type, dimensions, chemical composition, mechanical properties, section properties, heat number, and mill identification mark.

1.4.2 Qualifications

Sheeting installer must have, as a minimum, three successful past installations of sheet piling of comparable overall heights and sections and comparable penetration into soils similar to soils found on the project site.

1.5 DELIVERY, STORAGE, AND HANDLING

Materials delivered to the site shall be new and undamaged and shall be accompanied by certified test reports. Provide the manufacturer's logo and mill identification mark on the sheet piling as required by the referenced specifications. Store and handle sheet piling in the manner recommended by the manufacturer to prevent permanent deflection, distortion or damage to the interlocks; as a minimum, support on level blocks or racks spaced not more than 10 feet apart and not more than 2 feet from the ends. Storage of sheet piling should also facilitate required inspection activities and prevent damage to coatings and corrosion prior to installation. .

1.6 SHEET PILING INSTALLATION WORK PLAN

The Contractor shall submit a Work Plan 30 days prior to beginning sheet pile installation. The Work Plan shall include the following minimum information:

- Proposed construction method(s);
- Proposed sheet pile material composition;
- Bulk hydraulic conductivity of sheet pile with supporting calculations or material information;
- Engineering calculations and design for sheet pile wall installation certified by a NJ licensed professional engineer;
- Vibration monitoring plans (including format for reporting the vibration readings);
- Qualifications and resume for vibration specialist;
- Details for establishing and employing an alarm system to announce immediate shut down of vibration causing activities if established vibration threshold is exceeded;
- Anticipated vibration levels at the existing water treatment plant building; and
- Corrective action measures and procedures to be implemented if vibrations exceed acceptable levels determined by the Contractor.

1.6.1 Sheet Piling Design

The Contractor shall have a New Jersey Professional Engineer design the sheet piling. The calculations and design will be submitted for information purposes. The sheet piling shall be designed to reduce the flow of contaminated groundwater into the remediated areas.

1.6.2 Existing Conditions Survey

The Contractor shall conduct a survey of the existing water treatment plant building and pumping wells prior to sheet pile installation. The survey will include visual observations, measurements, sketches, and photographs. A report summarizing the findings of the survey and any areas of concern shall be submitted to the Contracting Officer a minimum of 14 calendar days prior

to beginning sheet pile installation. The survey shall be performed by a NJ licensed Profession Engineer experienced in evaluating structural vulnerabilities and vibration monitoring.

1.6.3 Vibration Controls

The Contractor shall employ a qualified vibration specialist to establish a safe vibration level for the existing groundwater treatment plant building. This specialist shall also supervise the Contractors vibration-monitoring program. During all vibration producing activities, the Contractor shall monitor vibration levels at the groundwater treatment plant building, and shall not exceed the safe level established.

The vibration monitoring equipment shall be capable of continuously recording the peak particle velocity and providing a permanent record of the entire vibration event. Copies of all vibration records and associated construction activity data shall be provided to the Contracting Officer weekly during sheet pile installation activities.

1.6.5 Corrective Action

The Contractor shall provide proposed alternative construction methods and equipment that will be used in the event acceptable vibration limits are exceeded.

1.7 POST CONSTRUCTION SURVEY

The Contractor shall perform a post-construction survey and analysis of the existing groundwater treatment plant building to determine if any structural changes are the result of the sheet pile installation. The Contractor shall provide the Contracting Officer with a copy of all post construction survey reports, daily summary logs for vibration monitors, and analysis documents comparing pre and post structural condition following completion of sheet pile as part of the closeout documentation.

PART 2 PRODUCTS

2.1 SHEET PILING

Submit detail drawings for sheet piling, including fabricated sections, showing complete piling dimensions and details, driving sequence and location of installed piling.

a. Include in the drawings details of top protection, special reinforcing tips, tip protection, lagging, splices, fabricated additions to plain piles, cut-off method, corrosion protection, and dimensions of templates and other temporary guide structures for installing piling. Provide details of the method for handling piling to prevent permanent deflection, distortion or damage to piling interlocks.

2.1.1 Interlocks

The interlocks of sheet piling shall be free-sliding, provide a swing angle suitable for the intended installation but not less than 5 degrees when interlocked, and maintain continuous interlocking when installed.

All interlocks shall be sealed to provide a bulk hydraulic conductivity for the sheet pile wall of $1x10^{-8}$ m/s.

2.1.2 General Requirements

Sheet piling shall be full-length sections of the dimensions shown. Sheet piling to be placed in a circular cell or a connecting arc shall be of the same manufacture. Provide sheet piling with standard pulling holes.

2.2 APPURTENANT MATERIALS

Provide installation materials conforming to sheet pile manufacturer's standards.

PART 3 EXECUTION

3.1 EARTHWORK

Perform in accordance with Section 31 23 00.00 20 EXCAVATION AND FILL.

3.2 INSTALLATION

3.2.1 Pile Driving Equipment

Submit complete descriptions of sheet piling driving equipment including hammers, extractors, protection caps and other installation appurtenances, prior to commencement of work. Descriptive information includes manufacturer's name, model numbers, capacity, rated energy, hammer details, cushion material, helmet, and templates. Provide pile driving equipment conforming to the following requirements.

3.2.1.1 Driving Hammers

Hammers shall be steam, air, or diesel drop, single-acting, double-acting, differential-acting or vibratory type. The driving energy of the hammers shall be as recommended by the manufacturer for the piling weights and subsurface materials to be encountered. Repair damage to piling caused by use of a pile hammer with excess delivered force or energy.

3.2.1.2 Jetting Equipment

Jetting will not be permitted.

3.2.2 Placing and Driving

3.2.2.1 Placing

Any excavation required within the area where sheet pilings are to be installed shall be completed prior to placing sheet pilings. Pilings properly placed and driven shall be interlocked throughout their length with adjacent pilings to form a continuous diaphragm throughout the length or run of piling wall.

a. Pilings shall be carefully located as indicated. Pilings shall be placed plumb with out-of-plumbness not exceeding 1/8 inch per foot of length and true to line. Place the pile so the face will not be more than 6 inches from vertical alignment at any point. Top of pile at elevation of cut-off shall be within 1/2 inch horizontally and 2 inches vertically of the location indicated. Manipulation of piles to force them into position will not be permitted. Check all piles for heave. Redrive all heaved piles to the required tip elevation.

b. Provide temporary wales, templates, or guide structures to ensure that the pilings are placed and driven to the correct alignment. Use a system of structural framing sufficiently rigid to resist lateral and driving forces and to adequately support the sheet piling until design tip elevation is achieved. Use two templates, at least, when placing each piling not less than 20 feet apart. Templates shall not move when supporting sheet piling. Fit templates with wood blocking to bear against the web of each alternate sheet pile and hold the sheet pile at the design location alignment. Provide outer template straps or other restraints as necessary to prevent the sheets from warping or wandering from the alignment. Mark template for the location of the leading edge of each alternate sheet pile. If in view, also mark the second level to assure that the piles are vertical and in position. If two guide marks cannot be seen, other means shall be used to keep the sheet pile vertical along its leading edge.

3.2.2.2 Driving

Submit records of the completed sheet piling driving operations, including a system of identification which shows the disposition of approved piling in the work, driving equipment performance data, piling penetration rate data, piling dimensions and top and bottom elevations of installed piling. Drive pilings with the proper size hammer and by approved methods so as not to subject the pilings to damage and to ensure proper interlocking throughout their lengths.

a. Maintain driving hammers in proper alignment during driving operations by use of leads or guides attached to the hammer. Caution shall be taken in the sustained use of vibratory hammers when a hard driving condition is encountered to avoid interlock-melt or damages. Discontinue the use of vibratory hammers and impact hammers employed when the penetration rate due to vibratory loading is one foot or less per minute.

b. Employ a protecting cap in driving when using impact hammers to prevent damage to the tops of pilings. Use cast steel shoe to prevent damage to the tip of the sheet piling. Remove and replace pilings damaged during driving or driven out of interlock.

c. Drive pilings without the aid of a water jet.

d. Take adequate precautions to ensure that pilings are driven plumb. Where possible, drive Z-pile with the ball end leading. If an open socket is leading, a bolt or similar object placed in the bottom of

the interlock will minimize packing material into it and ease driving for the next sheet. If at any time the forward or leading edge of the piling wall is found to be out-of-plumb in the plane of the wall the piling being driven shall be driven to the required depth and tapered pilings shall be provided and driven to interlock with the out-of-plumb leading edge or other approved corrective measures shall be taken to insure the plumbness of succeeding pilings. The maximum permissible taper for any tapered piling shall be 1/8 inch per foot of length.

e. Pilings in each run or continuous length of piling wall shall be driven alternately in increments of depth to the required depth or elevation. No piling shall be driven to a lower elevation than those behind it in the same run except when the pilings behind it cannot be driven deeper. Incrementally sequence driving of individual piles such that the tip of any sheet pile shall not be more than 4 feet below that of any adjacent sheet pile. When the penetration resistance exceeds five blows per inch, the tip of any sheet pile shall not be more than 2 feet below any adjacent sheet pile. If the piling next to the one being driven tends to follow below final elevation it may be pinned to the next adjacent piling.

f. If obstructions restrict driving a piling to the specified penetration, the obstructions shall be removed or penetrated with a chisel beam. If the Contractor demonstrates that removal or penetration is impractical, make changes in the design alignment of the piling structure as directed to ensure the adequacy and stability of the structure. Pilings shall be driven to a minimum depth of five feet below the final excavation depth. A tolerance of two inches above the indicated top elevation will be permitted. Pilings shall not be driven within 100 feet of concrete less than 7 days old.

g. Pre-augering or spudding of piles may be used. Use of pre-augering or spudding shall be in accordance with the sheet pile design requirements with limits determined by the sheet pile designer.

3.2.3 Cutting-Off and Splicing

Pilings driven to refusal or to the point where additional penetration cannot be attained and are extending above the required top elevation in excess of the specified tolerance shall be cut off to the required elevation. Pilings driven below the required top elevation and pilings damaged by driving and cut off to permit further driving shall be extended as required to reach the top elevation by splicing when directed.

a. Pilings adjoining spliced pilings shall be full length unless otherwise approved. Splicing of pilings shall be as indicated. Ends of pilings to be spliced shall be squared before splicing to eliminate dips or camber. Pilings shall be spliced together with concentric alignment of the interlocks so that there are no discontinuities, dips or camber at the abutting interlocks. Spliced pilings shall be free sliding and able to obtain the maximum swing with contiguous pilings. Welding shall be in accordance with the current standards of the American Welding Society. Shop and field welding, qualification of welding procedures, welders, and welding operators shall be in accordance with AWS D1.1/D1.1M.

b. The tops of pilings excessively battered during driving shall be trimmed when directed. Piling cut-offs shall become the property of the Contractor and shall be removed from the site.

c. Cut holes in pilings for bolts, rods, drains or utilities in a neat and workmanlike manner, as shown or as directed. Use a straight edge in cuts made by burning to avoid abrupt nicks. Bolt holes in steel piling shall be drilled or may be burned and reamed by approved methods which will not damage the surrounding material. Holes other than bolt holes shall be reasonably smooth and the proper size for rods and other items to be inserted. Do not use explosives for cutting.

3.2.4 Inspection of Driven Piling

Perform continuous inspection during pile driving. Inspect all piles for compliance with tolerance requirements. Bring any unusual problems which may occur to the attention of the Contracting Officer. Inspect the interlocked joints of driven pilings extending above ground. Pilings found to be out of interlock shall be removed and replaced.

