

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND, MID-ATLANTIC
MARINE CORPS AIR STATION, CHERRY POINT, NORTH CAROLINA

REPAIR J ST FROM 6TH AVE TO 7TH AVE (EMBARKATION)

AT THE

MARINE CORPS AIR STATION
CHERRY POINT, NORTH CAROLINA

PROJECT: 6486257

DESIGNED BY:

DESIGN MANAGEMENT AND ENGINEERING BRANCH
MCAS, CHERRY POINT, NC

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Date:

6/3/16

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LIST OF DRAWINGS

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PART 1 GENERAL

1.1 SUMMARY

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

1.2 CONTRACT DRAWINGS

Contract drawings are as follows:

<u>NAVFAC DWG NO.</u>	<u>SHEET NO.</u>	<u>TITLE</u>
12713755	G-001	COVER SHEET
12713756	G-002	SHEET STANDARDS
12713757	C-101	EXISTING SITE PLAN
12713758	C-201	TRAFFIC CONTROL PLAN 1
12713759	C-202	TRAFFIC CONTROL PLAN 2
12713760	C-301	EROSION CONTROL PLAN AND PAVEMENT REPAIR PLAN - "J" STREET
12713761	C-302	GRADING AND MARKING PLAN - "J" STREET
12713762	C-501	GEOTECHNICAL BORINGS, ASPHALT AND EROSION CONTROL NOTES
12713763	C-502	PAVEMENT PATCHING AND EROSION CONTROL DETAILS
12713764	C-503	TRAFFIC CONTROL AND MARKING DETAILS

1.3 SUPPLEMENTARY DRAWINGS

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

1.3.1 Boring Logs

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

-- End of Document --

SECTION 01 11 00

SUMMARY OF WORK

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PART 1 GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

1.1.1 Project Description

The work includes repairing J Street from 6th Avenue to 7th Avenue by full depth patching multiple areas, milling and asphalt overlay, RCP removal and installation, and grading and sodding swale as shown on the contract plans, and other related incidental work.

1.1.2 Location

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

1.2 OCCUPANCY OF PREMISES

The adjacent parking lot will be occupied during performance of work under this Contract. The parking lot shall be open to vehicular traffic throughout this Contract. Notifications will be posted in a prominent location in the work area, and coordinate all interferences through the Contracting Officer.

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

1.3 EXISTING WORK

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

- a. Remove or alter existing work in such a manner as to prevent injury or damage to any portions of the existing work which remain.
- b. Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, as approved by the Contracting Officer. At the completion of operations, existing work must be in a condition equal to or better than that which existed before new work started.

1.4 LOCATION OF UNDERGROUND UTILITIES

It shall be the responsibility of the contractor to locate all existing underground utilities that are within the limits of work, prior to any excavation activities. These include but are not limited to the following buried utilities: water lines, sanitary and storm sewers, steam condensate, fuel lines, gas lines, electrical ducts and direct buried conductors, commercial telephone, Base telephone, commercial cable TV, Base instructional cable TV, EMCS and fire alarm. The contractor shall employ the services of a qualified Utility locating company to locate, identify, and mark all underground utilities. The entire construction limits shall be thoroughly scanned and researched to determine existing utility

locations. Any existing utilities that are indicated on the project drawings shall be considered for reference use by the locating company and shall be verified. All underground utilities shall be clearly marked with flags, paint or stakes prior to any digging operation except that required to determine exact utility location and depth. CAUTION shall be used when trenching or excavating around or near buried utilities. The contractor shall be responsible for the timely repair and/or replacement of direct and collateral damage on any and all underground utilities that are severed, crushed, broken, displaced or otherwise disturbed by the construction operation. The Government shall not incur any additional cost for such repair or replacement. The contractor shall notify the FEAD a minimum of three working days prior to utility location. Do not continue with excavation or installation of new work without resolving elevation discrepancies and conflicts.

1.4.1 Notification Prior to Excavation

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

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 14 00

WORK RESTRICTIONS

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PART 1 GENERAL

1.1 SPECIAL SCHEDULING REQUIREMENTS

- a. The Contractor shall be ready for operation as approved by Contracting Officer before work is started under this contract which would interfere with normal operation.
- b. Have materials, equipment, and personnel required to perform the work at the site or show the Government that the Contractor has ready access to these materials, equipment and personnel prior to the commencement of the work.
- c. **The parking lot located on J Street must remain in operation during the entire construction period.** The Contractor must conduct his operations so as to cause the least possible interference with normal operations of the parking lot's activity during the following hours:

<u>Hours</u>	<u>Days of the Week</u>
0700-1630	Monday - Friday

- d. Permission to interrupt any activity on roadways, park lots, railroads, and/or utility service(s) must be requested in writing a minimum of 15 calendar days prior to the desired date of interruption. Railroads, roadways and major utility systems may only be taken out of service, closed or capacity reduced when material and equipment components are in place to quickly perform the work. The work under this contract requires special attention to the scheduling and conduct of the work in connection with existing operations. Identify on the construction schedule each factor which constitutes a potential interruption to operations. Schedule paving and milling activities as weekend work adjacent to these parking lots or during times of the day that will permit the parking lots to remain accessible. **Detours, road closures and temporary traffic control must be detailed in the Contractor's approved traffic control plan.**
- e. Contractor must prepare and submit a traffic control plan for approval before construction begins. Detour signs and traffic control devices must be in place before roadways and sidewalks are removed from service. Detour routes must allow for two full lanes of travel during all times of the day.
- f. For mobile operations, provide accommodations for traffic movements utilizing approved flaggers. The Contractor shall conduct his operations so as to cause the least possible interference with normal operations of the MCAS Cherry Point activity.
- g. Driveways will be closed only after specific notifications noted in the paragraph below have been given to the Contracting Officer and appropriate traffic control devices have been set. Driveway closures shall be properly addressed in the Contractor's approved traffic control plan.

- h. Construction activities, occurring outside of facilities that have been approved for full road closure, shall cease during periods of peak traffic demand. For periods of peak demand, travel lanes shall be opened in such a configuration to allow for 1) two way traffic movements, 2) maximum lane capacity required for traffic movements in the major direction of traffic flow and 3) work may continue in areas not impacted by traffic movements. When presented in the Contractor's approved work schedule and approved traffic control plan, pavement milling and patching work may shift to roadway segments outside of the high traffic areas.

Peak Hours of Traffic Demand

<u>Hours</u>	<u>Days of the Week</u>
0630 - 0800	Monday - Friday
1130 - 1300	Monday - Friday
1530 - 1700	Monday - Friday

- i. Insure that all underground utilities are located prior to construction.

1.1.1 General Notifications Required

General notifications shall be given to the Contracting Officer 15 days in advance of anticipated construction activities. Notifications shall be coordinated with the Contractor's approved work schedule.

1.1.2 Specific Notifications Required

In addition to the general notifications required by the paragraph above, provide additional notifications for the specific instances encountered below:

- a. Notice to building occupants shall be given via the Contracting Officer 7 days in advance of any driveway or roadway outage that will limit access to buildings.
- b. Notice to emergency organizations shall be provided to the Contracting Officer for dissemination. Provide the notification 24 hours in advance of changes in work locations, lane closures or road closures.

1.1.3 Access by Emergency Vehicles

Provide high priority for emergency vehicles passing through a work zone. If required, allow emergency vehicles to traverse through road or driveway closure areas by temporarily relocating traffic control devices.

1.1.4 Partial/Full Road Closures and Lane Closures

Provide traffic control devices to effectively close roadways partially or completely as required to perform pavement repairs and pavement markings. Closures must include pedestrian movements.

1.1.4.1 Prohibitions for Reopening Travel Lanes

Traffic lanes shall not be opened to traffic if any of the following conditions exist.

- a. Open excavations where the difference in elevations between excavation bottom and adjacent pavement exceeds 2 inches,
- b. During the installation of crack sealing materials until such materials reach a non-trackable state,
- c. A bituminous tack coat or prime coat is in place but is not fully cured,
- d. During times when newly placed bituminous pavement has not cooled to a surface temperature of less than 110 degrees or 6 hours after completion of pavement compaction activities; whichever is less,
- e. During the installation of pavement markings and pavement reflectors,
- f. During shoulder grading and sodding operations.

1.1.4.2 Traffic Control Measures

In accordance with the Contractor's approved traffic control plans, provide the following traffic control measures to insure safe travel through the work zone. Preparation and submission of the traffic control plans and provision and maintenance of all temporary traffic control devices shall be provided as required by each individual Task Order.

- a. For lane closures, barrels and cones shall be employed in accordance with the MUTCD guidelines and requirements. Road closures must utilize MUTCD Type III barricades complete with retroreflective road closed signs.
- b. Insure that either temporary retroreflective latex pavement markings are installed only on milled or intermediate pavement surfaces. Do not install temporary pavement markings on the final surface course.
- c. Provide temporary traffic control signs and detour signs throughout the work zone. Maintain and adjust signage during periods of time when there is active construction in the work zone. Cover signs when construction has been suspended or terminated.
- d. Provide flagging operations where two lane two-way traffic is reduced to one lane two-way traffic. Where flaggers are not in visual sight of one another, provide two way radio communications between flaggers or a pilot vehicle. Flaggers shall be certified in accordance with NCDOT's new certification program.
- e. Provide for continuous access to intersecting roads and streets unless approved detour routes are provided.

1.1.4.3 Pavement Transitions

Where bituminous milling operations terminate, provide temporary featheredges or temporary transition milling.

1.1.5 Traffic Control Plans

Each Bid Item shall include the preparation of traffic control plan. Plans shall be prepared by the Contractor and submitted to the Contracting Officer for approval. The cost for preparing and submitting the plans shall be considered incidental to the cost of performing work under this contract and no direct reimbursement shall be made to the Contractor. No site work, other than verification of quantities, shall be performed prior to obtaining approval of the traffic control plans. Refer to specification section 32 01 00, "Temporary Traffic Controls" for specific plan requirements. Insure that plans cover full roadway and parking lot closures, partial roadway (lane) closures and mobile construction operations.

1.2 CONTRACTOR ACCESS AND USE OF PREMISES

1.2.1 MCAS Cherry Point Regulations

Ensure that Contractor personnel employed on the MCAS Cherry Point become familiar with and obey MCAS Cherry Point regulations including safety, fire, traffic and security regulations. Keep within the limits of the work and avenues of ingress and egress. Wear hard hats in designated areas. Do not enter any restricted areas unless required to do so and until cleared for such entry. Mark Contractor equipment for identification.

1.2.1.1 Subcontractors and Personnel Contacts

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

1.2.1.1.1 Identification Badges and Installation Access

Application for and use of badges will be as directed. Obtain access to the installation by participating in the Navy Commercial Access Control System (NCACS), or by obtaining passes each day from the Base Pass and Identification Office. Costs for obtaining passes through the NCACS are the responsibility of the Contractor. One-day passes, issued through the Base Pass and Identification Office, will be furnished without charge.

NCACS Program: NCACS is a voluntary program in which Contractor personnel (and their sub-contractor personnel) who enroll, and are approved, are subsequently granted access to the installation for a period up to one year, or the length of the contract, whichever is less, and are not required to obtain a new pass from the Base Pass and Identification Office for each visit. Throughout the year the Contractor employee must continue to meet background screening standards. Periodic background screenings are conducted to verify continued NCACS participation and installation access privileges. Information on costs and requirements to participate and enroll in NCACS is available at <http://www.rapidgate.com> or by calling 1-877-727-4342. Contractors should be aware that the costs incurred to obtain NCACS credentials, or costs related to any means of access to an Installation, are not reimbursable. Any time invested, or price(s) paid, for obtaining NCACS credentials will not be compensated in any way or approved as a cost of any contract with the Department of the Navy.

1.2.1.2 No Smoking Policy

Smoking is prohibited within and outside of all buildings on installation, except in designated smoking areas. This applies to existing buildings, buildings under construction and buildings under renovation. Discarding tobacco materials other than into designated tobacco receptacles is considered littering and is subject to fines. The Contracting Officer will identify designated smoking areas.

1.2.2 Working Hours

Regular working hours shall consist of an 8 1/2 hour period normally between the hours of 7:00 am to 3:30 pm, Monday through Friday, excluding Government holidays.

1.2.3 Work Outside Regular Hours

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

1.2.4 Occupied Building[s]

The Contractor shall be working around existing buildings which are occupied. Do not enter the building[s] without prior approval of the Contracting Officer.

1.2.5 Utility Cutovers and Interruptions

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

1.3 SECURITY REQUIREMENTS

1.3.1 Station Regulations

No employee or representative of the contractor will be admitted to the work site without an Identification Badge or is specifically authorized admittance to the work site by the FEAD, Facilities Engineering & Acquisition Division.

IMPORTANT NOTE: FEAD personnel (Construction Managers, Engineers/Architects, Engineering Technicians, Contract Specialists, or Contract Surveillance Representatives) will not receive, process, re-transmit or otherwise handle IN ANY WAY Personally Identifiable Information (PII) related to the badging process. Do NOT forward any of this information to the FEAD

1.3.2 Contractor Access to MCAS Cherry Point and Outlying Areas

1. Documentation requirements for granting access to MCAS Cherry Point for commercial and contract employers and employees. This document is an aid in meeting ASO 5560.6A requirements and is not a substitute for the order

2. In response to new and emerging Department of Defense (DoD) and Headquarters Marine Corps requirements, MCAS Cherry Point is making significant changes which will directly impact how vendors, contractors, and service providers currently access the Installation. These changes will be fully implemented by April 4, 2016.

3. To further enhance compliance with these new directives, MCAS Cherry Point is implementing a program known as RAPIDGate, which will also be used at Camp Lejeune and MCAS New River. We recognize the important role that contractors play in our day-to-day operations and feel that RAPIDGate offers the best solution to meet complex and challenging requirements associated with Installation access control. This program will enhance our security while offering a streamlined access request procedure for contractors, sub-contractors, vendors, suppliers, and service providers with sustained, long-term access requirements (in excess of 1 day), that are otherwise not approved to receive the DoD Common Access Card (CAC).

4. Contractors should be aware that the costs incurred to obtain RAPIDGate credentials, or costs related to any means of access to this Installation, are not reimbursable. Any time invested, or price(s) paid, for obtaining RAPIDGate credentials will not be compensated in any way or approved as a cost of any contract with the Department of the Navy.

5. Upon issuance, the RAPIDGate credential will allow cardholders to access MCAS Cherry Point Gates in the same way as the CAC.

6. The RAPIDGate credential is the ONLY long-term credential that can be issued in excess of one year and to authorized contractors whose employers are enrolled and participating in the RAPIDGate Program. Local long-term credentials will NO LONGER BE ISSUED. During the enrollment process, you may apply to receive a ONE-TIME, pre-enrollment pass (valid for 30 days) at the Pass & Identification Office at Building 251. All currently issued contractor badges will maintain their existing expiration dates but are scheduled to be COLLECTED on April 4, 2016. If issued contract badges expire before April 4, 2016, options for Installation access will be the RAPIDGate Credential or a one-time 30 day pass followed by up to a 96 hour pass (4 days).

7. The Pass & Identification Office at Building 251 will issue RAPIDGate Credentials to authorized contractors who complete the process below. Sub-Contractors and suppliers must coordinate through the Prime-Contractor:

- a. The Contractor's RAPIDGate Company Administrator (RCA) must enroll in RAPIDGate at www.rapidgate.com or 1-877-RAPIDGate (1-877-727-4342).
- b. The RAPIDGate Program representative will confirm Contractor Company Approval by Installation. Note: Upon awarding a new construction, architect-engineer, or service contract, the Facilities Engineering & Acquisition Division (FEAD) (Tenant Sponsor) contract specialist will forward contract information to Pass & Identification Office. This information will also specify whether flightline and/or FRCE access is required.
- c. The RAPIDGate Program Representative will provide the Company RCA the "Company Code" to be used for employee enrollment.
- d. The Contractor Employee registers using the RAPIDGate Kiosk machine located at the Pass & Identification Office Building 251. (RAPIDGate "Company Code" is needed for this step).
- e. The RAPIDGate Company Administrator (RCA) verifies Employee Information.
- f. An Initial Background check is conducted by RAPIDGate.
- g. RAPIDGate Credential is manufactured and sent to the Pass & Identification Office at Building 251 for Issuance.
- h. The RCA and Employee are notified that the RAPIDGate Program Credential is ready for pickup.
- i. The Employee should make an appointment to pick up credential at Building 251.
- j. After review of Acceptable Identity Documents, RAPIDGate Program Credential is activated issued to Contractor Employee.
- k. RAPIDGate credentials are issued to cover the entire employer contract timeframe and are renewed through RAPIDGate Gate.
- l. RAPIDGate credentials must be returned to the RAPIDGate.

8. Criminal Activity. In accordance with ASO 5560.6A, the below list of criminal activities within an applicant's record are considered not in the best interest of the Marine Corps and will be grounds for automatic denial of access aboard the Installation:

- a. Conviction of any felony offense.
- b. Conviction of any misdemeanor offense, which was the result of a plea bargain of a felony offense.
- c. Conviction of any offense involving a weapon.
- d. Conviction of any drug offense involving manufacturing or

trafficking.

e. More than one misdemeanor conviction of drug related offenses over the applicant's lifetime or one misdemeanor drug related offense within the last five years.

f. Conviction of any assault charge.

g. Conviction of any offense involving theft or larceny.

h. Conviction of any offense of domestic violence.

i. Conviction of any offense related to the abuse/neglect of a child

j. Conviction of any sexual in nature related offense or registration as a sex offender. .

k. Commission of any grievous criminal offense/misconduct while aboard any Federal installation, including blatant disregard for rules and regulations of the Installation, but excluding minor traffic offenses.

l. Other than Honorable, Bad Conduct, and Dishonorable discharges from the U.S. Military.

m. Those identified as undocumented citizens.

n. Those on the National Terrorist Watch List.

o. Any individual who attempts to hide or purposely fails to disclose all past criminal history during the vetting process.

p. Any individual that the Provost Marshal's Office determines to present a risk to the security and safety of the Installation and whose access is deemed not in the best interest of the Marine Corps.

q. Any individual who has been debarred from the Installation by the Installation Commander or is currently listed as debarred from any other Federal installation.

r. Any individual with an outstanding warrant for their arrest or apprehension.

s. Any individual with a pending criminal court case that, if convicted, would result in access denial in accordance with the criteria listed above.

1.3.3 FLIGHTLINE SECURITY REQUIREMENTS

Work involved under this contract is in the Flightline Security Area. No employee or representative of the Contractor will be admitted to the work site unless they (1) are specifically authorized admittance by the FEAD, and (2) has a security badge. The Contractor shall obtain clearance and flightline security badges for all personnel required to be on the project site prior to performing any work. The Contractor shall submit a written request for security badges to the FEAD and to Pass & ID. Each employee will be required to go to PASS & ID at Building 251 to obtain his security

badge with flightline access. A limited number of Contractor vehicles will be allowed access to the site of work subject to meeting regular Station access requirements. No personal vehicles will be allowed behind the security fence. Parking of vehicles shall be restricted to the immediate project site as determined by the FEAD. The security badges issued under this contract are valid for this specific project and are not transferable to another project.

1.3.4 Staging Area

The Contractor's staging area will be coordinate by the Design Manager. Amount of material on site shall be kept to a minimum and shall only be material that is pertinent to the work currently being performed. All stockpiling of equipment and materials shall be closely coordinated with the Government and shall not disrupt activities at the site.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 01 20 00.00 20

PRICE AND PAYMENT PROCEDURES

05/16

PART 1 GENERAL

1.1 REFERENCES

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

U.S. ARMY CORPS OF ENGINEERS (USACE)

EP-1110-1-8 (2009) Construction Equipment Ownership and Operating Expense Schedule

1.2 SUBMITTALS

Government approval is required for all submittals in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Schedule of Prices

1.3 SCHEDULE OF PRICES

1.3.1 Data Required

Within 15 calendar days of notice of award, prepare and deliver to the Contracting Officer a Schedule of Prices (construction contract) as directed by the Contracting Officer. Provide a detailed breakdown of the contract price, giving quantities for each of the various kinds of work, unit prices, and extended prices. Costs shall be summarized and totals provided for each construction category.

1.3.2 Schedule Instructions

Payments will not be made until the Schedule of Prices has been submitted to and accepted by the Contracting Officer. Identify the cost for site work, and include incidental work to the 5 ft line. Identify costs for the building(s), and include work out to the 5 ft line. Work out to the 5 ft line shall include construction encompassed within a theoretical line 5 ft from the face of exterior walls and shall include attendant construction, such as pad mounted HVAC cooling equipment, cooling towers, and transformers placed beyond the 5 ft line.

1.3.3 Real Property Assets

The Government will provide the Draft DD Form 1354, Transfer and Acceptance of Military Real Property filled in with the appropriate Real Property Unique Identifiers (RPUID) and related construction Category Codes to summarize the designed real property assets that apply to this contract. The Contractor shall meet with the Contracting Officer and the Real Property Accounting Officer during the Pre Construction Meeting and the Project Closeout Meetings to modify and include any necessary changes to

the DD Form 1354. The Contractor shall provide the Interim DD Form 1354 that uses the appropriate division of the RPUIDs/ Category Codes to represent the final constructed facility and include all associated cost. Coordinate the Contractor's Price and Payment structure with the structure of the RPUIDs/ Category Codes.

Divide detailed asset breakdown into the RPUIDs and related construction Category Codes and populate associated costs which represent all aspects of the work. Where assets diverge into multiple RPUID/ Category Codes, divide the asset and provide the proportion of the assets in each RPUID/ Category Code. Assets and related RPUID/ Category Codes may be modified by the Contracting Officer as necessary during course of the work. Coordinate identification and proportion of these assets with the Government Real Property Accounting Officer.

Cost data accumulated under this section are required in the preparation of DD Form 1354.

1.4 CONTRACT MODIFICATIONS

In conjunction with the Contract Clause "DFARS 252.236-7000, Modification Proposals-Price Breakdown," and where actual ownership and operating costs of construction equipment cannot be determined from Contractor accounting records, equipment use rates shall be based upon the applicable provisions of the EP-1110-1-8.

1.5 CONTRACTOR'S INVOICE AND CONTRACT PERFORMANCE STATEMENT

1.5.1 Content of Invoice

Requests for payment will be processed in accordance with the Contract Clause FAR 52.232-27, Prompt Payment Construction Contracts and FAR 52.232-5, Payments Under Fixed-Price Construction Contracts. The requests for payment shall include the documents listed below.

- a. The Contractor's invoice, on NAVFAC Form 7300/30 furnished by the Government, showing in summary form, the basis for arriving at the amount of the invoice. Form 7300/30 shall include certification by Quality Control (QC) Manager as required by the contract.
- b. The Estimate for Voucher/ Contract Performance Statement on NAVFAC Form 7300/31 furnished by the Government, showing in detail: the estimated cost, percentage of completion, and value of completed performance for each of the construction categories stated in this contract. Use NAVFAC LANT Form 4-330/110 (New 7/84) on NAVFAC LANT contracts when a Monthly Estimate for Voucher is required.
- c. Updated Project Schedule and reports required by the contract.
- d. Contractor Safety Self Evaluation Checklist.
- e. Other supporting documents as requested.
- f. Updated copy of submittal register.
- g. Invoices not completed in accordance with contract requirements will be returned to the Contractor for correction of the deficiencies.

1.5.2 Submission of Invoices

If NFAS Clause 5252.232-9301 is included in the contract, the documents listed in paragraph "CONTENT OF INVOICE" shall be provided in their entirety as attachments in Wide Area Work Flow (WAWF) for each invoice submitted. The maximum size of each WAWF attachment is two megabytes, but there are no limits on the number of attachments. If a document cannot be attached in WAWF due to system or size restriction it shall be provided as instructed by the Contracting Officer.

1.5.3 Final Invoice

- a. A final invoice shall be accompanied by the certification required by DFARS 252.247.7023 TRANSPORTATION OF SUPPLIES BY SEA, and the Contractor's Final Release. If the Contractor is incorporated, the Final Release shall contain the corporate seal. An officer of the corporation shall sign and the corporate secretary shall certify the Final Release.
- b. For final invoices being submitted via WAWF, the original Contractor's Final Release Form and required certification of Transportation of Supplies by Sea must be provided directly to the respective Contracting Officer prior to submission of the final invoice. Once receipt of the original Final Release Form and required certification of Transportation of Supplies by Sea has been confirmed by the Contracting Officer, the Contractor shall then submit final invoice and attach a copy of the Final Release Form and required certification of Transportation of Supplies by Sea in WAWF.
- c. Final invoices not accompanied by the Contractor's Final Release and required certification of Transportation of Supplies by Sea will be considered incomplete and will be returned to the Contractor.

1.6 PAYMENTS TO THE CONTRACTOR

Payments will be made on submission of itemized requests by the Contractor which comply with the requirements of this section, and will be subject to reduction for overpayments or increase for underpayments made on previous payments to the Contractor.

1.6.1 Obligation of Government Payments

The obligation of the Government to make payments required under the provisions of this contract will, at the discretion of the Contracting Officer, be subject to reductions and/or suspensions permitted under the FAR and agency regulations including the following in accordance with "FAR 32.503-6:

- a. Reasonable deductions due to defects in material or workmanship;
- b. Claims which the Government may have against the Contractor under or in connection with this contract;
- c. Unless otherwise adjusted, repayment to the Government upon demand for overpayments made to the Contractor; and
- d. Failure to provide up to date record drawings not current as stated in Contract Clause "FAC 5252.236-9310, Record Drawings."

1.6.2 Payment for Onsite and Offsite Materials

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

- a. FAR 52.232-5(b) Payments Under Fixed Price Construction Contracts.
- b. Materials delivered on the site but not installed, including completed preparatory work, and off-site materials to be considered for progress payment shall be major high cost, long lead, special order, or specialty items, not susceptible to deterioration or physical damage in storage or in transit to the construction site. Examples of materials acceptable for payment consideration include, but are not limited to, structural steel, non-magnetic steel, non-magnetic aggregate, equipment, machinery, large pipe and fittings, precast/prestressed concrete products, plastic lumber (e.g., fender piles/curbs), and high-voltage electrical cable. Materials not acceptable for payment include consumable materials such as nails, fasteners, conduits, gypsum board, glass, insulation, and wall coverings.
- c. Materials to be considered for progress payment prior to installation shall be specifically and separately identified in the Contractor's estimates of work submitted for the Contracting Officer's approval in accordance with Schedule of Prices requirement of this contract. Requests for progress payment consideration for such items shall be supported by documents establishing their value and that the title requirements of the clause at FAR 52.232-5 have been met.
- d. Materials are adequately insured and protected from theft and exposure.
- e. Provide a written consent from the surety company with each payment request for offsite materials.
- f. Materials to be considered for progress payments prior to installation shall be stored either in Hawaii, Guam, Puerto Rico, or the Continental United States. Other locations are subject to written approval by the Contracting Officer.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 01 30 00

ADMINISTRATIVE REQUIREMENTS

05/16

PART 1 GENERAL

1.1 REFERENCES

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

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1 (2014) Safety and Health Requirements Manual

1.2 SUBMITTALS

Government approval is required for all in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

List of contact personnel

1.2.1 Contract Personnel

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

1.3 MINIMUM INSURANCE REQUIREMENTS

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

1.4 FIRST TIER CONTRACTOR REQUIREMENTS FOR ASBESTOS CONTAINING MATERIALS

Accomplish all contract requirements of Section assigned to the directly with a first tier subcontractor.

1.5 SUPERVISION

1.5.1 Minimum Communication Requirements

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

1.5.2 Superintendent Qualifications

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

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

1.5.2.1 Duties

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

1.5.3 Non-Compliance Actions

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

1.6 PRECONSTRUCTION

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 must also attend.

1.7 PARTNERING

To most effectively accomplish this contract, the Government requires the formation of a cohesive partnership within the Project Team whose members are from the Government, the Contractor and their Subcontractors. Key personnel from the Supported Command, the End User (who will occupy the facility), the Government Design and Construction team and Subject Matter Experts, the Installation, the Contractor and Subcontractors, and the Designer of Record will be invited to participate in the Partnering process. The Partnership will draw on the strength of each organization in an effort to achieve a project that is without any safety mishaps, conforms to the Contract, and stays within budget and on schedule.

The Contracting Officer will provide Information on the Partnering Process and a list of key and optional personnel who should attend the Partnering meeting.

1.7.1 Informal Partnering

The Contracting Officer will organize the Partnering Sessions with key personnel of the project team, including Contractor personnel and Government personnel.

The Initial Partnering session should be a part of the Pre-Construction Meeting. Partnering sessions will be held at a location agreed to by the Contracting Officer and the Contractor (typically a conference room provided by the office or the Contractor). The Initial Informal Partnering Session will be conducted and facilitated using electronic media (a video and accompanying forms) provided by the Contracting Officer. The Partners will determine the frequency of the follow-on sessions, at no more than 3 to six month intervals.

1.8 ELECTRONIC MAIL (E-MAIL) ADDRESS

Establish and maintain electronic mail (e-mail) capability along with the capability to open various electronic attachments as text files, pdf files, and other similar formats. Within 10 days after contract award, provide the Contracting Officer a single (only one) e-mail address for electronic communications from the Contractor 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 or terrorist threats. Multiple email addresses are not allowed.

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

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 01 32 16.00 20

SMALL PROJECT CONSTRUCTION PROGRESS SCHEDULES

05/16

PART 1 GENERAL

1.1 SUBMITTALS

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

SD-01 Preconstruction Submittals

Construction Schedule; G

SD-07 Certificates

Monthly Updates

1.2 ACCEPTANCE

Prior to the start of work, prepare and submit to the Contracting Officer for acceptance a construction schedule in the form of a [Network Analysis Schedule (NAS)] [Bar Chart Schedule] in accordance with the terms in Contract Clause "FAR 52.236-15, Schedules for Construction Contracts," except as modified in this contract.

The acceptance of a Baseline Construction Schedule is a condition precedent to:

- a. The Contractor starting work on the demolition or construction stage(s) of the contract.
- b. Processing Contractor's invoice(s) for construction activities/items of work.
- c. Review of any schedule updates.

Submittal of the Baseline Schedule, and subsequent schedule updates, is understood to be the Contractor's certification that the submitted schedule meets all of the requirements of the Contract Documents, represents the Contractor's plan on how the work will be accomplished, and accurately reflects the work that has been accomplished and how it was sequenced (as-built logic).

1.3 SCHEDULE FORMAT

1.3.1 Network Analysis Schedule (NAS)

Use the critical path method (CPM) to schedule and control project activities. Prepare and maintain project schedules using Primavera P6 or Microsoft Project 2010. Importing data into the scheduling program using data conversion techniques or third party software is cause for rejection of the submitted schedule. Build the schedule as follows:

- a. The Project Schedule must show submittals, Government review periods, material/equipment delivery, utility outages, all on-site construction, inspection, testing, and closeout activities. Government and Contractor on-site work activities must be driven by calendars that reflect Saturdays, Sundays and all Federal Holidays as non-work days.
- b. With the exception of the Contract Award and End Contract milestone activities, no activities shall be open-ended; each activity must have predecessor and successor ties. No activity must have open start or open finish (dangling) logic. Minimize redundant logic ties. Once an activity exists on the schedule it must not be deleted or renamed to change the scope of the activity and must not be removed from the schedule logic without approval from the Contracting Officer. While an activity cannot be deleted, where said activity is no longer applicable to the schedule but must remain within the logic stream for historical record, it can be changed to a milestone. Document any such change in the milestone's "Notebook", including a date and explanation for the change. The ID number for a deleted activity must not be re-used for another activity.
- c. Each activity must be assigned its appropriate Responsibility Code indicating responsibility to accomplish the work indicated by the activity, Phase Code and Work Location Code.
- d. Date/time constraint(s) and/or lags, other than those required by the contract, are not allowed unless accepted by the Contracting Officer. Include as the last activity in the contract schedule, a milestone activity named "Contract Completion Date".

1.3.1.1 Primavera P6 Settings and Parameters

Use the following Primavera P6 settings and parameters in preparing the Baseline Schedule. Deviation from these settings and parameters, without prior consent of the Contracting Officer, is cause for rejection of schedule submission.

- a. General: Define or establish Calendars and Activity Codes at the "Project" level, not the "Global" level.
- b. Admin Drop-Down Menu, Admin Preferences, Time Periods Tab:
 - (1) Set time periods for P6 to 8.0 Hours/Day, 40.0 Hours/Week, 172.0 Hours/Month and 2000.0 Hours/Year.
 - (2) Use assigned calendar to specify the number of work hours for each time period: Must be checked.
- c. Project Level, Dates Tab:
 - (1) Set "Must Finish By" date to "Contract Completion Date".
- d. Project Level, Defaults Tab:
 - (1) Duration Type: Set to "Fixed Duration & Units".
 - (2) Percent Complete Type: Set to "Physical".
 - (3) Activity Type: Set to "Task Dependent".

- (4) Calendar: Set to "Standard 5 Day Workweek". Calendar must reflect Saturday, Sunday and all Federal holidays as non-work days. Alternative calendars may be used with Contracting Officer approval.

e. Project Level, Calculations Tab:

- (1) Activity percent complete based on activity steps: Must be Checked.
- (2) Reset Remaining Duration and Units to Original: Must be Checked.
- (3) Subtract Actual from At Completion: Must be Checked.
- (4) Recalculate Actual units and Cost when duration percent (%) complete changes: Must be Checked.
- (5) Link Actual to Date and Actual This Period Units and Cost: Must be Checked.

f. Project Level, Settings Tab:

- (1) Define Critical Activities: Check "Total Float is less than or equal to" and add "0d".

g. No on-site construction activity may have durations in excess of 20 working days.

1.3.1.2 Microsoft Project 2010 Settings and Parameters

The Network must have a minimum of 30 construction activities. No on-site construction activity may have durations in excess of 20 working days.

1.3.1.3 Cost Loading Microsoft Project 2010 Schedules

Assign material, labor and equipment costs to their respective Construction Activities. Material and equipment costs for which payment will be requested in advance of installation must be assigned to their respective procurement activity (i.e. the material/equipment on-site activity). Evenly disperse overhead and profit to each activity over the duration of the project. Cost loading must total to 100 percent of the value of the contract.

- a. Submit an Earned Value Report with each schedule update showing activity budget, cost percent complete, earned amount and cost to complete as directed by the Contracting Officer.
- b. With each schedule submission, provide a Schedule Variance control (SVC) diagram showing:
 - (1) Cash Flow S-Curves indicating planned project cost based on projected early and late activity finish dates.
 - (2) Earned Value to-date. Revise Cash Flow S-Curves when the contract is modified, or as directed by the Contracting Officer.

1.3.2 Bar Chart Schedule

The Bar Chart must, as a minimum, show work activities, submittals,

Government review periods, material/equipment delivery, utility outages, on-site construction, inspection, testing, and closeout activities. The Bar Chart must be time scaled and generated using an electronic spreadsheet program.

1.3.3 Schedule Submittals and Procedures

Submit [Network Analysis Schedules (NAS)] [Bar Chart Schedules] and updates in hard copy and on electronic media that is acceptable to the Contracting Officer. Submit an electronic back-up of the project schedule in an import format compatible with the Government's scheduling program.

1.4 SCHEDULE MONTHLY UPDATES

Update the Construction Schedule at monthly intervals or when the schedule has been revised. The updated schedule must be kept current, reflecting actual activity progress and plan for completing the remaining work. Submit copies of purchase orders and confirmation of delivery dates as directed by the Contracting Officer.

a. Narrative Report: Provide with schedule updates. Identify and justify;

- (1) Progress made in each area of the project
- (2) Critical Path
- (3) Date/time constraint(s), other than those required by the contract
- (4) Changes in the following; added or deleted activities, original and remaining durations for activities that have not started, logic, milestones, planned sequence of operations, and critical path
- (5) Status of Contract Completion Date and interim milestones;
- (6) Current and anticipated delays (describe cause of delay and corrective actions(s) and mitigation measures to minimize);
- (7) Description of current and future schedule problem areas.

Each entry in the narrative report must cite the respective Activity ID and Activity Description, the date and reason for the change, and description of the change.

1.5 CONTRACT MODIFICATION

Submit a Time Impact Analysis (TIA) with each cost and time proposal for a proposed change. TIA must illustrate the influence of each change or delay on the Contract Completion Date or milestones. No time extensions will be granted nor delay damages paid unless a delay occurs which consumes all available Project Float, and extends the Projected Finish beyond the Contract Completion Date.