3.2.5 Pulling and Redriving

Submit the proposed method of pulling sheet piling, prior to pulling any piling. Pull, as directed, selected pilings after driving to determine the condition of the underground portions of pilings. Any piling so pulled and found to be damaged, to the extent that its usefulness in the structure is impaired, shall be removed and replaced. Pilings pulled and found to be in satisfactory condition shall be redriven when directed.

3.3 INSTALLATION RECORDS

Maintain a pile driving record for each sheet pile driven. Indicate on the installation record: installation dates and times, type and size of hammer, rate of operation, total driving time, dimensions of driving helmet and cap used, blows required per foot for each foot of penetration, final driving resistance in blows for final 6 inches, pile locations, tip elevations, ground elevations, cut-off elevations, and any reheading or cutting of piles. Record any unusual pile driving problems during driving. Submit complete records to the Contracting Officer.

-- End of Section --

SECTION 32 92 19

SEEDING

PART 1 GENERAL

1.1 SUMMARY

This section covers requirements for seeding following completion of excavation/backfilling, including acceptable products and application.

1.2 REFERENCES

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

ASTM INTERNATIONAL (ASTM)

ASTM C602	(2013a) Agricultural Liming Materials
ASTM D4972	(2013) pH of Soils

U.S. DEPARTMENT OF AGRICULTURE (USDA)

AMS Seed Act	(1940; R 1988; R 1998) Federal Seed Act
DOA SSIR 42	(1996) Soil Survey Investigation Report No. 42, Soil Survey Laboratory Methods Manual, Version 3.0

1.3 DEFINITIONS

1.4.1 Stand of Turf

95 percent ground cover of the established species.

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-03 Product Data

Wood cellulose fiber mulch

Fertilizer

Include physical characteristics, and recommendations.

SD-06 Test Reports

Topsoil composition tests (reports and recommendations).

SD-07 Certificates

State certification and approval for seed

1.5 DELIVERY, STORAGE, AND HANDLING

1.5.1 Delivery

1.5.1.1 Seed Protection

Protect from drying out and from contamination during delivery, on-site storage, and handling.

1.5.1.2 Fertilizer and Lime Delivery

Deliver to the site in original, unopened containers bearing manufacturer's chemical analysis, name, trade name, trademark, and indication of conformance to State and Federal laws. Instead of containers, fertilizer and lime may be furnished in bulk with certificate indicating the above information.

1.5.2 Storage

1.5.2.1 Seed, Fertilizer and Lime Storage

Store the seed, fertilizer and lime in cool, dry locations away from contaminants.

1.5.2.2 Topsoil

Prior to stockpiling topsoil, treat growing vegetation with application of appropriate specified non-selective herbicide. Clear and grub existing vegetation three to four weeks prior to stockpiling topsoil.

1.5.2.3 Handling

Do not drop or dump materials from vehicles.

1.6 TIME RESTRICTIONS AND PLANTING CONDITIONS

1.6.1 Restrictions

Do not plant when the ground is frozen, snow covered, muddy, or when air temperature exceeds 90 degrees Fahrenheit.

1.7 TIME LIMITATIONS

1.7.1 Seed

Apply seed within twenty-four hours after seed bed preparation.

PART 2 PRODUCTS

2.1 SEED

2.1.1 Classification

Provide State-approved seed of the latest season's crop delivered in original sealed packages, bearing producer's guaranteed analysis for percentages of mixtures, purity, germination, weed/seed content, and inert material. Label in conformance with AMS Seed Act and applicable state seed laws. Wet, moldy, or otherwise damaged seed will be rejected. Field mixes will be acceptable when field mix is performed on site in the presence of the Contracting Officer.

2.1.2 Planting Dates

Planting Season	Planting Dates
Warm Seed Mix	3/1 - 4/30
Cool Seed Mix	5/1 - 8/14
Temporary Seeding	Perennial ryegrass

2.1.3 Seed Purity

All seed shall be true to species with a minimum purity of 95% and a minimum germination rate of 90%.

2.1.4 Seed Mixture by Weight

Botanical Name	Common Name	Percent of Mixture
Andropogon gerardi	Big Bluestem	10
Sirzachyrim scoporim	Little Bluestem	20
Elymus virginicus	Virginia Wild Rye	15
Alopecurus pratensis	Meadow Foxtail	20
Panicum virgatum	Switchgrass	20
Panicum clandestimum	Tioga Deertongue	15

2.2 TOPSOIL

2.2.1 On-Site Topsoil

Surface soil stripped and stockpiled on site and modified as necessary to meet the requirements specified for topsoil in paragraph entitled "Composition." When available topsoil shall be existing surface soil stripped and stockpiled on-site.

2.2.2 Off-Site Topsoil

Conform to requirements specified in paragraph entitled "Composition." Additional topsoil shall be furnished by the Contractor. Off-site topsoil shall be chemical tested in accordance with 1.6 of Section 31 23 00.00 20 EXCAVATION AND FILL and 1.4.3.4 of Section 01 35 45.00 10 CHEMICAL DATA QUALITY CONTROL.

2.2.3 Composition

Containing from five to ten percent organic matter as determined by the topsoil composition tests of the Organic Carbon, 6A, Chemical Analysis Method described in DOA SSIR 42. The maximum particle size is 3/4 inch, with a maximum three percent retained on 1/4 inch screen. The pH shall be tested in accordance with ASTM D4972. Topsoil shall be friable and free of sticks, stones, roots, and other debris and objectionable materials. Other components shall conform to the following limits:

Silt	25-50 percent
Clay	10-30 percent
Sand	20-35 percent
pH	5.5 to 7.0
Soluble Salts	600 ppm maximum

2.3 SOIL CONDITIONERS

Add conditioners to topsoil as required to bring into compliance with "composition" standard for topsoil as specified herein.

2.3.1 Lime

Commercial grade limestone containing a calcium carbonate equivalent (C.C.E.) as specified in ASTM C602 of not less than 95 percent.

2.3.2 Aluminum Sulfate

Commercial grade.

2.3.3 Sulfur

100 percent elemental.

2.3.4 Iron

100 percent elemental.

2.3.5 Organic Matter

Topsoil hauled from offsite should have a minimum organic matter content of 2.75%. Organic matter content may be raised by additives.

2.3.6 Sand

Clean and free of materials harmful to plants.

2.3.7 Perlite

Horticultural grade.

2.3.8 Composted Derivatives

Ground bark, nitrolized sawdust, humus or other green wood waste material free of stones, sticks, and soil stabilized with nitrogen and having the following properties:

2.3.8.1 Particle Size

Minimum percent by weight passing:

No. 4 mesh screen	95
No. 8 mesh screen	80

2.3.8.2 Nitrogen Content

Minimum percent based on dry weight:

Fir Sawdust	0.7
Fir or Pine Bark	1.0

2.3.9 Gypsum

Coarsely ground gypsum comprised of calcium sulfate dihydrate 61 percent, calcium 22 percent, sulfur 17 percent; minimum 96 percent passing through 20 mesh screen, 100 percent passing thru 16 mesh screen.

2.3.10 Calcined Clay

Calcined clay shall be granular particles produced from montmorillonite clay calcined to a minimum temperature of 1200 degrees F. Gradation: A minimum 90 percent shall pass a No. 8 sieve; a minimum 99 percent shall be retained on a No. 60 sieve; and a maximum 2 percent shall pass a No. 100 sieve. Bulk density: A maximum 40 pounds per cubic foot.

2.4 FERTILIZER

2.4.1 Granular Fertilizer

Percentages by weight of plant nutrients shall be based on soil testing of existing on site soils to determine the nutrients required. The fertilizer nutrient content shall also meet the requirements of New Jersey’s Fertilizer Law.

2.4.2 Hydroseeding Fertilizer

Percentages by weight of plant nutrients shall be based on soil testing of existing on site soils to determine the nutrients required. The fertilizer nutrient content shall also meet the requirements of New Jersey’s Fertilizer Law.

2.5 MULCH

Mulch shall be free from noxious weeds, mold, and other deleterious materials.

2.5.1 Straw

Stalks are made from oats, wheat, rye, barley, or rice, and furnished in air-dry condition and of proper consistency for placing with commercial mulch blowing equipment. Straw shall contain no fertile seed.

2.5.2 Hay

Hay is stored in air-dry condition and made of proper consistency for placing with commercial mulch blowing equipment. Hay shall be sterile, containing no fertile seed.

2.5.3 Wood Cellulose Fiber Mulch

Use recovered materials of either paper-based (100 percent) or wood-based (100 percent) hydraulic mulch. Processed to contain no growth or germination-inhibiting factors and dyed an appropriate color to facilitate visual metering of materials application. Composition on air-dry weight basis: 9 to 15 percent moisture, pH range from 5.5 to 8.2. Use with hydraulic application of grass seed and fertilizer.

2.6 WATER

Source of water shall be approved by Contracting Officer and of suitable quality for irrigation, containing no elements toxic to plant life.

2.7 EROSION CONTROL MATERIALS

Erosion control material shall conform to Section 01 57 23 TEMPORARY STORM WATER POLLUTION PREVENTION PLAN.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 EXTENT OF WORK

Provide soil preparation (including soil conditioners as required), fertilizing, seeding, and surface topdressing of all newly graded finished earth surfaces, unless indicated otherwise, and at all areas inside or outside the limits of construction that are disturbed by the Contractor's operations.

3.1.1.1 Topsoil

Provide four inches of existing topsoil to meet specified finish grade. After areas have been brought to finished grade, incorporate fertilizer, pH adjusters, or soil conditioners as needed into soil a minimum depth of four inches by disking, harrowing, tilling, or other method approved by the Contracting Officer. Remove debris and stones larger than 3/4 inch in any dimension remaining on the surface after finish grading. Correct irregularities in finish surfaces to eliminate depressions. Protect finished topsoil areas from damage by vehicular or pedestrian traffic.

3.1.1.2 Soil Conditioner Application Rates

Apply soil conditioners at rates as determined by laboratory soil analysis of the soils at the job site.

3.1.1.3 Fertilizer Application Rates

Apply fertilizer at rates as determined by laboratory soil analysis of the soils at the job site and as required by New Jersey's Fertilizer Law. In accordance with the New Jersey Fertilizer Law, no fertilizer shall be applied within 25 feet of a water body.

3.2 SEEDING

3.2.1 Seed Application Seasons and Conditions

Immediately before seeding, restore soil to proper grade. Do not seed when ground is muddy, frozen or snow covered or in an unsatisfactory condition for seeding. If special conditions exist that may warrant a variance in the above seeding dates or conditions, submit a written request to the Contracting Officer stating the special conditions and proposed variance. Apply seed within twenty-four hours after seedbed preparation. Sow seed by approved sowing equipment. Sow one-half the seed in one direction, and sow remainder at right angles to the first sowing.

3.2.2 Seed Application Method

Seeding method shall be hydroseeding.

3.2.2.1 Hydroseeding

First, mix water and fiber. Wood cellulose fiber, paper fiber, or recycled paper shall be applied as part of the hydroseeding operation. Fiber shall be added at 1,000 pounds, dry weight, per acre. Then add and mix seed and fertilizer to produce homogeneous slurry. Seed shall be mixed to ensure broadcasting at the rate of specified by the manufacturer. When hydraulically sprayed on the ground, material shall form a blotter like cover impregnated uniformly with grass seed. Spread with one application with no second application of mulch.