- a. Each TIA must be in both narrative and schedule form. The narrative must define the scope and conditions of the change; provide start and finish dates of impact, successor and predecessor activity to impact period, responsible party, describe how it originated, and how it impacts the schedule. The schedule submission must consist of three native files:

- (1) Fragnet used to define the scope of the changed condition
 - (2) Most recent accepted schedule update as of the time of the proposal or claim submission that has been updated to show all activity progress as of the time of the impact start date.
 - (3) The impacted schedule that has the fragnet inserted in the updated schedule and the schedule "run" so that the new completion date is determined.
- b. For claimed as-built project delay, the inserted fragnet TIA method must be modified to account for as-built events known to occur after the data date of schedule update used.
- c. All TIAs must include any mitigation, and must determine the apportionment of the overall delay assignable to each individual delay. The associated narrative must clearly describe the findings in a chronological listing beginning with the earliest delay event.
- (1) Identify types of delays as follows:
 - (a) Excusable Delay: Force-Majeure (e.g. weather) - Contractor may receive time extension, but time will not be compensable.
 - (b) Inexcusable Delay: Contractor Responsibility - Contractor will not receive time extension.
 - (c) Compensable Delay: Government Responsibility - Contractor may receive compensable time extension.
 - (2) If a combination of any of the delay types outlined above occurs, it is considered a Concurrent Delay, which will require an analysis of the facts to determine compensability and entitlement to any time extension under the applicable contract clauses.
- d. Submit Data disks containing the narrative and native schedule files.
- e. Unless the Contracting Officer requests otherwise, only add conformed contract modifications into the Project NAS.

1.6 3-WEEK LOOK AHEAD SCHEDULE

Prepare and issue a 3-Week Look Ahead schedule to provide a more detailed day-to-day plan of upcoming work identified on the Construction Schedule. Key the work plans to activity numbers when a NAS is required and update each week to show the planned work for the current and following two-week period. Additionally, include upcoming outages, closures, preparatory meetings, and initial meetings. Identify critical path activities on the Three-Week Look Ahead Schedule. The detail work plans are to be bar chart type schedules, maintained separately from the Construction Schedule on an electronic spreadsheet program and printed on 8-1/2 by 11 inch sheets as directed by the Contracting Officer. Activities must not exceed 5 working days in duration and have sufficient level of detail to assign crews, tools and equipment required to complete the work. Deliver three hard copies and one electronic file of the 3-Week Look Ahead Schedule to the Contracting Officer no later than 8 a.m. each Monday, and review during the weekly CQC Coordination or Production Meeting.

1.7 CORRESPONDENCE AND TEST REPORTS:

All correspondence (e.g., letters, Requests for Information (RFIs), e-mails, meeting minute items, Production and QC Daily Reports, material delivery tickets, photographs) must reference Schedule Activities that are being addressed. All test reports (e.g., concrete, soil compaction, weld, pressure) must reference Schedule Activities that are being addressed.

1.8 ADDITIONAL SCHEDULING REQUIREMENTS

Any references to additional scheduling requirements, including systems to be inspected, tested and commissioned, that are located throughout the remainder of the Contract Documents, are subject to all requirements of this section.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 33 00

SUBMITTAL PROCEDURES

05/16

PART 1 GENERAL

1.1 DEFINITIONS

1.1.1 Submittal Descriptions (SD)

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

SD-01 Preconstruction Submittals

- Submittals which are required prior to
- Certificates of insurance
- Surety bonds
- List of proposed Subcontractors
- List of proposed products
- Construction progress schedule
- Network Analysis Schedule (NAS)
- Submittal register
- Schedule of prices or Earned Value Report
- Health and safety plan
- Work plan
- Quality Control(QC) plan
- Environmental protection plan
- Detour and Traffic Control Plans

SD-03 Product Data

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

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

SD-05 Design Data

Design calculations, mix designs, analyses or other data pertaining to

a part of work.

SD-06 Test Reports

Report signed by authorized official of testing laboratory that a material, product or system identical to the material, product or system to be provided has been tested in accord with specified requirements. Unless specified in another section, 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 document purpose is to further promote the orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel qualifications.

Confined space entry permits.

Text of posted operating instructions.

SD-08 Manufacturer's Instructions

Preprinted material describing installation of a product, system or material, including special notices and (MSDS) 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.

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

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

construction on a multi-phase contract.

1.1.2 Approving Authority

Office or designated person authorized to approve submittal.

1.1.3 Work

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

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor QC approval. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government.] Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with this section.

SD-01 Preconstruction Submittals

Submittal Register; G

1.3 SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

1.3.1 Government Approved (G)

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

1.3.2 Sustainability Reporting Submittals (S)

Submittals for Guiding Principle Validation (GPV) or Third Party Certification (TPC) are indicated with an "S" designation. Submit the information required by the technical sections that demonstrates compliance with the sustainable requirement, and for inclusion in the Sustainability Notebook as required by Section 01 33 29 SUSTAINABILITY REPORTING. A full submittal for an item may be provided under another SD; however, for the "S" submittal, only provide that portion of the submittal that demonstrates compliance with the sustainable requirement. If the sustainable submittal does require Government Approval, it may be tagged under another SD with a "G."

Schedule submittals for these items throughout the course of construction as provided; do not wait until closeout.

1.4 PREPARATION

1.4.1 Transmittal Form

1.4.2 Source Drawings for Shop Drawings

The entire set of Source Drawing files (DWG) will not be provided to the

Contractor. Only those requested by the Contractor to prepare shop drawings may be provided. Request the specific Drawing Number only for the preparation of Shop Drawings. These drawings may only be provided after award.

1.4.2.1 Terms and Conditions

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

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

1.5 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.

1.5.1 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 at no additional cost to the Government.

1.5.2 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.

1.5.3 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.

1.5.4 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.

1.6 SUBMITTAL REGISTER

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

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

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

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

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

1.6.1 Use of Submittal Register

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

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

schedule.

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

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

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

1.6.2 Contractor Use of Submittal Register

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

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

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

Column (l) List date of submittal transmission.

Column (q) List date approval received.

1.6.3 Approving Authority Use of Submittal Register

Update the following fields[in the Government-furnished submittal register program or equivalent fields in program utilized by Contractor].

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

Column (l) List date of submittal receipt.

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

Column (q) List date returned to Contractor.

1.6.4 Copies Delivered to the Government

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

1.7 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."

1.8 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 REVIEW NOTATIONS and with markings appropriate for action indicated.

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

1.8.1 Review Notations

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

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

1.9 DISAPPROVED OR REJECTED SUBMITTALS

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

If changes are necessary to submittals, 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.

1.10 APPROVED OR ACCEPTED SUBMITTALS

The Contracting Officer's approval or acceptance of submittals is not to be construed as a complete check, and indicates only that

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.

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.

1.11 APPROVED SAMPLES

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

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

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

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

Approval of the Contractor's samples by the Contracting Officer does not

relieve the Contractor of his responsibilities under the contract.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		MAILED TO CONTR/ DATE RCD FRM APPR AUTH
		01 20 00.00 20	SD-01 Preconstruction Submittals														
			Schedule of Prices	1.3													
		01 30 00	SD-01 Preconstruction Submittals														
			List of contact personnel	1.2.1													
		01 32 16.00 20	SD-01 Preconstruction Submittals														
			Construction Schedule	1.2	G												
			SD-07 Certificates														
			Monthly Updates	1.4													
		01 33 00	SD-01 Preconstruction Submittals														
			Submittal Register	1.6	G												
		01 35 26	SD-01 Preconstruction Submittals														
			Accident Prevention Plan (APP)	1.7													
			SD-06 Test Reports														
			Monthly Exposure Reports	1.4													
			Notifications and Reports	1.12													
			Accident Reports	1.12.2													
			LHE Inspection Reports	1.12.3													
			SD-07 Certificates														
			Crane Operators/Riggers	1.6.1.5													
			Standard Lift Plan	1.7.2.2													
			Critical Lift Plan	1.7.2.3													
			Naval Architecture Analysis	1.7.2.3													
			Activity Hazard Analysis (AHA)	1.8													
			Confined Space Entry Permit	1.9.1													
			Hot Work Permit	1.9.1													
			Certificate of Compliance	1.12.4													

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		01 35 26	License Certificates														
		01 45 00.00 20	SD-01 Preconstruction Submittals														
			Construction Quality Control (QC) Plan	1.6.1													
			Contract Document Review	1.9.2													
			SD-07 Certificates														
			CA Resume	1.5.2.2													
		01 57 19	SD-01 Preconstruction Submittals														
			Preconstruction Survey	1.6.1													
			Solid Waste Management Permit	1.10													
			Regulatory Notifications	1.6.2													
			Environmental Protection Plan	1.7													
			Stormwater Notice of Intent	3.2.1.2													
			Dirt and Dust Control Plan	1.7.9.1													
			Employee Training Records	1.6.5													
			Environmental Manager	1.6.4													
			Qualifications														
			SD-06 Test Reports														
			Laboratory Analysis	3.7.1.1.2													
			Inspection Reports	3.2.1.3													
			Solid Waste Management Report	3.7.2.1													
			SD-07 Certificates														
			Employee Training Records	1.6.5													
			Erosion and Sediment Control	1.6.5													
			Inspector														
			SD-11 Closeout Submittals														

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		MAILED TO CONTR/ DATE RCD FRM APPR AUTH	
																		(a)
		01 57 19	Stormwater Pollution Prevention Plan Compliance Notebook	3.2.1.4														
			Stormwater Notice of Termination	3.2.1.5														
			Waste Determination Documentation	3.7.1														
			Disposal Documentation for Hazardous and Regulated Waste	3.7.3.6														
			Assembled Employee Training Records	1.6.5														
			Solid Waste Management Permit	1.10														
			Solid Waste Management Report	3.7.2.1														
			Hazardous Waste/Debris Management	3.7.3.1														
			Regulatory Notifications	1.6.2														
			Sales Documentation	3.7.2.1														
			Contractor Certification	3.7.2.1														
			As-Built Topographic Survey	3.2.1.5														
		01 78 00	SD-11 Closeout Submittals															
			Record Drawings	1.2.1	G													
		02 41 00	SD-01 Preconstruction Submittals															
			Demolition plans		G													
			Pavement Removal Plan															
			Sign Removal Plan															
			Storm Drain Removal and Modification Plan															
			Curb Removal Plans															

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(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		02 41 00	Underground Utility Search Findings														
		31 00 00	SD-01 Preconstruction Submittals														
			Shoring	3.3	G												
			Dewatering Work Plan	1.6.2	G												
			Blasting		G												
			SD-03 Product Data														
			Utilization of Excavated Materials	3.7	G												
			Rock Excavation	1.6.1.2													
			Opening of any Excavation or Borrow Pit	3.2													
			Shoulder Construction	3.13													
			SD-06 Test Reports														
			Testing	3.15													
			Borrow Site Testing	2.1													
			SD-07 Certificates														
			Testing	3.15													
		31 23 00.00 20	SD-01 Preconstruction Submittals														
			Surface Dewatering work plan		G												
			Excavation Plan	1.5.1	G												
			Geosynthetic Fabric Location Plan		G												
			SD-06 Test Reports														
			Moisture Content Tests														
			Density tests	3.12.2.3	G												
			SD-07 Certificates														
			Granite Rip-rap	2.4	G												

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(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		32 01 00	SD-01 Preconstruction Submittals														
			General Traffic Control Plan	1.3.1.1	G												
			Flagger Certifications	2.4	G												
			Specific Traffic Control Plan		G												
			SD-04 Samples														
			Specific Traffic Control Plan														
		32 11 33	SD-04 Samples														
			Subbase aggregate	2.2.1													
			Base course aggregate	2.2.2													
			Flexible pavement base course	2.2.2.1													
			SD-05 Design Data														
			Mix design	2.5													
			Job-mix formula	2.5													
			SD-06 Test Reports														
			plasticity index	3.7.2.1													
			plasticity index	3.7.2.1													
			Sieve analysis	2.2.1													
			Compressive strength	2.4.1													
			Compressive strength	2.4.1													
			weight loss	2.4.3													
			percentage of wear	2.2.2.1													
			moisture-density	2.5													
			Liquid limit	3.7.2.1													
			Sieve analysis of combined material	3.7.2.1													

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(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		32 11 33	Optimum moisture content and maximum density	3.7.2.6													
			SD-07 Certificates														
			cement	2.1													
			Location of aggregate source	1.5.1													
			Method	1.5.1													
			Construction equipment list	1.5.1													
		32 17 23.00 20	SD-03 Product Data														
			Reflective media for roads and streets	2.1.1	G												
			Thermoplastic compounds	2.1.2	G												
			Preformed Retroreflective Thermoplastic Markings	2.1.2.2	G												
			Paints for roads and streets	2.1.3	G												
			Equipment		G												
			Qualifications	1.9													
			SD-06 Test Reports														
			Reflective media for roads and streets	2.1.1	G												
			Thermoplastic compounds	2.1.2	G												
			Paints for roads and streets	2.1.3	G												
			Construction equipment list	1.6	G												
			SD-07 Certificates														
			Reflective media for roads and streets	2.1.1	G												
			Thermoplastic compounds	2.1.2	G												

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																		(g)
		32 17 23.00 20	Construction equipment list	1.6	G													
			SD-08 Manufacturer's Instructions															
			Thermoplastic compounds	2.1.2	G													
			Preformed Retroreflective	2.1.2.2														
			Thermoplastic Markings															
			Paints for roads and streets	2.1.3	G													
		32 17 23.00 30	SD-03 Product Data															
			Frangible Sign Post Base		G													
			SD-07 Certificates															
			Sign supports and hardware		G													
			Signs, complete assembly		G													
			Manufacturer's Warranty for Reflective Sheeting															
			SD-08 Manufacturer's Instructions															
			Frangible Sign Post Base		G													
		32 92 23	SD-03 Product Data															
			Fertilizer	2.4	G													
			Turf Reinforcement Mat		G													
			SD-07 Certificates															
			sods	2.1	G													
			Fertilizer	2.4	G													
			SD-08 Manufacturer's Instructions															
			Turf Reinforcement Mat		G													
		33 40 00	SD-03 Product Data															
			Concrete Pipe															
			SD-07 Certificates															

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(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	
		33 40 00	NCDOT QC/QA Program Certification	2.1.1														

SECTION 01 35 26

GOVERNMENTAL SAFETY REQUIREMENTS

05/06

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN SOCIETY OF SAFETY ENGINEERS (ASSE/SAFE)

ASSE/SAFE A10.34	(2001; R 2012) Protection of the Public on or Adjacent to Construction Sites
ASSE/SAFE A10.44	(2014) Control of Energy Sources (Lockout/Tagout) for Construction and Demolition Operations
ASSE/SAFE Z244.1	(2003; R 2014) Control of Hazardous Energy Lockout/Tagout and Alternative Methods
ASSE/SAFE Z359.0	(2012) Definitions and Nomenclature Used for Fall Protection and Fall Arrest
ASSE/SAFE Z359.1	(2007) Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components
ASSE/SAFE Z359.11	(2014) Safety Requirements for Full Body Harnesses
ASSE/SAFE Z359.12	(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
ASSE/SAFE Z359.2	(2007) Minimum Requirements for a Comprehensive Managed Fall Protection Program
ASSE/SAFE Z359.3	(2007) Safety Requirements for Positioning and Travel Restraint Systems
ASSE/SAFE Z359.4	(2013) Safety Requirements for Assisted-Rescue and Self-Rescue Systems,

Subsystems and Components

- ASSE/SAFE Z359.6 (2009) Specifications and Design Requirements for Active Fall Protection Systems
- ASSE/SAFE Z359.7 (2011) Qualification and Verification Testing of Fall Protection Products

ASME INTERNATIONAL (ASME)

- ASME B30.20 (2013; INT Oct 2010 - May 2012) Below-the-Hook Lifting Devices
- ASME B30.22 (2010) Articulating Boom Cranes
- ASME B30.26 (2015; INT Jun 2010 - Jun 2014) Rigging Hardware
- ASME B30.3 (2012) Tower Cranes
- ASME B30.5 (2014) Mobile and Locomotive Cranes
- ASME B30.8 (2010) Floating Cranes and Floating Derricks
- ASME B30.9 (2014; INT Feb 2011 - Nov 2013) Slings

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
- IEEE C2 (2012; Errata 2012; INT 1-4 2012; INT 5-7 2013; INT 8-10 2014; INT 11 2015) National Electrical Safety Code

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

- NFPA 10 (2013) Standard for Portable Fire Extinguishers
- NFPA 241 (2013; Errata 2015) Standard for Safeguarding Construction, Alteration, and Demolition Operations
- NFPA 51B (2014) Standard for Fire Prevention During Welding, Cutting, and Other Hot Work
- NFPA 70 (2014; AMD 1 2013; Errata 1 2013; AMD 2 2013; Errata 2 2013; AMD 3 2014; Errata 3-4 2014; AMD 4-6 2014) National

Electrical Code

NFPA 70E (2015; ERTA 1 2015) Standard for Electrical Safety in the Workplace

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1 (2014) Safety and Health Requirements Manual

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

29 CFR 1910 Occupational Safety and Health Standards

29 CFR 1910.146 Permit-required Confined Spaces

29 CFR 1910.147 Control of Hazardous Energy (Lock Out/Tag Out)

29 CFR 1910.333 Selection and Use of Work Practices

29 CFR 1915 Confined and Enclosed Spaces and Other Dangerous Atmospheres in Shipyard Employment

29 CFR 1915.89 Control of Hazardous Energy (Lockout/Tags-Plus)

29 CFR 1926 Safety and Health Regulations for Construction

29 CFR 1926.1400 Cranes and Derricks in Construction

29 CFR 1926.16 Rules of Construction

29 CFR 1926.450 Scaffolds

29 CFR 1926.500 Fall Protection

CPL 2.100 (1995) Application of the Permit-Required Confined Spaces (PRCS) Standards, 29 CFR 1910.146

1.2 DEFINITIONS

1.2.1 Competent Person (CP)

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

1.2.2 Competent Person, Confined Space

The CP, Confined Space, is a person meeting the competent person requirements as defined EM 385-1-1 Appendix Q, with thorough knowledge of OSHA's Confined Space Standard, 29 CFR 1910.146, and designated in writing to be responsible for the immediate supervision, implementation and

monitoring of the confined space program, who through training, knowledge and experience in confined space entry is capable of identifying, evaluating and addressing existing and potential confined space hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.3 Competent Person, Cranes and Rigging

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

1.2.4 Competent Person, Excavation/Trenching

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

1.2.5 Competent Person, Fall Protection

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

1.2.6 Competent Person, Scaffolding

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

1.2.7 Competent Person (CP) Trainer

A competent person trainer as defined in EM 385-1-1 Appendix Q, who is

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

1.2.8 High Risk Activities

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

1.2.9 High Visibility Accident

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

1.2.10 Load Handling Equipment (LHE)

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

1.2.11 Medical Treatment

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

1.2.12 Near Miss

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

1.2.13 Operating Envelope

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

1.2.14 Qualified Person (QP)

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

1.2.15 Qualified Person, Fall Protection (QP for FP)

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

1.2.16 Recordable Injuries or Illnesses

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

- a. Death, regardless of the time between the injury and death, or the length of the illness;
- b. Days away from work (any time lost after day of injury/illness onset);
- c. Restricted work;
- d. Transfer to another job;
- e. Medical treatment beyond first aid;
- f. Loss of consciousness; or
- g. A significant injury or illness diagnosed by a physician or other licensed health care professional, even if it did not result in (a) through (f) above.

1.2.17 USACE Property and Equipment

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

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

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

1.3 SUBMITTALS

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

SD-01 Preconstruction Submittals

Accident Prevention Plan (APP)

SD-06 Test Reports

Monthly Exposure Reports
Notifications and Reports
Accident Reports
LHE Inspection Reports

SD-07 Certificates

Crane Operators/Riggers
Standard Lift Plan
Critical Lift Plan
Naval Architecture Analysis
Activity Hazard Analysis (AHA)
Confined Space Entry Permit
Hot Work Permit
Certificate of Compliance

License Certificates

1.4 MONTHLY EXPOSURE REPORTS

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

1.5 REGULATORY REQUIREMENTS

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

1.6 SITE QUALIFICATIONS, DUTIES, AND MEETINGS

1.6.1 Personnel Qualifications

1.6.1.1 Site Safety and Health Officer (SSHO)

Provide an SSHO that meets the requirements of EM 385-1-1 Section 1. The SSHO must ensure that the requirements of 29 CFR 1926.16 are met for the project. Provide a Safety oversight team that includes a minimum of one (1) person at each project site to function as the SSHO. The SSHO or an equally-qualified Alternate SSHO must be at the work site at all times to implement and administer the Contractor's safety program and government-accepted APP. The SSHO and Alternate SSHO must have the required training, experience, and qualifications in accordance with EM 385-1-1 Section 01.A.17, and all associated sub-paragraphs.

If the SSHO is off-site for a period longer than 24 hours, an equally-qualified alternate SSHO must be provided and must fulfill the same

roles and responsibilities as the primary SSHO. When the SSHO is temporarily (up to 24 hours) off-site, a Designated Representative (DR), as identified in the AHA may be used in lieu of an Alternate SSHO, and must be on the project site at all times when work is being performed. Note that the DR is a collateral duty safety position, with safety duties in addition to their full time occupation.

1.6.1.2 Contractor Quality Control (QC) Manager:

The Contractor Quality Control Manager can be the SSHO on this project.

1.6.1.3 Competent Person Qualifications

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

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

1.6.1.3.1 Competent Person for Confined Space Entry

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

1.6.1.3.2 Competent Person for Scaffolding

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

1.6.1.3.3 Competent Person for Fall Protection

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

1.6.1.4 Qualified Trainer Requirements

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

Instructors are required to:

- a. Prepare class presentations that cover construction-related safety requirements.
- b. Ensure that all attendees attend all sessions by using a class roster signed daily by each attendee. Maintain copies of the roster for at

least five (5) years. This is a certification class and must be attended 100 percent. In cases of emergency where an attendee cannot make it to a session, the attendee can make it up in another class session for the same subject.

- c. Update training course materials whenever an update of the EM 385-1-1 becomes available.
- d. Provide a written exam of at least 50 questions. Students are required to answer 80 percent correctly to pass.
- e. Request, review and incorporate student feedback into a continuous course improvement program.

1.6.1.5 Crane Operators/Riggers

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

1.6.2 Personnel Duties

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

The SSHO must:

- a. Conduct daily safety and health inspections and maintain a written log which includes area/operation inspected, date of inspection, identified hazards, recommended corrective actions, estimated and actual dates of corrections. Attach safety inspection logs to the Contractors' daily production report.
- b. Conduct mishap investigations and complete required accident reports. Report mishaps and near misses.
- c. Use OSHA's Form 300 to log work-related injuries and illnesses occurring on the project site for Prime Contractors and subcontractors. Post and maintain the Form 300 on the site Safety Bulletin Board.
- d. Maintain applicable safety reference material on the job site.
- e. Attend the pre-construction conference, pre-work meetings including preparatory meetings, and periodic in-progress meetings.
- f. Review the APP and AHAs for compliance with EM 385-1-1, and approve, sign, implement and enforce them.
- g. Establish a Safety and Occupational Health (SOH) Deficiency Tracking System that lists and monitors outstanding deficiencies until resolution.
- h. Ensure subcontractor compliance with safety and health requirements.
- i. Maintain a list of hazardous chemicals on site and their material

Safety Data Sheets (SDS).

- j. Maintain a weekly list of high hazard activities involving energy, equipment, excavation, entry into confined space, and elevation, and be prepared to discuss details during QC Meetings.
- k. Provide and keep a record of site safety orientation and indoctrination for Contractor employees, subcontractor employees, and site visitors.

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

1.6.3 Meetings

1.6.3.1 Preconstruction Conference

- a. Contractor representatives who have a responsibility or significant role in accident prevention on the project must attend the preconstruction conference. This includes the project superintendent, SSHO, quality control manager, or any other assigned safety and health professionals who participated in the development of the APP (including the AHAs and special plans, program and procedures associated with it).
- b. Discuss the details of the submitted APP to include incorporated plans, programs, procedures and a listing of anticipated AHAs that will be developed and implemented during the performance of the contract. This list of proposed AHAs will be reviewed at the conference and an agreement will be reached between the Contractor and the Contracting Officer as to which phases will require an analysis. In addition, establish a schedule for the preparation, submittal, and Government review of AHAs to preclude project delays.
- c. Deficiencies in the submitted APP, identified during the Contracting Officer's review, must be corrected, and the APP re-submitted for review prior to the start of construction. Work is not permitted to begin until an APP is established that is acceptable to the Contracting Officer.

1.6.3.2 Safety Meetings

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

1.7 ACCIDENT PREVENTION PLAN (APP)

A qualified person must prepare the written site-specific APP. Prepare the APP in accordance with the format and requirements of EM 385-1-1, Appendix

A, and as supplemented herein. Cover all paragraph and subparagraph elements in EM 385-1-1, Appendix A. The APP must be job-specific and address any unusual or unique aspects of the project or activity for which it is written. The APP must interface with the Contractor's overall safety and health program referenced in the APP in the applicable APP element, and made site-specific. Describe the methods to evaluate past safety performance of potential subcontractors in the selection process. Also, describe innovative methods used to ensure and monitor safe work practices of subcontractors. The Government considers the Prime Contractor to be the "controlling authority" for all work site safety and health of the subcontractors. Contractors are responsible for informing their subcontractors of the safety provisions under the terms of the contract and the penalties for noncompliance, coordinating the work to prevent one craft from interfering with or creating hazardous working conditions for other crafts, and inspecting subcontractor operations to ensure that accident prevention responsibilities are being carried out. The APP must be signed by an officer of the firm (Prime Contractor senior person), the individual preparing the APP, the on-site superintendent, the designated SSHO, the Contractor QC Manager, and any designated Certified Safety Professional (CSP) or Certified Health Physicist (CIH). The SSHO must provide and maintain the APP and a log of signatures by each subcontractor foreman, attesting that they have read and understand the APP, and make the APP and log available on-site to the Contracting Officer. If English is not the foreman's primary language, the Prime Contractor must provide an interpreter.

Submit the APP to the Contracting Officer 15 calendar days prior to the date of the preconstruction conference for acceptance. Work cannot proceed without an accepted APP. Once reviewed and accepted by the Contracting Officer, the APP and attachments will be enforced as part of the contract. Disregarding the provisions of this contract or the accepted APP is cause for stopping of work, at the discretion of the Contracting Officer, until the matter has been rectified. Continuously review and amend the APP, as necessary, throughout the life of the contract. Changes to the accepted APP must be made with the knowledge and concurrence of the Contracting Officer, project superintendent, SSHO and QC Manager. Incorporate unusual or high-hazard activities not identified in the original APP as they are discovered. Should any severe hazard exposure (i.e. imminent danger) become evident, stop work in the area, secure the area, and develop a plan to remove the exposure and control the hazard. Notify the Contracting Officer within 24 hours of discovery. Eliminate and remove the hazard. In the interim, take all necessary action to restore and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public (as defined by ASSE/SAFE A10.34), and the environment.

1.7.1 Names and Qualifications

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

- a. Names and qualifications (resumes including education, training, experience and certifications) of site safety and health personnel designated to perform work on this project to include the designated SSHO and other competent and qualified personnel to be used. Specify the duties of each position.
- b. Qualifications of competent and of qualified persons. As a minimum, designate and submit qualifications of competent persons for each of the following major areas: excavation; scaffolding; fall protection;

hazardous energy; confined space; health hazard recognition, evaluation and control of chemical, physical and biological agents; and personal protective equipment and clothing to include selection, use and maintenance.

1.7.2 Plans

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

1.7.2.1 Confined Space Entry Plan

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

1.7.2.2 Standard Lift Plan (SLP)

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

1.7.2.3 Critical Lift Plan - Crane or Load Handling Equipment

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

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

- a. For lifts of personnel, demonstrate compliance with the requirements of 29 CFR 1926.1400 and EM 385-1-1, Section 16.T.
- b. For barge mounted mobile cranes, provide a Naval Architecture Analysis and include an LHE Manufacturer's Floating Service Load Chart in accordance with the criteria from the selected standard in EM 385-1-1, Section 16.L.02. The Floating Service Load Chart must provide a table of rated load versus boom angle and radius. The Floating Service Load Chart must also provide the maximum allowable machine list and trim associated with the tabular loads and radii provided. If the Manufacturer's Floating Service Load Chart is not available, a floating service load chart may be developed and provided by a qualified Registered Professional Engineer (RPE), competent in the field of

floating cranes. The Load Chart must be in accordance with the criteria from the selected standard in EM 385-1-1, Section 16.L; provide a table of rated load versus boom angle and radius; provide the maximum allowable machine list and machine trim associated with the tabular loads and radii provided; and be stamped by a RPE qualified and competent in the field of floating cranes. The RPE, competent in the field of floating cranes must stamp and certify (sign) that the Naval Architectural Analysis (NAA) meets the requirements of EM 385-1-1, Section 16.L.03.

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

1.7.2.4 Fall Protection and Prevention (FP&P) Plan

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

1.7.2.5 Rescue and Evacuation Plan

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

1.7.2.6 Hazardous Energy Control Program (HECP)

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

1.7.2.7 Excavation Plan

Identify the safety and health aspects of excavation, and provide and prepare the plan in accordance with EM 385-1-1, Section 25.A and Section

31 00 00 EARTHWORK.

1.7.2.8 Occupant Protection Plan

Identify the safety and health aspects of lead-based paint removal, prepared in accordance with Section.

1.7.2.9 Site Safety and Health Plan

Identify the safety and health aspects, and prepare in accordance with Section 01 35 29.13 HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES FOR CONTAMINATED SITES.

1.7.2.10 Site Demolition Plan

Identify the safety and health aspects, and prepare in accordance with Section 02 41 00 [DEMOLITION] [AND] [DECONSTRUCTION] and referenced sources.

1.8 ACTIVITY HAZARD ANALYSIS (AHA)

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

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

1.8.1 AHA Management

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

1.8.2 AHA Signature Log

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

1.9 DISPLAY OF SAFETY INFORMATION

1.9.1 Safety Bulletin Board

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

- a. Confined space entry permit.
- b. Hot work permit.

1.9.2 Safety and Occupational Health (SOH) Deficiency Tracking System

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

- a. Date deficiency identified;
- b. Description of deficiency;
- c. Name of person responsible for correcting deficiency;
- d. Projected resolution date;
- e. Date actually resolved.

1.10 SITE SAFETY REFERENCE MATERIALS

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

1.11 EMERGENCY MEDICAL TREATMENT

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

1.12 NOTIFICATIONS and REPORTS

1.12.1 Mishap Notification

Notify the Contracting Officer as soon as practical, but no more than twenty-four hours, after any mishaps, including recordable accidents, incidents, and near misses, as defined in EM 385-1-1 Appendix Q, any report of injury, illness, LHE or rigging mishaps, or any property damage. The Contractor is responsible for obtaining appropriate medical and emergency assistance and for notifying fire, law enforcement, and regulatory agencies. Immediate reporting is required for electrical mishaps, to include Arc Flash; shock; uncontrolled release of hazardous

energy (includes electrical and non-electrical); load handling equipment or rigging; fall from height (any level other than same surface); and underwater diving. These mishaps must be investigated in depth to identify all causes and to recommend hazard control measures.

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

1.12.2 Accident Reports

- a. Conduct an accident investigation for recordable injuries and illnesses, property damage, and near misses as defined in EM 385-1-1, to establish the root cause(s) of the accident. Complete the applicable The Contracting Officer will provide copies of any required or special forms.
- b. Near Misses: Near miss reports are considered positive and proactive Contractor safety management actions.
- c. Conduct an accident investigation for any LHE accident (including rigging gear accidents) to establish the root cause(s) of the accident. Complete the LHE Accident Report (Crane and Rigging Gear) form and provide the report to the Contracting Officer within 30 calendar days of the accident. Do not proceed with crane operations until cause is determined and corrective actions have been implemented to the satisfaction of the Contracting Officer. The Contracting Officer will provide a blank copy of the accident report form.

1.12.3 LHE Inspection Reports

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

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

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

Develop an SLP in accordance with EM 385-1-1, Section 16.H.03 using Form 16-2 Standard Pre-Lift Crane Plan/Checklist for each lift planned. Submit SLP to the Contracting Officer for approval within 15 calendar days in advance of planned lift.

1.13 HOT WORK

1.13.1 Permit and Personnel Requirements

Submit and obtain a written permit prior to performing "Hot Work" (i.e. welding or cutting) or operating other flame-producing/spark producing devices, from the MCAS Cherry Point Fire Department. A permit is required

from the Explosives Safety Office for work in and around where explosives are processed, stored, or handled. CONTRACTORS ARE REQUIRED TO MEET ALL CRITERIA BEFORE A PERMIT IS ISSUED. Provide at least two 20 pound 4A:20 BC rated extinguishers for normal "Hot Work". The extinguishers must be current inspection tagged, and contain an approved safety pin and tamper resistant seal. It is also mandatory to have a designated FIRE WATCH for any "Hot Work" done at this activity. The Fire Watch must be trained in accordance with NFPA 51B and remain on-site for a minimum of 2 hours after completion of the task or as specified on the hot work permit.

When starting work in the facility, require personnel to familiarize themselves with the location of the nearest fire alarm boxes and place in memory the emergency Fire Department phone number. REPORT ANY FIRE, NO MATTER HOW SMALL, TO THE MCAS CHERRY POINT FIRE DEPARTMENT IMMEDIATELY.

1.13.2 Work Around Flammable Materials

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

Whenever these materials, except beryllium and chromium (VI), are encountered in indoor operations, local mechanical exhaust ventilation systems that are sufficient to reduce and maintain personal exposures to within acceptable limits must be used and maintained in accordance with manufacturer's instruction and supplemented by exceptions noted in EM 385-1-1, Section 06.H

1.14 CONFINED SPACE ENTRY REQUIREMENTS.

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

1.14.1 Entry Procedures

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

1.14.2 Forced Air Ventilation

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

1.14.3 Sewer Wet Wells

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

1.14.4 Rescue Procedures and Coordination with Local Emergency Responders

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

1.15 SEVERE STORM PLAN

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

- a. Secure outside equipment and materials and place materials that could be damaged in protected areas.
- b. Check surrounding area, including roof, for loose material, equipment, debris, and other objects that could be blown away or against existing facilities.
- c. Ensure that temporary erosion controls are adequate.

PART 2 PRODUCTS

PART 3 EXECUTION

3.1 CONSTRUCTION AND OTHER WORK

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

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

- a. Hard Hat
- b. Long Pants
- c. Appropriate Safety Shoes
- d. Appropriate Class Reflective Vests

3.1.1 Worksite Communication

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

3.1.2 Hazardous Material Exclusions

Notwithstanding any other hazardous material used in this contract, radioactive materials or instruments capable of producing ionizing/non-ionizing radiation (with the exception of radioactive material

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

3.1.3 Unforeseen Hazardous Material

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

3.2 PRE-OUTAGE COORDINATION MEETING

Apply for utility outages at least 15 days in advance. As a minimum, the request must include the location of the outage, utilities being affected, duration of outage and any necessary sketches. Special requirements for electrical outage requests are contained elsewhere in this specification section. Once approved, and prior to beginning work on the utility system requiring shut down, attend a pre-outage coordination meeting with the Contracting Officer to review the scope of work and the lock-out/tag-out procedures for worker protection. No work will be performed on energized electrical circuits unless proof is provided that no other means exist.

3.3 CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT)

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

3.4 FALL PROTECTION PROGRAM

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

3.4.1 Training

Institute a fall protection training program. As part of the FP&P Program, provide training for each employee who might be exposed to fall hazards. Provide training by a competent person for fall protection in accordance with EM 385-1-1, Section 21.C. Document training and practical application

of the competent person in accordance with EM 385-1-1, Section 21.C.04 and ASSE/SAFE Z359.2 in the AHA.

3.4.2 Fall Protection Equipment and Systems

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

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

3.4.2.1 Additional Personal Fall Protection

In addition to the required fall protection systems, other protection such as safety skiffs, personal floatation devices, and life rings, are required when working above or next to water in accordance with EM 385-1-1, Sections 21.0 through 21.0.06. Personal fall protection systems and equipment are required when working from an articulating or extendible boom, swing stages, or suspended platform. In addition, personal fall protection systems are required when operating other equipment such as scissor lifts. The need for tying-off in such equipment is to prevent ejection of the employee from the equipment during raising, lowering, travel, or while performing work.

3.4.2.2 Personal Fall Protection Harnesses

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

3.4.3 Fall Protection for Roofing Work

Implement fall protection controls based on the type of roof being constructed and work being performed. Evaluate the roof area to be accessed for its structural integrity including weight-bearing capabilities for the projected loading.

- a. Low Sloped Roofs:

(1) For work within 6 feet of an edge, on a roof having a slope less than or equal to 4:12 (vertical to horizontal), protect personnel from falling by use of personal fall arrest/restraint systems, guardrails, or safety nets. A safety monitoring system is not adequate fall protection and is not authorized. Provide in accordance with 29 CFR 1926.500.

(2) For work greater than 6 feet from an edge, erect and install warning lines in accordance with 29 CFR 1926.500 and EM 385-1-1, Section L.

- b. Steep-Sloped Roofs: Work on a roof having a slope greater than 4:12 (vertical to horizontal) requires a personal fall arrest system, guardrails with toe-boards, or safety nets. This requirement also applies to residential or housing type construction.