3.2.3 Mulching

3.2.3.1 Hay or Straw Mulch

Hay or straw mulch shall be spread uniformly at the rate of two tons per acre. Mulch shall be spread by hand, blower-type mulch spreader, or other approved method. Mulching shall be started on the windward side of relatively flat areas or on the upper part of steep slopes and continued uniformly until the area is covered. The mulch shall not be bunched or clumped. Sunlight shall not be completely excluded from penetrating to the ground surface. All areas installed with seed shall be mulched on the same day as the seeding. Mulch shall be anchored immediately following spreading.

3.2.3.2 Mechanical Anchor

Mechanical anchor shall be a V-type-wheel land packer; a scalloped-disk land packer designed to force mulch into the soil surface; or other suitable equipment.

3.2.3.3 Non-Asphaltic Tackifier

Hydrophilic colloid shall be applied at the rate recommended by the manufacturer, using hydraulic equipment suitable for thoroughly mixing with water. A uniform mixture shall be applied over the area.

3.2.4 Rolling

Immediately after seeding, firm the entire area except for slopes in excess of 3 to 1 with a roller not exceeding 90 pounds for each foot of roller width. If seeding is performed with cultipacker-type seeder or by hydroseeding, rolling may be eliminated.

3.2.5 Erosion Control Material

Install in accordance with manufacturer's instructions, where indicated or as directed by the Contracting Officer

3.2.6 Watering

Start watering areas seeded as required by temperature and wind conditions. Apply water at a rate sufficient to insure thorough wetting of soil to a depth of two inches without run off. During the germination process, seed is to be kept actively growing and not allowed to dry out.

3.3 MAINTENANCE OF SEEDED AREAS

Maintain seeded lawn areas a minimum of 90 days after installation. The maintenance period begins at completion of planting or installation of entire area to be seeded. The Contracting Officer will review the seeded area after installation for initial acceptance. Maintenance will include the following minimum requirements:

- Watering, fertilizing, weeding, mowing, and other operations such as rolling, regarding, and reseeding as required to establish a smooth, uniform lawn, free of weeds and eroded or bare areas.
- Layout for a temporary watering system and arrangement of a watering schedule that will avoid walking over muddy and newly seeded areas. Watering shall be accomplished in a manner that prevents puddling and water erosion and displacement of seed or mulch.
- Lawns shall be mowed as soon as there is enough top growth to cut with a mower set at the recommended height for the principal species planted.
    - Mowing shall be repeated as required to maintain an acceptable height;
    - Mowing shall not be delayed until grass blades are bent over and become matted;
    - Mowing shall not be completed when grass is wet;
    - Mowing shall be conducted as required to maintain a height of 1.5 to 2 inches; and
    - Do not mow lower than 1.5 inches.
- Remulch with new mulch in areas where mulch has been disturbed by wind or maintenance operations. Mulch shall be anchored to prevent displacement
- Replant bare areas using same materials specified

The Contracting Officer will review final acceptability of the installed areas at the end of the maintenance period. Areas shall continue to be

maintained until the end of the maintenance period or when all areas are accepted by the Contracting Officer, whichever is the longer period.

-- End of Section --

SECTION 33 11 00

WATER DISTRIBUTION

PART 1 GENERAL

1.1 SUMMARY

This section covers requirements for the installation of groundwater treatment system piping which will be completed prior to beginning the excavation work. Pipe replacement will include replacing the treatment plant discharge piping and piping from extraction manhole MH-1 and MH-2 with new plastic piping routed around the excavation area. Piping for PW-1 and PW-2 will also be replaced with galvanized steel, which will be capable of withstanding temperatures anticipated during the ISTT portion of the remedy. The ISTT will be conducted in the future under a separate contract. This section also includes requirements for the installation of backflow preventers if temporary connections are made to the existing potable water supply pipe located along Sharp Road for temporary facilities.

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.

AMERICAN WATER WORKS ASSOCIATION (AWWA)

AWWA C207	(2018) Standard for Steel Pipe Flanges for Waterworks Service, Sizes 4 in. through 144 in.
AWWA C208	(2017) Dimensions for Fabricated Steel Water Pipe Fittings
AWWA C209	(2013) Cold-Applied Tape Coatings for the Exterior of Special Sections, Connections and Fitting for Steel Water Pipelines
AWWA C511	(2017) Reduced-Pressure Principle Backflow Prevention Assembly
AWWA C800	(2014) Underground Service Line Valves and Fittings
AWWA C901	(2008) Polyethylene (PE) Pressure Pipe and Tubing, 4 In. (100mm) Through 63 In. (1600 mm), for Water Service
AWWA C906	(2008) Polyethylene (PE) Pressure Pipe and Tubing, 1/2 In. (13mm) Through 3 In. (76 mm), for Water Service
AWWA M11	(2016) Steel Pipe: A Guide for Design and Installation

AWWA M23	(2002; 2nd Ed.) Manual: PVC Pipe – Design and Installation
AWWA M55	(2006) PE Pipe – Design and Installation

ASME INTERNATIONAL (ASME)

ASME B1.20.1	(2013) Pipe Threads, General Purpose (Inch)
ASME B1.20.3	(1976; R 2013) Dryseal Pipe Threads (Inch)

ASTM INTERNATIONAL (ASTM)

ASTM A53/A53M	(2018) Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
ASTM D1599	(2014) Resistance to Short-Time Hydraulic Failure Pressure of Plastic Pipe, Tubing, and Fittings
ASTM D2657	(2007) Heat Fusion Joining Polyolefin Pipe and Fittings
ASTM D2774	(2012) Underground Installation of Thermoplastic Pressure Piping
ASTM D3139	(1998; R 2011) Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals
ASTM F477	(2010) Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe

FOUNDATION FOR CROSS-CONNECTION CONTROL AND HYDRAULIC RESEARCH (FCCCHR)

FCCCHR List	(continuously updated) List of Approved Backflow Prevention Assemblies

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 704	(2012) Standard System for the Identification of the Hazards of Materials for Emergency Response

1.3 DESIGN REQUIREMENTS

1.3.1 Groundwater Discharge Pipe

Provide discharge line indicated as four-inch diameter pipe of high density polyethylene (HDPE) pipe from the existing discharge pipe at the groundwater treatment plant building to the point of discharge shown on the Construction Drawings. Provide connections to connect the HDPE pipe to the existing PVC pipe at the building.

1.3.2 Groundwater Extraction Piping

Provide pre-manufactured double-wall HDPE pipe from the extraction manholes to the groundwater treatment building as shown on the Construction Drawings. The carrier pipe shall be 1″ HDPE SDR 11 and the containment pipe shall be 4″ HDPE SDR 17. Provide connections to connect the HDPE pipe to the existing PVC pipe at the building.

1.3.3 Communication and Electrical Piping Conduits

Provide 1″ HDPE conduit piping for electrical and communication lines from the extraction manholes to the groundwater treatment building as shown on the Construction Drawings. Provide connections to connect the HDPE pipe to the existing PVC pipe at the building.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Manufacturer’s Data Sheets/Specifications for piping, fittings, and backflow preventer

SD-05 Design Data

Design calculations for piping

SD-06 Test Reports

Backflow Preventer Tests; G

Hydrostatic Test Results

Leakage Test Results

SD-07 Certificates

Backflow Prevention Training Certificate

Backflow Tester Certification

Backflow Certificate

SD-08 Manufacturer's Instructions

Delivery, storage, and handling

Installation procedures for piping

1.5 QUALITY CONTROL

1.5.1 Qualifications for Backflow Preventers

1.5.1.1 Backflow Preventer Certificate

Certificate of Full Approval from FCCCHR List, University of Southern California, attesting that the design, size and make of each backflow preventer has satisfactorily passed the complete sequence of performance testing and evaluation for the respective level of approval. Certificate of Provisional Approval will not be acceptable.

1.5.1.1.1 Backflow Tester Certificate

Prior to testing, submit to the Contracting Officer certification issued by the State or local regulatory agency attesting that the backflow tester has successfully completed a certification course sponsored by the regulatory agency. Tester must not be affiliated with any company participating in any other phase of this Contract.

1.5.1.1.2 Backflow Prevention Training Certificate

Submit a certificate recognized by the State or local authority that states the Contractor has completed at least 10 hours of training in backflow preventer installations. The certificate must be current.

1.6 DELIVERY, STORAGE, AND HANDLING

1.6.1 Delivery and Storage

Inspect materials delivered to site for damage. Unload and store with minimum handling. Store materials on site in enclosures or under protective covering. Plastic piping and jointing materials will be stored under cover and out of direct sunlight. Do not store materials directly on the ground. Keep inside of pipes and fittings free of dirt and debris.

1.6.2 Handling

Handle pipe, fittings, and other accessories in a manner to ensure delivery to the trench in sound undamaged condition. Carry, do not drag pipe to the trench. Use of pinch bars and tongs for aligning or turning pipe will be permitted only on the bare ends of the pipe. Before installation, the pipe shall be inspected for defects. Material found to be defective before or after laying shall be replaced with sound material.

1.6.2.1 Polyethylene (PE) Pipe, Fittings, and Accessories

Handle PE pipe, fittings, and accessories in accordance with AWWA C901.

1.6.2.2 Polyvinyl Chloride (PVC) Pipe, Fittings, and Accessories

Handle PVC pipe, fittings, and accessories in accordance with AWWA C605.

PART 2 PRODUCTS

2.1 PIPING MATERIALS

2.1.1 Piping Materials

2.1.1.1 Plastic Piping

Plastic pipe and fittings shall bear the seal of the National Sanitation Foundation (NSF) for potable water service. Plastic pipe and fittings shall be supplied from the same manufacturer.

a. Polyethylene (PE) Plastic Pipe: HDPE material having minimum material designation code PE 4710 or PE 3608. Material shall meet the requirements of ASTM D 3350 and shall have a minimum cell classification of PE445474C for PE 4710 and PE345464C for PE 3608. Pipe tubing and heat fusion fitting shall conform to AWWA C901.

2.1.1.2 Steel Piping

Pipe, ASTM A53/A53M, standard weight, zinc-coated. Fittings, ASME B16.4, Class 125, zinc coated; or ASME B16.3, Class 150, zinc coated, threaded.

Mechanically apply, in a factory or plant especially equipped for the purpose, the protective materials for steel pipe. Unless otherwise indicated, the materials consist of the following for the indicated pipe material and size:

Clean pipe and fittings less than 3 inches in diameter of foreign material by wire brushing and solvent cleaning, and apply one coat of coal-tar primer and two coats of coal-tar enamel matching the requirements of AWWA C203; protect threaded ends of pipe and fittings prior to coating.

2.1.2 Fittings

2.1.2.1 Butt Fusion Fittings

Fittings shall be made of either PE4710 or PE 3608, with a minimum Cell Classification as noted in Part 2.2.1. Butt Fusion Fittings shall meet the requirements of ASTM D3261. Molded and fabricated fittings shall have a pressure rating equal to the pipe unless otherwise specified in the plans.

Markings for molded fittings shall comply with the requirements of ASTM D 3261. Fabricated fittings shall be marked in accordance with ASTM F 2206. Socket fittings shall meet ASTM D 2683.

2.1.2.2 Electrofusion Fittings

Fittings shall be PE4710 or PE 3608, with a minimum Cell Classification as noted in Part 2.2.1. Electrofusion Fittings shall have a manufacturing standard of ASTM F1055. Fittings shall have a pressure rating equal to the pipe unless otherwise specified on the plans.

2.1.2.3 Flanges and Mechanical Joint Adapters

Flanges and Mechanical Joint Adapters (MJ Adapters) – Flanges and Mechanical Joint Adapters shall be PE4710 or PE 3608, with a minimum Cell Classification as noted in Part 2.2.1. Flanged and Mechanical Joint Adapters can be made to ASTM D 3261 or if machined, must meet the requirements of ASTM F 2206. Flanges and MJ Adapters shall have a pressure rating equal to the pipe unless otherwise specified on the plans. Markings for molded or machined flange adapters or MJ Adapters shall be per ASTM D

3261. Fabricated (including machined) flange adapters shall be per ASTM F 2206.

2.2 BACKFLOW PREVENTER

Provide an AWWA C511 reduced pressure principle type backflow preventer meeting the requirements of the local water supplier.

The particular make, model, and size of backflow preventer to be installed must be included in the latest edition of the List of Approved Backflow Prevention Assemblies issued by the FCCCHR List and be accompanied by a backflow certificate of full approval from FCCCHR List. Select materials for piping, strainers, and valves used in assembly installation that are galvanically compatible. Materials joined, connected, or otherwise in contact are to have no greater than 0.25 V difference on the Anodic Index, unless separated by a dielectric type union or fitting.

2.2.1 Backflow Preventer Enclosure

Provide an enclosure.

2.3 GEOTEXTILE FABRIC

Provide nonwoven geotextile fabric between pipe bedding and backfill as shown on the Construction Drawings. Geotextile fabric shall be minimum weight of 5 oz/sy and meeting AASHTO M288 Class 2 requirements.

Property	**Test Method**	**Minimum Value**
Weight	ASTM D-5261	5 oz./sy
Tensile Strength	ASTM D-4632	130 lbs.
Elongation @break	ASTM D-4632	50%
Mullen Burst	ASTM-D-3786	300 psi
Puncture Strength	ASTM D-48033	70 lbs.
CBR Puncture	ASTM D-6241	300 lbs.
Trapezoidal Tear	ASTM D-4533	50 lbs.
Apparent Opening Size	ASTM D-4751	70 US Sieve Size
Permittivity	ASTM D-4491	1.5 sec-1
UV Resistance @500 hrs	ASTM D-4355	70%

PART 3 EXECUTION

3.1 JOINING METHODS

3.1.1 Butt Fusion

The pipe shall be joined by the butt fusion procedure outlined in ASTM F 2620 or PPI TR-33. All fusion joints shall be made in compliance with the pipe or fitting manufacturer’s recommendations. Fusion joints shall be made by qualified fusion technicians per PPI TN-42.

3.1.2 Saddle Fusion

Saddle fusion shall be done in accordance with ASTM F 2620 or TR-41 or the fitting manufacturer’s recommendations and PPI TR-41. Saddle fusion joints shall be made by qualified fusion technicians. Qualification of the fusion

technician shall be demonstrated by evidence of fusion training within the past year on the equipment to be utilized.

3.1.3 Electrofusion

Electrofusion joining shall be done in accordance with the manufacturers recommended procedure. Other sources of electrofusion joining information are ASTM F 1290 and PPI TN 34. The process of electrofusion requires an electric source, a transformer, commonly called an electrofusion box that has wire leads, a method to read electronically (by laser)or otherwise input the barcode of the fitting, and a fitting that is compatible with the type of electrofusion box used. The electrofusion box must be capable of reading and storing the input parameters and the fusion results for later download to a record file. Qualification of the fusion technician shall be demonstrated by evidence of electrofusion training within the past year on the equipment to be utilized.

3.1.4 Mechanical

Mechanical connection of HDPE to auxiliary equipment such as valves, pumps, and fittings shall use mechanical joint adapters and other devices in conformance with the PPI Handbook of Polyethylene Pipe, Chapter 9 and AWWA Manual of Practice M55, Chapter 6.

Mechanical connections shall be used to connect HDPE pipe to other HDPE pipe, or fittings, or to transition to another material. The use of stab-fit style couplings is allowed, along with the use of metallic couplings of brass and other materials. All mechanical and compression fittings shall be recommended by the manufacturer. When a compression type or mechanical type of coupling is used, the use of a rigid tubular insert stiffener inside the end of the pipe is required.

Mechanical couplings that wrap around the pipe and act as saddles shall be recommended by the manufacturer as being designed for use with HDPE pipe at the pressure class listed in this section.

Mechanical coupling shall be made by qualified technicians. Qualification of the field technician shall be demonstrated by evidence of mechanical coupling training within the past year. This training shall be on the equipment and pipe components to be utilized for this project.

3.2 INSTALLATION OF PIPELINES

3.2.1 General Requirements for Installation of Pipelines

These requirements shall apply to all pipeline installation except where specific exception is otherwise stated. All piping, fittings, joints and couplings shall be installed in accordance with the applicable referenced standard, the manufacturer’s instructions and as specified herein.

3.2.1.1 Location of Water Lines

Location of piping for the relocation of the groundwater treatment system piping shall be as shown on the Construction Drawings.

Terminate the work covered by this section at a point approximately 1.5 m (5 feet) from the building, unless otherwise indicated.

Do not lay water lines in the same trench with gas lines, fuel lines, electric wiring, or any other utility.

3.2.1.2 Trenching

Perform trenching in accordance with Section 31 23 00.00 20 EXCAVATION AND FILL.

3.2.1.3 Pipe Laying and Jointing

Remove fins and burrs from pipe and fittings. Before placing in position, clean pipe, fittings, and accessories, and maintain in a clean condition. Provide proper facilities for lowering sections of pipe into trenches. Do not under any circumstances drop or dump pipe, fittings, or any other water line material into trenches. Cut pipe in a neat workmanlike manner accurately to length established at the site and work into place without springing or forcing. Replace by one of the proper length any pipe or fitting that does not allow sufficient space for proper installation of jointing material. Grade the pipeline in straight lines; avoid the formation of dips and low points. Support pipe at proper elevation and grade. Secure firm, uniform support. Wood support blocking will not be permitted. Lay pipe so that the full length of each section of pipe and each fitting will rest solidly on the pipe bedding; excavate recesses to accommodate joints and couplings. Provide anchors and supports where necessary for fastening work into place. Make proper provision for expansion and contraction of pipelines. Keep trenches free of water until joints have been properly made. At the end of each work day, close open ends of pipe temporarily with wood blocks or bulkheads. Do not lay pipe when conditions of trench or weather prevent installation. Depth of cover over top of pipe shall not be less than 3.5 feet.

3.2.1.4 Installation of Tracer Wire

Install a continuous length of tracer wire for the full length of each run of nonmetallic pipe. Attach wire to top of pipe in such manner that it will not be displaced during construction operations.

3.2.1.5 Penetrations

Pipe passing through walls of structures shall be provided with ductile-iron or Schedule 40 steel wall sleeves. Annular space between walls and sleeves shall be filled with rich cement mortar. Annular space between pipe and sleeves shall be filled with mastic.

3.2.1.6 Installation of Plastic Piping

Install pipe and fittings in accordance with paragraph entitled "General Requirements for Installation of Pipelines" and with the applicable requirements of ASTM D2774 and ASTM D2855, unless otherwise specified.

3.2.1.7 Installation of Steel Piping

Install pipe and fittings in accordance with the general requirements for pipe installation and with the applicable requirements of AWWA C600 for pipe installation and the manufacturer's requirements, unless otherwise specified.

3.2.1.7.1 Screwed Joints

Make screwed joints up tight with a stiff mixture of graphite and oil, inert filler and oil, or graphite compound; apply to male threads only or with PTFE Tape, for use with threaded pipe. Threads are to be full cut; do not leave more than three threads on the pipe exposed after assembling the joint.

3.2.1.7.2 Flanged Joints

Make flanged joints up tight, avoid undue strain on flanges, valves, fittings, and accessories.

3.2.1.7.3 Protection of Buried Steel Piping

Prepare, prime, and coat exterior surface of zinc-coated steel pipe and associated fittings to be buried with hot-applied coal-tar enamel with a bonded single layer of felt wrap in accordance with AWWA C203. For the felt wrap material, use fibrous-glass mat as specified in AWWA C203; use of asbestos felt will not be permitted. Use solvent wash only to remove oil, grease, and other extraneous matter from zinc-coated pipe and fittings.

3.3 INSTALLATION OF BACKFLOW PREVENTER

Install backflow preventers in accordance with the water supplier's requirements and the manufacturer's recommendations.

3.4 FIELD QUALITY CONTROL

3.4.1 Field Tests and Inspections

Prior to testing, obtain Contracting Officer approval of the proposed method for disposal of wastewater from testing. The Contracting Officer will conduct field inspections and witness field tests specified in this section. The Contractor shall perform field tests, and provide labor, equipment, and incidentals required for testing. The Contractor shall produce evidence, when required, that any item of work has been constructed in accordance with the drawings and specifications.

3.4.2 Testing Procedure

3.4.2.1 Hydrostatic Testing for HDPE Piping

HDPE piping shall be hydrostatically tested in accordance with the pipe manufacturer's requirements and as specified herein. The pipe shall be pressurized at a pressure of 150 psi during the initial expansion period of the test. During the initial expansion period of the pipe, the Contractor shall supply sufficient make-up water at hourly intervals for up to 3 hours to maintain the test pressure. During this period the Contractor shall inspect all joints for any leakage. Any leakage must be repaired before proceeding with the test. After approximately 4 hours the initial expansion of the pipe should be complete and the actual test can begin. During the actual test the test pressure shall be reduced by 10 psi. This target test

pressure (140 psi) shall remain steady (within 5% of the target test pressure) for a period of one hour. If leakage is discovered, depressurize the test section before repairing the leaks. Allow the test section of the pipe to be depressurized for at least eight hours before retesting. The containment pipe for double-wall HDPE pipe shall be air tested at 5 psig.

3.4.2.1.1 Hydrostatic Testing for Metal Piping

Test piping in accordance with requirements of AWWA C600 for hydrostatic testing. No leakage will be allowed at joints.

3.4.2.2 Backflow Preventer Tests

After installation conduct Backflow Preventer Tests and provide test reports verifying that the installation meets the FCCCHR Manual Standards. Testing shall be done by a New Jersey licensed back flow device inspector.

3.5 CLEANUP

Upon completion of the installation of groundwater lines, and appurtenances, all debris and surplus materials resulting from the work shall be removed.

-- End of Section --

SECTION 33 24 13

GROUNDWATER MONITORING WELLS

PART 1 GENERAL

1.1 SUMMARY

This section covers requirements for decommissioning/abandoning groundwater monitoring wells within the limits of the excavation areas.

1.2 REFERENCES

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

ASTM INTERNATIONAL (ASTM)

ASTM A312/A312M	(2014b) Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes
ASTM C1107/C1107M	(2014) Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink)
ASTM C136	(2006) Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM C150/C150M	(2012) Standard Specification for Portland Cement
ASTM C387/C387M	(2011b) Standard Specification for Packaged, Dry, Combined Materials for Mortar and Concrete
ASTM D4380	(2012) Standard Test Method for Density of Bentonitic Slurries
ASTM D4750	(1987; R 2001) Determining Subsurface Liquid Levels in a Borehole or Monitoring Well (Observation Well)
ASTM D5088	(2002; R 2008) Decontamination of Field Equipment Used at Nonradioactive Waste Sites
ASTM D5299	(1999; E 2012; R 2012) Decommissioning of Ground Water Wells, Vadose Zone Monitoring Devices, Boreholes, and Other Devices for Environmental Activities

GEOLOGICAL SOCIETY OF AMERICA (GeoSA)

GSA RCC00100R	(2009) Geological Rock Color Chart (Munsell)

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION AGENCY (NJDEP)

N.J.A.C 7:9D	(2007) Well Construction and Maintenance; Sealing of Abandoned Wells

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2008; Errata 2011) Safety and Health Requirements Manual

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA 530/F-93/004	(1993; Rev O; Updates I, II, IIA, IIB, and III) Test Methods for Evaluating Solid Waste (Vol IA, IB, IC, and II) (SW-846)
EPA 600/4-79/020	(1983) Methods for Chemical Analysis of Water and Wastes
EPA SW-846	(Third Edition; Update IV) Test Methods for Evaluating Solid Waste: Physical/Chemical Methods

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

49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Well Decommissioning/Abandonment Records; G

Qualifications; G

Permits; G

1.4 QUALITY ASSURANCE

1.4.1 Notification

The Contractor shall notify the NJDEP prior to decommissioning any wells in accordance with N.J.A.C. 7:9D-1.17. A copy of the notification shall be submitted to the Contracting Officer.