3.4.4 Horizontal Lifelines (HLL)

Provide HLL in accordance with EM 385-1-1, Section 21.I.08.d.2. Commercially manufactured horizontal lifelines (HLL) must be designed, installed, certified and used, under the supervision of a qualified person, for fall protection as part of a complete fall arrest system which maintains a safety factor of 2 (29 CFR 1926.500). The competent person for fall protection may (if deemed appropriate by the qualified person) supervise the assembly, disassembly, use and inspection of the HLL system under the direction of the qualified person. Locally manufactured HLLs are not acceptable unless they are custom designed for limited or site specific applications by a Registered Professional Engineer who is qualified in designing HLL systems.

3.4.5 Guardrails and Safety Nets

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

3.4.6 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 AHA for the phase of work, in the FP&P Plan, and the APP. The plan must comply with the requirements of EM 385-1-1, ASSE/SAFE Z359.2, and ASSE/SAFE Z359.4.

3.5 WORK PLATFORMS

3.5.1 Scaffolding

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

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

- b. Ladders commonly provided by scaffold system manufacturers are prohibited for accessing scaffold platforms greater than 20 feet maximum in height.
- c. An adequate gate is required.
- d. Employees performing scaffold erection and dismantling must be qualified.
- e. Scaffold must be capable of supporting at least four times the maximum intended load or without appropriate fall protection as delineated in the accepted FP&P plan.
- f. Stationary scaffolds must be attached to structural building components to safeguard against tipping forward or backward.
- g. Special care must be given to ensure scaffold systems are not overloaded.
- h. Side brackets used to extend scaffold platforms on self-supported scaffold systems for the storage of material are prohibited. The first tie-in must be at the height equal to 4 times the width of the smallest dimension of the scaffold base.
- i. Scaffolding other than suspended types must bear on base plates upon wood mudsills (2 in x 10 in x 8 in minimum) or other adequate firm foundation.
- j. Scaffold or work platform erectors must have fall protection during the erection and dismantling of scaffolding or work platforms that are more than six feet.
- k. Delineate fall protection requirements when working above six feet or above dangerous operations in the FP&P Plan and AHA for the phase of work.

3.5.2 Elevated Aerial Work Platforms (AWPs)

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

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

3.6 EQUIPMENT

3.6.1 Material Handling Equipment (MHE)

- a. MHE such as forklifts must not be modified with work platform attachments for supporting employees unless specifically delineated in

the manufacturer's printed operating instructions. MHE fitted with personnel work platform attachments are prohibited from traveling or positioning while personnel are working on the platform.

- b. The use of hooks on equipment for lifting of material must be in accordance with manufacturer's printed instructions. MHE Operators must be trained in accordance with OSHA 29 CFR 1910, Subpart N.
- c. Operators of forklifts or power industrial trucks must be licensed in accordance with OSHA.

3.6.2 Load Handling Equipment (LHE)

- a. Equip cranes and derricks as specified in EM 385-1-1, Section 16.
- b. Notify the Contracting Officer 15 working days in advance of any LHE entering the activity, in accordance with EM 385-1-1, Section 16.A.02, so that necessary quality assurance spot checks can be coordinated. Contractor's operator must remain with the crane during the spot check. Rigging gear must comply with OSHA, ASME B30.9 Standards safety standards.
- c. Comply with the LHE manufacturer's specifications and limitations for erection and operation of cranes and hoists used in support of the work. Perform erection under the supervision of a designated person (as defined in ASME B30.5). Perform all testing in accordance with the manufacturer's recommended procedures.
- d. Comply with ASME B30.5 for mobile and locomotive cranes, ASME B30.22 for articulating boom cranes, ASME B30.3 for construction tower cranes, ASME B30.8 for floating cranes and floating derricks, ASME B30.9 for slings, ASME B30.20 for below the hook lifting devices and ASME B30.26 for rigging hardware.
- e. Under no circumstance must a Contractor make a lift at or above 90 percent of the cranes rated capacity in any configuration.
- f. When operating in the vicinity of overhead transmission lines, operators and riggers must be alert to this special hazard and follow the requirements of EM 385-1-1 Section 11, and ASME B30.5 or ASME B30.22 as applicable.
- g. Do not use crane suspended personnel work platforms (baskets) unless the Contractor proves that using any other access to the work location would provide a greater hazard to the workers or is impossible. Do not lift personnel with a line hoist or friction crane. Additionally, submit a specific AHA for this work to the Contracting Officer. Ensure the activity and AHA are thoroughly reviewed by all involved personnel.
- h. Inspect, maintain, and recharge portable fire extinguishers as specified in NFPA 10, Standard for Portable Fire Extinguishers.
- i. All employees must keep clear of loads about to be lifted and of suspended loads.
- j. Use cribbing when performing lifts on outriggers.
- k. The crane hook/block must be positioned directly over the load. Side loading of the crane is prohibited.

- l. A physical barricade must be positioned to prevent personnel access where accessible areas of the LHE's rotating superstructure poses a risk of striking, pinching or crushing personnel.
- m. Maintain inspection records in accordance by EM 385-1-1, Section 16.D, including shift, monthly, and annual inspections, the signature of the person performing the inspection, and the serial number or other identifier of the LHE that was inspected. Records must be available for review by the Contracting Officer.
- n. Maintain written reports of operational and load testing in accordance with EM 385-1-1, Section 16.F, listing the load test procedures used along with any repairs or alterations performed on the LHE. Reports must be available for review by the Contracting Officer.
- o. Certify that all LHE operators have been trained in proper use of all safety devices (e.g. anti-two block devices).
- p. Take steps to ensure that wind speed does not contribute to loss of control of the load during lifting operations. At wind speeds greater than 20 mph, the operator, rigger and lift supervisor must cease all crane operations, evaluate conditions and determine if the lift may proceed. Base the determination to proceed or not on wind calculations per the manufacturer and a reduction in LHE rated capacity if applicable. Include this maximum wind speed determination as part of the activity hazard analysis plan for that operation.

3.6.3 Machinery and Mechanized Equipment

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

3.6.4 USE OF EXPLOSIVES

Explosives must not be used or brought to the project site without prior written approval from the Contracting Officer. Such approval does not relieve the Contractor of responsibility for injury to persons or for damage to property due to blasting operations.

Storage of explosives, when permitted on Government property, must be only where directed and in approved storage facilities. These facilities must be kept locked at all times except for inspection, delivery, and withdrawal of explosives.

3.7 EXCAVATIONS

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

3.7.1 Utility Locations

Provide a third party, independent, private utility locating company to

positively identify underground utilities in the work area in addition to any station locating service and coordinated with the station utility department.

3.7.2 Utility Location Verification

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

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

Utilities located within and under concrete slabs or pier structures, bridges, parking areas, and the like, are extremely difficult to identify. Whenever contract work involves chipping, saw cutting, or core drilling through concrete, bituminous asphalt or other impervious surfaces, the existing utility location must be coordinated with station utility departments in addition to location and depth verification by a third party, independent, private locating company. The third party, independent, private locating company must locate utility depth by use of Ground Penetrating Radar (GPR), X-ray, bore scope, or ultrasound prior to the start of demolition and construction. Outages to isolate utility systems must be used in circumstances where utilities are unable to be positively identified. The use of historical drawings does not alleviate the Contractor from meeting this requirement.

3.8 ELECTRICAL

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

3.8.1 Conduct of Electrical Work

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

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

with and complies with these procedures and 29 CFR 1910.147.

3.8.2 Qualifications

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

3.8.3 Arc Flash

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

All personnel entering the identified arc flash protection boundary must be QPs and properly trained in NFPA 70E requirements and procedures. Unless permitted by NFPA 70E, no Unqualified Person is permitted to approach nearer than the Limited Approach Boundary of energized conductors and circuit parts. Training must be administered by an electrically qualified source and documented.

3.8.4 Grounding

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

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

3.8.5 Testing

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

-- End of Section --

SECTION 01 45 00.00 20

QUALITY CONTROL

05/16

PART 1 GENERAL

1.1 REFERENCES

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

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1 (2014) Safety and Health Requirements Manual

1.2 SUBMITTALS

Government approval is required for all submittals in accordance with Section 01 33 00 SUBMITTAL PROCEDURES

SD-01 Preconstruction Submittals

Construction Quality Control (QC) Plan

Submit a Construction QC Plan within 20 days after receipt of Notice of Award. The QC Plan shall include a preliminary submittal of the list of definable features of work that shall cover the first 90 days of construction.

Contract Document Review

SD-07 Certificates

CA Resume

1.3 INFORMATION FOR THE CONTRACTING OFFICER

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

Deliver the following to the Contracting Officer during Construction:

- a. CQC Report: Submit the report by 10:00 AM the next working day after each day that work is performed and for every seven consecutive calendar days of no-work.
- b. Contractor Production Report: Submit the report by 10:00 AM the next working day after each day that work is performed and for every seven consecutive calendar days of no-work, attached to the CQC Report.

- c. Preparatory Phase Checklist: Submit the report in the same manner as the CQC Report for each Preparatory Phase held.
- d. Initial Phase Checklist: Submit the report in the same manner as the CQC Report for each Initial Phase held.
- e. QC Specialist Reports: Submit the report by 10:00 AM the next working day after each day that work is performed.
- f. Field Test Reports: Within two working days after the test is performed, submit the report as an attachment to the CQC Report.
- g. Monthly Summary Report of Tests: Submit the report as an attachment to the CQC Report at the end of each month.
- h. Testing Plan and Log: Submit the report as an attachment to the CQC Report, at the end of each month. Provide a copy of the final Testing Plan and Log to the OMSI preparer for inclusion into the OMSI documentation.
- i. Rework Items List: Submit lists containing new entries daily, in the same manner as the CQC Report.
- j. CQC Meeting Minutes: Within two working days after the meeting is held, submit the report as an attachment to the CQC Report.
- k. QC Certifications: As required by the paragraph entitled "QC Certifications."
- l. Special Inspection Report: Submit the Special Inspection reports, in the same manner as the CQC Report.

1.4 QC PROGRAM REQUIREMENTS

Establish and maintain a QC program as described in this section. This QC program is a key element in meeting the objectives of NAVFAC Commissioning. The QC program consists of a QC Organization, QC Plan, QC Plan Meeting(s), a Coordination and Mutual Understanding Meeting, QC meetings, three phases of control, submittal review and approval, testing, completion inspections, QC certifications, [independent Special Inspections in accordance with Section 01 45 35 SPECIAL INSPECTIONS,] and documentation necessary to provide materials, equipment, workmanship, fabrication, construction and operations which comply with the requirements of this Contract. The QC program must cover on-site and off-site work and be keyed to the work sequence. No construction work or testing may be performed unless the QC Manager is on the work site. The QC Manager must report to an officer of the firm and not be subordinate to the Project Superintendent or the Project Manager. The QC Manager, Project Superintendent and Project Manager must work together effectively. Although the QC Manager is the primary individual responsible for quality control, all individuals will be held responsible for the quality of work on the job.

1.4.1 Commissioning

Commissioning (Cx) is a systematic process of ensuring that all building systems meet the requirements and perform interactively according to the Contract. The QC Program is a key to this process by coordinating, verifying and documenting measures to achieve the following objectives:

- a. Verify and document that the applicable equipment and systems are installed in accordance with the design intent as expressed through the Contract and according to the manufacturer's recommendations and industry accepted minimum standards.
- b. Verify and document that equipment and systems receive complete operational checkout by the installing contractors.
- c. Verify and document proper performance of equipment and systems.
- d. Verify that Operation and Maintenance (O&M) documentation is complete.
- e. Verify the Training Plan and training materials are accurate and provide correct instruction and documentation on the critical elements of the products, materials, and systems in the constructed facility. Verify that all identified Government operating personnel are trained.
- f. Verify and document that all contract requirements for LEED fundamental commissioning are met.

1.4.2 Acceptance of the Construction Quality Control (QC) Plan

Acceptance of the QC Plan is required prior to the start of construction. The Contracting Officer reserves the right to require changes in the QC Plan and operations as necessary, including removal of personnel, to ensure the specified quality of work. The Contracting Officer reserves the right to interview any member of the QC organization at any time in order to verify the submitted qualifications. All QC organization personnel are subject to acceptance by the Contracting Officer. The Contracting Officer may require the removal of any individual for non-compliance with quality requirements specified in the Contract.

1.4.3 Preliminary Construction Work Authorized Prior to Acceptance

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

1.4.4 Notification of Changes

Notify the Contracting Officer, in writing, of any proposed changes in the QC Plan or changes to the QC organization personnel, a minimum of 10 work days prior to a proposed change. Proposed changes are subject to acceptance by the Contracting Officer.

1.4.5 Special Inspections

Perform all required Special Inspections per Section 01 45 35 SPECIAL INSPECTIONS, the statement of Special Inspections and the Schedule of Special Inspections.

1.5 QC ORGANIZATION

1.5.1 QC Manager

1.5.1.1 Duties

Provide a QC Manager at the work site to implement and manage the QC program,

and to serve as the Site Safety and Health Officer (SSHO) as detailed in Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS. In addition to implementing and managing the QC program, the QC Manager may perform the duties of Project Superintendent. The QC Manager is required to attend the partnering meetings, QC Plan Meetings, Coordination and Mutual Understanding Meeting, conduct the QC meetings, perform the three phases of control, perform submittal review and approval, ensure testing is performed and provide QC certifications and documentation required in this Contract. The QC Manager is responsible for managing and coordinating the three phases of control and documentation performed by testing laboratory personnel and any other inspection and testing personnel required by this Contract. The QC Manager is the manager of all QC activities.

1.5.1.2 Qualifications

An individual with a minimum of 10 years combined experience in the following positions: Project Superintendent, QC Manager, Project Manager, Project Engineer or Construction Manager on similar size and type construction contracts which included the major trades that are part of this Contract. The individual must have at least two years experience as a QC Manager. The individual must be familiar with the requirements of EM 385-1-1, and have experience in the areas of hazard identification, safety compliance, and sustainability. Or a graduate of a four year accredited college or university program in one of the following disciplines: Engineering, Architecture, Construction Management, Engineering Technology, Building Construction, or Building Science, with a minimum of 05 years experience as a Project Superintendent, QC Manager, Project Manager, Project Engineer or Construction Manager on similar size and type construction contracts which included the major trades that are part of this Contract. The individual must have at least two years experience as a QC Manager. The individual must be familiar with the requirements of EM 385-1-1, and have experience in the areas of hazard identification, safety compliance, and sustainability.

1.5.2 Commissioning Authority

1.5.2.1 Duties

Provide a Commissioning Authority (CA) as key person for the Cx and documentation thereof, who is subordinate to the QC Manager. The CA directs and coordinates Cx activities and submits Cx reports to the Contracting Officer to meet the submittal and reporting requirements of Commissioning and develops the commissioning plan. The CA coordinates the actions of the QC Specialists, Testing Laboratory personnel, eOMSI Preparer, and other inspection and testing personnel required by this Contract for building Cx.

1.5.2.2 Qualifications

The CA must be certified as a commissioning professional by the Associated Air Balance Council (AABC) Commissioning Group (ACG), the Association of Energy Engineers (AEE), the American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE), the Commissioning Process Management Professional (CPMP), the Building Commissioning Association (BCA), the National Environmental Balancing Bureau (NEBB), or the University of Wisconsin - Madison (UWM). CA resume is required, providing education, experience and management capabilities on at least two similar size and type contracts. The CA may not have been involved with the project design, construction management, or supervision, and must be with a third-party

firm that is not on the design team.

1.5.3 Construction Quality Management Training

In addition to the above experience and education requirements, the QC Manager must have completed the course entitled "Construction Quality Management (CQM) for Contractors." If the QC Manager does not have a current certification, they must obtain the CQM for Contractors course certification within 90 days of award. This course is periodically offered by the Naval Facilities Engineering Command and the Army Corps of Engineers. Contact the Contracting Officer for information on the next scheduled class.

1.5.4 Alternate QC Manager Duties and Qualifications

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

1.5.5 Assistant QC Manager Duties and Qualifications

Provide an assistant to the QC Manager at the work site to perform the three phases of control, perform submittal review, ensure testing is performed, and prepare QC certifications and documentation required by this Contract. The individual must be familiar with the requirements of EM 385-1-1, and have experience in the areas of hazard identification and safety compliance.

Provide an assistant to the QC Manager at the work site to perform the three phases of control, perform submittal review, ensure testing is performed, and prepare QC certifications and documentation required by this Contract. The Assistant QC Manager must be on the work site during supplemental work shifts and perform the duties of the QC Manager during such supplemental shift work. The individual must be familiar with the requirements of EM 385-1-1, and have experience in the areas of hazard identification and safety compliance.

1.6 QUALITY CONTROL (QC) PLAN

1.6.1 Construction Quality Control (QC) Plan

1.6.1.1 Requirements

Provide, for acceptance by the Contracting Officer, a Construction QC Plan submitted in a three-ring binder that includes a table of contents, with major sections identified with tabs, with pages numbered sequentially, and that documents the proposed methods and responsibilities for accomplishing quality control commissioning activities during the construction of the project:

- a. QC ORGANIZATION: A chart showing the QC organizational structure.
- b. NAMES AND QUALIFICATIONS: Names and qualifications, in resume format, for each person in the QC organization. Include the CQM for Contractors course certifications for the QC Manager and Alternate QC Manager as required by the paragraphs entitled "Construction Quality Management Training" and "Alternate QC Manager Duties and

Qualifications".

- c. DUTIES, RESPONSIBILITY AND AUTHORITY OF QC PERSONNEL: Duties, responsibilities, and authorities of each person in the QC organization.
- d. OUTSIDE ORGANIZATIONS: A listing of outside organizations, such as architectural and consulting engineering firms, that will be employed by the Contractor and a description of the services these firms will provide.
- e. APPOINTMENT LETTERS: Letters signed by an officer of the firm appointing the QC Manager and Alternate QC Manager and stating that they are responsible for implementing and managing the QC program as described in this Contract. Include in this letter the responsibility of the QC Manager and Alternate QC Manager to implement and manage the three phases of control, and their authority to stop work which is not in compliance with the Contract. Letters of direction are to be issued by the QC Manager to [the Assistant QC Manager and]all other QC Specialists outlining their duties, authorities, and responsibilities. Include copies of the letters in the QC Plan.
- f. SUBMITTAL PROCEDURES AND INITIAL SUBMITTAL REGISTER: Procedures for reviewing, approving, and managing submittals. Provide the name(s) of the person(s) in the QC organization authorized to review and certify submittals prior to approval. Provide the initial submittal of the Submittal Register as specified in Section 01 33 00 SUBMITTAL PROCEDURES.
- g. TESTING LABORATORY INFORMATION: Testing laboratory information required by the paragraphs entitled "Accreditation Requirements", as applicable.
- h. TESTING PLAN AND LOG: A Testing Plan and Log that includes the tests required, referenced by the specification paragraph number requiring the test, the frequency, and the person responsible for each test. Use Government forms to log and track tests.
- i. PROCEDURES TO COMPLETE REWORK ITEMS: Procedures to identify, record, track, and complete rework items. Use Government forms to record and track rework items.
- j. DOCUMENTATION PROCEDURES: Use Government form.
- k. LIST OF DEFINABLE FEATURES: A Definable Feature of Work (DFOW) is a task that is separate and distinct from other tasks and has control requirements and work crews unique to that task. A DFOW is identified by different trades or disciplines and is an item or activity on the construction schedule. Include in the list of DFOWs, but not be limited to, all critical path activities on the NAS. Include all activities for which this specification requires QC Specialists or specialty inspection personnel. Provide separate DFOWs in the Network Analysis Schedule for each design development stage and submittal package.
- l. PROCEDURES FOR PERFORMING THE THREE PHASES OF CONTROL: Identify procedures used to ensure the three phases of control to manage the quality on this project. For each DFOW, a Preparatory and Initial phase checklist will be filled out during the Preparatory and Initial phase meetings. Conduct the Preparatory and Initial Phases and

meetings with a view towards obtaining quality construction by planning ahead and identifying potential problems for each DFOW.

- m. PERSONNEL MATRIX: A personnel matrix showing for each section of the specification who will review and approve submittals, who will perform and document the three phases of control, and who will perform and document the testing.
- n. PROCEDURES FOR COMPLETION INSPECTION: Procedures for identifying and documenting the completion inspection process. Include in these procedures the responsible party for punch out inspection, pre-final inspection, and final acceptance inspection.
- o. TRAINING PROCEDURES AND TRAINING LOG: Procedures for coordinating and documenting the training of personnel required by the Contract.
- p. ORGANIZATION AND PERSONNEL CERTIFICATIONS LOG: Procedures for coordinating, tracking and documenting all certifications on subcontractors, testing laboratories, suppliers, personnel, etc. QC Manager will ensure that certifications are current, appropriate for the work being performed, and will not lapse during any period of the contract that the work is being performed.

1.7 COORDINATION AND MUTUAL UNDERSTANDING MEETING

After submission of the QC Plan, and prior to Government approval and the start of construction, the QC Manager will meet with the Contracting Officer to present the QC program required by this Contract. When a new QC Manager is appointed, the coordination and mutual understanding meeting must be repeated.

1.7.1 Purpose

The purpose of this meeting is to develop a mutual understanding of the QC details, including documentation, administration for on-site and off-site work, design intent, Cx, environmental requirements and procedures, coordination of activities to be performed, [Special Inspections,] and the coordination of the Contractor's management, production, and QC personnel. At the meeting, the Contractor will be required to explain in detail how three phases of control will be implemented for each DFOW, as well as how each DFOW will be affected by each management plan or requirement as listed below:

- a. Waste Management Plan.
- b. IAQ Management Plan.
- c. Procedures for noise and acoustics management.
- d. Environmental Protection Plan.
- e. Environmental regulatory requirements.
- f. Cx Plan.

1.7.2 Coordination of Activities

Coordinate activities included in various sections to assure efficient and orderly installation of each component. Coordinate operations included under different sections that are dependent on each other for proper installation and operation. Schedule construction operations with consideration for indoor air quality as specified in the IAQ Management Plan. Coordinate prefunctional tests and startup testing with Cx.

1.7.3 Attendees

As a minimum, the Contractor's personnel required to attend include an officer of the firm, the Project Manager, Project Superintendent, QC Manager, Alternate QC Manager, and subcontractor representatives. Each subcontractor who will be assigned QC responsibilities must have a principal of the firm at the meeting. Minutes of the meeting will be prepared by the QC Manager and signed by the Contractor[, the A/E] and the Contracting Officer. Provide a copy of the signed minutes to all attendees[and include in the QC Plan].

1.8 QC MEETINGS

After the start of construction, conduct weekly QC meetings by the QC Manager at the work site with the Project Superintendent. The QC Manager is to prepare the minutes of the meeting and provide a copy to the Contracting Officer within two working days after the meeting. The Contracting Officer may attend these meetings. As a minimum, accomplish the following at each meeting:

- a. Review the minutes of the previous meeting.
- b. Review the schedule and the status of work and rework.
- c. Review the status of submittals.
- d. Review the work to be accomplished in the next two weeks and documentation required.
- e. Resolve QC and production problems (RFI, etc.).
- f. Address items that may require revising the QC Plan.
- g. Review Accident Prevention Plan (APP).
- h. Review environmental requirements and procedures.
- i. Review Waste Management Plan.
- j. Review IAQ Management Plan.
- k. Review Environmental Management Plan.
- l. Review the status of training completion.
- m. Review Cx Plan and progress.

1.9 DESIGN REVIEW AND DOCUMENTATION

1.9.1 Design Review

The CA must review design documents to verify that each commissioned system meets the design intent relative to functionality, energy performance, water performance, maintainability, sustainability, system cost, indoor environmental quality, and local environmental impacts. Fully document design review in written report.

1.9.2 Contract Document Review

The CA must review the Contract documents to verify that Cx is adequately specified, and that each commissioned system is likely to meet the design intent relative to functionality, energy performance, water performance, maintainability, sustainability, system cost, indoor environmental quality, and local environmental impacts. Fully document contract document review in written report.

1.10 THREE PHASES OF CONTROL

Adequately cover both on-site and off-site work with the Three Phases of Control and include the following for each DFOW.

1.10.1 Preparatory Phase

Notify the Contracting Officer at least two work days in advance of each preparatory phase meeting. The meeting will be conducted by the QC Manager and attended by the foreman responsible for the DFOW. When the DFOW will be accomplished by a subcontractor, that subcontractor's foreman must attend the preparatory phase meeting. Document the results of the preparatory phase actions in the daily Contractor Quality Control Report and in the Preparatory Phase Checklist. Perform the following prior to beginning work on each DFOW:

- a. Review each paragraph of the applicable specification sections.
- b. Review the Contract drawings.
- c. Verify that field measurements are as indicated on construction and/or shop drawings before confirming product orders, in order to minimize waste due to excessive materials.
- d. Verify that appropriate shop drawings and submittals for materials and equipment have been submitted and approved. Verify receipt of approved factory test results, when required.
- e. Review the testing plan and ensure that provisions have been made to provide the required QC testing.
- f. Review special inspections required by Section 01 45 35 SPECIAL INSPECTION, the statement of special inspections and the schedule of special inspections.
- g. Examine the work area to ensure that the required preliminary work has been completed.
- h. Coordinate the schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to

stored materials.

- i. Arrange for the return of shipping/packaging materials, such as wood pallets, where economically feasible.
- j. Examine the required materials, equipment and sample work to ensure that they are on hand and conform to the approved shop drawings and submitted data and are properly stored.
- k. Discuss specific controls used and construction methods, construction tolerances, workmanship standards, and the approach that will be used to provide quality construction by planning ahead and identifying potential problems for each DFOW.
- l. Review the APP and appropriate Activity Hazard Analysis (AHA) to ensure that applicable safety requirements are met, and that required Material Safety Data Sheets (MSDS) are submitted.
- m. Review the Cx Plan and ensure all preliminary work items have been completed and documented.

1.10.2 Initial Phase

Notify the Contracting Officer at least two work days in advance of each initial phase. When construction crews are ready to start work on a DFOW, conduct the initial phase with the foreman responsible for that DFOW. Observe the initial segment of the DFOW to ensure that the work complies with Contract requirements. Document the results of the initial phase in the Initial Phase Checklist. Repeat the initial phase for each new crew to work on-site, or when acceptable levels of specified quality are not being met. Perform the following for each DFOW:

- a. Establish level of workmanship and verify that it meets the minimum acceptable workmanship standards. Compare with required sample panels as appropriate.
- b. Resolve any workmanship issues.
- c. Ensure that testing is performed by the approved laboratory.
- d. Check work procedures for compliance with the APP and the appropriate AHA to ensure that applicable safety requirements are met.
- e. Review project specific work plans (i.e. Cx, HAZMAT Abatement, Stormwater Management) to ensure all preparatory work items have been completed and documented.
- f. Coordinate scheduled work with special inspections required by Section 01 45 35 SPECIAL INSPECTIONS, the statement of special inspections and the schedule of special inspections.

1.10.3 Follow-Up Phase

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

- a. Ensure the work is in compliance with Contract requirements.

- b. Maintain the quality of workmanship required.
- c. Ensure that testing is performed by the approved laboratory.
- d. Ensure that rework items are being corrected.
- e. Assure manufacturers representatives have performed necessary inspections if required and perform safety inspections.
- f. Review the Cx Plan and ensure all work items, testing, and documentation has been completed.
- g. Coordinate scheduled work with special inspections required by Section 01 45 35 SPECIAL INSPECTIONS, the statement of special inspections and the schedule of special inspections.

1.10.4 Additional Preparatory and Initial Phases

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

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

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

1.11 SUBMITTAL REVIEW AND APPROVAL

Procedures for submission, review and approval of submittals are described in Section 01 33 00 SUBMITTAL PROCEDURES.

1.12 TESTING

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

1.12.1 Accreditation Requirements

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

1.12.2 Laboratory Accreditation Authorities

Laboratory Accreditation Authorities include the National Voluntary Laboratory Accreditation Program (NVLAP) administered by the National Institute of Standards and Technology at <http://ts.nist.gov/ts/htdocs/210/214/214.htm> , the American Association of State Highway and Transportation Officials (AASHTO) program at <http://www.amrl.net/amrlsitefinity/default/aap.aspx> , International

Accreditation Services, Inc. (IAS) at <http://www.iasonline.org>, U. S. Army Corps of Engineers Materials Testing Center (MTC) at <http://gsl.erdc.usace.army.mil/SL/MTC/>, the American Association for Laboratory Accreditation (A2LA) program at <http://www.a2la.org/>, the Washington Association of Building Officials (WABO) at <http://www.wabo.org/> (Approval authority for WABO is limited to projects within Washington State), and the Washington Area Council of Engineering Laboratories (WACEL) at <http://wacel.org/fmi/xsl/wacel/index.xsl> (Approval authority by WACEL is limited to projects within Facilities Engineering Command (FEC) Washington geographical area).

1.12.3 Capability Check

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

1.12.4 Test Results

Cite applicable Contract requirements, tests or analytical procedures used. Provide actual results and include a statement that the item tested or analyzed conforms or fails to conform to specified requirements. If the item fails to conform, notify the Contracting Officer immediately. Conspicuously stamp the cover sheet for each report in large red letters "CONFORMS" or "DOES NOT CONFORM" to the specification requirements, whichever is applicable. Test results must be signed by a testing laboratory representative authorized to sign certified test reports. Furnish the signed reports, certifications, and other documentation to the Contracting Officer via the QC Manager. Furnish a summary report of field tests at the end of each month, in accordance with paragraph INFORMATION FOR THE CONTRACTING OFFICER.

1.12.5 Test Reports and Monthly Summary Report of Tests

Furnish the signed reports, certifications, and a summary report of field tests at the end of each month to the Contracting Officer. Attach a copy of the summary report to the last daily Contractor Quality Control Report of each month. Provide a copy of the signed test reports and certifications to the OMSI preparer for inclusion into the OMSI documentation.

1.13 QC CERTIFICATIONS

1.13.1 CQC Report Certification

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

1.13.2 Invoice Certification

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

1.13.3 Completion Certification

Upon completion of work under this Contract, the QC Manager must furnish a certificate to the Contracting Officer attesting that "the work has been completed, inspected, tested and is in compliance with the Contract." Provide a copy of this final QC Certification for completion to the OMSI preparer for inclusion into the OMSI documentation.

1.14 COMPLETION INSPECTIONS

1.14.1 Punch-Out Inspection

Near the completion of all work or any increment thereof, established by a completion time stated in the Contract Clause entitled "Commencement, Prosecution, and Completion of Work," or stated elsewhere in the specifications, the QC Manager and the CA must conduct an inspection of the work and develop a "punch list" of items which do not conform to the approved drawings, specifications and Contract. Include in the punch list any remaining items on the "Rework Items List", which were not corrected prior to the Punch-Out Inspection. Include within the punch list the estimated date by which the deficiencies will be corrected. Provide a copy of the punch list to the Contracting Officer. The QC Manager, or staff, must make follow-on inspections to ascertain that all deficiencies have been corrected. Once this is accomplished, notify the Government that the facility is ready for the Government "Pre-Final Inspection".

1.14.2 Pre-Final Inspection

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

1.14.3 Final Acceptance Inspection

Notify the Contracting Officer at least 14 calendar days prior to the date a final acceptance inspection can be held. State within the notice that all items previously identified on the pre-final punch list will be corrected and acceptable, along with any other unfinished Contract work, by the date of the final acceptance inspection. The Contractor must be represented by the QC Manager, the Project Superintendent, the CA, and others deemed necessary. Attendees for the Government will include the Contracting Officer, other FEAD/ROICC personnel, and personnel representing the Client. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the Contracting Officer to bill the Contractor for the Government's additional inspection cost in accordance with the Contract Clause entitled "Inspection of Construction."

1.15 DOCUMENTATION

Maintain current and complete records of on-site and off-site QC program operations and activities.

1.15.1 Construction Documentation

Reports are required for each day that work is performed and must [be attached to]the Contractor Quality Control Report prepared for the same day. Maintain current and complete records of on-site and off-site QC program operations and activities. The forms identified under the paragraph "INFORMATION FOR THE CONTRACTING OFFICER" will be used. Reports are required for each day work is performed. Account for each calendar day throughout the life of the Contract. Every space on the forms must be filled in. Use N/A if nothing can be reported in one of the spaces. The Project Superintendent and the QC Manager must prepare and sign the Contractor Production and CQC Reports, respectively. The reporting of work must be identified by terminology consistent with the construction schedule. In the "remarks" sections of the reports, enter pertinent information including directions received, problems encountered during construction, work progress and delays, conflicts or errors in the drawings or specifications, field changes, safety hazards encountered, instructions given and corrective actions taken, delays encountered and a record of visitors to the work site, quality control problem areas, deviations from the QC Plan, construction deficiencies encountered, meetings held. For each entry in the report(s), identify the Schedule Activity No. that is associated with the entered remark.

1.15.2 Quality Control Validation

Establish and maintain the following in a series of three ring binders. Binders must be divided and tabbed as shown below. These binders must be readily available to the Contracting Officer during all business hours.

- a. All completed Preparatory and Initial Phase Checklists, arranged by specification section.
- b. All milestone inspections, arranged by Activity Number.
- c. An up-to-date copy of the Testing Plan and Log with supporting field test reports, arranged by specification section.
- d. Copies of all contract modifications, arranged in numerical order. Also include documentation that modified work was accomplished.
- e. An up-to-date copy of the Rework Items List.
- f. Maintain up-to-date copies of all punch lists issued by the QC staff to the Contractor and Sub-Contractors and all punch lists issued by the Government.
- g. Commissioning documentation including Cx checklists, schedules, tests, and reports.
- h. Special inspection reports.

1.15.3 Testing Plan and Log

As tests are performed, [the CA] [and] [the QC Manager] will record on the "Testing Plan and Log" the date the test was performed and the date the test results were forwarded to the Contracting Officer. Attach a copy of the updated "Testing Plan and Log" to the last daily CQC Report of each month, per the paragraph "INFORMATION FOR THE CONTRACTING OFFICER". Provide a copy of the final "Testing Plan and Log" to the OMSI preparer for

inclusion into the OMSI documentation.

1.15.4 Rework Items List

The QC Manager must maintain a list of work that does not comply with the Contract, identifying what items need to be reworked, the date the item was originally discovered, the date the item will be corrected by, and the date the item was corrected. There is no requirement to report a rework item that is corrected the same day it is discovered. [Attach a copy of the "Rework Items List" to the last daily CQC Report of each month.]The Contractor is responsible for including those items identified by the Contracting Officer.

1.15.5 As-Built Drawings

The QC Manager is required to ensure the as-built drawings, required by Section 01 78 00 CLOSEOUT SUBMITTALS are kept current on a daily basis and marked to show deviations which have been made from the Contract drawings. Ensure each deviation has been identified with the appropriate modifying documentation (e.g. PC No., Modification No., Request for Information No., etc.). The QC Manager must initial each revision. Upon completion of work, the QC Manager will furnish a certificate attesting to the accuracy of the as-built drawings prior to submission to the Contracting Officer.

1.16 NOTIFICATION ON NON-COMPLIANCE

The Contracting Officer will notify the Contractor of any detected non-compliance with the Contract. Take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, is deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders will be made the subject of claim for extension of time for excess costs or damages by the Contractor.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 PREPARATION

Designate receiving/storage areas for incoming material to be delivered according to installation schedule and to be placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication. Store and handle materials in a manner as to prevent loss from weather and other damage. Keep materials, products, and accessories covered and off the ground, and store in a dry, secure area. Prevent contact with material that may cause corrosion, discoloration, or staining. Protect all materials and installations from damage by the activities of other trades.

-- End of Section --

SECTION 01 57 19

TEMPORARY ENVIRONMENTAL CONTROLS

11/15

PART 1 GENERAL

1.1 REFERENCES

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

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA SW-846 (Third Edition; Update IV) Test Methods
for Evaluating Solid Waste:
Physical/Chemical Methods

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

29 CFR 1910.120 Hazardous Waste Operations and Emergency
Response

40 CFR 112 Oil Pollution Prevention

40 CFR 122.26 Storm Water Discharges (Applicable to
State NPDES Programs, see section 123.25)

40 CFR 241 Guidelines for Disposal of Solid Waste

40 CFR 243 Guidelines for the Storage and Collection
of Residential, Commercial, and
Institutional Solid Waste

40 CFR 258 Subtitle D Landfill Requirements

40 CFR 260 Hazardous Waste Management System: General

40 CFR 261 Identification and Listing of Hazardous
Waste

40 CFR 261.7 Residues of Hazardous Waste in Empty
Containers

40 CFR 262 Standards Applicable to Generators of
Hazardous Waste

40 CFR 262.31 Standards Applicable to Generators of
Hazardous Waste-Labeling

40 CFR 262.34 Standards Applicable to Generators of
Hazardous Waste-Accumulation Time

40 CFR 263 Standards Applicable to Transporters of
Hazardous Waste

40 CFR 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 265	Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 266	Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities
40 CFR 268	Land Disposal Restrictions
40 CFR 273	Standards For Universal Waste Management
40 CFR 273.2	Standards for Universal Waste Management - Batteries
40 CFR 273.4	Standards for Universal Waste Management - Mercury Containing Equipment
40 CFR 273.5	Standards for Universal Waste Management - Lamps
40 CFR 279	Standards for the Management of Used Oil
40 CFR 300	National Oil and Hazardous Substances Pollution Contingency Plan
40 CFR 300.125	National Oil and Hazardous Substances Pollution Contingency Plan - Notification and Communications
40 CFR 355	Emergency Planning and Notification
40 CFR 403	General Pretreatment Regulations for Existing and New Sources of Pollution
40 CFR 50	National Primary and Secondary Ambient Air Quality Standards
40 CFR 60	Standards of Performance for New Stationary Sources
40 CFR 61	National Emission Standards for Hazardous Air Pollutants
40 CFR 63	National Emission Standards for Hazardous Air Pollutants for Source Categories
40 CFR 64	Compliance Assurance Monitoring
40 CFR 745	Lead-Based Paint Poisoning Prevention in Certain Residential Structures
40 CFR 761	Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions

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 172.101	Hazardous Material Regulation-Purpose and Use of Hazardous Material Table
49 CFR 173	Shippers - General Requirements for Shipments and Packagings
49 CFR 178	Specifications for Packagings

1.2 DEFINITIONS

1.2.1 Class I and II Ozone Depleting Substance (ODS)

Class I ODS is defined in Section 602(a) of The Clean Air Act. A list of Class I ODS can be found on the EPA website at the following weblink.
<http://www.epa.gov/ozone/science/ods/classone.html>.