1.4.2 Qualifications

Provide a driller licensed in the State of New Jersey, according to the State requirements.

1.5 SITE CONDITIONS

Access to the site will be granted prior to the beginning of work. The Contractor is responsible for submitting a NJ One Call ticket prior to the start of work and shall obtain and submit a copy of all permits, licenses, or other requirements necessary for execution of the work. Before beginning work, the Contractor shall notify NJDEP of the type and location of wells to be decommissioned, the method of decommissioning and anticipated schedule for decommissioning of the wells. Furnish a copy of all such correspondence to the Contracting Officer. Obtaining rights-of-entry is the responsibility of the Government.

PART 2 PRODUCTS

2.1 CEMENT AND BENTONITE GROUT

Provide cement grout with a mixture of a 8.3 gallons of approved water per 94 lb bag of portland cement, conforming to ASTM C150/C150M, Type I. Add 5.3 percent by weight of bentonite powder to reduce shrinkage, hold the cement in suspension prior to the grout set. Use sodium bentonite powder and/or granules for high-solids bentonite grout. Mix water from an approved source with these powders or granules to form a thick bentonite slurry, consisting of a mixture of bentonite and the manufacturer's recommended volume of water to achieve an optimal seal. The slurry shall contain 26 percent solids by weight and have a density of 13.4 to 14.5 lb. per gallon of water.

2.2 CONTAINERIZATION OF DEVELOPMENT WATER, AND DRILL CUTTINGS

Provide D.O.T. approved drums, containers, or vessels for containment of water removed during development and testing operations, and cuttings from the drilling operations, as specified in 49 CFR 172. Furnish polyethylene and steel drums with lids, lid gaskets, bolts, chain of custody forms and drum labels. Mark each drum label in accordance with 49 CFR 172 in addition to the following information:

a. drum number,
b. site name,
c. well name and number,
d. contents and date,
e. approximate depth of material contained in each drum, and
f. the name and phone number of the Installation Environmental Coordinator (IEC).

PART 3 EXECUTION

3.1 PROTECTION OF EXISTING CONDITIONS

Maintain all existing survey monuments and monitoring wells, and protect them from damage from equipment and vehicular traffic. Immediately report and repair any items damaged by the Contractor. Re-install monitoring wells

requiring replacement due to Contractor negligence according to these specifications. Protect wells scheduled for abandonment from damage so that abandonment may be performed according to these specifications. Prior to excavation, obtain written approval from the local utility companies to drill at each site, to avoid disturbing buried utilities.

3.2 WELL DECOMMISSIONING/ABANDONMENT

Wells with bottoms beneath the specified excavation bottom depth shall be decommissioned/abandoned according to the requirements of Subchapter 3 of N.J.A.C. 7:9D, ASTM D5299, and the requirements of these specifications. Grout decommissioned/abandoned wells from the bottom to within two feet of the top of the ground surface according to the protocol for grout/bentonite placement established in paragraph Grout Placement, using the grout mix specified in paragraph CEMENT AND BENTONITE GROUT. The remaining top two feet shall be backfilled with imported backfill meeting the requirements of Section 31 23 00.00 20 EXCAVATION AND FILL.

Wells with bottom depths above or at the specified excavation depth shall be excavated along with soils removed for off-site disposal.

Maintain a well decommissioning/abandonment record as specified in paragraph Well Decommissioning/Abandonment Records. Measure groundwater levels, if encountered before decommissioning/abandonment, in all borings prior to backfilling. Include these water levels in the well decommissioning/abandonment records. No well apart from those identified in the Contract Documents may be decommissioned/abandoned without the approval of the Contracting Officer.

3.2.1 Grout Placement

Grout shall be pumped into the well under pressure through a tremie pipe that discharges at the bottom of the well. If an annular space is being sealed, the material shall discharge at the bottom of the annular space. During sealing, the tremie pipe may be raised from the bottom of the space being filled in a manner which insures that the discharge end of the tremie pipe is constantly submerged within the column of undiluted grout material in the well. The grout shall be pumped into the well until all water has been displaced from the well and until the decommissioning material overflowing the well has a density within the acceptable density range of the grout.

3.3 SITE CLEANUP

After completion of the work, remove tools, appliances, surplus materials, temporary drainage, rubbish, and debris incidental to work, and backfill the excavation and vehicular ruts and dress to conform to the existing landscape or terrain. Utilities, structures, roads, fences, or any other pre-existing item which must be repaired or replaced due to the Contractor's negligence are the Contractor's responsibility; accomplish repair or replacement prior to completion of this contract.

3.4 DOCUMENTATION AND QUALITY CONTROL REPORTS

Submit reports for well construction and development. Establish and maintain documentation and quality control reports for well construction and

development to record the desired information and to assure compliance with contract requirements, including, but not limited to, the following:

3.4.1 Well Decommissioning/Abandonment Records

Well decommissioning/abandonment is to be completed in accordance with NJDEP guidelines and be conducted by a NJ licensed well driller. Submit well decommissioning record, for each well, or test hole abandoned, within ten working days of the completion of the abandonment procedure. Include in decommissioning/abandonment records, as a minimum, the following:

a. Project name.

b. Well or test hole number.

c. Well/boring location, depth and diameter.

d. Date of decommissioning/abandonment.

e. Method of decommissioning/abandonment.

f. All materials used in the decommissioning/abandonment procedure and the interval in which test materials were placed.

g. Casing, and/or other items left in hole by depth, description, and composition.

h. Description and total quantity of grout used initially.

i. Description and daily quantities of grout used to compensate for settlement.

j. Water or mud level (specify) prior to grouting and date measured.

k. The reason for decommissioning/abandonment of the monitoring well/test hole.

-- End of Section --

SECTION 33 71 02

UNDERGROUND ELECTRICAL DISTRIBUTION

PART 1 GENERAL

1.1 SUMMARY

This section includes the requirements for relocating the underground electrical wiring and conduit for extraction manholes MH-1 and MH-2 around the excavation area and for replacing existing underground electrical conduit for electrical wiring for pumping wells PW-1 and PW-2. The new electrical conduit replaced for MH-1 and MH-2 will be replaced with metal conduit capable of withstanding temperatures of 120 degrees Celsius.

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.

AMERICAN WELDING SOCIETY (AWS)

AWS D1.1/D1.1M	(2015; Errata 1 2015; Errata 2 2016) Structural Welding Code - Steel

ASTM INTERNATIONAL (ASTM)

ASTM A48/A48M	(2003; R 2012) Standard Specification for Gray Iron Castings
ASTM B1	(2013) Standard Specification for Hard-Drawn Copper Wire
ASTM B231/B231M	(2012) Standard Specification for Concentric-Lay-Stranded Aluminum 1350 Conductors
ASTM B3	(2013) Standard Specification for Soft or Annealed Copper Wire
ASTM B400/B400M	(2008; E 2013) Standard Specification for Compact Round Concentric-Lay-Stranded Aluminum 1350 Conductor
ASTM B496	(2016) Standard Specification for Compact Round Concentric-Lay-Stranded Copper Conductors
ASTM B609/B609M	(2012; E 2015) Standard Specification for Aluminum 1350 Round Wire, Annealed and Intermediate Tempers, for Electrical purposes

ASTM B8	(2011; R 2017) Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
ASTM B800	(2005; R 2011) Standard Specification for 8000 Series Aluminum Alloy Wire for Electrical Purposes-Annealed and Intermediate Tempers
ASTM F2160	(2016) Standard Specification for Solid Wall High Density Polyethylene (HDPE) Conduit Based on Controlled Outside Diameter (OD)
ASTM F512	(2012; R 2017) Standard Specification for Smooth-Wall Poly (Vinyl Chloride) (PVC) Conduit and Fittings for Underground Installation

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE 400.2	(2013) Guide for Field Testing of Shielded Power Cable Systems Using Very Low Frequency (VLF)
IEEE 495	(2007) Guide for Testing Faulted Circuit Indicators
IEEE 81	(2012) Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System
IEEE C2	(2017; Errata 1-2 2017; INT 1 2017) National Electrical Safety Code
IEEE C37.20.3	(2013) Standard for Metal-Enclosed Interrupter Switchgear
IEEE Stds Dictionary	(2009) IEEE Standards Dictionary: Glossary of Terms & Definitions

INTERNATIONAL ELECTRICAL TESTING ASSOCIATION (NETA)

NETA ATS	(2017; Errata 2017) Standard for Acceptance Testing Specifications for Electrical Power Equipment and Systems

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

ANSI C119.1	(2016) Electric Connectors - Sealed Insulated Underground Connector Systems Rated 600 Volts

ANSI/NEMA WC 71/ICEA S-96-659	(2014) Standard for Nonshielded Cables Rated 2001-5000 Volts for use in the Distribution of Electric Energy
NEMA C119.4	(2011) Electric Connectors - Connectors for Use Between Aluminum-to-Aluminum or Aluminum-to-Copper Conductors Designed for Normal Operation at or Below 93 Degrees C and Copper-to-Copper Conductors Designed for Normal Operation at or Below 100 Degrees C
NEMA RN 1	(2005; R 2013) Polyvinyl-Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit
NEMA TC 2	(2013) Standard for Electrical Polyvinyl Chloride (PVC) Conduit
NEMA TC 3	(2016) Polyvinyl Chloride (PVC) Fittings for Use With Rigid PVC Conduit and Tubing
NEMA TC 6 & 8	(2013) Standard for Polyvinyl Chloride (PVC) Plastic Utilities Duct for Underground Installations
NEMA TC 7	(2016) Smooth-Wall Coilable Electrical Polyethylene Conduit
NEMA TC 9	(2004) Standard for Fittings for Polyvinyl Chloride (PVC) Plastic Utilities Duct for Underground Installation
NEMA WC 70	(2009) Power Cable Rated 2000 V or Less for the Distribution of Electrical Energy--S95-658

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(2017; ERTA 1-2 2017; TIA 17-1; TIA 17-2; TIA 17-3; TIA 17-4; TIA 17-5; TIA 17-6; TIA 17-7; TIA 17-8; TIA 17-9; TIA 17-10; TIA 17-11; TIA 17-12; TIA 17-13; TIA 17-14; TIA 17-15; TIA 17-16; TIA 17-17) National Electrical Code

SOCIETY OF CABLE TELECOMMUNICATIONS ENGINEERS (SCTE)

ANSI/SCTE 77	(2013) Specification for Underground Enclosure Integrity

TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA)

TIA-758	(2012b) Customer-Owned Outside Plant Telecommunications Infrastructure Standard

U.S. DEPARTMENT OF AGRICULTURE (USDA)

RUS Bull 1751F-644	(2002) Underground Plant Construction

U.S. GENERAL SERVICES ADMINISTRATION (GSA)

CID A-A-60005	(Basic; Notice 2) Frames, Covers, Gratings, Steps, Sump And Catch Basin, Manhole

UNDERWRITERS LABORATORIES (UL)

UL 1242	(2006; Reprint Mar 2014) Standard for Electrical Intermediate Metal Conduit -- Steel
UL 44	(2018) UL Standard for Safety Thermoset-Insulated Wires and Cables
UL 467	(2013; Reprint Jun 2017) UL Standard for Safety Grounding and Bonding Equipment
UL 486A-486B	(2018) UL Standard for Safety Wire Connectors
UL 510	(2017) UL Standard for Safety Polyvinyl Chloride, Polyethylene and Rubber Insulating Tape
UL 514A	(2013; Reprint Aug 2017) UL Standard for Safety Metallic Outlet Boxes
UL 514B	(2012; Reprint Nov 2014) Conduit, Tubing and Cable Fittings
UL 6	(2007; Reprint Nov 2014) Electrical Rigid Metal Conduit-Steel
UL 651	(2011; Reprint Jun 2016) UL Standard for Safety Schedule 40 and 80 Rigid PVC Conduit and Fittings
UL 83	(2017) UL Standard for Safety Thermoplastic-Insulated Wires and Cables
UL 854	(2004; Reprint Nov 2014) Standard for Service-Entrance Cables
UL 94	(2013; Reprint Sep 2017) UL Standard for Safety Tests for Flammability of Plastic Materials for Parts in Devices and Appliances

American National Standards Institute (ANSI)

ANSI C80.1	American National Standard for Electrical Rigid Steel Conduit (ERCS)
ANSI/ASME B 1.20.1	Standard Pipe Threads, General Purpose (inch)

1.3 DEFINITIONS

a. Unless otherwise specified or indicated, electrical and electronics terms used in these specifications, and on the drawings, are as defined in IEEE Stds Dictionary.

b. In the text of this section, the words conduit and duct are used interchangeably and have the same meaning.

c. In the text of this section, "medium voltage cable splices," and "medium voltage cable joints" are used interchangeably and have the same meaning.

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-02 Shop Drawings

Aluminum conductors; G

SD-03 Product Data

Sealing Material

SD-06 Test Reports

Field Acceptance Checks and Tests; G

Cable Installation Plan and Procedure; G

Six copies of the information described below in 8-1/2 by 11 inch binders having a minimum of three rings from which material may readily be removed and replaced, including a separate section for each cable pull. Separate sections by heavy plastic dividers with tabs, with all data sheets signed and dated by the person supervising the pull.

a. Site layout drawing with cable pulls numerically identified.

b. A list of equipment used, with calibration certifications. The manufacturer and quantity of lubricant used on pull.

c. The cable manufacturer and type of cable.

d. The dates of cable pulls, time of day, and ambient temperature.

e. The length of cable pull and calculated cable pulling tensions.

f. The actual cable pulling tensions encountered during pull.

SD-07 Certificates

Cable splicer/terminator; G

Cable Installer Qualifications; G

1.5 QUALITY ASSURANCE

1.5.1 Cable Installer Qualifications

Provide at least one onsite person in a supervisory position with a documentable level of competency and experience to supervise all cable pulling operations. Provide a resume showing the cable installers' experience in the last three years, including a list of references complete with points of contact, addresses and telephone numbers. Cable installer must demonstrate experience with a minimum of three medium voltage cable installations. The Contracting Officer reserves the right to require additional proof of competency or to reject the individual and call for an alternate qualified cable installer.

1.5.2 Regulatory Requirements

In each of the publications referred to herein, consider the advisory provisions to be mandatory, as though the word, "must" had been substituted for "should" wherever it appears. Interpret references in these publications to the "authority having jurisdiction," or words of similar meaning, to mean the Contracting Officer. Equipment, materials, installation, and workmanship must be in accordance with the mandatory and advisory provisions of IEEE C2 and NFPA 70 unless more stringent requirements are specified or indicated.

1.5.3 Standard Products

Provide materials and equipment that are products of manufacturers regularly engaged in the production of such products which are of equal material, design and workmanship. Products must have been in satisfactory commercial or industrial use for 2 years prior to bid opening. The 2-year period must include applications of equipment and materials under similar circumstances and of similar size. The product must have been for sale on the commercial market through advertisements, manufacturers' catalogs, or brochures during the 2-year period. Where two or more items of the same class of equipment are required, these items must be products of a single manufacturer; however, the component parts of the item need not be the products of the same manufacturer unless stated in this section.

1.5.3.1 Alternative Qualifications

Products having less than a 2-year field service record will be acceptable if a certified record of satisfactory field operation for not less than 6000 hours, exclusive of the manufacturers' factory or laboratory tests, is furnished.

1.5.3.2 Material and Equipment Manufacturing Date

Products manufactured more than 3 years prior to date of delivery to site are not acceptable, unless specified otherwise.

PART 2 PRODUCTS

2.1 CONDUIT, DUCTS, AND FITTINGS

2.1.1 Rigid Steel Conduit

Rigid steel conduit shall be hot-dip galvanized listed to UL 6 and manufactured in accordance with ANSI C80.1. Rigid steel conduit shall be threaded on both ends. Taper of conduit threads shall be ¾″ per foot per ANSI/ASME B.1.20.1. Conduit threads shall be hot galvanized after cutting. Rigid steel conduit shall be supplied with a straight-tapped electro-galvanized steel coupling manufactured in accordance with UL 6 on one end. A color-coded thread protector shall be installed on the other end: Trade Sizes 1, 2, 3, 4, 5, 6 (blue; ½, 1-1/2, 2-1/2, 3-1/2 (Black); ¾, 1-1/4 (red).

2.1.3 Plastic Conduit for Direct Burial and Riser Applications

UL 651 and NEMA TC 2, EPC-40.

2.1.4 Plastic Duct for Concrete Encasement

Provide Type EB-20 per UL 651, ASTM F512, and NEMA TC 6 & 8 or Type EPC-40 per UL 651 and NEMA TC 2.

2.1.5 Duct Sealant

UL 94, Class HBF. Provide high-expansion urethane foam duct sealant that expands and hardens to form a closed, chemically and water resistant, rigid structure. Sealant must be compatible with common cable and wire jackets and capable of adhering to metals, plastics and concrete. Sealant must be capable of curing in temperature ranges of 2 degrees C to 35 degrees C (35 degrees F to 95 degrees F). Cured sealant must withstand temperature ranges of -29 degrees C to 93 degrees C (-20 degrees F to 200 degrees F) without loss of function.

2.1.8 Fittings

2.1.8.1 Metal Fittings

UL 514B.

2.1.8.1.1 Elbows

Elbows shall be listed to UL 6 and manufactured in accordance with ANSI C80.1

2.1.8.1.2 Nipples

Nipples shall be listed to UL 6 and manufactured in accordance with ANSI C80.1.

2.1.8.2 PVC Conduit Fittings

UL 514B, UL 651, NEMA TC 3.

2.1.8.3 PVC Duct Fittings

NEMA TC 9.

2.2 LOW VOLTAGE INSULATED CONDUCTORS AND CABLES

Insulated conductors must be rated 600 volts and conform to the requirements of NFPA 70, including listing requirements, or in accordance with NEMA WC 70. Wires and cables manufactured more than 24 months prior to date of delivery to the site are not acceptable. Service entrance conductors must conform to UL 854, type USE.

2.2.1 Conductor Types

Cable and duct sizes indicated are for copper conductors and THHN/THWN unless otherwise noted. Conductors No. 10 AWG and smaller must be solid. Conductors No. 8 AWG and larger must be stranded. Conductors No. 6 AWG and smaller must be copper. Conductors No. 4 AWG and larger may be either copper or aluminum, at the Contractor's option. Do not substitute aluminum for copper if the equivalent aluminum conductor size would exceed 500 kcmil. When the Contractor chooses to use aluminum for conductors No. 4 AWG and larger, the Contractor must: increase the conductor size to have the same ampacity as the copper size indicated; increase the conduit and pull box sizes to accommodate the larger size aluminum conductors in accordance with NFPA 70; ensure that the pulling tension rating of the aluminum conductor is sufficient; relocate equipment, modify equipment terminations, resize equipment, and resolve to the satisfaction of the Contracting Officer problems that are direct results of the use of aluminum conductors in lieu of copper.

2.2.2 Conductor Material

Unless specified or indicated otherwise or required by NFPA 70, wires in conduit, other than service entrance, must be 600-volt, Type THWN/THHN conforming to UL 83 or Type XHHW or RHW conforming to UL 44. Copper conductors must be annealed copper complying with ASTM B3 and ASTM B8. Aluminum conductors must be Type AA-8000 aluminum conductors complying with ASTM B800 and ASTM B801, and must be of an aluminum alloy listed or labeled by UL as "component aluminum-wire stock (conductor material). Type 1350 is not acceptable. Intermixing of copper and aluminum conductors in the same raceway is not permitted.

2.2.3 Jackets

Multiconductor cables must have an overall PVC outer jacket. For multiconductors installed within the ISTR area the outer jacket shall be of a material that can withstand a temperature of 120 degrees Celsius.

2.2.4 Direct Buried

Single-conductor and multi-conductor cables must be of a type identified for direct burial.

2.2.5 In Duct

Cables must be single-conductor cable. Cables in factory-installed, coilable-plastic-duct assemblies must conform to NEMA TC 7.

2.2.6 Cable Marking

Insulated conductors must have the date of manufacture and other identification imprinted on the outer surface of each cable at regular intervals throughout the cable length.

Identify each cable by means of a fiber, laminated plastic, or non-ferrous metal tags, or approved equal, in each manhole, handhole, junction box, and each terminal. Each tag must contain the following information; cable type, conductor size, circuit number, circuit voltage, cable destination and phase identification.

Conductors must be color coded. Provide conductor identification within each enclosure where a tap, splice, or termination is made. Conductor identification must be by color-coded insulated conductors, plastic-coated self-sticking printed markers, colored nylon cable ties and plates, heat shrink type sleeves, or colored electrical tape. Control circuit terminations must be properly identified. Color must be green for grounding conductors and white for neutrals; except where neutrals of more than one system are installed in same raceway or box, other neutrals must be white with a different colored (not green) stripe for each. Color of ungrounded conductors in different voltage systems must be as follows:

a. 208/120 volt, three-phase

(1) Phase A - black

(2) Phase B - red

(3) Phase C - blue

b. 480/277 volt, three-phase

(1) Phase A - brown

(2) Phase B - orange

(3) Phase C - yellow

c. 120/240 volt, single phase: Black and red

d. On three-phase, four-wire delta system, high leg must be orange, as required by NFPA 70.

2.3 LOW VOLTAGE WIRE CONNECTORS AND TERMINALS

Must provide a uniform compression over the entire conductor contact surface. Use solderless terminal lugs on stranded conductors.

a. For use with copper conductors: UL 486A-486B.

b. For use with aluminum conductors: UL 486A-486B. For connecting aluminum to copper, connectors must be the circumferentially compressed, metallurgically bonded type.

2.4 LOW VOLTAGE SPLICES

Provide splices in conductors with a compression connector on the conductor and by insulating and waterproofing using one of the following methods which are suitable for continuous submersion in water and comply with ANSI C119.1.