Class II ODS is defined in Section 602(s) of The Clean Air Act. A list of Class II ODS can be found on the EPA website at the following weblink.
<http://www.epa.gov/ozone/science/ods/classtwo.html>.

1.2.2 Contractor Generated Hazardous Waste

Contractor generated hazardous waste is materials that, if abandoned or disposed of, may meet the definition of a hazardous waste. These waste streams would typically consist of material brought on site by the Contractor to execute work, but are not fully consumed during the course of construction. Examples include, but are not limited to, excess paint thinners (i.e. methyl ethyl ketone, toluene), waste thinners, excess paints, excess solvents, waste solvents, excess pesticides, and contaminated pesticide equipment rinse water.

1.2.3 Electronics Waste

Electronics waste is discarded electronic devices intended for salvage, recycling, or disposal.

1.2.4 Environmental Pollution and Damage

Environmental pollution and damage is the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade the environment aesthetically, culturally or historically.

1.2.5 Environmental Protection

Environmental protection is the prevention/control of pollution and habitat disruption that may occur to the environment during construction. The control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes

management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.2.6 Hazardous Debris

As defined in paragraph SOLID WASTE, debris that contains listed hazardous waste (either on the debris surface, or in its interstices, such as pore structure) in accordance with 40 CFR 261. Hazardous debris also includes debris that exhibits a characteristic of hazardous waste in accordance with 40 CFR 261.

1.2.7 Hazardous Materials

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

Hazardous material is any material that: Is regulated as a hazardous material in accordance with 49 CFR 173; or requires a Safety Data Sheet (SDS) in accordance with 29 CFR 1910.120; or during end use, treatment, handling, packaging, storage, transportation, or disposal meets or has components that meet or have potential to meet the definition of a hazardous waste as defined by 40 CFR 261 Subparts A, B, C, or D. Designation of a material by this definition, when separately regulated or controlled by other sections or directives, does not eliminate the need for adherence to that hazard-specific guidance which takes precedence over this section for "control" purposes. Such material includes ammunition, weapons, explosive actuated devices, propellants, pyrotechnics, chemical and biological warfare materials, medical and pharmaceutical supplies, medical waste and infectious materials, bulk fuels, radioactive materials, and other materials such as asbestos, mercury, and polychlorinated biphenyls (PCBs).

1.2.8 Hazardous Waste

Hazardous Waste is any material that meets the definition of a solid waste and exhibit a hazardous characteristic (ignitability, corrosivity, reactivity, or toxicity) as specified in 40 CFR 261, Subpart C, or contains a listed hazardous waste as identified in 40 CFR 261, Subpart D.

1.2.9 Land Application

Land Application means spreading or spraying discharge water at a rate that allows the water to percolate into the soil. No sheeting action, soil erosion, discharge into storm sewers, discharge into defined drainage areas, or discharge into the "waters of the United States" must occur. Comply with federal, state, and local laws and regulations.

1.2.10 Municipal Separate Storm Sewer System (MS4) Permit

MS4 permits are those held by installations to obtain NPDES permit coverage for their stormwater discharges.

1.2.11 National Pollutant Discharge Elimination System (NPDES)

The NPDES permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States.

1.2.12 Oily Waste

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

This definition includes materials such as oily rags, "kitty litter" sorbent clay and organic sorbent material. These materials may be land filled provided that: It is not prohibited in other state regulations or local ordinances; the amount generated is "de minimus" (a small amount); it is the result of minor leaks or spills resulting from normal process operations; and free-flowing oil has been removed to the practicable extent possible. Large quantities of this material, generated as a result of a major spill or in lieu of proper maintenance of the processing equipment, are a solid waste. As a solid waste, perform a hazardous waste determination prior to disposal. As this can be an expensive process, it is recommended that this type of waste be minimized through good housekeeping practices and employee education.

1.2.13 Regulated Waste

Regulated waste are solid wastes that have specific additional federal, state, or local controls for handling, storage, or disposal.

1.2.14 Sediment

Sediment is soil and other debris that have eroded and have been transported by runoff water or wind.

1.2.15 Solid Waste

Solid waste is a solid, liquid, semi-solid or contained gaseous waste. A solid waste can be a hazardous waste, non-hazardous waste, or non-Resource Conservation and Recovery Act (RCRA) regulated waste. Types of solid waste typically generated at construction sites may include:

1.2.15.1 Debris

Debris is non-hazardous solid material generated during the construction, demolition, or renovation of a structure that exceeds 2.5-inch particle size that is: a manufactured object; plant or animal matter; or natural geologic material (for example, cobbles and boulders), broken or removed concrete, masonry, and rock asphalt paving; ceramics; roofing paper and shingles. Inert materials may be reinforced with or contain ferrous wire, rods, accessories and weldments. A mixture of debris and other material such as soil or sludge is also subject to regulation as debris if the mixture is comprised primarily of debris by volume, based on visual inspection.

1.2.15.2 Green Waste

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

included.

1.2.15.3 Material not regulated as solid waste

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

1.2.15.4 Non-Hazardous Waste

Non-hazardous waste is waste that is excluded from, or does not meet, hazardous waste criteria in accordance with 40 CFR 263.

1.2.15.5 Recyclables

Recyclables are materials, equipment and assemblies such as doors, windows, door and window frames, plumbing fixtures, glazing and mirrors that are recovered and sold as recyclable, wiring, insulated/non-insulated copper wire cable, wire rope, and structural components. It also includes commercial-grade refrigeration equipment with Freon removed, household appliances where the basic material content is metal, clean polyethylene terephthalate bottles, cooking oil, used fuel oil, textiles, high-grade paper products and corrugated cardboard, stackable pallets in good condition, clean crating material, and clean rubber/vehicle tires. Metal meeting the definition of lead contaminated or lead based paint contaminated may not be included as recyclable if sold to a scrap metal company. Paint cans that meet the definition of empty containers in accordance with 40 CFR 261.7 may be included as recyclable if sold to a scrap metal company.

1.2.15.6 Surplus Soil

Surplus soil is existing soil that is in excess of what is required for this work, including aggregates intended, but not used, for on-site mixing of concrete, mortars, and paving. Contaminated soil meeting the definition of hazardous material or hazardous waste is not included and must be managed in accordance with paragraph HAZARDOUS MATERIAL MANAGEMENT.

1.2.15.7 Scrap Metal

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

1.2.15.8 Wood

Wood is dimension and non-dimension lumber, plywood, chipboard, hardboard. Treated or painted wood that meets the definition of lead contaminated or lead based contaminated paint is not included. Treated wood includes, but is not limited to, lumber, utility poles, crossties, and other wood products with chemical treatment.

1.2.16 Surface Discharge

Surface discharge means discharge of water into drainage ditches, storm

sewers, creeks or "waters of the United States". Surface discharges are discrete, identifiable sources and require a permit from the governing agency. Comply with federal, state, and local laws and regulations.

1.2.17 Wastewater

Wastewater is the used water and solids from a community that flow to a treatment plant.

1.2.17.1 Stormwater

Stormwater is any precipitation in an urban or suburban area that does not evaporate or soak into the ground, but instead collects and flows into storm drains, rivers, and streams.

1.2.18 Waters of the United States

Waters of the United States means Federally jurisdictional waters, including wetlands, that are subject to regulation under Section 404 of the Clean Water Act or navigable waters, as defined under the Rivers and Harbors Act.

1.2.19 Wetlands

Wetlands are those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

1.2.20 Universal Waste

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

1.3 SUBMITTALS

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

SD-01 Preconstruction Submittals

- Preconstruction Survey
- Solid Waste Management Permit
- Regulatory Notifications
- Environmental Protection Plan
- Stormwater Notice of Intent (for NPDES coverage under the general permit for construction activities)
- Dirt and Dust Control Plan
- Employee Training Records
- Environmental Manager Qualifications

SD-06 Test Reports

Laboratory Analysis
Inspection Reports
Solid Waste Management Report

SD-07 Certificates

Employee Training Records

Erosion and Sediment Control Inspector Qualifications

SD-11 Closeout Submittals

Stormwater Pollution Prevention Plan Compliance Notebook
Stormwater Notice of Termination (for NPDES coverage under the
general permit for construction activities)
Waste Determination Documentation
Disposal Documentation for Hazardous and Regulated Waste
Assembled Employee Training Records
Solid Waste Management Permit
Solid Waste Management Report

Hazardous Waste/Debris Management
Regulatory Notifications
Sales Documentation
Contractor Certification
As-Built Topographic Survey

1.4 ENVIRONMENTAL PROTECTION REQUIREMENTS

Provide and maintain, during the life of the contract, environmental protection as defined. Plan for and provide environmental protective measures to control pollution that develops during construction practice. Plan for and provide environmental protective measures required to correct conditions that develop during the construction of permanent or temporary environmental features associated with the project. Protect the environmental resources within the project boundaries and those affected outside the limits of permanent work during the entire duration of this Contract. Comply with federal, state, and local regulations pertaining to the environment, including water, air, solid waste, hazardous waste and substances, oily substances, and noise pollution.

Tests and procedures assessing whether construction operations comply with Applicable Environmental Laws may be required. Analytical work must be performed by qualified laboratories; and where required by law, the laboratories must be certified.

1.4.1 Conformance with the Environmental Management System

Perform work under this contract consistent with the policy and objectives identified in the installation's Environmental Management System (EMS). Perform work in a manner that conforms to objectives and targets of the environmental programs and operational controls identified by the EMS. Support Government personnel when environmental compliance and EMS audits are conducted by escorting auditors at the Project site, answering questions, and providing proof of records being maintained. Provide monitoring and measurement information as necessary to address environmental performance relative to environmental, energy, and transportation management goals. In the event an EMS nonconformance or environmental noncompliance associated with the contracted services, tasks,

or actions occurs, take corrective and preventative actions. In addition, employees must be aware of their roles and responsibilities under the installation EMS and of how these EMS roles and responsibilities affect work performed under the contract.

Coordinate with the installation's EMS coordinator to identify training needs associated with environmental aspects and the EMS, and arrange training or take other action to meet these needs. Provide training documentation to the Contracting Officer. The Installation Environmental Office will retain associated environmental compliance records. Make EMS Awareness training completion certificates available to Government auditors during EMS audits and include the certificates in the Employee Training Records. See paragraph EMPLOYEE TRAINING RECORDS.

1.5 SPECIAL ENVIRONMENTAL REQUIREMENTS

Comply with the special environmental requirements listed here.

1.6 QUALITY ASSURANCE

1.6.1 Preconstruction Survey and Protection of Features

This paragraph supplements the Contract Clause PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS. Prior to start of any onsite construction activities, perform a Preconstruction Survey of the project site with the Contracting Officer, and take photographs showing existing environmental conditions in and adjacent to the site. Submit a report for the record. Include in the report a plan describing the features requiring protection under the provisions of the Contract Clauses, which are not specifically identified on the drawings as environmental features requiring protection along with the condition of trees, shrubs and grassed areas immediately adjacent to the site of work and adjacent to the Contractor's assigned storage area and access route(s), as applicable. The Contractor and the Contracting Officer will sign this survey report upon mutual agreement regarding its accuracy and completeness. Protect those environmental features included in the survey report and any indicated on the drawings, regardless of interference that their preservation may cause to the work under the Contract.

1.6.2 Regulatory Notifications

Provide regulatory notification requirements in accordance with federal, state and local regulations. In cases where the Government will also provide public notification (such as stormwater permitting), coordinate with the Contracting Officer. Submit copies of regulatory notifications to the Contracting Officer within 15 days prior to commencement of work activities. Typically, regulatory notifications must be provided for the following (this listing is not all-inclusive): demolition, renovation, NPDES defined site work, construction, removal or use of a permitted air emissions source, and remediation of controlled substances (asbestos, hazardous waste, lead paint).

1.6.3 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 installation; and types and quantities of wastes/wastewater that may be generated during the Contract. Discuss the results of the Preconstruction Survey at this time.

Prior to initiating any work on site, meet with the Contracting Officer and installation Environmental Office to discuss the proposed Environmental Protection Plan (EPP). Develop a mutual understanding relative to the details of environmental protection, including measures for protecting natural and cultural resources, required reports, required permits, permit requirements (such as mitigation measures), and other measures to be taken.

1.6.4 Environmental Manager

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

1.6.5 Employee Training Records

Prepare and maintain Employee Training Records throughout the term of the contract meeting applicable 40 CFR requirements. Provide Employee Training Records in the Environmental Records Binder. Submit these Assembled Employee Training Records to the Contracting Officer at the conclusion of the project, unless otherwise directed.

Train personnel to meet state requirements. Conduct environmental protection/pollution control meetings for personnel prior to commencing construction activities. Contact additional meetings for new personnel and when site conditions change. Include in the training and meeting agenda: methods of detecting and avoiding pollution; familiarization with statutory and contractual pollution standards; installation and care of devices, vegetative covers, and instruments required for monitoring purposes to ensure adequate and continuous environmental protection/pollution control; anticipated hazardous or toxic chemicals or wastes, and other regulated contaminants; recognition and protection of archaeological sites, artifacts, waters of the United States, and endangered species and their habitat that are known to be in the area. [Provide copy of the Erosion and Sediment Control Inspector [Qualifications as defined by EPA] [Certification as required by [state]].]

1.6.6 Non-Compliance Notifications

The Contracting Officer will notify the Contractor in writing of any observed noncompliance with federal, state or local environmental laws or regulations, permits, and other elements of the Contractor's EPP. After receipt of such notice, inform the Contracting Officer of the proposed

corrective action and take such action when approved by the Contracting Officer. The Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time extensions will be granted or equitable adjustments allowed for any such suspensions. This is in addition to any other actions the Contracting Officer may take under the contract, or in accordance with the Federal Acquisition Regulation or Federal Law.

1.7 ENVIRONMENTAL PROTECTION PLAN

The purpose of the EPP is to present an overview of known or potential environmental issues that must be considered and addressed during construction. Incorporate construction related objectives and targets from the installation's EMS into the EPP. Include in the EPP measures for protecting natural and cultural resources, required reports, and other measures to be taken. Meet with the Contracting Officer to discuss the EPP and develop a mutual understanding relative to the details for environmental protection including measures for protecting natural resources, required reports, and other measures to be taken. Submit the EPP within 15 days after notice to proceed and not less than 10 days before the preconstruction meeting. Revise the EPP throughout the project to include any reporting requirements, changes in site conditions, or contract modifications that change the project scope of work in a way that could have an environmental impact. No requirement in this section will relieve the Contractor of any applicable federal, state, and local environmental protection laws and regulations. During Construction, identify, implement, and submit for approval any additional requirements to be included in the EPP. Maintain the current version onsite.

The EPP includes, but is not limited to, the following elements:

1.7.1 General Overview and Purpose

1.7.1.1 Descriptions

A brief description of each specific plan required by environmental permit or elsewhere in this Contract such as [stormwater pollution prevention plan,] [spill control plan,] [solid waste management plan,] [wastewater management plan,] [air pollution control plan,] [contaminant prevention plan,] [a historical, archaeological, cultural resources, biological resources and wetlands plan,] [traffic control plan] [Hazardous, Toxic and Radioactive Waste (HTRW) Plan] [Non-Hazardous Solid Waste Disposal Plan] [borrowing material plan] [_____].

1.7.1.2 Duties

The duties and level of authority assigned to the person(s) on the job site who oversee environmental compliance, such as who is responsible for adherence to the EPP, who is responsible for spill cleanup and training personnel on spill response procedures, who is responsible for manifesting hazardous waste to be removed from the site (if applicable), and who is responsible for training the Contractor's environmental protection personnel.

1.7.1.3 Procedures

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

1.7.1.4 Communications

Communication and training procedures that will be used to convey environmental management requirements to Contractor employees and subcontractors.

1.7.1.5 Contact Information

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

1.7.2 General Site Information

1.7.2.1 Drawings

Drawings showing locations of proposed temporary excavations or embankments for haul roads, stream crossings, jurisdictional wetlands, material storage areas, structures, sanitary facilities, storm drains and conveyances, and stockpiles of excess soil.

1.7.2.2 Work Area

Work area plan showing the proposed activity in each portion of the area and identify the areas of limited use or nonuse. Include measures for marking the limits of use areas, including methods for protection of features to be preserved within authorized work areas and methods to control runoff and to contain materials on site, and a traffic control plan.

1.7.2.3 Documentation

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

1.7.3 Management of Natural Resources

- a. Land resources
- b. Tree protection
- c. Replacement of damaged landscape features
- d. Temporary construction
- e. Stream crossings
- f. Fish and wildlife resources
- g. Wetland areas

1.7.4 Protection of Historical and Archaeological Resources

- a. Objectives
- b. Methods

1.7.5 Stormwater Management and Control

- a. Ground cover
- b. Erodible soils
- c. Temporary measures
 - (1) Structural Practices
 - (2) Temporary and permanent stabilization
- d. Effective selection, implementation and maintenance of Best Management Practices (BMPs).

1.7.6 Protection of the Environment from Waste Derived from Contractor Operations

Control and disposal of solid and sanitary waste. Control and disposal of hazardous waste.

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

- a. List of the types of hazardous wastes expected to be generated
- b. Procedures to ensure a written waste determination is made for appropriate wastes that are to be generated
- c. Sampling/analysis plan, including laboratory method(s) that will be used for waste determinations and copies of relevant laboratory certifications
- d. Methods and proposed locations for hazardous waste accumulation/storage (that is, in tanks or containers)
- e. Management procedures for storage, labeling, transportation, and disposal of waste (treatment of waste is not allowed unless specifically noted)
- f. Management procedures and regulatory documentation ensuring disposal of hazardous waste complies with Land Disposal Restrictions (40 CFR 268)
- g. Management procedures for recyclable hazardous materials such as lead-acid batteries, used oil, and similar
- h. Used oil management procedures in accordance with 40 CFR 279; Hazardous waste minimization procedures
- i. Plans for the disposal of hazardous waste by permitted facilities; and Procedures to be employed to ensure required employee training records are maintained.

1.7.7 Prevention of Releases to the Environment

Procedures to prevent releases to the environment

Notifications in the event of a release to the environment

1.7.8 Regulatory Notification and Permits

List what notifications and permit applications must be made. Some permits require up to 180 days to obtain. Demonstrate that those permits have been obtained or applied for by including copies of applicable environmental permits. The EPP will not be approved until the permits have been obtained.

1.7.9 Clean Air Act Compliance

1.7.9.1 Haul Route

Submit truck and material haul routes along with a Dirt and Dust Control Plan for controlling dirt, debris, and dust on Installation roadways. As a minimum, identify in the plan the subcontractor and equipment for cleaning along the haul route and measures to reduce dirt, dust, and debris from roadways.

1.7.9.2 Pollution Generating Equipment

Identify air pollution generating equipment or processes that may require federal, state, or local permits under the Clean Air Act. Determine requirements based on any current installation permits and the impacts of the project. Provide a list of all fixed or mobile equipment, machinery or operations that could generate air emissions during the project to the Installation Environmental Office (Air Program Manager).

1.7.9.3 Stationary Internal Combustion Engines

Identify portable and stationary internal combustion engines that will be supplied, used or serviced. Comply with 40 CFR 60 Subpart IIII, 40 CFR 60 Subpart JJJJ, 40 CFR 63 Subpart ZZZZ, and local regulations as applicable. At minimum, include the make, model, serial number, manufacture date, size (engine brake horsepower), and EPA emission certification status of each engine. Maintain applicable records and log hours of operation and fuel use. Logs must include reasons for operation and delineate between emergency and non-emergency operation.

1.7.9.4 Refrigerants

Identify management practices to ensure that heating, ventilation, and air conditioning (HVAC) work involving refrigerants complies with 40 CFR 82 requirements. Technicians must be certified, maintain copies of certification on site, use certified equipment and log work that requires the addition or removal of refrigerant. Any refrigerant reclaimed is the property of the Government, coordinate with the Installation Environmental Office to determine the appropriate turn in location.

1.7.9.5 Air Pollution-engineering Processes

Identify planned air pollution-generating processes and management control measures (including, but not limited to, spray painting, abrasive blasting, demolition, material handling, fugitive dust, and fugitive emissions). Log hours of operations and track quantities of materials used.

1.7.9.6 Compliant Materials

Provide the Government a list of and SDSs for all hazardous materials proposed for use on site. Materials must be compliant with all Clean Air Act regulations for emissions including solvent and volatile organic compound contents, and applicable National Emission Standards for Hazardous Air Pollutants requirements. The Government may alter or limit use of specific materials as needed to meet installation permit requirements for emissions.

1.8 LICENSES AND PERMITS

Obtain licenses and permits required for the construction of the project and in accordance with FAR 52.236-7. Notify the Government of all general use permitted equipment the Contractor plans to use on site. This paragraph supplements the Contractor's responsibility under FAR 52.236-7.

1.9 ENVIRONMENTAL RECORDS BINDER

Maintain on-site a separate three-ring Environmental Records Binder and submit at the completion of the project. Make separate parts within the binder that correspond to each submittal listed under paragraph CLOSEOUT SUBMITTALS in this section.

1.10 SOLID WASTE MANAGEMENT PERMIT

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

1.10.1 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.

1.11 FACILITY HAZARDOUS WASTE GENERATOR STATUS

Marine Corps Air Station Cherry Point is designated as a Large Quantity Generator. Meet the regulatory requirements of this generator designation for any work conducted within the boundaries of this Installation. Comply with provisions of federal, state, and local regulatory requirements applicable to this generator status regarding training and storage, handling, and disposal of construction derived wastes.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 PROTECTION OF NATURAL RESOURCES

Minimize interference with, disturbance to, and damage to fish, wildlife, and plants, including their habitats. Prior to the commencement of activities, consult with the Installation Environmental Office, regarding rare species or sensitive habitats that need to be protected. The protection of rare, threatened, and endangered animal and plant species identified, including their habitats, is the Contractor's responsibility.

Preserve the natural resources within the project boundaries and outside the limits of permanent work. Restore to an equivalent or improved condition upon completion of work that is consistent with the requirements of the Installation Environmental Office or as otherwise specified. Confine construction activities to within the limits of the work indicated or specified.

3.1.1 Flow Ways

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

3.1.2 Vegetation

Except in areas to be cleared, do not remove, cut, deface, injure, or destroy trees or shrubs without the Contracting Officer's permission. Do not fasten or attach ropes, cables, or 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 is responsible for any resultant damage.

Protect existing trees that are to remain to ensure they are not injured, bruised, defaced, or otherwise damaged by construction operations. Remove displaced rocks from uncleared areas. Coordinate with the Contracting Officer and Installation Environmental Office to determine appropriate action for trees and other landscape features scarred or damaged by equipment operations.

3.1.3 Streams

Stream crossings must allow movement of materials or equipment without violating water pollution control standards of the federal, state, and local governments. Construction of stream crossing structures must be in compliance with any required permits including, but not limited to, Clean Water Act Section 404, and Section 401 Water Quality.

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

3.2 STORMWATER

Do not discharge stormwater from construction sites to the sanitary sewer.

If the water is noted or suspected of being contaminated, it may only be released to the storm drain system if the discharge is specifically permitted. Obtain authorization in advance from the Installation Environmental Office for any release of contaminated water.

3.2.1 Construction General Permit

Provide a Construction General Permit as required by 40 CFR 122.26 or the State of North Carolina General Permit. Under the terms and conditions of the permit, install, inspect, maintain BMPs, prepare stormwater erosion and sediment control inspection reports, and submit SWPPP inspection reports. Maintain construction operations and management in compliance with the terms and conditions of the general permit for stormwater discharges from construction activities.

3.2.1.1 Stormwater Pollution Prevention Plan

Submit a project-specific Stormwater Pollution Prevention Plan (SWPPP) to the Contracting Officer for approval, prior to the commencement of work. The SWPPP must meet the requirements of 40 CFR 122.26 and the State of North Carolina General Permit for stormwater discharges from construction sites.

Include the following:

- a. Comply with terms of the state general permit for stormwater discharges from construction activities. Prepare SWPPP in accordance with state requirements. Use state guide Developing your Stormwater Pollution Prevention Plan located at <http://water.epa.gov/polwaste/npdes/stormwater/Stormwater-Pollution-Prevention-Plans-for-Construction-Activities.cfm> to prepare the SWPPP.
- b. Select applicable BMPs from EPA Fact Sheets located at <http://water.epa.gov/polwaste/npdes/swbmp/Construction-Site-StormWater-Run-Off-Control.cfm> or in accordance with applicable state or local requirements.
- c. Include a completed copy of the Notice of Intent, BMP Inspection Report Template, and Stormwater Notice of Termination, except for the effective date.

3.2.1.2 Stormwater Notice of Intent for Construction Activities

Prepare and submit the Notice of Intent for NPDES coverage under the general permit for construction activities to the Contracting Officer for review and approval.

Prepare and submit a Notice of Intent as a co-permittee to the Contracting Officer, for review and approval.

Submit the approved NOI and appropriate permit fees onto the appropriate federal or state agency for approval. No land disturbing activities may commence without permit coverage. Maintain an approved copy of the SWPPP at the onsite construction office, and continually update as regulations require, reflecting current site conditions.

3.2.1.3 Inspection Reports

Submit "Inspection Reports" to the Contracting Officer in accordance with the State of North Carolina Construction General Permit.

3.2.1.4 Stormwater Pollution Prevention Plan Compliance Notebook

Create and maintain a three ring binder of documents that demonstrate compliance with the Construction General Permit. Include a copy of the permit Notice of Intent, proof of permit fee payment, SWPPP and SWPPP update amendments, inspection reports and related corrective action records, copies of correspondence with the the State of North Carolina Permitting Agency, and a copy of the permit Notice of Termination in the binder. At project completion, the notebook becomes property of the Government. Provide the compliance notebook to the Contracting Officer.

3.2.1.5 Stormwater Notice of Termination for Construction Activities

Submit a Notice of Termination to the Contracting Officer for approval once construction is complete and final stabilization has been achieved on all portions of the site for which the permittee is responsible. Once approved, submit the Notice of Termination to the appropriate state or federal agency. [Prepare as-built topographic survey information required by the permitting agency for certification of the stormwater management system, and provide to the Contracting Officer.]

3.2.2 Erosion and Sediment Control Measures

Provide erosion and sediment control measures in accordance with state and local laws and regulations. Preserve vegetation to the maximum extent practicable.

Erosion control inspection reports may be compiled as part of a stormwater pollution prevention plan inspection reports.

3.2.2.1 Erosion Control

Prevent erosion by mulching and Geotextiles. Stabilize slopes by sodding, seeding, or such combination of these methods necessary for effective erosion control. Use of hay bales is prohibited.

Provide seeding in accordance with Section 32 92 19 SEEDING.

3.2.2.2 Sediment Control Practices

Implement sediment control 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 sediment control practices prior to soil disturbance and prior to creating areas with concentrated flow, during the construction process to minimize erosion and sediment laden runoff. Include the following devices: silt fence, and storm drain inlet protection. Location and details of installation and construction are indicated on the drawings.

3.2.3 Work Area Limits

Mark the areas that need not be disturbed under this Contract prior to commencing construction activities. Mark or fence isolated areas within the general work area that are not to be disturbed. Protect monuments and markers before construction operations commence. Where construction operations are to be conducted during darkness, any markers must be visible in the dark. Personnel must be knowledgeable of the purpose for marking and protecting particular objects.

3.2.4 Contractor Facilities and Work Areas

Place field offices, staging areas, stockpile storage, and temporary buildings in areas designated on the drawings or as directed by the Contracting Officer. Move or relocate the Contractor facilities only when approved by the Government. Provide erosion and sediment controls for onsite borrow and spoil areas to prevent sediment from entering nearby waters. Control temporary excavation and embankments for plant or work areas to protect adjacent areas.

3.2.5 Municipal Separate Storm Sewer System (MS4) Management

Comply with the Installation's MS4 permit requirements.

3.3 SURFACE AND GROUNDWATER

3.3.1 Cofferdams, Diversions, and Dewatering

Construction operations for dewatering, removal of cofferdams, tailrace excavation, and tunnel closure must be constantly controlled to maintain compliance with existing state water quality standards and designated uses of the surface water body. Comply with the State of North Carolina water quality standards and anti-degradation provisions. Do not discharge excavation ground water to the sanitary sewer, storm drains, or to surface waters without prior specific authorization in writing from the Installation Environmental Office. Discharge of hazardous substances will not be permitted under any circumstances. Use sediment control BMPs to prevent construction site runoff from directly entering any storm drain or surface waters.

If the construction dewatering is noted or suspected of being contaminated, it may only be released to the storm drain system if the discharge is specifically permitted. Obtain authorization for any contaminated groundwater release in advance from the Installation Environmental Officer and the federal or state authority, as applicable. Discharge of hazardous substances will not be permitted under any circumstances.

3.3.2 Waters of the United States

Do not enter, disturb, destroy, or allow discharge of contaminants into waters of the United States except as authorized herein. The protection of waters of the United States shown on the drawings in accordance with paragraph LICENSES AND PERMITS is the Contractor's responsibility. Authorization to enter specific waters of the United States identified does not relieve the Contractor from any obligation to protect other waters of the United States within, adjacent to, or in the vicinity of the construction site and associated boundaries.

3.4 PROTECTION OF CULTURAL RESOURCES

3.4.1 Archaeological Resources

Existing archaeological resources within the work area are shown on the drawings. Protect these resources and be responsible for their preservation during the life of the Contract. If, during excavation or other construction activities, any previously unidentified or unanticipated historical, archaeological, and cultural resources are discovered or found, activities that may damage or alter such resources will be suspended. Resources covered by this paragraph include, but are not limited to: any

human skeletal remains or burials; artifacts; shell, midden, bone, charcoal, or other deposits; rock or coral alignments, pavings, wall, or other constructed features; and any indication of agricultural or other human activities. Upon such discovery or find, immediately notify the Contracting Officer so that the appropriate authorities may be notified and a determination made as to their significance and what, if any, special disposition of the finds should be made. Cease all activities that may result in impact to or the destruction of these resources. Secure the area and prevent employees or other persons from trespassing on, removing, or otherwise disturbing such resources. The Government retains ownership and control over archaeological resources.

3.4.2 Historical Resources

Existing historical resources within the work area are shown on the drawings. Protect these resources and be responsible for their preservation during the life of the Contract.

3.5 AIR RESOURCES

Equipment operation, activities, or processes will be in accordance with 40 CFR 64 and state air emission and performance laws and standards.

3.5.1 Preconstruction Air Permits

Notify the Air Program Manager, through the Contracting Officer, at least 6 months prior to bringing equipment, assembled or unassembled, onto the Installation, so that air permits can be secured. Necessary permitting time must be considered in regard to construction activities. Clean Air Act (CAA) permits must be obtained prior to bringing equipment, assembled or unassembled, onto the Installation.

3.5.2 Oil or Dual-fuel Boilers and Furnaces

Provide product data and details for new, replacement, or relocated fuel fired boilers, heaters, or furnaces to the Installation Environmental Office (Air Program Manager) through the Contracting Officer. Data to be reported include: equipment purpose (water heater, building heat, process), manufacturer, model number, serial number, fuel type (oil type, gas type) size (MMBTU heat input). Provide in accordance with paragraph PRECONSTRUCTION AIR PERMITS.

3.5.3 Burning

Burning is prohibited on the Government premises.

3.5.4 Class I and II ODS Prohibition

Class I and II ODS are Government property and must be returned to the Government for appropriate management. Coordinate with the Installation Environmental Office to determine the appropriate location for turn in of all reclaimed refrigerant.

3.5.5 Accidental Venting of Refrigerant

Accidental venting of a refrigerant is a release and must be reported immediately to the Contracting Officer.

3.5.6 EPA Certification Requirements

Heating and air conditioning technicians must be certified through an EPA-approved program. Maintain copies of certifications at the employees' places of business; technicians must carry certification wallet cards, as provided by environmental law.

3.5.7 Dust Control

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

3.5.7.1 Particulates

Dust particles, aerosols and gaseous by-products from construction activities, and processing and preparation of materials (such as from asphaltic batch plants) must be controlled at all times, including weekends, holidays, and hours when work is not in progress. Maintain excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and other work areas within or outside the project boundaries free from particulates that would exceed 40 CFR 50, state, and local air pollution standards or that would cause a hazard or a nuisance. Sprinkling, chemical treatment of an approved type, baghouse, scrubbers, electrostatic precipitators, or other methods will be permitted to control particulates in the work area. Sprinkling, to be efficient, must be repeated to keep the disturbed area damp. Provide sufficient, competent equipment available to accomplish these tasks. Perform particulate control as the work proceeds and whenever a particulate nuisance or hazard occurs. Comply with state and local visibility regulations.

3.5.7.2 Abrasive Blasting

Blasting operations cannot be performed without prior approval of the Installation Air Program Manager. The use of silica sand is prohibited in sandblasting.

Provide tarpaulin drop cloths and windscreens to enclose abrasive blasting operations to confine and collect dust, abrasive agent, paint chips, and other debris. Perform work involving removal of hazardous material in accordance with 29 CFR 1910.

3.5.8 Odors

Control odors from construction activities. The odors must be in compliance with state regulations and local ordinances and may not constitute a health hazard.

3.6 WASTE MINIMIZATION

Minimize the use of hazardous materials and the generation of waste. Include procedures for pollution prevention/hazardous waste minimization in the Hazardous Waste Management Section of the EPP. Obtain a copy of the

installation's Pollution Prevention/Hazardous Waste Minimization Plan for reference material when preparing this part of the EPP. If no written plan exists, obtain information by contacting the Contracting Officer. Describe the anticipated types of the hazardous materials to be used in the construction when requesting information.

3.6.1 Salvage, Reuse and Recycle

Identify anticipated materials and waste for salvage, reuse, and recycling. Describe actions to promote material reuse, resale or recycling. To the extent practicable, all scrap metal must be sent for reuse or recycling and will not be disposed of in a landfill.

Include the name, physical address, and telephone number of the hauler, if transported by a franchised solid waste hauler. Include the destination and, unless exempted, provide a copy of the state or local permit (cover) or license for recycling.

3.6.2 Nonhazardous Solid Waste Diversion Report

Maintain an inventory of nonhazardous solid waste diversion and disposal of construction and demolition debris. Submit a report to the Contracting Officer on the first working day after each fiscal year quarter, starting the first quarter that nonhazardous solid waste has been generated. Include the following in the report:

Construction and Demolition (C&D) Debris Disposed	(____) (cubic yards) or (tons), as appropriate
C&D Debris Recycled	(____) (cubic yards) or (tons), as appropriate
Total C&D Debris Generated	(____) (cubic yards) or (tons), as appropriate
Waste Sent to Waste-To-Energy Incineration Plant (This amount should not be included in the recycled amount)	(____) (cubic yards) or (tons), as appropriate

3.7 WASTE MANAGEMENT AND DISPOSAL

3.7.1 Waste Determination Documentation

Complete a Waste Determination form (provided at the pre-construction conference) for Contractor-derived wastes to be generated. All potentially hazardous solid waste streams that are not subject to a specific exclusion or exemption from the hazardous waste regulations (e.g. scrap metal, domestic sewage) or subject to special rules, (lead-acid batteries and precious metals) must be characterized in accordance with the requirements of 40 CFR 261 or corresponding applicable state or local regulations. Base waste determination on user knowledge of the processes and materials used, and analytical data when necessary. Consult with the Installation environmental staff for guidance on specific requirements. Attach support documentation to the Waste Determination form. As a minimum, provide a Waste Determination form for the following waste (this listing is not

inclusive): oil- and latex -based painting and caulking products, solvents, adhesives, aerosols, petroleum products, and containers of the original materials.