2.4.1 Heat Shrinkable Splice

Provide heat shrinkable splice insulation by means of a thermoplastic adhesive sealant material applied in accordance with the manufacturer's written instructions.

2.4.2 Cold Shrink Rubber Splice

Provide a cold-shrink rubber splice which consists of EPDM rubber tube which has been factory stretched onto a spiraled core which is removed during splice installation. The installation must not require heat or flame, or any additional materials such as covering or adhesive. It must be designed for use with inline compression type connectors, or indoor, outdoor, direct-burial or submerged locations.

2.5 TAPE

2.5.1 Insulating Tape

UL 510, plastic insulating tape, capable of performing in a continuous temperature environment of 80 degrees C.

2.5.2 Buried Warning and Identification Tape

Provide acid and alkali-resistant polyethylene plastic tape conforming to the width, color, and printing requirements specified below, with a minimum thickness of 0.003 inch and a minimum strength of 1500 psi lengthwise, and 1250 psi crosswise, with a maximum 350 percent elongation.

2.5.3 Fireproofing Tape

Provide tape composed of a flexible, conformable, unsupported intumescent elastomer. Tape must be not less than 0.762 mm (.030 inch) thick, noncorrosive to cable sheath, self-extinguishing, noncombustible, adhesive-free, and must not deteriorate when subjected to oil, water, gases, salt water, sewage, and fungus.

2.6 PULL ROPE

Plastic or flat pull line (bull line) having a minimum tensile strength of 890 N (200 pounds).

2.7 GROUNDING AND BONDING

2.7.1 Driven Ground Rods

Provide ground rods conforming to UL 467.

2.7.2 Grounding Conductors

Stranded-bare copper conductors must conform to ASTM B8, Class B, soft-drawn unless otherwise indicated. Solid-bare copper conductors must conform to

ASTM B1 for sizes No. 8 and smaller. Insulated conductors must be of the same material as phase conductors and green color-coded, except that conductors must be rated no more than 600 volts. Aluminum is not acceptable.

2.8 LOW VOLTAGE ABOVE GROUND TERMINATION PEDESTAL

Provide copolymer polypropylene, low voltage above ground termination pedestal manufactured through an injection molding process. Pedestals must resist fertilizers, salt air environments and ultra-violet radiation. Pedestal top must be imprinted with a "WARNING" and "ELECTRIC" identification. Pedestal must contain three lay-in six port connectors. Connectors must be NEMA C119.4, Class "A", dual rated for aluminum or copper, and capable of terminating conductors ranging from 10 AWG to 500 kcmil. Protect each connector with a clear, hard lexan (plastic) cover. Pedestal must be provided with rust-free material and stainless steel hardware. Pedestal must be lockable.

PART 3 EXECUTION

3.1 INSTALLATION

Install equipment and devices in accordance with the manufacturer's published instructions and with the requirements and recommendations of NFPA 70 and IEEE C2as applicable. In addition to these requirements, install telecommunications in accordance with TIA-758 and RUS Bull 1751F-644.

3.2 CABLE INSPECTION

Inspect each cable reel for correct storage positions, signs of physical damage, and broken end seals prior to installation. If end seal is broken, remove moisture from cable prior to installation in accordance with the cable manufacturer's recommendations.

3.3 CABLE INSTALLATION PLAN AND PROCEDURE

Obtain from the manufacturer an installation manual or set of instructions which addresses such aspects as cable construction, insulation type, cable diameter, bending radius, cable temperature limits for installation, lubricants, coefficient of friction, conduit cleaning, storage procedures, moisture seals, testing for and purging moisture, maximum allowable pulling tension, and maximum allowable sidewall bearing pressure. Prepare a checklist of significant requirements and submit along with the manufacturer's instructions in accordance with SUBMITTALS. Install cable strictly in accordance with the cable manufacturer's recommendations and the approved installation plan.

3.4 DIRECT BURIAL CABLE SYSTEM

Cables must be buried directly in the earth below the frostline to the requirements of NFPA 70 and IEEE C2, whichever is more stringent.

3.4.1 Trenching

Excavate trenches for direct-burial cables to provide a minimum cable cover of 24 inches below finished grade for power conductors operated at 600

volts or less, and 30 inches below finished grade for over 600 volts in accordance with IEEE C2. When rock is encountered, remove to a depth of at least 3 inches below the cable and fill the space with sand or clean earth free from particles larger than 1/4 inch. Bottoms of trenches must be smooth and free of stones and sharp objects. Where materials in bottoms of trenches are other than sand, a 75 mm 3 inch layer of sand must be laid first and compacted to approximate densities of surrounding firm soil. Trenches must be not less than 6 inches wide, and must be in straight lines between cable markers. Bends in trenches must have a radius consistent with the cable manufacturer's published minimum cable bending radius for the cable installed.

3.4.2 Cable Installation

Unreel cables along the sides of or in trenches and carefully place on sand or earth bottoms. Pulling cables into direct-burial trenches from a fixed reel position is not permitted, except as required to pull cables through conduits under paving or railroad tracks.

Where two or more cables are laid parallel in the same trench, space cables laterally at not less than 3 inches apart, except that communication cable must be separated from power cable by a minimum distance of 12 inches.

Where direct-burial cables cross under roads or other paving exceeding 5 feet in width, such cables must be installed inducts. Ducts must extend at least 5 feet beyond each edge of any paving. Cables may be pulled into duct from a fixed reel where suitable rollers are provided in the trench. Where direct burial cable transitions to duct-enclosed cable, direct-burial cables must be centered in duct entrances, and a waterproof nonhardening mastic compound must be used to facilitate such centering. If paving is in place where cables are to be installed, coated rigid steel conduits driven under the paving may be used in lieu of ducts. Prevent damage to conduit coatings by providing ferrous pipe jackets or by predrilling. Where cuts are made in any paving, the paving and subbase must be restored to their original condition. Where cable is placed in duct(e.g. under paved areas, roads), slope ducts to drain.

3.4.3 Splicing

Provide cables in one piece without splices between connections except where the distance exceeds the lengths in which cables are manufactured. Where splices are required, provide splices designed and rated for direct burial.

3.4.4 Bends

Bends in cables must have an inner radius not less than those specified in NFPA 70 for the type of cable, or manufacturer's recommendation.

3.4.5 Horizontal Slack

Leave approximately 3 feet of horizontal slack in the ground on each end of cable runs, on each side of connection boxes, and at points where connections are brought above ground. Where cable is brought above ground, leave additional slack to make necessary connections.

3.5 UNDERGROUND CONDUIT AND DUCT SYSTEMS

3.5.1 Requirements

Run conduit in straight lines except where a change of direction is necessary. Provide numbers and sizes of ducts consistent with current sizes being replaced/rerouted. Bond bare copper grounding conductor to ground rings (loops) in all manholes and to ground rings (loops) at all equipment slabs (pads). Route grouding conductor into manholes with the duct bank (sleeving is not required). Ducts must have a continuous slope downward toward underground structures and away from buildings, laid with a minimum slope of 3 inches per 100 feet. Depending on the contour of the finished grade, the high-point may be at a terminal, a manhole, a handhole, or between manholes or handholes. Provide ducts with end bells whenever duct lines terminate in structures.

Perform changes in ductbank direction as follows:

a. Short-radius manufactured 90-degree duct bends may be used only for pole or equipment risers, unless specifically indicated as acceptable.

b. The minimum manufactured bend radius must be 18 inches for ducts of less than 3 inch diameter, and 36 inches for ducts 3 inches or greater in diameter.

c. As an exception to the bend radius required above, provide field manufactured longsweep bends having a minimum radius of 25 feet for a change of direction of more than 5 degrees, either horizontally or vertically, using a combination of curved and straight sections. Maximum manufactured curved sections: 30 degrees.

3.5.2 Treatment

Ducts must be kept clean of concrete, dirt, or foreign substances during construction. Field cuts requiring tapers must be made with proper tools and match factory tapers. A coupling recommended by the duct manufacturer must be used whenever an existing duct is connected to a duct of different material or shape. Ducts must be stored to avoid warping and deterioration with ends sufficiently plugged to prevent entry of any water or solid substances. Ducts must be thoroughly cleaned before being laid. Plastic ducts must be stored on a flat surface and protected from the direct rays of the sun.

3.5.3 Conduit Cleaning

As each conduit run is completed, for conduit sizes 3 inches and larger, draw a flexible testing mandrel approximately 12 inches long with a diameter less than the inside diameter of the conduit through the conduit. After which, draw a stiff bristle brush through until conduit is clear of particles of earth, sand and gravel; then immediately install conduit plugs. For conduit sizes less than 3 inches, draw a stiff bristle brush through until conduit is clear of particles of earth, sand and gravel; then immediately install conduit plugs.

3.5.4 Jacking and Drilling Under Roads and Structures

Conduits to be installed under existing paved areas which are not to be disturbed, and under roads and railroad tracks, must be zinc-coated, rigid steel, jacked into place. Where ducts are jacked under existing pavement, rigid steel conduit must be installed because of its strength. To protect the corrosion-resistant conduit coating, predrilling or installing conduit inside a larger iron pipe sleeve (jack-and-sleeve) is required. Separators or spacing blocks must be made of steel, concrete, plastic, or a combination of these materials placed not farther apart than 4 feet on centers. Hydraulic jet method must not be used.

3.5.5 Multiple Conduits

Separate multiple conduits by a minimum distance of 3 inches . Stagger the joints of the conduits by rows (horizontally) and layers (vertically) to strengthen the conduit assembly. Provide plastic duct spacers that interlock vertically and horizontally. Spacer assembly must consist of base spacers, intermediate spacers, ties, and locking device on top to provide a completely enclosed and locked-in conduit assembly. Install spacers per manufacturer's instructions, but provide a minimum of two spacer assemblies per 10 feet of conduit assembly.

3.5.6 Conduit Plugs and Pull Rope

New conduit indicated as being unused or empty must be provided with plugs on each end. Plugs must contain a weephole or screen to allow water drainage. Provide a plastic pull rope having 3 feet of slack at each end of unused or empty conduits.

3.5.7 Conduit and Duct Without Concrete Encasement

Depths to top of the conduit must be not less than 24 inches below finished grade. Provide not less than 3 inches clearance from the conduit to each side of the trench. Grade bottom of trench smooth; where rock, soft spots, or sharp-edged materials are encountered, excavate the bottom for an additional 3 inches, fill and tamp level with original bottom with sand or earth free from particles, that would be retained on a 1/4 inch sieve. The first 6 inch layer of backfill cover must be sand compacted as previously specified. The rest of the excavation must be backfilled and compacted in 3 to 6 inch layers.

Provide warning tape manufactured for specifically for warning and identification of buried utility lines. Provide tape on rolls, 3 inches minimum width, color coded red for electric and orange for telephone and other communications. Warning and identification shall also be imprinted in bold black letters continuously over the entire tape length. Warning and identification to read, “Caution, Buried (intended service) line below” or similar wording. Provide permanent color and printed, unaffected by moisture or soil.

3.5.7.1 Encasement Under Roads and Structures

Under roads, paved areas, and railroad tracks, install conduits in concrete encasement of rectangular cross-section providing a minimum of 75 mm (3 inch) concrete cover around ducts. Concrete encasement must extend at least 1525 mm (5 feet) beyond the edges of paved areas and roads, and 3660 mm (12 feet) beyond the rails on each side of railroad tracks. Depths to top of the concrete envelope must be not less than 610 mm (24 inches) below

finished grade[, and under railroad tracks not less than 1270 mm (50 inches) below the top of the rails].

3.5.7.2 Connections to Manholes

Duct bank envelopes connecting to underground structures must be flared to have enlarged cross-section at the manhole entrance to provide additional shear strength. Dimensions of the flared cross-section must be larger than the corresponding manhole opening dimensions by no less than 12 inches in each direction. Perimeter of the duct bank opening in the underground structure must be flared toward the inside or keyed to provide a positive interlock between the duct bank and the wall of the structure. Use vibrators when this portion of the encasement is poured to assure a seal between the envelope and the wall of the structure.

3.5.7.3 Connections to Existing Underground Structures

For duct bank connections to existing structures, break the structure wall out to the dimensions required and preserve steel in the structure wall. Cut steel and extend into the duct bank envelope. Chip the perimeter surface of the duct bank opening to form a key or flared surface, providing a positive connection with the duct bank envelope.

3.5.7.4 Connections to Existing Concrete Pads

For duct bank connections to concrete pads, break an opening in the pad out to the dimensions required and preserve steel in pad. Cut the steel and extend into the duct bank envelope. Chip out the opening in the pad to form a key for the duct bank envelope.

3.5.7.5 Connections to Existing Ducts

Where connections to existing duct banks are indicated, excavate the banks to the maximum depth necessary. Cut off the banks and remove loose concrete from the conduits before new concrete-encased ducts are installed. Provide a reinforced concrete collar, poured monolithically with the new duct bank, to take the shear at the joint of the duct banks. Abandon in place those no longer used ducts and cables which do not interfere with the work.

3.5.7.6 Partially Completed Duct Banks

During construction wherever a construction joint is necessary in a duct bank, prevent debris such as mud, and, and dirt from entering ducts by providing suitable conduit plugs. Fit concrete envelope of a partially completed duct bank with reinforcing steel extending a minimum of 2 feet back into the envelope and a minimum of 2 feet beyond the end of the envelope. Provide one No. 4 bar in each corner, 3 inches from the edge of the envelope. Secure corner bars with two No. 3 ties, spaced approximately one foot apart. Restrain reinforcing assembly from moving during concrete pouring.

3.5.7.7 Removal of Ducts

Where duct lines are removed from existing underground structures, close the openings to waterproof the structure. Chip out the wall opening to provide a key for the new section of wall.

3.5.8 Duct Sealing

Seal all electrical penetrations for radon mitigation, maintaining integrity of the vapor barrier, and to prevent infiltration of air, insects, and vermin.

3.6 CABLE PULLING

Pull cables down grade with the feed-in point at the manhole or buildings of the highest elevation. Use flexible cable feeds to convey cables through manhole opening and into duct runs. Do not exceed the specified cable bending radii when installing cable under any conditions, including turnups into switches, transformers, switchgear, switchboards, and other enclosures. Cable with tape or wire shield must have a bending radius not less than 12 times the overall diameter of the completed cable. If basket-grip type cable-pulling devices are used to pull cable in place, cut off the section of cable under the grip before splicing and terminating.

3.6.1 Cable Lubricants

Use lubricants that are specifically recommended by the cable manufacturer for assisting in pulling jacketed cables.

3.7 CABLES IN UNDERGROUND STRUCTURES

Do not install cables utilizing the shortest path between penetrations, but route along those walls providing the longest route and the maximum spare cable lengths. Form cables to closely parallel walls, not to interfere with duct entrances, and support on brackets and cable insulators. Support cable splices in underground structures by racks on each side of the splice. Locate splices to prevent cyclic bending in the spliced sheath. Install cables at middle and bottom of cable racks, leaving top space open for future cables, except as otherwise indicated for existing installations. Provide one spare three-insulator rack arm for each cable rack in each underground structure.

3.7.1 Cable Tag Installation

Install cable tags in each manhole as specified, including each splice. Tag wire and cable provided by this contract. Install cable tags over the fireproofing, if any, and locate the tags so that they are clearly visible without disturbing any cabling or wiring in the manholes.

3.8 CONDUCTORS INSTALLED IN PARALLEL

Conductors must be grouped such that each conduit of a parallel run contains 1 Phase A conductor, 1 Phase B conductor, 1 Phase C conductor, and 1 neutral conductor.

3.9 LOW VOLTAGE CABLE SPLICING AND TERMINATING

Make terminations and splices with materials and methods as indicated or specified herein and as designated by the written instructions of the manufacturer. Do not allow the cables to be moved until after the splicing material has completely set.

3.9.1 Terminating Aluminum Conductors

a. Use particular care in making up joints and terminations. Remove surface oxides by cleaning with a wire brush or emery cloth. Apply joint compound to conductors, and use UL-listed solid aluminum connectors for connecting aluminum conductors. When connecting aluminum to copper conductors, use connectors specifically designed for this purpose.

b. Terminate aluminum conductors to copper bus either by: (1) in line splicing a copper pigtail to the aluminum conductor (copper pigtail must have a ampacity at least that of the aluminum conductor); or (2) using a circumferential compression type, aluminum bodied terminal lug UL listed for AL/CU and steel Belleville spring washers, flat washers, bolts, and nuts. Belleville spring washers must be cadmium-plated hardened steel. Install the Belleville spring washers with the crown up toward the nut or bolt head, with the concave side of the Belleville bearing on a heavy-duty, wide series flat washer of larger diameter than the Belleville. Tighten nuts sufficient to flatten Belleville and leave in that position. Lubricate hardware with joint compound prior to making connection. Wire brush and apply joint compound to conductor prior to inserting in lug.

c. Terminate aluminum conductors to aluminum bus by using all-aluminum nuts, bolts, washers, and lugs. Wire brush and apply inhibiting compound to conductor prior to inserting in lug. Lubricate hardware with joint compound prior to making connection; if bus contact surface is unplated, scratch-brush and coat with joint compound (without grit).

3.10 CABLE END CAPS

Cable ends must be sealed at all times with coated heat shrinkable end caps. Cables ends must be sealed when the cable is delivered to the job site, while the cable is stored and during installation of the cable. The caps must remain in place until the cable is spliced or terminated. Sealing compounds and tape are not acceptable substitutes for heat shrinkable end caps. Cable which is not sealed in the specified manner at all times will be rejected.

3.11 FIREPROOFING OF CABLES IN UNDERGROUND STRUCTURES

Fireproof (arc proof) wire and cables which will carry current at 2200 volts or more in underground structures.

3.11.1 Fireproofing Tape

Tightly wrap strips of fireproofing tape around each cable spirally in half-lapped wrapping. Install tape in accordance with manufacturer's instructions.

3.11.2 Tape-Wrap

Tape-wrap metallic-sheathed or metallic armored cables without a nonmetallic protective covering over the sheath or armor prior to application of fireproofing. Wrap must be in the form of two tightly applied half-lapped layers of a pressure-sensitive 0.254 mm (10 mil) thick

plastic tape, and must extend not less than 25 mm (one inch) into the duct. Even out irregularities of the cable, such as at splices, with insulation putty before applying tape.

3.12 GROUNDING SYSTEMS

NFPA 70 and IEEE C2, except provide grounding systems with a resistance to solid earth ground not exceeding 25 ohms.

3.12.1 Grounding Electrodes

Provide cone pointed driven ground rods driven full depth plus12 inches, installed to provide an earth ground of the appropriate value for the particular equipment being grounded.
If the specified ground resistance is not met, an additional ground rod must be provided in accordance with the requirements of NFPA 70 (placed not less than 6 feet from the first rod). Should the resultant (combined) resistance exceed the specified resistance, measured not less than 48 hours after rainfall, notify the Contracting Officer immediately.

3.12.2 Grounding Connections

Make grounding connections which are buried or otherwise normally inaccessible, by exothermic weld or compression connector.

a. Make exothermic welds strictly in accordance with the weld manufacturer's written recommendations. Welds which are "puffed up" or which show convex surfaces indicating improper cleaning are not acceptable. Mechanical connectors are not required at exothermic welds.

b. Make compression connections using a hydraulic compression tool to provide the correct circumferential pressure. Tools and dies must be as recommended by the manufacturer. An embossing die code or other standard method must provide visible indication that a connector has been adequately compressed on the ground wire.

3.12.3 Grounding Conductors

Provide bare grounding conductors, except where installed in conduit with associated phase conductors. Ground cable sheaths, cable shields, conduit, and equipment with No. 6 AWG. Ground other noncurrent-carrying metal parts and equipment frames of metal-enclosed equipment. Ground metallic frames and covers of handholes and pull boxes with a braided, copper ground strap with equivalent ampacity of No. 6 AWG.

3.12.4 Ground Cable Crossing Expansion Joints

Protect ground cables crossing expansion joints or similar separations in structures and pavements by use of approved devices or methods of installation which provide the necessary slack in the cable across the joint to permit movement. Use stranded or other approved flexible copper cable across such separations.

3.12.5 Manhole Grounding

Loop a 4/0 AWG grounding conductor around the interior perimeter, approximately 12 inches above finished floor. Secure the conductor to the manhole walls at intervals not exceeding 36 inches. Connect the conductor to the manhole grounding electrode with 4/0 AWG conductor. Connect all incoming 4/0 grounding conductors to the ground loop adjacent to the point of entry into the manhole. Bond the ground loop to all cable shields, metal cable racks, and other metal equipment with a minimum 6 AWG conductor.

3.13 EXCAVATING, BACKFILLING, AND COMPACTING

Provide in accordance with NFPA 70 and Section 31 23 00.00 20 EXCAVATION AND FILL.

3.14 FIELD QUALITY CONTROL

3.14.1 Performance of Field Acceptance Checks and Tests

Perform in accordance with the manufacturer's recommendations, and include the following visual and mechanical inspections and electrical tests, performed in accordance with NETA ATS.

3.14.1.1 Low Voltage Cables, 600-Volt

Perform tests after installation of cable, splices and terminations and before terminating to equipment or splicing to existing circuits.

a. Visual and Mechanical Inspection

(1) Inspect exposed cable sections for physical damage.

(2) Verify that cable is supplied and connected in accordance with contract plans and specifications.

(3) Verify tightness of accessible bolted electrical connections.

(4) Inspect compression-applied connectors for correct cable match and indentation.

(5) Visually inspect jacket and insulation condition.

(6) Inspect for proper phase identification and arrangement.

b. Electrical Tests

(1) Perform insulation resistance tests on wiring No. 6 AWG and larger diameter using instrument which applies voltage of approximately 1000 volts dc for one minute.

(2) Perform continuity tests to insure correct cable connection.

3.14.1.2 Grounding System

a. Visual and mechanical inspection

Inspect ground system for compliance with contract plans and specifications.

b. Electrical tests

Perform ground-impedance measurements utilizing the fall-of-potential method in accordance with IEEE 81. On systems consisting of interconnected ground rods, perform tests after interconnections are complete. On systems consisting of a single ground rod perform tests before any wire is connected. Take measurements in normally dry weather, not less than 48 hours after rainfall. Use a portable ground resistance tester in accordance with manufacturer's instructions to test each ground or group of grounds. The instrument must be equipped with a meter reading directly in ohms or fractions thereof to indicate the ground value of the ground rod or grounding systems under test. Provide site diagram indicating location of test probes with associated distances, and provide a plot of resistance vs. distance.

3.14.2 Follow-Up Verification

Upon completion of acceptance checks and tests, show by demonstration in service that circuits and devices are in good operating condition and properly performing the intended function. As an exception to requirements stated elsewhere in the contract, the Contracting Officer must be given 5 working days advance notice of the dates and times of checking and testing.

-- End of Section --