3.7.1.1 Sampling and Analysis of Waste

3.7.1.1.1 Waste Sampling

Sample waste in accordance with EPA SW-846. Clearly mark each sampled drum or container with the Contractor's identification number, and cross reference to the chemical analysis performed.

3.7.1.1.2 Laboratory Analysis

Follow the analytical procedure and methods in accordance with the 40 CFR 261. Provide analytical results and reports performed to the Contracting Officer.

3.7.1.1.3 Analysis Type

Identify hazardous waste by analyzing for the following characteristics: ignitability, corrosivity, reactivity, toxicity based on TCLP results, _____.

3.7.2 Solid Waste Management

3.7.2.1 Solid Waste Management Report

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

3.7.2.2 Control and Management of Solid Wastes

Pick up solid wastes, and place in covered containers that are regularly emptied. Do not prepare or cook food on the project site. Prevent contamination of the site or other areas when handling and disposing of wastes. At project completion, leave the areas clean. Employ segregation measures so that no hazardous or toxic waste will become co-mingled with non-hazardous solid waste. Transport solid waste off Government property and dispose of it in compliance with 40 CFR 260, state, and local requirements for solid waste disposal. A Subtitle D RCRA permitted landfill is the minimum acceptable offsite solid waste disposal option. Verify that the selected transporters and disposal facilities have the necessary permits and licenses to operate. Solid waste disposal offsite must comply with most stringent local, state, and federal requirements, including 40 CFR 241, 40 CFR 243, and 40 CFR 258.

Manage hazardous material used in construction, including but not limited to, aerosol cans, waste paint, cleaning solvents, contaminated brushes, and

used rags, in accordance with 49 CFR 173.

3.7.3 Control and Management of Hazardous Waste

Do not dispose of hazardous waste on Government property. Do not discharge any waste to a sanitary sewer, storm drain, or to surface waters or conduct waste treatment or disposal on Government property without written approval of the Contracting Officer.

3.7.3.1 Hazardous Waste/Debris Management

Identify construction activities that will generate hazardous waste or debris. Provide a documented waste determination for resultant waste streams. Identify, label, handle, store, and dispose of hazardous waste or debris in accordance with federal, state, and local regulations, including 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, 40 CFR 265, 40 CFR 266, and 40 CFR 268.

Manage hazardous waste in accordance with the approved Hazardous Waste Management Section of the EPP. Store hazardous wastes in approved containers in accordance with 49 CFR 173 and 49 CFR 178. Hazardous waste generated within the confines of Government facilities is identified as being generated by the Government. Prior to removal of any hazardous waste from Government property, hazardous waste manifests must be signed by personnel from the Installation Environmental Office. Do not bring hazardous waste onto Government property. Provide the Contracting Officer with a copy of waste determination documentation for any solid waste streams that have any potential to be hazardous waste or contain any chemical constituents listed in 40 CFR 372-SUBPART D.

3.7.3.2 Waste Storage/Satellite Accumulation/90 Day Storage Areas

Accumulate hazardous waste at satellite accumulation points and in compliance with 40 CFR 262.34 and applicable state or local regulations. Individual waste streams will be limited to 55 gallons of accumulation (or 1 quart for acutely hazardous wastes). If the Contractor expects to generate hazardous waste at a rate and quantity that makes satellite accumulation impractical, the Contractor may request a temporary 90 day accumulation point be established. Submit a request in writing to the Contracting Officer and provide the following information (Attach Site Plan to the Request):

Contract Number	
Contractor	
Haz/Waste or Regulated Waste POC	
Phone Number	
Type of Waste	
Source of Waste	
Emergency POC	
Phone Number	

Contract Number	
Location of the Site	

Attach a Waste Determination form for the expected waste streams. Allow 10 working days for processing this request. Additional compliance requirements (e.g. training and contingency planning) that may be required are the responsibility of the Contractor. Barricade the designated area where waste is being stored and post a sign identifying as follows:

"DANGER - UNAUTHORIZED PERSONNEL KEEP OUT"

3.7.3.3 Hazardous Waste Disposal

3.7.3.3.1 Responsibilities for Contractor's Disposal

Provide hazardous waste manifest to the Installations Environmental Office for review, approval, and signature prior to shipping waste off Government property.

3.7.3.3.1.1 Services

Provide service necessary for the final treatment or disposal of the hazardous material or waste in accordance with 40 CFR 260, local, and state, laws and regulations, and the terms and conditions of the Contract within 60 days after the materials have been generated. These services include necessary personnel, labor, transportation, packaging, detailed analysis (if required for disposal or transportation, include manifesting or complete waste profile sheets, equipment, and compile documentation).

3.7.3.3.1.2 Samples

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

3.7.3.3.1.3 Analysis

Analyze each sample taken and provide analytical results to the Contracting Officer. See paragraph WASTE DETERMINATION DOCUMENTATION.

3.7.3.3.1.4 Labeling

Determine the Department of Transportation's (DOT's) proper shipping names for waste (each container requiring disposal) and demonstrate to the Contracting Officer how this determination is developed and supported by the sampling and analysis requirements contained herein. Label all containers of hazardous waste with the words "Hazardous Waste" or other words to describe the contents of the container in accordance with 40 CFR 262.31 and applicable state or local regulations.

3.7.3.3.2 Contractor Disposal Turn-In Requirements

Hazardous waste generated must be disposed of in accordance with the following conditions to meet installation requirements:

- a. Drums must be compatible with waste contents and drums must meet DOT requirements for 49 CFR 173 for transportation of materials.
- b. Band drums to wooden pallets.
- c. No more than three 55 gallon drums or two 85 gallon over packs are to be banded to a pallet.
- d. Band using 1-1/4 inch minimum band on upper third of drum.
- e. Provide label in accordance with 49 CFR 172.101.
- f. Leave 3 to 5 inches of empty space above volume of material.

3.7.3.4 Universal Waste Management

Manage the following categories of universal waste in accordance with federal, state, and local requirements and installation instructions:

- a. Batteries as described in 40 CFR 273.2
- b. Lamps as described in 40 CFR 273.5
- c. Mercury-containing equipment as described in 40 CFR 273.4

Mercury is prohibited in the construction of this facility, unless specified otherwise, and with the exception of mercury vapor lamps and fluorescent lamps. Dumping of mercury-containing materials and devices such as mercury vapor lamps, fluorescent lamps, and mercury switches, in rubbish containers is prohibited. Remove without breaking, pack to prevent breakage, and transport out of the activity in an unbroken condition for disposal as directed.

3.7.3.5 Electronics End-of-Life Management

Recycle or dispose of electronics waste, including, but not limited to, used electronic devices such as computers, monitors, hard-copy devices, televisions, mobile devices, in accordance with 40 CFR 260-262, state, and local requirements, and installation instructions.

3.7.3.6 Disposal Documentation for Hazardous and Regulated Waste

Contact the Contracting Officer for the facility RCRA identification number that is to be used on each manifest.

Submit a copy of the applicable EPA and or state permit(s), manifest(s), or license(s) for transportation, treatment, storage, and disposal of hazardous and regulated waste by permitted facilities. Hazardous or toxic waste manifests must be reviewed, signed, and approved by the Contracting Officer before the Contractor may ship waste. To obtain specific disposal instructions, coordinate with the Installation Environmental Office. Refer to Section 01 57 19.01 20 SUPPLEMENTAL TEMPORARY ENVIRONMENTAL CONTROLS for the Installation Point of Contact information.

3.7.4 Releases/Spills of Oil and Hazardous Substances

3.7.4.1 Response and Notifications

Exercise due diligence to prevent, contain, and respond to spills of

hazardous material, hazardous substances, hazardous waste, sewage, regulated gas, petroleum, lubrication oil, and other substances regulated in accordance with 40 CFR 300. Maintain spill cleanup equipment and materials at the work site. In the event of a spill, take prompt, effective action to stop, contain, curtail, or otherwise limit the amount, duration, and severity of the spill/release. In the event of any releases of oil and hazardous substances, chemicals, or gases; immediately (within 15 minutes) notify the Installation Fire Department, the Installation Command Duty Officer, the Installation Environmental Office, the Contracting Officer[and the state or local authority].

Submit verbal and written notifications as required by the federal (40 CFR 300.125 and 40 CFR 355), state, local regulations and instructions. Provide copies of the written notification and documentation that a verbal notification was made within 20 days. Spill response must be in accordance with 40 CFR 300 and applicable state and local regulations. Contain and clean up these spills without cost to the Government.

3.7.4.2 Clean Up

Clean up hazardous and non-hazardous waste spills. Reimburse the Government for costs incurred including sample analysis materials, clothing, equipment, and labor if the Government will initiate its own spill cleanup procedures, for Contractor-responsible spills, when: Spill cleanup procedures have not begun within one hour of spill discovery/occurrence; or, in the Government's judgment, spill cleanup is inadequate and the spill remains a threat to human health or the environment.

3.7.5 Mercury Materials

Immediately report to the Environmental Office and the Contracting Officer instances of breakage or mercury spillage. Clean mercury spill area to the satisfaction of the Contracting Officer.

Do not recycle a mercury spill cleanup; manage it as a hazardous waste for disposal.

3.7.6 Wastewater

3.7.6.1 Disposal of wastewater must be as specified below.

3.7.6.1.1 Treatment

Do not allow wastewater from construction activities, such as onsite material processing, concrete curing, foundation and concrete clean-up, water used in concrete trucks, and forms to enter water ways or to be discharged prior to being treated to remove pollutants. Dispose of the construction-related waste water[off-Government property in accordance with 40 CFR 403, state, regional, and local laws and regulations.][by collecting and placing it in a retention pond where suspended material can be settled out or the water can evaporate to separate pollutants from the water. The site for the retention pond must be coordinated and approved with the Contracting Officer. The residue left in the pond prior to completion of the project must be removed, tested, and disposed of off-Government property in accordance with federal, state, and local laws and regulations. Backfill the area to the original grade, top-soiled, and seeded or sodded. Test the water in the retention pond for pollutants and have the results reviewed and approved by the Contracting Officer prior to

being discharged or disposed of off- Government property.

3.7.6.1.2 Surface Discharge

For discharge of ground water, obtain a state or federal permit specific for pumping and discharging ground water prior to surface discharging. Surface discharge in accordance with federal, state, and local laws and regulations. Surface discharge in accordance with the requirements of the NPDES or state STORMWATER DISCHARGES FROM CONSTRUCTION SITES permit.

3.7.6.1.3 Land Application

Water generated from the flushing of lines after disinfection must be discharged into the sanitary sewer with prior approval and notification to the Wastewater Treatment Plant's Operator.

3.8 HAZARDOUS MATERIAL MANAGEMENT

Include hazardous material control procedures in the Safety Plan, in accordance with Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS. Address procedures and proper handling of hazardous materials, including the appropriate transportation requirements. Do not bring hazardous material onto Government property that does not directly relate to requirements for the performance of this contract. Submit an SDS and estimated quantities to be used for each hazardous material to the Contracting Officer prior to bringing the material on the installation. Typical materials requiring SDS and quantity reporting include, but are not limited to, oil and latex based painting and caulking products, solvents, adhesives, aerosol, and petroleum products. Use hazardous materials in a manner that minimizes the amount of hazardous waste generated. Containers of hazardous materials must have National Fire Protection Association labels or their equivalent. Certify that hazardous materials removed from the site are hazardous materials and do not meet the definition of hazardous waste, in accordance with 40 CFR 261.

3.9 PREVIOUSLY USED EQUIPMENT

Clean previously used construction equipment prior to bringing it onto the project site. Equipment must be free from soil residuals, egg deposits from plant pests, noxious weeds, and plant seeds. Consult with the U.S. Department of Agriculture jurisdictional office for additional cleaning requirements.

3.10 CONTROL AND MANAGEMENT OF ASBESTOS-CONTAINING MATERIAL (ACM)

Manage and dispose of asbestos- containing waste in accordance with 40 CFR 61. Refer to [Section 02 82 13.00 10 ASBESTOS ABATEMENT IN SCHOOLS (K-12) BUILDINGS] [Section 02 82 16.00 20 ASBESTOS ABATEMENT IN NON-SCHOOL (K-12) BUILDING]. Manifest asbestos-containing waste and provide the manifest to the Contracting Officer. Notifications to the state and Installation Air Program Manager are required before starting any asbestos work.

3.11 CONTROL AND MANAGEMENT OF LEAD-BASED PAINT (LBP)

Manage and dispose of lead-contaminated waste in accordance with 40 CFR 745 and [Section 02 82 33.13 20 REMOVAL/CONTROL AND DISPOSAL OF PAINT WITH LEAD;] [Section 02 83 13.00 20 LEAD IN CONSTRUCTION;] [Section 02 83 19.00 10 LEAD BASED PAINT HAZARD ABATEMENT, TARGET HOUSING AND CHILD OCCUPIED FACILITIES]. Manifest any lead-contaminated waste and provide the

manifest to the Contracting Officer.

3.12 CONTROL AND MANAGEMENT OF POLYCHLORINATED BIPHENYLS (PCBS)

Manage and dispose of PCB-contaminated waste in accordance with 40 CFR 761 and Section 02 84 33 REMOVAL AND DISPOSAL OF POLYCHLORINATED BIPHENYLS (PCBS).

3.13 CONTROL AND MANAGEMENT OF LIGHTING BALLAST AND LAMPS CONTAINING PCBS

Manage and dispose of contaminated waste in accordance with 40 CFR 761. [Refer to Section 02 84 16 HANDLING OF LIGHTING BALLASTS AND LAMPS CONTAINING PCBS AND MERCURY.]

3.14 MILITARY MUNITIONS

In the event military munitions, as defined in 40 CFR 260, are discovered or uncovered, immediately stop work in that area and immediately inform the Contracting Officer.

3.15 PETROLEUM, OIL, LUBRICANT (POL) STORAGE AND FUELING

POL products include flammable or combustible liquids, such as gasoline, diesel, lubricating oil, used engine oil, hydraulic oil, mineral oil, and cooking oil. Store POL products and fuel equipment and motor vehicles in a manner that affords the maximum protection against spills into the environment. Manage and store POL products in accordance with EPA 40 CFR 112, and other federal, state, regional, and local laws and regulations. Use secondary containments, dikes, curbs, and other barriers, to prevent POL products from spilling and entering the ground, storm or sewer drains, stormwater ditches or canals, or navigable waters of the United States. Describe in the EPP (see paragraph ENVIRONMENTAL PROTECTION PLAN) how POL tanks and containers must be stored, managed, and inspected and what protections must be provided. [Storage of oil, including fuel, on the project site is not allowed. Fuel must be brought to the project site each day that work is performed.] [Storage of fuel on the project site must be in accordance with EPA, state, and local laws and regulations and paragraph OIL STORAGE INCLUDING FUEL TANKS.]

3.15.1 Used Oil Management

Manage used oil generated on site in accordance with 40 CFR 279. Determine if any used oil generated while onsite exhibits a characteristic of hazardous waste. Used oil containing 1,000 parts per million of solvents is considered a hazardous waste and disposed of at the Contractor's expense. Used oil mixed with a hazardous waste is also considered a hazardous waste. Dispose in accordance with paragraph HAZARDOUS WASTE DISPOSAL.

3.15.2 Oil Storage Including Fuel Tanks

Provide secondary containment and overfill protection for oil storage tanks. A berm used to provide secondary containment must be of sufficient size and strength to contain the contents of the tanks plus 5 inches freeboard for precipitation. Construct the berm to be impervious to oil for 72 hours that no discharge will permeate, drain, infiltrate, or otherwise escape before cleanup occurs. Use drip pans during oil transfer operations; adequate absorbent material must be onsite to clean up any spills and prevent releases to the environment. Cover tanks and drip pans

during inclement weather. Provide procedures and equipment to prevent overfilling of tanks. If tanks and containers with an aggregate aboveground capacity greater than 1320 gallons will be used onsite (only containers with a capacity of 55 gallons or greater are counted), provide and implement a SPCC plan meeting the requirements of 40 CFR 112. Do not bring underground storage tanks to the installation for Contractor use during a project. Submit the SPCC plan to the Contracting Officer for approval.

Monitor and remove any rainwater that accumulates in open containment dikes or berms. Inspect the accumulated rainwater prior to draining from a containment dike to the environment, to determine there is no oil sheen present.

3.16 INADVERTENT DISCOVERY OF PETROLEUM-CONTAMINATED SOIL OR HAZARDOUS WASTES

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

3.17 CHLORDANE

Evaluate excess soils and concrete foundation debris generated during the demolition of housing units or other wooden structures for the presence of chlordane or other pesticides prior to reuse or final disposal.

3.18 SOUND INTRUSION

Make the maximum use of low-noise emission products, as certified by the EPA. Blasting or use of explosives are not permitted without written permission from the Contracting Officer, and then only during the designated times.

Keep construction activities under surveillance and control to minimize environment damage by noise. Comply with the provisions of the State of North Carolina rules.

3.19 POST CONSTRUCTION CLEANUP

Clean up areas used for construction in accordance with Contract Clause: "Cleaning Up". Unless otherwise instructed in writing by the Contracting Officer, remove traces of temporary construction facilities such as haul roads, work area, structures, foundations of temporary structures, stockpiles of excess or waste materials, and other vestiges of construction prior to final acceptance of the work. Grade parking area and similar temporarily used areas to conform with surrounding contours.

-- End of Section --

SECTION 01 78 00

CLOSEOUT SUBMITTALS
05/16

PART 1 GENERAL

1.1 SUBMITTALS

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

SD-11 Closeout Submittals

Record Drawings;G

1.2 PROJECT RECORD DOCUMENTS

1.2.1 Record Drawings

Drawings showing final as-built conditions of the project. This paragraph covers record drawings complete, as a requirement of the contract. The terms "drawings," "contract drawings," "drawing files," "working record drawings" and "final record drawings" refer to contract drawings which are revised to be used for final record drawings showing as-built conditions. The final record drawings must consist of one set of electronic PDF drawing files in the specified format, 2 sets of prints, and one set of the approved working Record drawings.

1.2.1.1 Working Record and Final Record Drawings

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

- a. 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. Systems designed or enhanced by the Contractor, such as HVAC controls, fire alarm, fire sprinkler, and irrigation systems.
- j. Modifications (include within change order price the cost to change working and final record drawings to reflect modifications) and compliance with the following procedures.
 - (1) Follow directions in the modification for posting descriptive changes.
 - (2) Place a Modification Circle at the location of each deletion.
 - (3) For new details or sections which are added to a drawing, place a Modification Circle by the detail or section title.
 - (4) For minor changes, place a Modification Circle by the area changed on the drawing (each location).
 - (5) For major changes to a drawing, place a Modification Circle by the title of the affected plan, section, or detail at each location.
 - (6) For changes to schedules or drawings, place a Modification Circle either by the schedule heading or by the change in the schedule.
 - (7) The Modification Circle size shall be 1/2 inch diameter unless the area where the circle is to be placed is crowded. Smaller size circle shall be used for crowded areas.

1.2.1.2 Drawing Preparation

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

1.2.1.3 Payment

No separate payment will be made for record drawings required under this contract, and all costs accrued in connection with such drawings are considered a subsidiary obligation of the Contractor.

1.2.2 Final Approved Shop Drawings

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

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 02 41 00

DEMOLITION
04/16

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI A10.6

(2006) Demolition Operations

1.2 GENERAL REQUIREMENTS

Do not begin demolition until authorization is received from the Contracting Officer. Provide advance notices as required by specification section 01 14 00, "Work Restrictions". All traffic controls shall be in place and approved prior to closing any lanes. All required submittals shall have been submitted and approval received from the Contracting Officer before work begins. Remove rubbish and debris from the Air Station daily; do not allow accumulations on roadways.

1.3 SUBMITTALS

Submit the following in accordance with Section 01 33 00, "Submittal Procedures." Submittal preparations including supporting documents shall be prepared as Bid Item 0001, Firm Fixed Price Lump Sum work.

SD-01 Preconstruction Data

Demolition plans; G

a. Submit proposed demolition procedures for all demolition requirements. Include salvage, demolition and removal procedures that will minimize unnecessary exposure of subgrades to weather and heavy construction equipment. Submit the plan to the Contracting Officer for approval before work is started. Coordinate the demolition plan with the traffic control plan required by specification section 01 50 00.00 20. Specific detailed demolition plans and sequences of work are noted below:

b. Pavement Removal Plan

Describe sequence of events required to remove pavement structures under a) road and lane closure conditions and b) temporary lane closure conditions. Reference typical traffic control plans that will be utilized submitted separately. Show pavement demolition (separate from the milling limits plan required elsewhere in the specifications).

e. Sign Removal Plan

Provide location plan and sign inventory for signs to be removed, salvaged and reinstalled. Record sign post type (wood or metal). Present information in a tabular format showing each sign keyed to a unique sign identifier. In the table, provide a columns for use by the Government to indicate the disposition of each sign and of each post. The Government will use the columns to indicate if signs are to be salvaged and reused.

f. Storm Drain Removal and Modification Plan

Based on the CQC field survey, show storm drain demolition requirements on a set of plans. Note pipe segments to be removed and pipe inverts of the pipe to be removed. Describe methods that will be employed to control storm water during construction. Note inlet geometrics scheduled to receive modifications.

g. Curb Removal Plans

Show limits of sidewalk and curbing removal on a set of plans. Record elevations of the various elements to be removed by roadway stationing. Locate the nearest joint to which the concrete will be removed.

c. Underground Utility Search Findings

The Contractor's CQC surveyor must record any utilities discovered during the utility search. Place the data on a unique layer reserved for underground utility data.

1.4 REGULATORY AND SAFETY REQUIREMENTS

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

1.5 DUST AND DEBRIS CONTROL

Prevent the spread of dust and debris onto Air Station roadways.

1.6 PROTECTION

1.6.1 Traffic Control Signs

Where pedestrian and driver safety is endangered in the area of removal work, use traffic control measures indicated on the drawings and by specification section 32 01 00, "Temporary Traffic Controls." Notify the Contracting Officer once traffic controls are in-place for field inspection and approval. Make adjustments to traffic controls when directed by the Contracting Officer.

1.6.2 Existing Work

Protect existing work which is to remain in place, be reused, or remain the property of the Government. Repair items which are to remain which are to be salvaged and which are damaged during performance of the work to their original condition, or replace with new. Do not overload pavements to remain.

1.7 SALVAGED ITEMS

Perform the removal and reinstallation of salvaged items where indicated on the contract drawings with workmen skilled in the trades involved. Repair items to be relocated which are damaged or replace damaged items with new undamaged items as approved by the Contracting Officer.

1.8 Required Data

Demolition plan shall include procedures for careful removal and disposition of materials specified to be salvaged, coordination with other work in progress, a detailed description of methods and equipment to be used for each operation and of the sequence of operations. Include statements affirming Contractor plan to remove surface storm water runoff.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 ADVANCE NOTICES TO THE GOVERNMENT

Provide advance notice to the Contracting Officer before removing pavements, railroad or utilities from service. Refer to specification section 01 14 00, "Work Restrictions" for specific and general notices that are required.

3.2 EXISTING FACILITIES TO BE REMOVED

Insure that all approved submittals are in place and that materials, labor and equipment noted in specification section 01 14 00, "Work Restrictions" are in-place before taking any work feature out of service.

3.2.1 Traffic Control Signs

Remove signs and posts indicated on the drawings for reinstallation or relocation upon completion of work. Protect signs from damage during construction. Should sign posts become difficult to salvage, the Contractor may provide new sign posts to match and dispose of the existing posts.

3.2.2 Paving and Concrete Demolition

Remove sawcut and milled asphaltic concrete paving to a depths indicated on the contract drawings. Contractor shall be prepared to trim pavements broken during construction at no additional cost to the Government. Saw cuts shall be made to the full depth thickness of the bituminous concrete.

3.3 DISPOSITION OF MATERIAL

3.3.1 Title to Materials

Except where specified in other sections, all materials and equipment removed, and not reused, shall become the property of the Contractor and shall be removed from Government property. Title to materials resulting from demolition, and materials and equipment to be removed, is vested in the Contractor upon approval by the Contracting Officer of the Contractor's demolition and removal procedures, and authorization by the Contracting

Officer to begin demolition. The Government will not be responsible for the condition or loss of, or damage to, such property after contract award. Materials and equipment shall not be viewed by prospective purchasers or sold on the site.

3.3.2 Reuse of Materials and Equipment

Remove and store signs (and posts when directed by the Contracting Officer), railroad rails, tie plates and joint bar hardware and timber railroad ties in good condition to be reused or relocated to prevent damage, and reinstall as the work progresses.

3.4 CLEANUP

3.4.1 Debris and Rubbish

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

-- End of Section --

SECTION 31 00 00

EARTHWORK
08/08

PART 1 GENERAL

1.1 MEASUREMENT PROCEDURES

1.1.1 Excavation

The unit of measurement for excavation will be the cubic yard, computed by the average end area method from cross sections taken before and after the excavation operations, including the excavation for ditches, gutters, and channel changes, when the material is acceptably utilized or disposed of as herein specified. The measurements will include authorized excavation of rock (except for piping trenches that is covered below), authorized excavation of unsatisfactory subgrade soil, and the volume of loose, scattered rocks and boulders collected within the limits of the work; allowance will be made on the same basis for selected backfill ordered as replacement. The measurement will not include the volume of subgrade material or other material that is scarified or plowed and reused in-place, and will not include the volume excavated without authorization or the volume of any material used for purposes other than directed. The measurement will not include the volume of any excavation performed prior to the taking of elevations and measurements of the undisturbed grade.

1.1.2 Piping Trench Excavation

Measure trench excavation by the number of linear feet along the centerline of the trench and excavate to the depths and widths specified for the particular size of pipe. Replace unstable trench bottoms with a selected granular material. Include the additional width at manholes and similar structures, the furnishing, placing and removal of sheeting and bracing, pumping and bailing, and all incidentals necessary to complete the work required by this section.

1.1.3 Rock Excavation for Trenches

Measure and pay for rock excavation by the number of cubic yards of acceptably excavated rock material. Measure the material in place, but base volume on a maximum 30 inches width for pipes 12 inches in diameter or less, and a maximum width of 16 inches greater than the outside diameter of the pipe for pipes over 12 inches in diameter. Provide the measurement to include all authorized overdepth rock excavation as determined by the Contracting Officer. For manholes and other appurtenances, compute volumes of rock excavation on the basis of 1 foot outside of the wall lines of the structures.

1.1.4 Overhaul Requirements

Allow the unit of measurement for overhaul to be the station-yard. The overhaul distance will be the distance in stations between the center of volume of the overhaul material in its original position and the center of volume after placing, minus the free-haul distance in stations. The haul distance will be measured along the shortest route determined by the Contracting Officer as feasible and satisfactory.

1.1.5 Select Granular Material

Measure select granular material in place as the actual cubic yards replacing wet or unstable material in trench bottoms [within the limits shown] [in authorized overdepth areas]. Provide unit prices which include furnishing and placing the granular material, excavation and disposal of unsatisfactory material, and additional requirements for sheeting and bracing, pumping, bailing, cleaning, and other incidentals necessary to complete the work.

1.2 PAYMENT PROCEDURES

Payment will constitute full compensation for all labor, equipment, tools, supplies, and incidentals necessary to complete the work.

1.2.1 Classified Excavation

Classified excavation will be paid for at the contract unit prices per cubic yard for common or rock excavation.

1.2.2 Piping Trench Excavation

Payment for trench excavation will constitute full payment for excavation and backfilling, [including specified overdepth] except in rock or unstable trench bottoms.

1.2.3 Rock Excavation for Trenches

Payment for rock excavation will be made in addition to the price bid for the trench excavation, and will include all necessary drilling and blasting and all incidentals necessary to excavate and dispose of the rock. Select granular material, used as backfill replacing rock excavation, will not be paid for separately, but will be included in the unit price for rock excavation.

1.2.4 Unclassified Excavation

Unclassified excavation will be paid for at the contract unit price per cubic yard for unclassified excavation.

1.2.5 Authorized Overhaul

The number of station-yards of overhaul to be paid for will be the product of number of cubic yards of overhaul material measured in the original position, multiplied by the overhaul distance measured in stations of 100 feet and will be paid for at the contract unit price per station-yard for overhaul in excess of the free-haul limit as designated in paragraph DEFINITIONS.

1.2.6 Sheeting and Bracing

Sheeting and bracing, when shown or authorized by the Contracting Officer to be left in place, will be paid for as follows: [_____].

1.2.6.1 Timber Sheeting

Timber sheeting will be paid for as the number of board feet of lumber below finish grade measured in place prior to backfilling. Include in the

measurement sheeting wasted when cut off between the finished grade and 1 foot below the finished grade.

1.2.6.2 Steel Sheeting and Soldier Piles

Steel sheeting, soldier piles, and steel bracing will be paid for according to the number of pounds of steel calculated. Calculate the steel by multiplying the measured in-place length in feet below finish grade by the unit weight of the section in pounds per foot. Obtain unit weight of rolled steel sections from recognized steel manuals.

1.3 CRITERIA FOR BIDDING

Base bids on the following criteria:

- a. Surface elevations are as indicated.
- b. Pipes or other artificial obstructions, except those indicated, will not be encountered.
- c. Ground water elevations indicated by the boring log were those existing at the time subsurface investigations were made and do not necessarily represent ground water elevation at the time of construction.
- e. [Material character is indicated by the boring logs.]
- f. Refer to the bore logs to determine if hard materials be encountered below existing surface elevations.

1.4 REFERENCES

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

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO T 180	(2010) Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop
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AASHTO T 224	(2010) Standard Method of Test for Correction for Coarse Particles in the Soil Compaction Test
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AMERICAN WATER WORKS ASSOCIATION (AWWA)

AWWA C600	(2010) Installation of Ductile-Iron Water Mains and Their Appurtenances
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AMERICAN WELDING SOCIETY (AWS)

AWS D1.1/D1.1M	(2010; Errata 2011) Structural Welding Code - Steel
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ASTM INTERNATIONAL (ASTM)

ASTM C136/C136M	(2014) Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM C33/C33M	(2013) Standard Specification for Concrete Aggregates
ASTM D1140	(2014) 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/ft ³) (2700 kN-m/m ³)
ASTM D2167	(2008) Density and Unit Weight of Soil in Place by the Rubber Balloon Method
ASTM D2487	(2011) Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D2937	(2010) Density of Soil in Place by the Drive-Cylinder Method
ASTM D422	(1963; R 2007; E 2014; E 2014) Particle-Size Analysis of Soils
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. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA 600/4-79/020	(1983) Methods for Chemical Analysis of Water and Wastes
EPA SW-846.3-3	(1999, Third Edition, Update III-A) Test Methods for Evaluating Solid Waste: Physical/Chemical Methods

U.S. GENERAL SERVICES ADMINISTRATION (GSA)

CID A-A-203	(Rev C; Notice 3) Paper, Kraft, Untreated
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1.5 DEFINITIONS

1.5.1 Satisfactory Materials

Satisfactory materials comprise any materials classified by ASTM D2487 as GW, GP, GM, GP-GM, GW-GM, GC, GP-GC, GM-GC, SW, SP, [SM,] [SW-SM,] [SC,] [SW-SC,] [SP-SM,] [SP-SC,] [CL,] [ML,] [CL-ML,] [CH,] [MH]. Satisfactory materials for grading comprise stones less than 8 inches, except for fill material for pavements and railroads which comprise stones less than 3 inches in any dimension.

1.5.2 Unsatisfactory Materials

Materials which do not comply with the requirements for satisfactory materials are unsatisfactory. Unsatisfactory materials also include man-made fills; trash; refuse; backfills from previous construction; and material classified as satisfactory which contains root and other organic matter or frozen material. Notify the Contracting Officer when encountering any contaminated materials.

1.5.3 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 and SM will be identified as cohesionless only when the fines are nonplastic. Perform testing, required for classifying materials, in accordance with ASTM D4318, ASTM C136/C136M, ASTM D422, and ASTM D1140.

1.5.4 Degree of Compaction

Degree of compaction required, except as noted in the second sentence, is expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D1557 abbreviated as a percent of laboratory maximum density. Since ASTM D1557 applies only to soils that have 30 percent or less by weight of their particles retained on the 3/4 inch sieve, express the degree of compaction for material having more than 30 percent by weight of their particles retained on the 3/4 inch sieve as a percentage of the maximum density in accordance with AASHTO T 180 and corrected with AASHTO T 224. To maintain the same percentage of coarse material, use the "remove and replace" procedure as described in NOTE 8 of Paragraph 7.2 in AASHTO T 180.

1.5.5 Overhaul

Overhaul is the authorized transportation of satisfactory excavation or borrow materials in excess of the free-haul. Overhaul is the product of the quantity of materials hauled beyond the free-haul limit, and the distance such materials are hauled beyond the free-haul limit, expressed in station yards.

1.5.6 Hard/Unyielding Materials

Hard/Unyielding materials comprise weathered rock, dense consolidated deposits, or conglomerate materials which are not included in the definition of "rock" with stones greater than [_____] inch in any dimension or as defined by the pipe manufacturer, whichever is smaller. These materials usually require the use of heavy excavation equipment, ripper teeth, or jack hammers for removal.

1.5.7 Rock

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

1.5.8 Unstable Material

Unstable materials are too wet to properly support the utility pipe, conduit, or appurtenant structure.

1.5.9 Select Granular Material

1.5.9.1 General Requirements

Select granular material consist of materials classified as GW,GP, SW, or SP by ASTM D2487 where indicated. The liquid limit of such material must not exceed 35 percent when tested in accordance with ASTM D4318. The plasticity index must not be greater than 12 percent when tested in accordance with ASTM D4318, and not more than 35 percent by weight may be finer than No. 200 sieve when tested in accordance with ASTM D1140.

1.5.10 Initial Backfill Material

Initial backfill consists of select granular material or satisfactory materials free from rocks of such size as recommended by the pipe manufacturer.

1.5.11 Expansive Soils

Expansive soils are defined as soils that have a plasticity index equal to or greater than 15 when tested in accordance with ASTM D4318.

1.5.12 Nonfrost Susceptible (NFS) Material

Nonfrost susceptible material are a uniformly graded washed sand with a maximum particle size of 1/4 inch sieve inch and less than 5 percent passing the No. 200 size sieve, and with not more than 3 percent by weight finer than 0.02 mm grain size.

1.5.13 Pile Supported Structure

As used herein, a structure where both the foundation and floor slab are pile supported.

1.6 SYSTEM DESCRIPTION

Subsurface soil boring logs are shown on the drawings. These data represent the best subsurface information available; however, variations may exist in the subsurface between boring locations.

1.6.1 Classification of Excavation

[No consideration will be given to the nature of the materials, and all excavation will be designated as unclassified excavation.] [Finish the specified excavation on a classified basis, in accordance with the following designations and classifications.]

1.6.1.1 Common Excavation

Include common excavation with the satisfactory removal and disposal of all materials not classified as rock excavation.

1.6.1.2 Rock Excavation

Submit notification of encountering rock in the project. Include rock excavation with blasting, excavating, grading, disposing of material classified as rock, and the satisfactory removal and disposal of boulders 1/2 cubic yard or more in volume; solid rock; rock material that is in ledges, bedded deposits, and unstratified masses, which cannot be removed without systematic drilling and blasting; firmly cemented conglomerate deposits possessing the characteristics of solid rock impossible to remove without systematic drilling and blasting; and hard materials (see Definitions). Include the removal of any concrete or masonry structures, except pavements, exceeding 1/2 cubic yard in volume that may be encountered in the work in this classification. If at any time during excavation, the Contractor encounters material that may be classified as rock excavation, uncover such material and notify the Contracting Officer. Do not proceed with the excavation of this material until the Contracting Officer has classified the materials as common excavation or rock excavation and has taken cross sections as required. Failure on the part of the Contractor to uncover such material, notify the Contracting Officer, and allow ample time for classification and cross sectioning of the undisturbed surface of such material will cause the forfeiture of the Contractor's right of claim to any classification or volume of material to be paid for other than that allowed by the Contracting Officer for the areas of work in which such deposits occur.

1.6.2 Dewatering Work Plan

Submit procedures for accomplishing dewatering work.

1.7 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for [Contractor Quality Control approval.] [information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government.] Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Shoring; G
Dewatering Work Plan; G
Blasting; G

SD-03 Product Data

Utilization of Excavated Materials; G
 Rock Excavation
 Opening of any Excavation or Borrow Pit
 Shoulder Construction

SD-06 Test Reports

Testing

Borrow Site Testing

Within 24 hours of conclusion of physical tests, submit [_____] copies of test results, including calibration curves and results of calibration tests.

SD-07 Certificates

Testing

PART 2 PRODUCTS

2.1 REQUIREMENTS FOR OFFSITE SOILS

Test offsite soils brought in for use as backfill for Total Petroleum Hydrocarbons (TPH), Benzene, Toluene, Ethyl Benzene, and Xylene (BTEX) and full Toxicity Characteristic Leaching Procedure (TCLP) including ignitability, corrosivity and reactivity. Backfill shall contain a maximum of [100] [_____] parts per million (ppm) of total petroleum hydrocarbons (TPH) and a maximum of [10] [_____] ppm of the sum of Benzene, Toluene, Ethyl Benzene, and Xylene (BTEX) and shall pass the TCPL test. Determine TPH concentrations by using EPA 600/4-79/020 Method 418.1. Determine BTEX concentrations by using EPA SW-846.3-3 Method 5030/8020. Perform TCLP in accordance with EPA SW-846.3-3 Method 1311. Provide Borrow Site Testing for TPH, BTEX and TCLP from a composite sample of material from the borrow site, with at least one test from each borrow site. Do not bring material onsite until tests have been approved by the Contracting Officer.

2.2 BURIED WARNING AND IDENTIFICATION TAPE

Provide [polyethylene plastic] [and] [metallic core or metallic-faced, acid- and alkali-resistant, polyethylene plastic] warning tape manufactured specifically for warning and identification of buried utility lines. Provide tape on rolls, 3 inches minimum width, color coded as specified below for the intended utility with warning and identification imprinted in bold black letters continuously over the entire tape length. Warning and identification to read, "CAUTION, BURIED (intended service) LINE BELOW" or similar wording. Provide permanent color and printing, unaffected by moisture or soil.

Warning Tape Color Codes	
Red	Electric
Yellow	Gas, Oil; Dangerous Materials
Orange	Telephone and Other Communications

Warning Tape Color Codes	
Blue	Water Systems
Green	Sewer Systems
White	Steam Systems
Gray	Compressed Air

2.2.1 Warning Tape for Metallic Piping

Provide acid and alkali-resistant polyethylene plastic tape conforming to the width, color, and printing requirements specified above, 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.

2.2.2 Detectable Warning Tape for Non-Metallic Piping

Provide polyethylene plastic tape conforming to the width, color, and printing requirements specified above, with a minimum thickness of 0.004 inch, and a minimum strength of 1500 psi lengthwise and 1250 psi crosswise. Manufacture tape with integral wires, foil backing, or other means of enabling detection by a metal detector when tape is buried up to 3 feet deep. Encase metallic element of the tape in a protective jacket or provide with other means of corrosion protection.

2.3 DETECTION WIRE FOR NON-METALLIC PIPING

Insulate a single strand, solid copper detection wire with a minimum of 12 AWG.

2.4 MATERIAL FOR RIP-RAP

Provide filter fabric and rock conforming to NCDOT Standard for construction indicated.

2.4.1 Bedding Material

Provide bedding material consisting of sand, gravel, or crushed rock, well graded with a maximum particle size of 2 inches. Compose material of tough, durable particles. Allow fines passing the No. 200 standard sieve with a plasticity index less than six.

2.4.2 Grout

Provide durable grout composed of cement, water, an air-entraining admixture, and sand mixed in proportions of one part portland cement to two parts of sand, sufficient water to produce a workable mixture, and an amount of admixture which will entrain sufficient air, as determined by the Contracting Officer. Mix grout in a concrete mixer. Allow a sufficient mixing time to produce a mixture having a consistency permitting gravity flow into the interstices of the rip-rap with limited spading and brooming.

2.4.3 Rock

Provide rock fragments sufficiently durable to ensure permanence in the

structure and the environment in which it is to be used. Use rock fragments free from cracks, seams, and other defects that would increase the risk of deterioration from natural causes. Provide fragments sized so that no individual fragment exceeds a weight of 150 pounds and that no more than 10 percent of the mixture, by weight, consists of fragments weighing 2 pounds or less each. Provide rock with a minimum specific gravity of 2.50. Do not permit the inclusion of more than trace [1 percent] [_____] quantities of dirt, sand, clay, and rock fines.

PART 3 EXECUTION

3.1 GENERAL EXCAVATION

Perform excavation of every type of material encountered within the limits of the project to the lines, grades, and elevations indicated and as specified. Perform the grading in accordance with the typical sections shown and the tolerances specified in paragraph FINISHING. Transport satisfactory excavated materials and place in fill or embankment within the limits of the work. Excavate unsatisfactory materials encountered within the limits of the work below grade and replace with satisfactory materials as directed. Include such excavated material and the satisfactory material ordered as replacement in excavation. Dispose surplus satisfactory excavated material not required for fill or embankment in areas approved for surplus material storage or designated waste areas. Dispose unsatisfactory excavated material in designated waste or spoil areas. During construction, perform excavation and fill in a manner and sequence that will provide proper drainage at all times. Excavate material required for fill or embankment in excess of that produced by excavation within the grading limits from other approved areas selected by the Contractor as specified.

3.1.1 Ditches, Gutters, and Channel Changes

Finish excavation of ditches, gutters, and channel changes by cutting accurately to the cross sections, grades, and elevations shown on Drawing Sheet No. [____]. Do not excavate ditches and gutters below grades shown. Backfill the excessive open ditch or gutter excavation with satisfactory, thoroughly compacted, material or with suitable stone or cobble to grades shown. Dispose excavated material as shown or as directed, except in no case allow material be deposited a maximum 4 feet from edge of a ditch. Maintain excavations free from detrimental quantities of leaves, brush, sticks, trash, and other debris until final acceptance of the work.

3.1.2 Drainage Structures

Make excavations to the lines, grades, and elevations shown, or as directed. Provide trenches and foundation pits of sufficient size to permit the placement and removal of forms for the full length and width of structure footings and foundations as shown. Clean rock or other hard foundation material of loose debris and cut to a firm, level, stepped, or serrated surface. Remove loose disintegrated rock and thin strata. Do not disturb the bottom of the excavation when concrete or masonry is to be placed in an excavated area. Do not excavate to the final grade level until just before the concrete or masonry is to be placed. Where pile foundations are to be used, stop the excavation of each pit at an elevation 1 foot above the base of the footing, as specified, before piles are driven. After the pile driving has been completed, remove loose and displaced material and complete excavation, leaving a smooth, solid,

undisturbed surface to receive the concrete or masonry.

3.1.3 Drainage

Provide for the collection and disposal of surface and subsurface water encountered during construction. Completely drain construction site during periods of construction to keep soil materials sufficiently dry. Construct storm drainage features (ponds/basins) at the earliest stages of site development, and throughout construction grade the construction area to provide positive surface water runoff away from the construction activity [and] [or] provide temporary ditches, swales, and other drainage features and equipment as required to maintain dry soils. When unsuitable working platforms for equipment operation and unsuitable soil support for subsequent construction features develop, remove unsuitable material and provide new soil material as specified herein. 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.

3.1.4 Dewatering

Control groundwater flowing toward or into excavations to prevent sloughing of excavation slopes and walls, boils, uplift and heave in the excavation and to eliminate interference with orderly progress of construction. Do not permit French drains, sumps, ditches or trenches within 3 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. Take control measures 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.

3.1.5 Trench Excavation Requirements

Excavate the trench as recommended by the manufacturer of the pipe to be installed. Slope trench walls below the top of the pipe, or make vertical, and of such width as recommended in the manufacturer's printed installation manual. Provide vertical trench walls where no manufacturer's printed installation manual is available. Shore trench walls in accordance to OSHA, cut back to a stable slope, or provide with equivalent means of protection for employees who may be exposed to moving ground or cave in. Excavate trench walls which are cut back to at least the angle of repose of the soil. Give special attention to slopes which may be adversely affected by weather or moisture content. Do not exceed the trench width below the pipe top of 24 inches plus pipe outside diameter (O.D.) for pipes of less than 24 inches inside diameter, and do not exceed 36 inches plus pipe outside diameter for sizes larger than 24 inches inside diameter. Where recommended trench widths are exceeded, provide redesign, stronger pipe, or special installation procedures by the Contractor. The Contractor is responsible for the cost of redesign, stronger pipe, or special installation procedures without any additional cost to the Government.

3.1.5.1 Bottom Preparation

Grade the bottoms of trenches accurately to provide uniform bearing and support for the bottom quadrant of each section of the pipe. Excavate bell holes to the necessary size at each joint or coupling to eliminate point bearing. Remove stones of [_____] inch or greater in any dimension, or as recommended by the pipe manufacturer, whichever is smaller, to avoid point

bearing.

3.1.5.2 Removal of Unyielding Material

Where [overdepth is not indicated and] unyielding material is encountered in the bottom of the trench, remove such material [_____] inch below the required grade and replaced with suitable materials as provided in paragraph BACKFILLING AND COMPACTION.

3.1.5.3 Removal of Unstable Material

Where unstable material is encountered in the bottom of the trench, remove such material to the depth directed and replace it to the proper grade with select granular material as provided in paragraph BACKFILLING AND COMPACTION. When removal of unstable material is required due to the Contractor's fault or neglect in performing the work, the Contractor is responsible for excavating the resulting material and replacing it without additional cost to the Government.

3.1.5.4 Excavation for Appurtenances

Provide excavation for manholes, catch-basins, inlets, or similar structures [sufficient to leave at least 12 inches clear between the outer structure surfaces and the face of the excavation or support members.] [of sufficient size to permit the placement and removal of forms for the full length and width of structure footings and foundations as shown.] Clean rock or loose debris and cut to a firm surface either level, stepped, or serrated, as shown or as directed. Remove loose disintegrated rock and thin strata. Specify removal of unstable material. When concrete or masonry is to be placed in an excavated area, take special care not to disturb the bottom of the excavation. Do not excavate to the final grade level until just before the concrete or masonry is to be placed.

3.1.5.5 Jacking, Boring, and Tunneling

Unless otherwise indicated, provide excavation by open cut except that sections of a trench may be jacked, bored, or tunneled if, in the opinion of the Contracting Officer, the pipe, cable, or duct can be safely and properly installed and backfill can be properly compacted in such sections.

3.1.6 Underground Utilities

The Contractor is responsible for movement of construction machinery and equipment over pipes and utilities during construction. [Perform work adjacent to non-Government utilities as indicated in accordance with procedures outlined by utility company.] [Excavation made with power-driven equipment is not permitted within [2] [_____] feet of known Government-owned utility or subsurface construction. 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.

3.1.7 Structural Excavation

Ensure that footing subgrades have been inspected and approved by the

Contracting Officer prior to concrete placement. Excavate to bottom of pile cap prior to placing or driving piles, unless authorized otherwise by the Contracting Officer. Backfill and compact over excavations and changes in grade due to pile driving operations to 95 percent of ASTM D698 maximum density.

3.2 OPENING AND DRAINAGE OF EXCAVATION

Notify the Contracting Officer sufficiently in advance of the opening of any excavation or borrow pit to permit elevations and measurements of the undisturbed ground surface to be taken. Except as otherwise permitted, excavation areas providing adequate drainage. Transport overburden and other spoil material to designated spoil areas or otherwise dispose of as directed. Ensure that excavation of any area, or dumping of spoil material results in minimum detrimental effects on natural environmental conditions.

3.3 SHORING

3.3.1 General Requirements

Submit a Shoring and Sheet piling plan for approval 15 days prior to starting work. Submit drawings and calculations, certified by a registered professional engineer, describing the methods for shoring and sheet piling of excavations. Finish shoring, including sheet piling, and install as necessary to protect workmen, banks, adjacent paving, structures, and utilities. Remove shoring, bracing, and sheet piling as excavations are backfilled, in a manner to prevent caving.

3.4 GRADING AREAS

Where indicated, divide work into grading areas within which satisfactory excavated material will be placed in embankments, fills, and required backfills. Do not haul satisfactory material excavated in one grading area to another grading area except when so directed in writing. Place and grade stockpiles of satisfactory [and unsatisfactory] [and wasted materials] as specified. Keep stockpiles in a neat and well drained condition, giving due consideration to drainage at all times. Clear, grub, and seal by rubber-tired equipment, the ground surface at stockpile locations; separately stockpile excavated satisfactory and unsatisfactory materials. Protect stockpiles of satisfactory materials from contamination which may destroy the quality and fitness of the stockpiled material. If the Contractor fails to protect the stockpiles, and any material becomes unsatisfactory, remove and replace such material with satisfactory material from approved sources.

3.5 FINAL GRADE OF SURFACES TO SUPPORT CONCRETE

Do not excavate to final grade until just before concrete is to be placed. [For pile foundations, stop the excavation at an elevation of from 6 to 12 inches above the bottom of the footing before driving piles. After pile driving has been completed, complete the remainder of the excavation to the elevations shown.] Only use excavation methods that will leave the foundation rock in a solid and unshattered condition. Roughen the level surfaces, and cut the sloped surfaces, as indicated, into rough steps or benches to provide a satisfactory bond. Protect shales from slaking and all surfaces from erosion resulting from ponding or water flow.

3.6 GROUND SURFACE PREPARATION

3.6.1 General Requirements

Remove and replace unsatisfactory material with satisfactory materials, as directed by the Contracting Officer, in surfaces to receive fill or in excavated areas. Scarify the surface to a depth of 6 inches before the fill is started. Plow, step, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so that the fill material will bond with the existing material. When subgrades are less than the specified density, break up the ground surface to a minimum depth of 6 inches, pulverizing, and compacting to the specified density. When the subgrade is part fill and part excavation or natural ground, scarify the excavated or natural ground portion to a depth of 12 inches and compact it as specified for the adjacent fill.

3.6.2 Frozen Material

Do not place material on surfaces that are muddy, frozen, or contain frost. Finish compaction by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, or other approved equipment well suited to the soil being compacted. Moisten material as necessary [to plus or minus [_____] percent of optimum moisture] [to provide the moisture content that will readily facilitate obtaining the specified compaction with the equipment used].

3.7 UTILIZATION OF EXCAVATED MATERIALS

Dispose unsatisfactory materials removing from excavations into designated waste disposal or spoil areas. Use satisfactory material removed from excavations, insofar as practicable, in the construction of fills, embankments, subgrades, shoulders, bedding (as backfill), and for similar purposes. Submit procedure and location for disposal of unused satisfactory material. . Do not waste any satisfactory excavated material without specific written authorization. Dispose of satisfactory material, authorized to be wasted, in designated areas approved for surplus material storage or designated waste areas as directed. Clear and grub newly designated waste areas on Government-controlled land before disposal of waste material thereon. Stockpile and use coarse rock from excavations for constructing slopes or embankments adjacent to streams, or sides and bottoms of channels and for protecting against erosion. Do not dispose excavated material to obstruct the flow of any stream, endanger a partly finished structure, impair the efficiency or appearance of any structure, or be detrimental to the completed work in any way.

3.8 BURIED TAPE AND DETECTION WIRE

3.8.1 Buried Warning and Identification Tape

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

3.8.2 Buried Detection Wire

Bury detection wire directly above non-metallic piping at a distance not to exceed 12 inches above the top of pipe. Extend the wire continuously and unbroken, from manhole to manhole. Terminate the ends of the wire inside the manholes at each end of the pipe, with a minimum of 3 feet of wire,

coiled, remaining accessible in each manhole. Furnish insulated wire over it's entire length. Install wires at manholes between the top of the corbel and the frame, and extend up through the chimney seal between the frame and the chimney seal. For force mains, terminate the wire in the valve pit at the pump station end of the pipe.

3.9 BACKFILLING AND COMPACTION

Place backfill adjacent to any and all types of structures, and compact to at least 90 percent laboratory maximum density for cohesive materials or 95 percent laboratory maximum density for cohesionless materials, to prevent wedging action or eccentric loading upon or against the structure. Prepare ground surface on which backfill is to be placed and provide compaction requirements for backfill materials in conformance with the applicable portions of paragraphs GROUND SURFACE PREPARATION. Finish compaction by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment.

3.9.1 Trench Backfill

Backfill trenches to the grade shown. [Do not backfill the trench until all specified tests are performed.

3.9.1.1 Replacement of Unyielding Material

Replace unyielding material removed from the bottom of the trench with select granular material or initial backfill material.

3.9.1.2 Replacement of Unstable Material

Replace unstable material removed from the bottom of the trench or excavation with select granular material placed in layers not exceeding 6 inches loose thickness.

3.9.1.3 Bedding and Initial Backfill

Place initial backfill material and compact it with approved tampers to a height of at least one foot above the utility pipe or conduit. Bring up the backfill evenly on both sides of the pipe for the full length of the pipe. Take care to ensure thorough compaction of the fill under the haunches of the pipe. Except as specified otherwise in the individual piping section, provide bedding for buried piping in accordance with AWWA C600, Type 4, except as specified herein. Compact backfill to top of pipe to 95 percent of ASTM D698 maximum density. Provide plastic piping with bedding to spring line of pipe. Provide materials as follows:

3.9.1.3.1 Class I

Angular, 0.25 to 1.5 inch, graded stone, including a number of fill materials that have regional significance such as coral, slag, cinders, crushed stone, and crushed shells.

3.9.1.3.2 Class II

Coarse sands and gravels with maximum particle size of 1.5 inch, including various graded sands and gravels containing small percentages of fines, generally granular and noncohesive, either wet or dry. Soil Types GW, GP, SW, and SP are included in this class as specified in ASTM D2487.

3.9.1.3.3 Sand

Clean, coarse-grained sand classified as [_____] in accordance with Section 31 23 00.00 20 EXCAVATION AND FILL, [gradation [_____] of the [DOT] [State Standard] or [SW] [or] [SP] by ASTM D2487 for [bedding] [and] [backfill] [as indicated]].

3.9.1.3.4 Gravel and Crushed Stone

Clean, coarsely graded natural gravel, crushed stone or a combination thereof identified as [_____] in accordance with Section 31 23 00.00 20 EXCAVATION AND FILL, [gradation [_____] of the [DOT] [State Standard]] or having a classification of [GW] [GP] in accordance with ASTM D2487 for [bedding] [and] [backfill] [as indicated]. [Do not exceed maximum particle size of [3] [_____] inches.]

3.9.1.4 Final Backfill

Fill the remainder of the trench, except for special materials for roadways, railroads and airfields, with satisfactory material. Place backfill material and compact as follows:

3.9.1.4.1 Roadways, Railroads, and Airfields

Place backfill up to the required elevation as specified. Do not permit water flooding or jetting methods of compaction.

3.9.1.4.2 Sidewalks, Turfed or Seeded Areas and Miscellaneous Areas

Deposit backfill in layers of a maximum of 8 inches loose thickness, and compact it to 85 percent maximum density for cohesive soils and 90 percent maximum density for cohesionless soils. Do not permit compaction by water flooding or jetting. Apply this requirement to all other areas not specifically designated above.

3.10 SPECIAL REQUIREMENTS

Special requirements for both excavation and backfill relating to the specific utilities are as follows:

3.10.1 Gas Distribution

Excavate trenches to a depth that will provide a minimum 18 inches of cover in rock excavation and a minimum 24 inch of cover in other excavation.

3.10.2 Water Lines

Excavate trenches to a depth that provides a minimum cover of [_____] feet from the existing ground surface, or from the indicated finished grade, whichever is lower, to the top of the pipe. [For fire protection yard mains or piping, an additional [_____] inch of cover is required.]

3.10.3 Heat Distribution System

Free initial backfill material of stones larger than 1/4 inch in any dimension.

3.10.4 Electrical Distribution System

Provide a minimum cover of 24 inches from the finished grade to direct burial cable and conduit or duct line, unless otherwise indicated.

3.10.5 Sewage Absorption Trenches or Pits

3.10.5.1 Porous Fill

Provide backfill material consisting of clean crushed rock or gravel having a gradation [such that 100 percent passes the 2 inch sieve and zero percent passes the 1/2 inch sieve.] [conforming to the requirements of gradation [No. 4] [_____] for coarse aggregate in ASTM C33/C33M.]

3.10.5.2 Cover

[Filter fabric] [Concrete] [Kraft paper conforming to CID A-A-203, Grade B, No. 2, 50 pound weight] [or a layer of straw at least 2 inches thick] as indicated.

3.10.6 Pipeline Casing

Provide new smooth wall steel pipeline casing under [new] [existing] [railroad] [and] [pavement] [in a trench] [by the boring and jacking method of installation]. Provide each new pipeline casing, where indicated and to the lengths and dimensions shown, complete and suitable for use with the new piped utility as indicated. [Install pipeline casing by dry boring and jacking method as follows:]

3.10.6.1 Bore Holes

Mechanically bore holes and case through the soil with a cutting head on a continuous auger mounted inside the casing pipe. Weld lengths of pipe together in accordance with AWS D1.1/D1.1M. Do not use water or other fluids in connection with the boring operation.

3.10.6.2 Cleaning

Clean inside of the pipeline casing of dirt, weld splatters, and other foreign matter which would interfere with insertion of the piped utilities by attaching a pipe cleaning plug to the boring rig and passing it through the pipe.

3.10.6.3 End Seals

After installation of piped utilities in pipeline casing, provide watertight end seals at each end of pipeline casing between pipeline casing and piping utilities. Provide watertight [end seals as indicated.] [segmented elastomeric end seals.]

3.10.7 Rip-Rap Construction

Construct rip-rap [on bedding material] [on filter fabric] [with grout] [in accordance with [DOT] [_____] State Standard, paragraph [_____] in the areas indicated. Trim and dress indicated areas to conform to cross sections, lines and grades shown within a tolerance of 0.1 foot.

3.10.7.1 Bedding Placement

Spread [filter fabric] bedding material uniformly to a thickness of at least [3] [_____] inches on prepared subgrade as indicated. [Compaction of bedding is not required. Finish bedding to present even surface free from mounds and windrows.]

3.10.7.2 Stone Placement

Place rock for rip-rap on prepared bedding material to produce a well graded mass with the minimum practicable percentage of voids in conformance with lines and grades indicated. Distribute larger rock fragments, with dimensions extending the full depth of the rip-rap throughout the entire mass and eliminate "pockets" of small rock fragments. Rearrange individual pieces by mechanical equipment or by hand as necessary to obtain the distribution of fragment sizes specified above. [For grouted rip-rap, hand-place surface rock with open joints to facilitate grouting and do not fill smaller spaces between surface rock with finer material. Provide at least one "weep hole" through grouted rip-rap for every 50 square feet of finished surface. Provide weep holes with columns of bedding material, 4 inches in diameter, extending up to the rip-rap surface without grout.]

3.10.7.3 Grouting

[Prior to grouting, wet rip-rap surfaces. Grout rip-rap in successive longitudinal strips, approximately 10 feet in width, commencing at the lowest strip and working up the slope. Distribute grout to place of final deposit and work into place between stones with brooms, spades, trowels, or vibrating equipment. Take precautions to prevent grout from penetrating bedding layer. Protect and cure surface for a minimum of 7 days.]

3.11 EMBANKMENTS

3.11.1 Earth Embankments

Construct earth embankments from satisfactory materials free of organic or frozen material and rocks with any dimension greater than 3 inches. Place the material in successive horizontal layers of loose material not more than 12 inches in depth. Spread each layer uniformly on a soil surface that has been moistened or aerated as necessary, and scarified or otherwise broken up so that the fill will bond with the surface on which it is placed. After spreading, plow, disk, or otherwise break up each layer; moisten or aerate as necessary; thoroughly mix; and compact to at least 90 percent laboratory maximum density for cohesive materials or 95 percent laboratory maximum density for cohesionless materials. Compaction requirements for the upper portion of earth embankments forming subgrade for pavements are identical with those requirements specified in paragraph SUBGRADE PREPARATION. Finish compaction by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment.

3.12 SUBGRADE PREPARATION

3.12.1 Compaction

Finish compaction by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment. Except for paved areas and railroads, compact each layer of the embankment to at least 85 percent of laboratory maximum density.

3.12.1.1 Subgrade for Pavements

Compact subgrade for pavements to at least 95 percentage laboratory maximum density for the depth below the surface of the pavement shown. When more than one soil classification is present in the subgrade, thoroughly blend, reshape, and compact the top 6 inch of subgrade.

3.12.1.2 Subgrade for Shoulders

Compact subgrade for shoulders to at least 90 percentage laboratory maximum density for the full depth of the shoulder.

3.13 SHOULDER CONSTRUCTION

Construct shoulders of satisfactory excavated material or as otherwise shown or specified. Submit advanced notice on shoulder construction for rigid pavements. Construct shoulders immediately after adjacent paving is complete. In the case of rigid pavements, do not construct shoulders until permission of the Contracting Officer has been obtained. Compact the entire shoulder area to at least the percentage of maximum density as specified in paragraph SUBGRADE PREPARATION above, for specific ranges of depth below the surface of the shoulder. Finish compaction by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment. Finish shoulder construction in proper sequence in such a manner that adjacent ditches will be drained effectively and that no damage of any kind is done to the adjacent completed pavement. Align the completed shoulders true to grade and shaped to drain in conformity with the cross section shown.

3.14 FINISHING

Finish the surface of excavations, embankments, and subgrades to a smooth and compact surface in accordance with the lines, grades, and cross sections or elevations shown. Provide the degree of finish for graded areas within 0.1 foot of the grades and elevations indicated except that the degree of finish for subgrades specified in paragraph SUBGRADE PREPARATION. Finish gutters and ditches in a manner that will result in effective drainage. Finish the surface of areas to be turfed from settlement or washing to a smoothness suitable for the application of turfing materials. Repair graded, topsoiled, or backfilled areas prior to acceptance of the work, and re-established grades to the required elevations and slopes.

3.14.1 Subgrade and Embankments

During construction, keep embankments and excavations shaped and drained. Maintain ditches and drains along subgrade to drain effectively at all times. Do not disturb the finished subgrade by traffic or other operation. Protect and maintain the finished subgrade in a satisfactory condition until ballast, subbase, base, or pavement is placed. Do not permit the storage or stockpiling of materials on the finished subgrade. Do not lay subbase, base course, ballast, or pavement until the subgrade has been checked and approved, and in no case place subbase, base, surfacing, pavement, or ballast on a muddy, spongy, or frozen subgrade.

3.14.2 Capillary Water Barrier

Place a capillary water barrier under concrete floor and area-way slabs

grade directly on the subgrade and compact with a minimum of two passes of a hand-operated plate-type vibratory compactor.

3.14.3 Grading Around Structures

Construct areas within 5 feet outside of each building and structure line true-to-grade, shape to drain, and maintain free of trash and debris until final inspection has been completed and the work has been accepted.

3.15 TESTING

Perform testing by a Corps validated commercial testing laboratory or the Contractor's validated testing facility. Submit qualifications of the Corps validated commercial testing laboratory or the Contractor's validated testing facilities. If the Contractor elects to establish testing facilities, do not permit work requiring testing until the Contractor's facilities have been inspected, Corps validated and approved by the Contracting Officer.

- a. Determine field in-place density in accordance with [ASTM D1556] [ASTM D2167] [ASTM D6938]. [When ASTM D6938 is used, check the calibration curves and adjust using only the sand cone method as described in ASTM D1556. ASTM D6938 results in a wet unit weight of soil in determining the moisture content of the soil when using this method.
- b. Check the calibration curves furnished with the moisture gauges along with density calibration checks as described in ASTM D6938; check the calibration of both the density and moisture gauges at the beginning of a job on each different type of material encountered and at intervals as directed by the Contracting Officer.] [ASTM D2937, use the Drive Cylinder Method only for soft, fine-grained, cohesive soils.] When test results indicate, as determined by the Contracting Officer, that compaction is not as specified, remove the material, replace and recompact to meet specification requirements.
- c. Perform tests on recompacted areas to determine conformance with specification requirements. Appoint a registered professional civil engineer to certify inspections and test results. These certifications shall state that the tests and observations were performed by or under the direct supervision of the engineer and that the results are representative of the materials or conditions being certified by the tests. The following number of tests, if performed at the appropriate time, will be the minimum acceptable for each type operation.

3.15.1 Fill and Backfill Material Gradation

One test per 6000 cubic yards stockpiled or in-place source material. Determine gradation of fill and backfill material in accordance with [ASTM C136/C136M] [ASTM D422] [ASTM D1140].

3.15.2 In-Place Densities

- a. One test per 6000 square feet, or fraction thereof, of each lift of fill or backfill areas compacted by other than hand-operated machines.
- b. One test per 6000 square feet, or fraction thereof, of each lift of fill or backfill areas compacted by hand-operated machines.

- c. One test per 50 linear feet, or fraction thereof, of each lift of embankment or backfill for roads.

3.15.3 Check Tests on In-Place Densities

If ASTM D6938 is used, check in-place densities by ASTM D1556 as follows:

- a. One check test per lift for each 3000 square feet, or fraction thereof, of each lift of fill or backfill compacted by other than hand-operated machines.
- b. One check test per lift for each 3000 square feet, of fill or backfill areas compacted by hand-operated machines.
- c. One check test per lift for each 50 linear feet, or fraction thereof, of embankment or backfill for roads.

3.15.4 Moisture Contents

In the stockpile, excavation, or borrow areas, perform a minimum of two tests per day per type of material or source of material being placed during stable weather conditions. During unstable weather, perform tests as dictated by local conditions and approved by the Contracting Officer.

3.15.5 Optimum Moisture and Laboratory Maximum Density

Perform tests for each type material or source of material to determine the optimum moisture and laboratory maximum density values. One representative test per [_____] cubic yards of fill and backfill, or when any change in material occurs which may affect the optimum moisture content or laboratory maximum density.

3.15.6 Tolerance Tests for Subgrades

Perform continuous checks on the degree of finish specified in paragraph SUBGRADE PREPARATION during construction of the subgrades.

3.16 DISPOSITION OF SURPLUS MATERIAL

Remove surplus material or other soil material not required or suitable for filling or backfilling, and brush, refuse, stumps, roots, and timber [to a Government disposal area [as indicated] [which is located within a haul distance of [_____] miles]] [from Government property to an approved location] [from Government property and delivered to a licensed/permitted facility or to a location approved by the Contracting Officer.].

-- End of Section --

SECTION 31 23 00.00 20

EXCAVATION AND FILL

04/16

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- ASTM C136 (2006) Sieve Analysis of Fine and Coarse Aggregates
- ASTM D698 (2007e1) Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft (600 kN-m/m))
- ASTM D1140 (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 (2009) Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft (2,700 kN-m/m))
- ASTM D2487 (2011) Classification of Soils for Engineering Purposes (Unified Soil Classification System)
- ASTM D2922 (2005) Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
- ASTM D3017 (2005) Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)
- ASTM D4318 (2010) Liquid Limit, Plastic Limit, and Plasticity Index of Soils

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

- NCDOT SSRS 2012 (English) Specifications for Roads and Structures

1.2 SUBMITTALS

Submit the following in accordance with Section 01 33 00, "Submittal Procedures."

SD-01 Preconstruction Submittals

Surface Dewatering work plan; G

Excavation Plan; G

Geosynthetic Fabric Location Plan; G

Submit 15 days prior to starting work.

SD-06 Test Reports

Moisture Content Tests

Density tests; G

SD-07 Certificates

Granite Rip-rap; G

1.3 DELIVERY, STORAGE, AND HANDLING

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

1.4 CRITERIA FOR BIDDING

Base bids on the following criteria:

- a. Existing surface elevations will be determined by the contractor's CQC surveyor and approved by the Contracting Officer prior to beginning construction.
- b. Contractor must bid on the worst case of excavating 11 inches of existing aggregate base course and subgrade materials across the entire area of pavement to be reconstructed.
- b. Contractor will be responsible for scanning the site for underground utilities.

1.5 QUALITY ASSURANCE

1.5.1 Dewatering Work Plan

Submit procedures for accomplishing surface dewatering work.

1.5.2 Excavation Plan

Excavation work shall be controlled by the Contractor's CQC surveyor. Provide additional surveying as required to accurately locate and control the work. As part of Bid Item 0001, include necessary CQC surveyor work required to control excavation depths. Submit plans to the Contracting Officer for review and approval prior to beginning work on-site. Excavation depths must be calculated from finished elevations set by the contract drawings. Control elevations for top of subgrade, top of aggregate base course, storm drain modifications and shoulder/ drainage way regarding.

1.6 Location Controls for Excavation Limits

Control excavation limits utilizing the Contractor's on-site georeferenced

control points. Utilize Government supplied georeferenced control points for establishing roadway centerlines, offsets and feature specific points required to properly control excavation limits. Re-establish control points as often as is necessary to support construction efforts.

1.6.1 Elevation Controls for Excavation and Fill

Utilize one individual Government supplied georeferenced control point for elevation control. The point is located within 1000 feet of the work site. Note the control point used on the Contractor's grading plan and excavation plan. Establish temporary bench marks where necessary. Utilize grade stakes in sufficient quantity to indicate depths of excavations and fill activities. Provide additional grade stakes as necessary to insure that positive drainage is maintained once existing subgrades have been excavated. **For roadway work, the intent of this contract is to install various pavement layers to uniform thicknesses** . Exceptions will be made for repair and resurfacing work on secondary driveways and parking lots.

Verify invert elevations and side slope elevations where ditch and swale regrading is required by the contract drawings. Set new inlet elevations for modified drainage structures.

PART 2 PRODUCTS

2.1 SOIL MATERIALS

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.

2.1.1 Requirements for Offsite Soils

Do not furnish or transport soils onto MCAS Cherry Point or outlying fields when such act would violate the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) or the General Statutes of North Carolina.

2.1.1.1 Documentation

The Contractor shall provide documentation certifying that all soils furnished under the contract contains no petroleum or hazardous or toxic materials as stated in DOD Instruction 4715.6, which implements 10 U.S.C. 2692. This documentation shall include the Soils Authorization Form (SAF) showing the volume of soil needed, analytical test data to support the environmental condition of the soil, and a copy of the State-issued "mining permit" for the borrow pit source. The Contractor shall obtain the SAF from MCAS Cherry Point Environmental Affairs Department (EAD). EAD will review these documents before off site soil is considered approved for use.

2.1.1.2 Sampling Requirements

Sampling requirements are summarized below and are for a single soil source only.

- a. For contracts that require 200 cubic yards or less of off site soil, the contractor shall certify the soil meets the requirements for off site soil (RFOSS) by inspecting for "apparent contamination" as

determined by visual or other indications of contamination including abnormal or unnatural color, chemical or petroleum odors or saturation with a chemical or petroleum. If the soil shows no apparent contamination, the contractor shall provide to EAD a signed SAF certifying the soil contains no apparent contamination. Soil showing apparent contamination shall not be utilized aboard MCAS Cherry Point or outlying fields.

- b. Take one representative sample for soil volumes of 200 cubic yards to 1,000 cubic yards
- c. For soil volumes greater than 1,000 cubic yards, take one additional representative sample for each additional 2000 cubic yards or portion thereof.

A representative sample is achieved by collecting multiple samples in a defined area (i.e. soil stockpile or borrow pit) and directing the laboratory to combine them into a "composite sample" for analysis. The composite or representative sample is intended to represent the soil source as a whole.

2.1.1.3 Soil Sampling

Samples shall be collected by qualified personnel following proper field sampling methodology. For each representative sample, 3 "primary samples" from each of 2 soil borings (or excavation pits) shall be obtained for a total of 6 primary samples. The 3 primary samples collected from each boring/ pit shall be obtained at even intervals throughout the soil column (i.e. upper, middle, lower) and placed into individual sampling containers. Samples shall not be combined in the field. The 6 primary samples shall be sent to the NC certified laboratory where they will be combined into one "composite sample" for analysis.

2.1.1.4 Transporting, Storage and Handling

Follow proper field sampling methodology and proper chain-of-custody protocols for each test to be performed. Consult with the selected laboratory about specific sample handling procedures required by the test and method of analysis. Container labeling, containers, sample volumes and timeframes differ depending on the analytical method. Failure to follow proper field sampling, handling methods and proper chain-of-custody protocols will render the test and analysis invalid.

2.1.1.5 Soil Testing and Analysis

If the total amount of soil to be brought aboard MCAS, Cherry Point exceeds 200 cubic yards, the soil shall be analyzed by a North Carolina certified laboratory. A laboratory must be certified for each specific test to be performed. Utilize proper sampling, specimen storage and handling procedures required above. Testing will be performed by laboratory personnel certified to perform each test.

Utilize the following methods for testing and analyzing soil to determine if soil meets the requirements for off site soil (RFOSS).

Soil sample(s) shall be analyzed for Gasoline Range Organics (GRO), Diesel Range Organics (DRO), Oil and Grease (O&G) and eight metals (Arsenic; Barium; Cadmium; Chromium; Lead; Mercury; Selenium; and Silver). The laboratory method detection limits must be set below the State action

levels or the testing will be considered invalid. All units are to be reported in milliagrams per kilogram (mg/kg).

- a. Gasoline Range Organics - use EPA Standard Method 5030
- b. Diesel Range Organics - use EPA Standard Method 5030
- c. Oil & Grease - use EPA Method 9071 with a silica gel wash
- d. Total Metals - use EPA 6010 (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium and Silver)
- e. Total Metals - Use EPA 7471 (Mercury only)

If test results are greater than the allowed detection limits for petroleum constituents (GRO, DOR and O&G) or the standards for the eight metals (as provided by the EPA), the soil from which the sample was taken shall not be approved for use.

2.1.2 Common Fill

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

2.1.3 Backfill and Fill Material

ASTM D2487, classification GW, GP, GM, SW, SP, SM 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.

2.1.4 Topsoil

Provide as specified in Section 32 92 23, "Turf (SOD)".

2.1.5 Select Material

ASTM D2487, classification GW, GP, SW, SP.

2.2 BORROW

Obtain borrow materials required in excess of those generated from the job site excavations from sources outside of Government property. Test materials to insure that there are no contaminants as stated by paragraph 1.6, "Requirements for Offsite Soil".

2.3 DETECTION WIRE FOR NON-METALLIC PIPING

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

2.4 MATERIAL FOR RIP-RAP

Rock shall conforming to NCDOT SSRS, Class B and shall be manufactured from granite. Provide granite rip-rap. Gradation shall meet SSRS Section 1042, Class B. Mat thickness will be 18 inches and shall be placed over an approved nonwoven geotextile fabric.

2.4.1 Bedding Material

Consisting of sand, gravel, or crushed rock, well graded. Provide separate stockpiles of minus 1 inch maximum particle size material and minus 1/2 inch maximum particle size material for use in constructing minor storm drain work. Material shall be composed of tough, durable particles. Fines passing the No. 200 standard sieve shall have a plasticity index less than six.

2.4.2 Stone Aggregate Base Course

NCDOT SSRS, materials for construction of the base course shall be in accordance with Section 1005 and Section 1010, Type ABC gradation.

2.5 GEOTEXTILE FABRIC

Fabric will be a needle punched nonwoven fabric weighing no less than 6 ounces per square yard.

2.6 TURF REINFORCEMENT FABRIC

Refer to specification section 32 92 23, "Turf (Sod)" for material requirements.

PART 3 EXECUTION

3.1 SURFACE PREPARATION

3.1.1 Erosion Control Measures

Prior to the removal of turf or beginning demolition or grading work, insure that all erosion control devices (minimum effort shown on the contract drawings) are in-place. Maintain each device through the life of the contract.

3.1.2 Weather and Seasonal Limitations

Limitations set by NCDOT SSRS, paragraph 520-5 will be in full effect for work produced by this contract. Do not begin milling and demolition operations when freezing or other inclement weather is threatening. Fill and backfill shall not be constructed when weather conditions detrimentally affect the quality of the finished course. Place fill and backfill only if the atmospheric temperature is above freezing in the shade and is rising. Do not construct fill and backfill in the rain or on saturated subgrades. If weather conditions are windy, hot or arid, with high rate of evaporation, schedule the placement in cooler portions of the day and furnish equipment to add moisture to the fill or backfill during and after placement.

3.1.3 Drainage

Plan work to coincide with favorable weather conditions. Should unexpected storms approach the work site, the Contractor shall be prepared to dispose of surface water which may accumulate in open excavations, unfinished fills, or other low areas. Provide sump conditions to collect and remove surface storm water runoff. Due to the location of the work, the contractor must keep pumps and intake/ discharge piping readily available so that collected runoff can be quickly removed. Remove water as rapidly as possible to prevent softening of exposed surfaces. Collect and dispose of

surface and subsurface water encountered in the course of construction. **Where fine aggregate particles are washed out of the aggregate matrix, scarify and reblend aggregates to a uniform gradation or remove aggregates and install new approved materials at no additional cost to the Government.**

3.1.4 Unsuitable Material

Remove soft soils, vegetation, debris, decayed vegetable matter, sod, mulch, and rubbish underneath or adjacent to paved areas or new concrete work.

3.2 EXCAVATION WORK

3.2.1 Removal of Bituminous Pavement Overburden

Refer to specification section 01 90 00, "Scope of Work" for bituminous pavement removal requirements.

3.2.2 Excavations for Excess Impervious Areas

Remove excess existing aggregate materials where generally indicated on the contractor's approved grading plan. Excavation work must be controlled by the Contractor's CQC surveyor. The Contracting Officer must approve the Contractor's grading plan prior to beginning excavation work. Refill excavations with an approved offsite structural fill material. Excavate soil disturbed or weakened by construction operations or soils soften from exposure to weather at no additional cost to the Government.

3.2.3 Excavations for Reconstructed Pavements and New Drainage Features

Calculate all excavations depths based on the finished elevations shown on the contractor's approved grading plan. The Contractor's CQC surveyor may calculate additional control elevations to assist with the construction. Shape and compact disturbed subgrades to provide the required cross slopes indicated on the contract drawings.

3.2.4 Excavations for Pavements Adjacent to Roadways

Lightly scarify and remove existing aggregates where required to allow for the new pavement structure. Scarification will provide superior interlock between existing aggregates and new aggregates.

3.2.5 Excavation of Additional Soils

Excavate soil disturbed or weakened by Contractor's operations, soils softened or made unsuitable for subsequent construction due to exposure to weather. Where excess pavement will be removed, backfill excavations with stockpiled on-site soils and topsoil. Refill excavations with compacted structural fill and/ or crushed stone aggregates sized to meet the requirements of the manufacturer. Refill excavations cut below indicated depth with an approved select fill.

3.2.6 Stockpiling Suitable Soil Materials

Stockpile excavated soil materials for use in backfilling behind new curb lines and for shoulder regrading. Separately stockpile excavated topsoil materials for reuse in turf establishment applications. The Government will indicate stockpile locations adjacent to the site for use by the Contractor. Protect stockpiled materials from erosion with an approved silt

fence system.

3.3 REMOVAL OF EXCESS SOILS AND AGGREGATES

Due to poor soil conditions, the contractor is forewarned that heavy equipment such as dump trucks and rubber tired excavation equipment is not recommended for use on exposed soil subgrades and disturbed aggregate surfaces. It is strongly recommended that hauling equipment and excavation equipment be staged on undisturbed aggregate base courses only.

3.4 FILLING AND BACKFILLING UNDER PAVEMENTS

3.4.1 Subgrade Preparations

Shape and compact exposed soil subgrades and remaining aggregate base courses disturbed by pavement removal operations. Provide grade checking by the Contractor's CQC surveyor throughout the operation to insure that the elevations and grade lines are accurate to the grade requirements set by the paragraphs below.

Only use low tread pressure tracked vehicles to fine grade subgrades and light rollers operated in a static vibratory mode to compact subgrades. Work the exposed soil subgrades to meet the subgrade elevations calculated from the contractor's approved grading plan. Grade checking will be performed by the Contractor's CQC surveyor. The surveyor will certify to the Contracting Officer in writing that the finished subgrade is at the required elevations and grades prior to placing aggregate base course materials.

Moisten or aerate material as necessary to provide the moisture content that will readily facilitate obtaining the specified compaction with the equipment used. Do not place material on surfaces that are muddy, frozen, or contain frost. Shape and compact exposed subgrade soils to a minimum of 98 percent of ASTM D 698 density.

3.4.1.1 Proof Rolling

Finish proof rolling on an exposed subgrade free of surface water (wet conditions resulting from rainfall) which would promote degradation of an otherwise acceptable subgrade. After the subgrade has been excavated, regraded and compacted to the required elevations, proof roll the subgrade with six passes of a 15 ton, pneumatic-tired roller. Operate the roller in a systematic manner to ensure the number of passes over all areas, and at speeds between 2-1/2 to 3-1/2 mph. Notify the Contracting Officer a minimum of 3 days prior to proof rolling. Perform proof rolling in the presence of the Contracting Officer. Undercut rutting or pumping of material as directed by the Contracting Officer and replace with an approved select material.

3.4.1.2 Subgrade Grading

Shape subgrade to line, grade, and cross section, and compact as specified. The Contractor's CQC surveyor will provide location and elevation controls so that a uniform thickness of new stone base course and new asphalt pavement can be placed. Include plowing, disking, and any moistening or aerating required to obtain specified compaction for this operation. Remove soft or otherwise unsatisfactory material and replace with satisfactory excavated material or other approved material as directed. Bring up low areas resulting from removal of unsatisfactory

material to required grade with satisfactory materials. Based on the CQC surveyor's finished grades, test for smoothness and elevation control required by the paragraphs below for "Finishing Operations."

3.4.2 Select Material Placement

Place in 6 inch lifts for overexcavations when directed by the Contracting Officer. Meet compaction requirements below.

3.4.3 Placing Topsoil

On areas to receive topsoil, prepare the compacted subgrade soil to a 2 inches depth for bonding of topsoil with subsoil. Spread topsoil evenly to a thickness of 4 inches and grade to the elevations and slopes shown. Do not spread topsoil when frozen or excessively wet or dry. Obtain approved material required for topsoil from off base sources. Grade new topsoil materials so that the finished surface adjacent to roadways, sidewalks and curbs is one inch below the finished pavement/ curb elevation.

3.5 PLACEMENT OF AGGREGAT BASE COURSE

With the exception where shown on the the contract drawings, place new NCDOT SSRS type ABC aggregate course to a uniform thickness of 6 inches (minimum compacted thickness). Fine grade and compact newly placed aggregates to the density specified below. Tolerances for smoothness shall match the requirements for finished subgrades as specified below. Excess materials shall be removed and the surface recompacted. Meet compaction requirements and grading requirements as specified below.

3.6 PLACEMENT OF RIP-RAP

After the ditch or swale has been brought to final grades and finished elevations, neatly undercut the ditch or swale within the rip-rap limits shown on the contract drawings and verified by the Contractor's CQC surveyor. Excavate side slopes to accept an equal thickness of stone mat. Install geotextile fabric anchored into the soil and around new or existing storm drain features in order to minimize the movement of soil under the fabric. If machine placement methods are used to install the rip-rap, do not drop the stone from a height of over 3 feet so to not damage the fabric. Arrange larger stones choked with smaller stones to produce a dense mat of approximately even thickness.

3.7 COMPACTION

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

3.7.1 General Site

Compact underneath areas designated for vegetation and areas outside the 5 foot line of the structure to 90 percent of ASTM D698.

Finish compaction by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment. Choose equipment best suited for the soil characteristics requiring compacting.

3.7.2 Pavement subgrades

3.7.2.1 General Requirements

Cohesionless materials include gravels, gravel-sand mixtures, sands, and gravelly sands. Cohesive materials include clayey and silty gravels, gravel-silt mixtures, clayey and silty sands, sand-clay mixtures, clays, silts, and very fine sands. When results of compaction tests for moisture-density relations are recorded on graphs, cohesionless soils will show straight lines or reverse-shaped moisture-density curves, and cohesive soils will show normal moisture-density curves.

3.7.2.2 Minimum Density

Backfill over and around the pipe and backfill around and adjacent to drainage structures shall be compacted at the approved moisture content to the following applicable minimum density, which will be determined as specified below.

- a. Under pavements, paved roads, streets, parking areas, and similar-use pavements including adjacent shoulder areas, the density shall be not less than 90 percent of maximum density for cohesive material and 95 percent of ASTM D 698 maximum density for cohesionless material, up to the elevation where requirements for pavement subgrade materials and compaction shall control.
- b. Under unpaved or turfed traffic areas, density shall not be less than 90 percent of maximum density for cohesive material and 95 percent of maximum density for cohesionless material.
- c. Under nontraffic areas, density shall be not less than that of the surrounding material.

3.7.3 Stone Aggregates

Compact stone aggregates as each lift is placed. Compact to 95 percent of ASTM D1557.

3.8 DETERMINATION OF DENSITY

Testing is the responsibility of the Contractor and performed at no additional cost to the Government. Testing shall be performed by an approved commercial testing laboratory or by the Contractor subject to approval. Tests shall be performed in sufficient number to ensure that specified density is being obtained. Laboratory tests for moisture-density relations shall be made in accordance with ASTM D 698 except that mechanical tampers may be used provided the results are correlated with those obtained with the specified hand tamper. Field density tests shall be determined in accordance with ASTM D 2167 or ASTM D 6938. When ASTM D 6938 is used, the calibration curves shall be checked and adjusted, if necessary, using the sand cone method as described in paragraph Calibration of the referenced publications. ASTM D 6938 results in a wet unit weight of soil and ASTM D 6938 shall be used to determine the moisture content of the soil. The calibration curves furnished with the moisture gauges shall be checked along with density calibration checks as described in ASTM D 6938. Test results shall be furnished to the Contracting Officer. The calibration checks of both the density and moisture gauges shall be made at the beginning of a job on each different type of material

encountered and at intervals as directed.

3.9 FINISHING OPERATIONS

3.9.1 Grading for Shoulders and Drainage Features

Grade to finished grades within 0.05 foot. Grade areas to drain water away from pavements. Shoulder cross slopes must be graded to a slope of 1 inch per foot. Ditches and swales will be shaped by the contractor to meet contract drawings shown on the Contractor's approved grading plan. Undercut additional soils to accommodate turf reinforcement mats. Existing grades which are to remain but are disturbed by the Contractor's operations shall be restored as specified herein.

3.9.2 Grading and Finishing Behind Curb Lines

Backfill with salvaged soils and new topsoil to best tie-in the curb line to surrounding undisturbed elevations and contours. Lightly compact soils behind curb lines and allow 1/2" back of curb reveal to allow for the installation of the new sod mat.

3.9.3 Grading and Finishing Aggregate Base Courses for Pavements and Concrete Drainage Features

Calculate finish aggregate base course grades based on the finished elevations shown on the Contractor's approved grading plan. Grades shall meet planned grades within 0.1 foot for subgrades and 0.05 foot for aggregate base courses. For existing grades that will remain but which were disturbed by Contractor's operations, grade to meet finished elevations and grade lines shown on the Contractor's approved grading plan. Refer to the contract drawings for the minimum compacted thickness of new bituminous pavement that must be accommodated.

Lightly scarify or blade existing and new aggregate surfaces surface to bring the finished surface to within 0.05 foot of the calculated grade and to eliminate imprints made by compaction and shaping equipment. Surface shall show no deviations in excess of 1/2 inch when tested with a 10 foot straightedge.

3.9.4 Spreading Topsoil

Clear areas indicated or specified to receive topsoil of materials interfering with planting and maintenance operations. Do not place topsoil when subgrade is frozen, extremely wet or dry, or in other conditions detrimental to seeding, planting, or grading. Spread topsoil to a uniform depth of 4 inches over the designated area.

3.9.5 Rip-Rap

Once ditch and swale surface have been brought to grade, mark out and undercut additional soil materials to a depth of 12 inches where rip-rap is required on the contract drawings. Install new geotextile fabric materials and anchor the material into the ground as detailed on the drawings. Hand place rip-rap pieces to insure that the pieces interlock well with adjacent pieces. Intent is to provide a dense mat of stone having a relatively uniform appearance. Perimeter edge of the rip-rap will have approximately the same elevation as the surrounding soil.

3.9.6 Protection of Surfaces

Protect newly graded areas from traffic, erosion, and settlements that may occur and as required in the Section 01 57 19.00 20, "Temporary Environmental Controls" and as specified in the paragraph entitled "Protection and Restoration of Surfaces." Repair or reestablish damaged grades, elevations, or slopes prior to acceptance of work.

3.10 SOD

Provide as specified in Section 32 92 23, "Turf (Sodding)." Place sod as soon as a surface receives final grading. Conduct overall operations in such a manner as to minimize the time that soil surfaces are exposed to the elements.

3.11 DISPOSITION OF SURPLUS MATERIAL

Excess soil materials that are determined to be not contaminated by the Contractor, shall become the property of the Contractor and removed from the Air Station. Materials that are confirmed to be contaminated, shall be removed to the appropriate landfill off-station in accordance with the specification section 01 57 19.00 20, "Temporary Environmental Controls". Remove from Government property, brush, refuse, stumps and roots.

3.12 FIELD QUALITY CONTROL

3.12.1 Sampling

Take the number and size of samples required to perform the following tests.

3.12.2 Testing

Perform one of each of the following tests for each material used. Provide additional tests for each source change.

3.12.2.1 Fill and Backfill Material Testing

Test fill and backfill materials 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 or ASTM D1557 for moisture density relations, as applicable.

3.12.2.2 Select Material Testing

Test select material in accordance with ASTM C136 for conformance to ASTM D2487 gradation limits; ASTM D1140 for material finer than the No. 200 sieve; ASTM D698 or ASTM D1557 for moisture density relations, as applicable.

3.12.2.3 Density Tests

Test density in accordance with ASTM D1556, or ASTM D2922 and ASTM D3017. When ASTM D2922 and ASTM D3017 density tests are used, verify density test results by performing an ASTM D1556 density test at a location already tested as specified herein. Perform an ASTM D1556 density test at the start of the job, and for every 10 ASTM D2922 and ASTM D3017 density tests thereafter. Test each lift at randomly selected locations every 500 square feet of existing grade in fills for roadway pavements.

-- End of Section --

SECTION 32 01 00.00 00

TEMPORARY TRAFFIC CONTROLS

04/18

PART 1 GENERAL

No separate method of payment is provided for traffic control costs. Insure that each line item of work carries prorated costs for work described herein. Provide separate traffic control plans for each task. Individual plans shall indicate the type and location for traffic control devices and detour routes, if used. Plans must emphasize road and parking lot closures. The plan must also emphasize alternative access routes.

1.1 REFERENCES

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

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

NCDOT RSD (Latest Version) NORTH CAROLINA DEPARTMENT OF TRANSPORTATION ROADWAY STANDARD DRAWINGS

U.S. FEDERAL HIGHWAY ADMINISTRATION (FHWA)

MUTCD (Latest Version) Manual of Uniform Traffic Control Devices

1.2 GENERAL REQUIREMENTS

The Contractor shall be responsible for furnishing, installation and field maintaining all temporary traffic control devices required during the life of the contract. Devices shall be checked on a regular schedule daily and at the end of the beginning and end of each work day to insure that all devices are intact and functional. Adjustments to the approved traffic control plan must be made by the Contractor as construction schedules are adjusted. It is also the Contractor's responsibility to notify the Contracting Officer as far in advance as possible for changes to the construction schedule and traffic control plan adjustments. This will allow for the widest dissemination of the changes to residents, employees and life safety functions aboard the Air Station. Insure that residential address numbers are used verses building numbers.

1.3 SUBMITTALS

Submit the following in accordance with Section 01 33 00, "Submittal Procedures."

1.3.1 SD-01 Data

- a. General Traffic Control Plan; G
- b. Flagger Certifications; G
- c. Specific Traffic Control Plan; G

1.3.1.1 General Traffic Control Plan

Submit a description of the traffic control equipment and methods required for each phase of the work. Emphasis shall be placed on operations that will require full roadway closure, partial roadway closure, temporary parking, oneway traffic routes and for mobile operations. Refer to the MUTCD for typical construction related signs and placement of oneway traffic signs. Utilize NCDOT RSD for barrel and sign placement. Provide copies of the standard drawings referenced by the traffic control description.

1.3.2 SD-04 Drawings

a. Specific Traffic Control Plan

1.3.2.1 Required Drawings and Narratives

The plan shall address specific traffic control and detour route needs for each phase of the work. Using the Contractor's assets, the Contractor shall prepare and submit traffic control plans for each phase of the work. Locations for each type of traffic control device shall be encoded on the drawing. Temporary traffic controls shall be placed on unique layers of the drawing so that these layers of information can be easily turned off or modified. Submit drawings or sketches to the Contracting Officer for approval before beginning work. Show detour routes where full or partial road closures will be required. Plans shall be coordinated with specification section 01 40 00, "Work Restrictions." Insure that the plan indicates all of the traffic control elements that will be deployed by the Contractor. For road work, insure that all approaches through the planned segment of work are provided with detour and/ or lane shift signs. **It is intended that detour signs route traffic completely around the work segment in both directions.** Plans shall also indicate locations where flagging or pilot car operations will be required. Provide a written narrative as to how the flagging and pilot car operations will be run. Include qualifications for flagging personnel to be used in the performance of this contract.

PART 2 MATERIALS

2.1 Lane Delineators

Devices shall conform to MUTCD and NCDOT RSD 1130.01. Traffic cones shall meet the requirements of MUTCD and NCDOT RSD 1135.01. All devices shall be ballasted to prevent movement. Replace devices that become damaged during the course of construction.

2.2 Barricades

Devices shall conform to MUTCD and NCDOT RSD 1145.01. At least one Type III barricade shall be deployed across each lane to be closed. Provide striping that will accomodate the traffic patterns that are anticipated. Refer to note 9 drawing 1145.01 in this regard. All devices shall be ballasted to prevent movement. Replace devices that become damaged during the course of construction.

2.3 Temporary Traffic Signs

Temporary Signs shall be placed in accordance with recommended MUTCD practices. Signs shall conform in color and message in accordance with chapter 6F of the MUTCD. Replace signs or support posts that become damaged during the course of construction. Detour signs may have adjustable arrows; however, arrows must be secured after each adjustment.

2.4 Flagging Equipment and Personnel

Each person utilized for flagging operations shall be certified with flagger certifications by the North Carolina Department of Transportation once the certification process is approved by the Department. Submit a copy of the certification for each person intended for use in flagging operations. Equipment shall meet the device requirements of NCDOT RSD 1150.01.

2.5 Temporary Pavement Markings

Temporary markings will only be used on exposed binder courses and must not be used on any finished surface course. Temporary markings shall be latex pavement marking paint conforming to SSRS, section 1087. Glass beads shall conform to SSRS, section 1087-4. Equipment for applying paint shall use truck mounted pneumatic spray equipment. Spray guns may be used for words, symbols and transverse lines. Temporary pavement markings will be reimbursed by Estimated Quantity Line Item.

PART 3 EXECUTION

Provide sufficient number of barrels and traffic cones to provide coverage rates as noted herein. Higher density of devices shall be used to control turning traffic.

3.1 General Intent

Devices shall be deployed in accordance with the Contractor's approved traffic control plans. It is recognized by the Government that there will be phases of the work (example: short term mobile operations) that will require deviations from the approved plans. In such instances, the Contractor shall supply the Contracting Officer with a description of the deviations intended. In addition, the Contractor shall make every effort to keep the Contracting Officer informed of the day's intended operations; referencing the portion of the approved traffic control plan that applies.

3.2 Lane Delineators

Provide barrels and cones spaces at the posted speed limit (converted directly to feet). Maintain minimum travel lane widths of 10 feet.

3.3 Barricades

Install and maintain barricades at orientations that provide maximum visibility to the approaching vehicle. Barricades may be staggered to allow for construction access; however, the approach view of the barricade line shall appear to be continuous.

3.4 Temporary Traffic Signs

Locate signs transverse to the edge of pavement. Offset near edge of the

sign from the edge of pavement (new pavement if applicable) at a minimum of 4 feet (6 feet preferred). Near edge of signs located behind curbs shall be placed no closer than 2 feet as measured from the back of curb. Sign heights shall meet MUTCD criteria, Section 6F.03.

3.5 Temporary Pavement Markings

Apply temporary pavement markings on milled surfaces or binder courses. Glass beads shall be applied to all temporary pavement markings intended to last more than 14 days. Milled surfaces that are exposed for more than 6 months shall have markings reapplied in accordance with SSRS section 1205-8, subparagraph C.

3.6 Detour Routes

Where roadway segments require full road closures, the Contractor's approved traffic control plans shall include fully detailed detour route plans. The plans shall note sign placements that will insure coverage for all approaches to the work zone. Before closing the road segment, the Contractor and Government will drive the intended route(s) to insure that all approaches to the work zone are adequately signed. Where detour routes must vary by time of day, signs shall be covered when the route is taken out of operation. Particular care shall be taken by the Contractor when operating detour route plans during peak rush hours.

3.7 Roadway or Driveway Closures Serving Commercial Businesses

Special considerations shall be made to insure that access to business operations are not disrupted for longer periods than necessary. Only one entrance will be closed at any given time. When periods of disruption are required, advance notice shall be given to the Contracting Officer for relay to each business. Notices shall indicate the time frame for the closure and shall identify alternative routing for traffic within the business and for detour routes that will serve the business.

-- End of Section --

SECTION 32 01 16.17

COLD MILLING OF BITUMINOUS PAVEMENTS
04/16

PART 1 GENERAL

When conducting pavement repairs and pavement reconstruction, cold milling will be the preferred method for removing existing bituminous (asphalt) pavement. Differential milling will be used to transition new pavement surface to existing pavement surfaces. Full depth milling will be used to remove existing asphalt pavement overburden and expose the aggregate base course for further excavation and/ or regrading. It is intended that bituminous millings shall become the property of the Contractor and removed from the Air Station. Milling limits and milling depths will be controlled by the Contractor's CQC surveyor and the Contractor's approved grading plan.

1.1 SYSTEM DESCRIPTION

Maintain in a satisfactory working condition equipment, tools, and machines used in the performance of the work.

1.1.1 Cold-Milling Machine

Provide a cold-milling machine which is self-propelled, capable of milling the pavement to a specified depth and smoothness and of establishing grade control; with means of controlling transverse slope and dust produced during the pavement milling operation. The machine shall have the ability to remove the millings or cuttings from the pavement and load them into a truck. The milling machine shall not cause damage to any part of the pavement structure that is not to be removed.

1.1.2 Cleaning Equipment

Provide cleaning equipment suitable for removing and cleaning loose material from the pavement surface.

1.1.3 Straightedge

Furnish and maintain at the site, in good condition, one 12 foot straightedge or other suitable device for each milling machine, for testing the finished surface. Make straightedge available for Government use. Straightedges shall be constructed of aluminum or other lightweight metal, with blades of box or box-girder cross section with flat bottom reinforced to insure rigidity and accuracy. Straightedges shall have handles to facilitate movement on the pavement.

1.2 QUALITY ASSURANCE

1.2.1 Transition Milling Grades and Elevations

Conform the finished milled surfaces to the elevations indicated on the contract drawings and the Contractor's approved grading plan. The finished milled-pavement surfaces shall vary not more than 1/4 inch from the established plan grade line and elevation. Finished surfaces at a juncture with other pavements shall coincide with the finished surfaces of the

abutting pavements. Where new pavement must match grade with adjacent existing pavement, provide a vertical sawcut joint at these milling limits. Chip out pavement to produce a neat and well defined milling limit.

1.2.2 Surface Smoothness

Finished surfaces shall not deviate from the testing edge of a straightedge more than 1/4 inch in the transverse or longitudinal direction.

1.2.3 Traffic Control

Provide all necessary traffic controls during milling operations as required by 32 01 00, "Temporary Traffic Controls."

1.3 ENVIRONMENTAL REQUIREMENTS

Milling shall not be performed when there is accumulation of snow or ice on the pavement surface.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 PREPARATION OF SURFACE

Clean the pavement surface of excessive dirt, clay, or other foreign material immediately prior to milling the pavement.

3.2 GRADE CONTROLS AND LOCATION CONTROLS FOR UNIFORM MILLING

The CQC surveyor will establish milling limits for uniform milling operations based on the Contractor's approved milling plan. Refer to specification section 01 90 00, "Scope of Work" for preparation of the milling plan. Indicate on the pavement and on the approved milling plans the limits and anticipated depth required for milling activities. Where pavement reconstruction is required, provide additional passes of the milling equipment to remove existing asphalt pavement full depth.

3.3 GRADE CONTROLS AND LOCATION CONTROLS FOR DIFFERENTIAL MILLING

Differential milling (variable depth milling) will be used to transition new pavement overlays to match grade with adjacent existing pavements. The CQC surveyor will establish milling limits for differential milling and indicate depth of milling at various points of interest. Trim existing pavements at milling limits by sawcutting and chipping out pavement to create a uniform vertical surface.

3.4 MOBILIZATION OF MILLING EQUIPMENT

Provide at a minimum one equipment mobilization for each roadway section of construction shown on the contract drawings. Provide additional mobilizations if required to support the Contractor's own construction sequence for this contract.

3.5 MILLING OPERATION

A minimum of seven days notice is required, prior to start work, for the Contracting Officer to coordinate the milling operation with other activities at the site. Make sufficient passes so that the designated area

is milled to the grades and cross sections indicated. The milling shall proceed with care and in depth increments that will not damage the pavement below the designated finished grade. Utilize spotters when needed guide milling activities and to protect at-grade utility features and concrete gutters. Repair or replace, as directed, items damaged during milling such as manholes, valve boxes, utility lines, pavement that is torn, cracked, gouged, broken, or undercut. The milled material shall be removed from the pavement and loaded into trucks as work progresses.

3.5.1 Transition Milling

Provide milling to transition existing asphalt pavement thicknesses in lieu of traditional asphalt featheredge practices. Mill pavement to a depth of 0.75 inches where new pavement will abut existing pavements or concrete gutters.

3.5.2 Milling for Demolition Purposes

Provide full depth pavement removal. Plan operations to keep trucks required for hauling on unmilled pavements or exposed aggregate base courses to the maximum extent possible. Separate passes off the cold planer may be used to remove aggregate base course materials.

3.6 GRADE AND SURFACE-SMOOTHNESS TESTING

3.6.1 Grade-Conformance Tests

Test the finished milled surface of the pavement for conformance with the plan-grade requirements and for acceptance by the Contracting Officer by running lines of levels at intervals of 25' feet longitudinally and 10 feet minimum feet transversely to check milled surface elevations. Correct variations from the designated grade line and elevation in excess of the plan-grade requirements as directed. Skin patching for correcting low areas will not be permitted. Remove and replace the deficient low area. Remove sufficient material to allow at least 1.5 inch of asphalt concrete to be placed at no additional cost to the Government.

3.6.2 Surface-Smoothness Tests

After completion of the final milling, the finished milled surface will be tested by the Government with a straightedge. Other approved devices may be used, provided that when satisfactorily and properly operated, such devices reveal all surface irregularities exceeding the tolerances specified. Correct surface irregularities that depart from the testing edge by more than 1/4 inch. Skin patching for correcting low areas will not be permitted. Remove and replace the deficient low area. Remove sufficient material to allow at least 1.5 inch of asphalt concrete to be placed at no additional cost to the Government..

3.7 REMOVAL OF MILLED MATERIAL

Material that is removed shall become the property of the Contractor and removed from the site as the material is generated. Do not stockpile milling materials on the site.

-- End of Section --

SECTION 32 11 33

CEMENT STABILIZED BASE AND SUBBASE COURSE AT AIRFIELDS AND ROADS

04/16

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
(AASHTO)

AASHTO M 140	(2013) Standard Specification for Emulsified Asphalt
AASHTO M 208	(2001; R 2009) Standard Specification for Cationic Emulsified Asphalt
AASHTO M 81	(1992; R 2008) Standard Specification for Cutback Asphalt (Rapid-Curing Type)
AASHTO M 82	(1975; R 2008) Standard Specification for Cutback Asphalt (Medium-Curing Type)

ASTM INTERNATIONAL (ASTM)

ASTM C117	(2013) Standard Test Method for Materials Finer than 75-um (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C131/C131M	(2014) Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C136/C136M	(2014) Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM C150/C150M	(2012) Standard Specification for Portland Cement
ASTM C171	(2007) Standard Specification for Sheet Materials for Curing Concrete
ASTM C29/C29M	(2009) Standard Test Method for Bulk Density ("Unit Weight") and Voids in Aggregate
ASTM C595/C595M	(2014) Standard Specification for Blended Hydraulic Cements
ASTM D1140	(2014) 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 D1632 (2007) Making and Curing Soil-Cement Compression and Flexure Test Specimens in the Laboratory

ASTM D1633 (2000; R 2007) Compressive Strength of Molded Soil-Cement Cylinders

ASTM D2027/D2027M (2013) Cutback Asphalt (Medium-Curing Type)

ASTM D2028/D2028M (2015) Cutback Asphalt (Rapid-Curing Type)

ASTM D2487 (2011) Soils for Engineering Purposes (Unified Soil Classification System)

ASTM D420 (1998; R 2003) Site Characterization for Engineering Design, and Construction Purposes

ASTM D4318 (2010; E 2014) Liquid Limit, Plastic Limit, and Plasticity Index of Soils

ASTM D558 (2011) Moisture-Density (Unit Weight) Relations of Soil-Cement Mixtures

ASTM D559 (2003) Wetting and Drying Compacted Soil-Cement Mixtures

ASTM D560 (2003) Freezing and Thawing Compacted Soil-Cement Mixtures

ASTM D6938 (2010) Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

ASTM D75/D75M (2014) Standard Practice for Sampling Aggregates

ASTM D977 (2013; E 2014) Emulsified Asphalt

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)

NIOSH 81-123 (1981) Occupational Health Guideline for Chemical Hazards, (Vols. 1, 2, and 3)

U.S. GENERAL SERVICES ADMINISTRATION (GSA)

FS CCC-C-467 (Rev C; Notice 1) Cloth, Burlap, Jute (or Kenaf)

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.][for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for

the Government.] Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-04 Samples

Subbase aggregate

Base course aggregate

Flexible pavement base course

Submit duplicate samples of material to be subjected to field testing, as required in paragraph entitled "Field Sampling and Testing." Select the source(s) and provide sample of the aggregate listed above before the materials are required for mix design. [Submit duplicate samples for approval at least 30 days prior to start of work. Do not use aggregate prior to receiving written approval of the samples]. Investigate new sources in accordance with ASTM D420. Take samples from pits, borrow areas, stockpiles or other locations in conformance with ASTM D75/D75M and test. For determining optimum moisture content and maximum density, samples of the blended mixture(s) shall be representative of the processing area before addition of cement.

SD-05 Design Data

Mix design

Job-mix formula

Submit a contractor-furnished mix design [thirty] [_____] days prior to commencement of work. After receiving approval of the mix design, submit a job-mix formula.

SD-06 Test Reports

Aggregate plasticity index

Sieve analysis of aggregate

Compressive strength

Soil-cement weight loss

Aggregate percentage of wear

Existing soil moisture-density

Liquid limit of aggregates

Plasticity index of aggregates

Sieve analysis of combined material

Compressive strength of soil aggregate material

Optimum moisture content and maximum density

Submit results of ASTM C136/C136M sieve analysis and ASTM D1633 compressive strength testing.

SD-07 Certificates

Portland cement

Location of aggregate source

Method of installation

Construction equipment list

1.3 DELIVERY AND STORAGE

1.3.1 Cement

Store cement immediately upon receipt. Store cement in bags on pallets in an airtight and weatherproof structure. Elevate pallets above surface a distance sufficient to prevent the absorption of moisture. Stack bags close together to reduce circulation of air, but do not stack against outside walls. The manner of storage shall permit easy access for inspection and identification of each shipment. Transfer bulk cement to elevated airtight and weatherproof bins. Cement shall be free-flowing and free of lumps. Test cement that has been in storage longer than 6 months by standard mortar tests or loss on ignition test and use such cement only with approval of the Contracting Officer. Show the date of receipt of shipment on each bag of cement.

1.3.2 Aggregates

Store aggregates in a manner to minimize segregation and contamination. To prevent the inclusion of contaminants, store aggregates on surfaces covered with tightly laid wooden planks, sheet metal, or other hard and clean material. Store aggregates of different sizes in separate piles. Form stockpiles of coarse aggregates by spreading the materials in horizontal layers not exceeding 5 feet in depth. Stockpiling may be the single-core type, cast and spread type or truck-dumped type. Should the coarse aggregates become segregated, re-mix the stockpile to conform to specified grading requirements. Aggregate obtained from below existing watertable shall be drained before use.

1.3.3 Curing Materials

Deliver curing materials in original sealed containers showing trade name, specification number and manufacturer's name. Store in a manner that will prevent damage and contamination.

1.4 ENVIRONMENTAL CONDITIONS

Do not construct [base] [subbase] when weather conditions will detrimentally affect quality of the finished course. Apply cement when the ambient temperature is a minimum of 40 degrees F and rising. Do not apply cement to aggregate materials that are frozen or contain frost. If ambient temperature falls below 40 degrees F, protect completed cement-treated areas against freezing. Reprocess, reshape, and recompact damaged material. Provide drainage to prevent water from collecting or standing

stabilized areas, and on the pulverized, mixed, or partially mixed materials.

1.5 QUALITY ASSURANCE

1.5.1 Required Data

Submit location of aggregate source in writing. Do not construe Government approval of samples as approval of the source of the samples. Submit a construction equipment list, and method of proportioning, spreading, compacting and curing to be used, thirty days prior to commencement of work.

PART 2 PRODUCTS

2.1 CEMENT

ASTM C150/C150M, [Type I] [Type I or II] [Type II, low alkali] or ASTM C595/C595M [Type IP] [Type I PM].

2.2 AGGREGATE MATERIALS

2.2.1 Subbase Aggregate

Select aggregate materials which conform to ASTM D2487, classified as GW, GP, GM, GC, SW, SM, SC, SP or combination(s) thereof except as modified. Sample materials in accordance with ASTM D75/D75M. Plasticity index shall not exceed 12 or liquid limit not more than 21 when tested in accordance with ASTM D4318. [Dry weight of air cooled, blast-furnace slag shall be not less than 70 pounds per cubic foot in accordance with ASTM C29/C29M. Perform sieve analysis in accordance with ASTM C117 AND ASTM C136/C136M. Conform to the following gradation limits:

TABLE I		
Sieve Designation	Percent by Weight Passing	
	(1)	[(2)]
No. 4	55 - 100	[_____]
No. 10	36 - 60	[_____]
No. 100	3 - 20	[_____]

2.2.2 Base Course Aggregate

Crushed coarse and fine aggregate. Sample materials in accordance with ASTM D75/D75M. Material passing the No. 40 sieve shall have a maximum liquid limit of 25 and a maximum plasticity index of 12 in accordance with ASTM D4318. The aggregate sand equivalent is to exceed 18. Perform sieve analysis in accordance with ASTM C117 and ASTM C136/C136M.

2.2.2.1 Flexible Pavement Base Course

Plasticity index of less than 6 and liquid limit less than 25 in accordance with ASTM D4318. [Percentage of wear less than 50 percent in accordance with ASTM C131/C131M.]

2.2.2.2 Gradation of Aggregate

Conform to the following:

TABLE I			
Sieve Designation	Percent by Weight Passing		
	(1)	(2)	[(3)]
3 inch		100	[_____]
2 1/2 inch		90-100	[_____]
2 inch			[_____]
1 1/2 inch			[_____]
1 inch	100		[_____]
3/4 inch	0-100		[_____]
1/2 inch			[_____]
No. 4	5-70	55-70	[_____]
No. 10			[_____]
No. 30	2-55		[_____]
No. 40			[_____]
No. 200	3-15	3-20	[_____]

2.3 WATER

Provide potable, clean, fresh and free from injurious amounts of oils, acid, salt, alkali, organic matter and other substances deleterious to the hardening of soil-cement.

2.4 CEMENT-TREATED [BASE] [SUBBASE]

Uniformly blend aggregates and cement together, mixed with water. Provide cement treated [base] [subbase] produced with the following characteristics:

2.4.1 Compressive Strength

Unconfined compressive strength at optimum moisture content a minimum of [650] psi at 7 days when tested in accordance with ASTM D1633.

2.4.2 Cement Content

When blended with soil aggregates and water, mixture shall meet the indicated compressive strength not to exceed 10 percent of cement by weight of drying aggregate for base.

2.4.3 Weight Loss of Specimens

Less than 14 percent when subjected to 12 cycles of wet-dry tests in accordance with ASTM D559.

Less than 14 percent when subjected to 12 cycles of freeze-thaw tests in accordance with ASTM D560.

2.5 MIX DESIGN

Provide a mix design and job-mix formula for plant mix material for subbase and base prepared by an approved laboratory. Show amount of cement needed and the moisture-density relations of the composite aggregate mixture in accordance with ASTM D558. Mix design shall include certified test reports showing results of tests and results of 7-day compressive tests. Mold a minimum of two cylinders of each cement mixture in accordance with ASTM D1632, except that test specimen molds shall be 4 inches in diameter by 4.6 inches high. Cure and test specimens in accordance with ASTM D1633 with the following exceptions: (1) cure specimens in moist room at 100 percent relative humidity for 7 days; and (2) after curing, cap specimens and immerse in water at room temperature for a period of 4 hours prior to testing. Before or during construction, if the source of any materials is changed, or if there is any variation in quality of materials furnished, conduct additional tests and adjust amount of cement as required to obtain the specified results.

2.6 CURING MATERIALS

2.6.1 Bituminous Material

2.6.1.1 Liquid Asphalt

ASTM D2027/D2027M or AASHTO M 82, Type [MC-70] [MC-250] for medium-curing asphalt; ASTM D2028/D2028M or AASHTO M 81, type [RC-70] [RC-250] for rapid-curing asphalt.

2.6.1.2 Emulsified Asphalt

ASTM D977 or AASHTO M 140, Type [RS-1] [RS-2] or AASHTO M 208 [CRS-1] [CRS-2].

2.6.2 Burlap

FS CCC-C-467.

2.6.3 Polyethylene Sheeting

White, opaque, free of defects, uniform in appearance, a minimum 4 mils thick. Water retention requirements shall be in accordance with ASTM C171.

2.6.4 Polyethylene-Coated Burlap

White, opaque, 4 mil thick film, impregnated into, extruded on, or permanently affixed to surface of one side of burlap weighing not less than 9 ounces per square yard prior to coating. Water retention requirements shall be in accordance with ASTM C171.

2.6.5 Waterproof Paper

White topside. Water retention requirements shall be in accordance with ASTM C171.

PART 3 EXECUTION

3.1 SITE PREPARATION

3.1.1 Grade Control

Maintain lines and grades indicated. When the stabilized course is part of a pavement which is to meet a fixed grade, construct a transition of sufficient length to minimize abrupt or noticeable grade changes.

3.2 MIXING AND PLACING

3.2.1 Mixing

Mix cement and aggregate [in a central mixing plant] [in a traveling plant] [in place]. Proportion aggregate by weight or by volume in such quantities that specified gradation, bearing ratio, liquid limit, and plasticity index requirements are met after [base] [subbase] has been placed and compacted. Proportion cement by weight in accordance with job-mix formula. Provide necessary moisture content for specified compaction by addition of water by weight or by volume. Mixing operations shall produce uniform blending and the method of discharging shall not produce segregation.

3.2.2 Plant Mix Materials

Materials from several sources which are blended and mixed or processed in a central mixing plant or in a traveling mixing plant. Add cement in accordance with job-mix formula. Uniformly mix materials with required amount of water. After mixing is completed, transport the materials to, and spread on, prepared underlying course without undue loss of the moisture content.

Mixed-In-Place Materials

Materials which are proportioned and mixed or blended in place. Add cement in accordance with the job-mix formula. Apply water uniformly prior to and during the mixing operation, if necessary, to maintain required moisture content.

3.2.3 Placing

Compacted thickness of individual layers shall not exceed [8] inches. When stabilized course is constructed in more than one layer, clean previously constructed layers of loose and foreign matter by sweeping with power sweepers or power brooms, except that hand brooms may be used where permitted by the Contracting Officer. Not more than 60 minutes shall elapse between start of moist mixing and start of compaction of treated layer. Not more than 30 minutes shall elapse between placement of cement-treated aggregates in adjacent lanes. If elapsed time exceeds 30 minutes, provide construction joint. Layers are to be uniform in thickness.

3.2.4 Compaction

With the exception of materials placed by traveling-plant method,

thoroughly loosen blended materials to full depth by disks or scarifiers and determine moisture content of mixture and compare with laboratory optimum moisture content. Begin rolling and compaction when moisture content is within plus or minus 2 percentage points of optimum moisture content. Compact layers of [base] [subbase] course materials. Continue compaction until layer or layers are compacted through full depth of [base] [subbase]. Begin rolling at outside edge of a minimum one half the width of the roller. Subsequent rolled trips shall be slightly different lengths. In places not accessible to rolling equipment, compact the material by mechanical tamping. Continue blading, rolling and tamping until surface is smooth and free from waves and irregularities. Determine in-place density of compacted cement-aggregate mixture in accordance with ASTM D1556 with minimum compaction of 100 percent of maximum density in accordance with ASTM D558.

3.3 FINISHING

3.3.1 Finishing

After compaction, moisten surface if necessary, and shape to required lines, grades and cross section. Lightly scarify surface to eliminate imprints made by the compacting or shaping equipment. Thoroughly compact surface to specified density with rubber-tired rollers and smooth-wheel tandem rollers to provide a smooth, dense, uniform surface free of surface checking, ridges or loose material and conforming to crown, grade and line indicated. Complete finishing operations within 2 hours after completion of mixing operations. In places not accessible to finishing and shaping equipment, compact mixture with mechanical tampers to density specified; shape and finish by hand methods. Reprocess with additional cement, the portion of the compacted mix with density less than that specified, or that has not properly hardened, or that is improperly finished.

3.3.2 Edges of Stabilized Course

Place material along edges of the stabilized course in a quantity that will compact to thickness of course being constructed. If constructed in two or more layers, place in a quantity that will compact to thickness of each layer. Allow in each operation, a minimum width of one foot of the shoulder to be rolled and compacted simultaneously with each layer of the stabilized course.

3.3.3 Thickness Control

Where average measured thickness of stabilized course is more than 1/2 inch deficient in thickness, conduct additional tests and correct deficiencies as directed by the Contracting Officer. Correct excesses in thickness if so directed by the Contracting Officer. Average job thickness is the average of the job measurements determined as specified in paragraph entitled "Thickness Test," in this section, but within 1/2 inch of the thickness indicated. Replace material removed for test holes or for deficient thickness reconstruction and compact with new soil-cement mixture.

3.3.4 Construction Joints

At the end of each work day, form a straight transverse construction joint by cutting back into completed work to form a true vertical face free of loose or shattered material. Remove improperly compacted material along construction joints and replace with soil-cement that is mixed, moistened, and compacted in accordance with this specification.

3.4 CURING AND PROTECTION

3.4.1 Curing, Protection and Cover

Immediately after completion of finishing operations, but no later than the end of each days stabilization work, protect the surface against rapid drying for seven days by one of the methods specified. In addition, protect the stabilized area from freezing during the curing period or until hardened, whichever period is longer.

3.4.2 Bituminous Material

Immediately after finishing, clean surface of loose and foreign matter. Ensure that surface contains sufficient moisture, by applying water in a fine spray as required, to prevent penetration of bituminous material. Treat areas inaccessible to, or missed by distributor using manually operated hose attachment.

3.4.3 Burlap or Cotton Mats

Burlap covers consisting of two or more layers of burlap having a combined weight of 14 ounces or more per square yard in a dry condition. Burlap may be either new or have been used only for curing concrete. Cotton mats and burlap strips shall have a length, after shrinkage, at least one foot greater than required to cover the entire width and edges of finished stabilized area. Mats shall overlap each other at least 6 inches. Thoroughly wet mats before placing and keep them continuously wet and in intimate contact with surface and edges of finished stabilized area during entire curing period.

3.4.4 Waterproof Paper, Blankets, or Impermeable Sheets

Moisten surface with a fine spray of water, then cover with waterproof-paper, waterproof-paper blankets, polyethylene-coated burlap blankets, or polyethylene sheeting. Thoroughly saturate polyethylene-coated burlap with water before placing. Place waterproof-paper blankets, polyethylene-coated burlap blankets, or polyethylene sheeting with the light-colored side up. Extend sheets over the edges of stabilized area and secure in place during the curing period. Overlap edges of sheets a minimum of one foot and securely cement or tape to form continuous closed joints. Immediately repair tears and holes in sheets. Reject curing material that does not provide a continuous cover.

3.4.5 Moist Curing

Apply a 2 inch covering of soil or minimum 4 pounds per square yard of straw. Moisten material initially and keep moistened throughout curing period.

3.5 MAINTENANCE AND TRAFFIC CONTROL

3.5.1 Maintenance

After stabilization is completed, maintain [base] [subbase] except where succeeding course is under construction. Maintenance shall include drainage and watering as required to maintain course in proper condition. Correct deficiencies in thickness, composition, construction, smoothness or density which develop during maintenance to conform to requirements

specified. Maintain surface moisture by lightly sprinkling with water to prevent dust.

3.5.2 Traffic Control

Completed portions of the cement-stabilized area may be opened to light, local traffic provided the curing process is not impaired and to other traffic after curing period has elapsed, provided that the cement-stabilized course has hardened sufficiently to prevent surface marring or distortion by equipment or traffic. Do not permit heavy equipment on the area during protection and curing periods. Necessary cement and water may be hauled over the area with pneumatic-tired equipment on approval of the Contracting Officer. Protect finished portions of cement stabilized [base] [subbase] from traffic of equipment used in constructing adjoining sections in a manner to prevent marring or damaging completed work.

3.6 SAFETY REQUIREMENTS

In addition to Safety Requirements contained within the Contract Clauses; prevent employee respiratory, eye or skin contact with Portland Cement during wet or dry mixing or of cutback asphalts during transport or application. Provide and require employee to use and dispose or clean the following in accordance with the pertinent provisions of NIOSH 81-123:

- a. Impervious: Clothing, boots and gloves.
- b. Splash-proof safety goggles and face shields.
- c. Respiratory protection equipment.

3.6.1 Additional Safety Requirements for Cutback Asphalts

Application temperatures of asphalt cutbacks specified usually exceed flash point of the material. Take suitable safety precautions to prevent flashing of asphalt. Exercise the following minimum safety precautions:

- a. Do not permit open flames or sparks close to the cutback asphalts. Apply controlled heat in heating kettles, mixers, distributors, or other equipment designed and approved for the purpose.
- b. Do not use open flames to examine drums, tank cars, or other containers or cutback asphalts.
- c. Properly and fully vent vehicles transporting cutback asphalts.
- d. Permit only experienced personnel to supervise the handling of cutback asphalt materials.
- e. Comply with all applicable intrastate and interstate commerce regulations for transporting cutback asphalts.

3.7 FIELD SAMPLING AND TESTING

In addition to provisions set forth elsewhere in this contract, specified sampling and testing shall be conducted by an approved laboratory. Take duplicate samples at the same time and in the same manner as the original.

3.7.1 Sampling

3.7.1.1 Aggregates at Source

Collect samples by taking three incremental specimens at random from source material to make a composite sample a minimum of 150 pounds. Thereafter, during the course of the project, take one random sample from each [4000] [] tons of material or a day's run, whichever is less. Take the samples at random to make a composite sample of not less than 50 pounds. Repeat the sampling when source of material is changed or when unacceptable deficiencies or variations from specified grading of materials are found in testing.

3.7.1.2 Cement-Treated Materials

After cement and water have been added to the aggregates, thoroughly blend the mixture. Place a sample in a closed and insulated container, before cement hydration is completed, and promptly transport to the laboratory.

3.7.1.3 Sample Identification

Place each sample in a clean container and securely close. Identify each sample with a tag containing the following information:

Contract No.:

Sample No.: Quantity:

Date of Sample:

Sampler:

Source:

Intended Use:

For Testing:

3.7.2 Testing

3.7.2.1 Aggregate Testing

Perform the following tests on each sample of the specified aggregate and existing soil-aggregate materials:

- a. Sieve analysis of combined material: ASTM C136/C136M and ASTM D1140.
- b. Liquid limit: ASTM D4318.
- c. Plasticity index: ASTM D4318.

Perform other specified tests when there is a change of aggregate source. Material shall conform to approved test results developed for the mix design.

3.7.2.2 Compressive Tests

Test composite sample of cement treated materials for compressive strength. Mold specimens in accordance with ASTM D558, Method A or B (as

appropriate), cure and test according to ASTM D1632 and ASTM D1633. Test specimens for compressive strength at 7 days, and submit results to the Contracting Officer.

3.7.2.3 Smoothness Test

Test compacted surface with a 10 foot straightedge applied parallel with, and at right angles to center line of paved area, and correct deviations in excess of 1/2 inch. When [base] [subbase] course is to be constructed in more than one layer, specified smoothness requirements apply only to the top layer.

3.7.2.4 Thickness Test

Measure thickness of the [base] [subbase] course using 3 inch diameter test holes through the full depth for each 500 square yards of completed course. Refill holes with cement treated material and compact.

3.7.2.5 Field Density Tests

Perform field density tests in accordance with ASTM D1556 or ASTM D6938. Perform one field density test for each [2000] [_____] square yards for each layer of [base] [subbase] material placed.

3.7.2.6 Laboratory Test

Determine optimum moisture content and maximum density relationship in accordance with ASTM D558.

-- End of Section --

SECTION 32 12 17

HOT MIX BITUMINOUS PAVEMENT

04/16

PART 1 GENERAL

1.1 WORK SUMMARY:

This section covers installation of new hot-mix bituminous concrete mixtures for the pavement surface course. **Recycled asphalt pavement (RAP) and/ or recycled asphalt shingles (RAS) materials may be used as components for binder, base course or surfaces mixes** . Refer to specific asphalt mixes specified below. Provisions for milling existing pavement are included in specification section 32 01 16.17, "Cold Milling of Bituminous Pavements."

1.2 REFERENCES

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

AMERICAN ASSOCIATION OF STATE HIGHWAY
AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO M140	Emulsified Asphalt
AASHTO M208	Cationic Emulsified Asphalt
AASHTO T209	Maximum Specific Gravity of Bituminous Mixtures
AASHTO MP-1	Performance Graded Asphalt Binder

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D2950	Standard Test Method for Density of Bituminous In Place by Nuclear Method
ASTM D3665	Standard Practice for Random Sampling of Construction Materials

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (NCDOT)

SSRS	(2012, English Units) Standard Specifications for Roads and Structures
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1.2.1 Modification to References

Except as specified herein or as indicated, work and materials shall be in accordance with the NCDOT SSRS, 2012, English Edition. The provisions therein for method of measurement and payment do not apply, and references to "Engineer" shall be interpreted to mean the Contracting Officer.

In the specifications, bid items or contract drawings, where reference is made to asphalt "surface course," the reference shall be interpreted to mean "asphalt concrete surface course" (Asphalt Concrete Mix Type

designation by the NCDOT SSRS). In the specifications, bid items or contract drawings, where reference is made to asphalt "binder course", the reference shall be interpreted to mean "asphalt concrete intermediate course" (Asphalt Concrete Mix Type designation by the NCDOT SSRS). In the specifications, bid items and contract drawings refer to "asphalt base course", that reference shall be interpreted to mean "asphalt concrete base course" (Asphalt Concrete Mix Type designation by the NCDOT SSRS).

1.3 SUBMITTALS

Submit the following in accordance with Section 01 33 00, "Submittal Procedures." Submit Mix design data to the Facilities Engineering Department for approval. Submit for approval a minimum of 30 days prior to use.

1.3.1 Certificates of Compliance

- a. Superpave mix design; G,
- b. Bituminous Tack Coat; G,
- c. NCDOT QMS certifications (for Roadway personnel); G,

1.3.2 Bituminous Concrete Laboratory Testing:

Submit the following test data to the Facilities Engineering Department for approval.

- a. Asphalt Cement
- b. Asphalt Mix Design Data

1.3.3 Equipment Data

Submit the following equipment data for approval. Equipment approvals will remain in effect until another piece of equipment is substituted by the Contractor.

- a. Asphalt Distributor; G,
- b. Compaction Equipment; G,
- c. Straightedge; G,
- c. Asphalt Paver; G,

1.3.4 Field Testing

Submit test data as work progresses to the Contracting Officer. Delays in submitting test data shall not, in any way, relieve the Contractor from correcting deficiencies discovered by the test data.

- a. Bituminous Mat Thickness; G,
- b. Bituminous Mat Density; G,
- c. Bituminous Mat Smoothness; G,

1.3.5 Delivery tickets

Delivery tickets shall be the vehicle for payment for work performed under this specification section. The Contactor shall collect delivery tickets daily and submit the tickets attached to the daily report. Before the final statement is allowed, the Contractor shall file with the Contracting Officer certified delivery tickets for all bituminous materials actually used in construction. Insure that the delivery ticket provides the following information:

- a. Truck No:
- b. Time In:
- c. Time Out:
- d. Tonnage and Discharge Temperature:
- e. Mix Type:
- f. Location:
- g. Stations and Lane Placed:
- h. Maximum Specific Gravity

1.4 ENVIRONMENTAL AND SEASONAL LIMITATIONS

Conform to the restrictions set forth in NCDOT SSRS, Section 610-4. In addition to these requirements, do not produce or place bituminous concrete when the weather is foggy, when the base course has excess moisture which can prevent proper bond.

1.5 TRAFFIC BARRICADES AND SIGNS

Provide devices that are supportive of the Contractor's approved traffic control plan designed for each work zone and construction activity. Refer to requirements of sections 01 14 00, "Work Restrictions", 01 50 00.00 20, "Temporary Facilities and Controls" for special scheduling and specification section 32 01 00, "Temporary Traffic Controls" for traffic control devices and traffic control operations required during construction.

1.5.1 Detour Signs

Provide detour signs for each phase of the work where road closure conditions are required. Refer to Special Scheduling paragraphs, Section 01 14 00, "Work Restrictions" and related specification sections. Do not remove signs until the roadway segment or parking lot is reopened to traffic.

PART 2 PRODUCTS

2.1 MATERIALS

Submit Certificates of Compliance for the following materials.

2.1.1 Aggregates for Asphalt Pavement

NCDOT SSRS, Section 1006 Aggregate Quality Control and Section 1012-1 for Aggregates for Asphalt Plant Mixes.

2.1.2 Bituminous Tack Coat

Insure that bituminous materials are selected to best penetrate and adhere to shellrock limestone aggregates.

a. Asphalt Binder: AASHTO MP-1, grade PG-64, and as specified in NCDOT SSRS Sections 605-2 and 1020-2.

b. Anionic Emulsified Asphalts: AASHTO M140, and as specified in NCDOT SSRS Sections 600-2 and Article 1020-6.

c. Cationic Emulsified Asphalts: AASHTO M208, and as specified in NCDOT SSRS Sections 600-2 and Article 1020-7.

2.1.3 Superpave Mix Design

Shall conform to NCDOT SSRS, Section 610 for Superpave type mixes. Insure that the mix design's AASHTO T209 maximum specific gravity is clearly legible on each delivery ticket.

2.2 PLANT AND EQUIPMENT

2.2.1 Mix Plant

Shall conform to NCDOT SSRS, sections 610-5 and 610-6. As noted above, recycled asphalt materials will not be allowed under this specification.

2.2 PLANT AND EQUIPMENT

2.2.1 Access to plant and equipment

The Contracting Officer shall have access at all times to all parts of the paving plant for checking adequacy of the equipment in use; inspecting operation of the plant; verifying weights, proportions, and character of materials; and checking temperatures maintained in preparation of the mixtures.

2.3 Straightedge

The Contractor shall furnish and maintain at the site, in good condition, one 12-foot straightedge for each bituminous paver. Straightedge shall be made available for Government use. Straightedges shall be constructed of aluminum or other lightweight metal and shall have blades of box or box-girder cross section with flat bottom reinforced to insure rigidity and accuracy. Straightedges shall have handles to facilitate movement on pavement.

2.4 Asphalt Distributor

Shall conform to MS-8, Section 4.02. Insure that nozzles are adjusted to fan the spray of material in an overlapping pattern. Clogged nozzles will not be tolerated.

2.5 Paving Equipment

Utilize for the placement of asphalt mixes required under Bid Item 9 on the bid sheet. Shall conform to MS-8, Sections 4.06 and 4.07. In addition, pavers shall be provided with 30 feet skis for leveling over existing asphalt pavements and electronic controls. Equip spreading equipment with tamping or vibrating devices, electronically adjustable screeds and equalizing devices. Operating speeds shall be variable between 5 and 45 feet per minute.

2.6 Compaction Equipment

Compaction of the asphalt mixture shall begin immediately after the asphalt mixture has been placed. Compaction equipment shall conform to NCDOT SSRS Section 610-9 and to MS-8, Sections 4.11 and 4.12.

In addition, pneumatic-tired rollers may be used to assist in meeting target densities. Pneumatic-tired rollers shall be capable of operating both forward and backward without turning on the mat, and without loosening the surface being rolled. Suitable wetting devices shall be employed to prevent adherence of bituminous mixtures.

PART 3 EXECUTION

3.1 WORK IDENTIFICATION

Areas of work are identified on the contract drawings. Based on the contract drawings, paving limits, pavement layouts and elevations for each paving course will be calculated by the Contractor from his approved grading plan. Pavement elevations will be controlled by the Contractor's CQC surveyor. The roadway finished product will have layers of aggregate and bituminous pavement having uniform thicknesses by controlling elevations of subgrade.

Areas indicated on the contract drawings to receive spot pavement repairs will be located by the CQC surveyor. Notify the Government should the volume of work identified exceed the quantity of work indicated on the contract drawings. **Do not proceed with work that exceeds the quantity of work indicated on the contract drawings.**

Once spot repairs and reconstruction work is complete, within the paving limits, install a final continuous surface course that matches grade with surrounding pavements and existing/ new concrete gutter lines.

3.2 WORK SCHEDULING

Except at locations where road closures are planned, pavement removal shall be planned only for the rate in which repairs can be made within the limits of a workday and/ or weather conditions. Where pavements can be closed to traffic, work may progress relative to weather limitations. Do not demolish more pavements than can be sealed off from inclement weather. Refer to the special scheduling paragraphs contained within specification section 01 14 00, "Work Restrictions."

3.3 WEATHER, TEMPERATURE AND SEASONAL LIMITATIONS

Limitations set by NCDOT SSRS, paragraph 610-4 will be in full effect for work produced by this contract. Do not begin milling and demolition operations when freezing or other inclement weather is threatening.

3.4 PAVEMENT DEMOLITION

Partial and full depth bituminous pavement demolition shall use milling as the preferred method of removal. In areas not accessible to the cold planer, provide the traditional sawcut and excavation method for removing pavement. Sawcuts shall be made for the full depth of asphalt pavement with the exception that partial depth sawcutting is required to trim pavements where transition milling is required. Sawcut transition milled areas to a depth of 1.5 inches. Full depth milling thickness may vary in order to remove all remnants of the existing bituminous pavement. Excavation and milling activities shall be conducted with the utmost care to minimize disruptions to remaining structures. Overexcavation will not be tolerated and shall be repaired at no additional cost to the Government. Carefully remove pavement spoil materials and remove from Government facilities as work progresses.

3.5 PREPARATIONS FOR PAVING

3.5.1 Subgrade Preparations

Aggregate base courses will be prepared in accordance with 31 23 00.00 20, "Excavation and Fill."

3.5.2 Manholes and Valve Boxes

Protect existing manholes and valve boxes from damage during pavement removal operations and subsequent paving operations. Adjust grade elevations of manholes prior to the placement of new bituminous courses. Check grades on manhole frames to match grade with new finished bituminous surface courses. Insure that valve box covers match grade with the repaired pavement. Neatly sawcut new pavements to accept new concrete valve box aprons.

3.5.3 Bituminous Tack Coat Placement

Provide tack coat on milled pavement surfaces, pavement repair edges and at construction joints. Apply tack at the rate of 0.06 gallon residual asphalt per square yard at the temperatures noted in Table 605-1 of the NCDOT SSRS and in accordance with NCDOT SSRS Section 605-8. Thoroughly clean surfaces to receive the tack coat immediately prior to application of tack coat. Protect concrete surfaces from overspray during applications of tack coat. Ambient temperature shall be 35 Degrees F and rising. Do not apply when weather is foggy or rainy.

3.5.4 Bituminous Concrete Application

3.5.4.1 Transportation of Bituminous Mixtures

Transport bituminous material from the mixing plant to the paving site in trucks having tight, clean, smooth beds that have been coated with a minimum amount of concentrated solution of hydrated lime and water or other approved coating to prevent adhesion of the mixture to the truck. Petroleum products will not be permitted for coating truck. Cover each load with canvas or other approved material of ample size to protect the mixture from the loss of heat. Make deliveries so that the spreading and rolling of all the mixture prepared for one day's run can be completed during daylight, unless adequate approved artificial lighting is provided. Deliver mixture to area to be paved so that the temperature at the time of dumping into the

spreader is within the range specified herein. Reject loads that are below minimum temperature, that have crusts of cold unworkable material, or that have been wet excessively by rain. Hauling over freshly laid material is prohibited.

3.5.4.2 Placing Temperature

Minimum temperature of bituminous concrete during placement into mechanical spreader shall be within a tolerance of +15 Degrees F to -25 Degrees F of the job mix formula mixture. Mixtures which have a lower temperature shall be rejected. At the time of discharge and using the port provided at the bottom of the truck bed, the Contactor's QC staff shall obtain the temperature of each truck load and record the temperature on the delivery ticket. Turn in the delivery tickets to the Contracting Officer daily.

3.5.4.3 Joints

Where new pavement abuts existing bituminous pavement, cut existing surface course along straight lines approximately 6 inches from edge. Cuts shall be vertical and extend full depth. As an option the contractor may mill pavements in lieu of saw cutting. Milling operations shall cease if under the opinion of the Contracting Officer, edges of the remaining pavement appears ragged and broken. Curbs and other appurtenances shall be protected if milling is required or chosen as an option. Prior to bituminous concrete placement, apply tack coat of asphalt cement to exposed edges of cold joints. Joints required during the construction of a bituminous mat shall conform to NCDOT SSRS, Section 610-11. Paper parting strips are required under this contract as specified under NCDOT SSRS Section 610-11.

3.5.4.4 Machine Spreading and Finishing Equipment

The Contractor is responsible for spreading the bituminous concrete to a uniform density and produce a smooth finish, true to cross section and free from irregularities. Pavers shall be provided with a joint matching device as described in NCDOT SSRS, section 610-8. For roadways where curb and gutters are not present, provide string line control for vertical control for new construction and 30 feet skis for hot mix overlays over existing asphalt pavements. Provide grade stakes for string line controls. Provide electronically controlled adjustable screeds to shape the surface to true cross section.

3.5.4.5 Hand Spreading and Finishing

In areas where the use of machine spreading is impractical, spread mixture by hand. The mix temperature shall, whenever possible, meet the temperature required by the JMF as determined above. Order asphalt mix materials in quantities that match the rate of installation for sawcut and patch operations. Spread hot mixtures with rakes in a uniformly loose layer of at thickness that, when compacted will conform to the required grade, thickness and smoothness. **Broadcasting of mixtures over the repair area will not be permitted.** At the Contracting Officer's option, segregated mats shall be removed and replaced by the Contractor at no additional cost to the Government.

Schedule delivery trucks to provide a minimum disruption to the placement of the mat. Placement shall be as continuous as possible. **During the placement of the initial pavement lift(s), protect existing pavements and adjacent concrete curbs and valley gutters from damage by delivery trucks,**

paving and compaction equipment. Provide spotters to prevent damage by compaction equipment.

3.5.4.6 Placement of the Bituminous Surface Course

On the final lift of paving, provide transverse paper joints where delays are required. Cut back the mat to remove the paper at the time that paving resumes. Intersections and irregular areas shall be placed after the adjacent roadway has been paved. The final surface course mix shall be placed in minimum 1-1/2 inch lift (compacted thickness). Avoid passing rollers over unprotected edges of bituminous concrete prior to bituminous concrete cooling. If damage or displacement to an unprotected edge occurs, cut bituminous concrete back to expose full depth of bituminous concrete and make repairs acceptable to the Contracting Officer. Immediately prior to resumption of bituminous concrete placement, coat exposed edges of bituminous concrete with asphalt cement.

3.5.5 Compaction

3.5.5.1 Roller Compaction

Compaction shall conform to NCDOT SSRS Section 610-9. Employ steel wheel roller for the finish rolling. Set compaction procedures at the beginning of the mat placement. Maintain rolling patterns throughout with adjustments made as necessary to maintain density. Compaction criteria for all superpave mixes shall meet NCDOT SSRS Section 610-10. Finished surfaces shall be uniform in texture and appearance and free of cracks and creases. The Contractor's QC staff shall be present to observe all compaction operations. The Contractor shall have NCDOT QMS certified roadway technicians present during all compaction operations to provide continuous testing of the pavement density. The technician shall direct and control compaction operations to achieve the target density. Refer to the Field Testing and Quality Control paragraphs below.

3.5.5.2 Plate Compaction

In places not accessible to rollers, compact mixtures thoroughly with hot hand tampers for subcourses. The finished surface course shall be rolled with conventional rollers. Finished surfaces shall match adjacent pavement grades.

3.5.6 Grade and Surface-Smoothness Requirements

The intent is to match grades with surrounding pavements unless specifically directed otherwise by the Contracting Officer. Perform smoothness tests in the presence of the Contracting Officer. Adjustments required to cross slopes shall be made during placement of the initial pavement lift(s) so that the final lift across the work site will be uniform in thickness. The only exception will be where only a minimum thickness surface course is required.

3.5.7 Surface Smoothness

When a 12-foot straightedge is laid on the surface parallel with the centerline of the paved area or transverse from crown to pavement edge, the surface shall vary not more than 1/4 inch from the straightedge.

3.5.8 Protection

No vehicular traffic shall be allowed on pavement until bituminous concrete has cooled sufficiently to support traffic. Refer to specification section 01 14 00, "Work Restrictions" for requirements that must be met before opening new pavement to traffic.

3.6 QUALITY CONTROL

The Contractor shall conduct a Quality Control Program in accordance with NCDOT SSRS Section 609-5, except as modified herein. The QC program is defined as all activities, including mix design, process control inspection, plant and equipment calibration, sampling and testing, and necessary adjustments in the processes that are related to production of pavements meeting these specifications. All Quality Control shall be performed by the Contractor's QC staff which meet NCDOT SSRS Section 609-5(A). The Contractor shall provide a fully equipped laboratory in accordance with NCDOT SSRS, Section 609-5(B). The compensation provisions for damage to test equipment under Article 104-7 shall not apply to this contract. Payment of the testing laboratory shall be made under the firm fixed price portion of the contract and shall apply to all firm fixed price work. Quality control cost for estimated quantity line items shall be prorated in each unit price to include all field quality control cost including the field laboratory. Provide certificates of compliance for QC staff and equipment operators prior to beginning work.

3.6.1 Preconstruction Bituminous Concrete Laboratory Testing

Provide for each sample.

a. Job Mix: Determine gradation and bitumen content. Test results shall be compared with only the approved job mix formula. Results shall fall within the range of tolerances set forth in NCDOT SSRS, Section 610-3 for the type of mix being applied.

b. Maximum Laboratory Density: AASHTO T209 Compare field density tests to the approved AASHTO T209 maximum density of each mix design used.

3.6.2 Field Testing and Quality Control

Perform the following tests:

- a. Density: Field testing for density shall be taken using a certified nuclear gauge in accordance with ASTM D2950 or other method approved by the Contracting Officer. Sampling shall be taken continuously as paving repair work progresses. For record purposes, record random density reading in accordance with ASTM D3665 and at locations requested by the Contracting Officer. Test results shall indicate if the test was performed within the bituminous mat, longitudinal joints or at transverse construction joints. Test results from the nuclear gauge shall be compared with the AASHTO T209 density derived in the laboratory for the approved job mix. Test report shall indicate the location where the testing took place and the date that the test was performed.

Maximum allowable deficiency at any point, excluding joints, shall not be more than 2 percent less than the specified density for any course. The average density of each course, excluding joints,

shall be not less than the specified density. Joint densities shall not be more than 2 percent less than specified course densities and are not included when calculating average course densities. When the deficiency exceeds the specified tolerances, correct each such representative area or areas by removing the deficient pavement and replacing with new pavement.

- b. Thickness: Minimum thickness shall be recorded for each repair and shall be based on the depth of excavation (by milling or traditional excavation techniques). Confirm that the depth of repair meets the requirements shown on the contract drawings.

Determine thickness of base, binder and wearing courses by taking vertical before and after elevations, by the use of approved probes and by averaging the tonnage of bituminous pavement placed over a measured area. The maximum allowable deficiency at any point shall not be more than 1/4 inch less than the thickness for the indicated course. Average thickness of course or of combined courses shall be not less than the indicated thickness. Where a deficiency exceeds the specified tolerances, correct each such representative area or areas by removing the deficient pavement by milling and replacing with new pavement. Repair work shall be performed at no expense to the Government.

- c. Smoothness: Straightedge test the compacted surface of base leveling, binder, and wearing courses as work progresses. Apply straightedge parallel with and at right angles to the centerline after final rolling. Unevenness of new bituminous base course shall not vary more than 1/2 inch in 10 feet. Unevenness of leveling and binder courses shall not vary more than 1/4 inch in 10 feet; variations in the wearing course shall not vary more than 1/8 inch in 10 feet. Correct each portion of the pavement showing irregularities greater than that specified.
- f. Finish Surface Texture of Wearing Course: Visually check final surface texture for uniformity and reasonable compactness and tightness. Final wearing course with a surface texture having undesirable irregularities such as segregation, cavities, pulls or tears, checking, excessive exposure of coarse aggregates, sand streaks, indentations, ripples, or lack of uniformity shall be removed and replaced with new materials.

3.6.2.1 Field Quality Control

Provide NCDOT QMA certified roadway technician(s) to insure that the field quality control requirements of NCDOT SSRS, Section 609 and the paragraphs below are met.

3.6.2.2 Field Testing

Provide tests as work progresses and at locations indicated by the Contracting Officer. Record results by location and date. Test results shall be submitted to the Contracting Officer for review and approval prior to making requests for payment.

3.6.3 Quality Assurance

The Government at its own expense has the option to perform Quality Assurance at any time during the construction. This QA program will not

exclude the procedures as outlined in NCDOT SSRS 609-6. Any discrepancies between the Contractor's QC results and Government's QA results will require the Contractor to acquire new samples and have the samples tested at both the Contractor's Lab and the Owner's Lab. The costs of the additional tests will be borne by the Contractor unless the tests reveal the discrepancies are in error which will then require the Government to pay for the additional expense at usual customary rates.

-- End of Section --

SECTION 32 17 23.00 20

PAVEMENT MARKINGS

04/16

PART 1 GENERAL

1.1 COORDINATION AND SPECIAL SCHEDULING

Work performed under this section shall be coordinated through the Contracting Officer. Once new pavements have satisfactorily cured, new pavement markings may be installed. The Government's preference is to install new pavement markings prior to opening the pavements to traffic.

Refer to special scheduling section 01 14 00, "Work Restrictions" for planning pavement marking activities.

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.

North Carolina Department of Transportation

SSRS 2012 Edition, Standard Specifications for Roads and Structures

RSD 2012 Edition, Roadway Standard Drawings

U.S. GENERAL SERVICES ADMINISTRATION (GSA)

FS TT-P-1952 (Rev D) Paint, Traffic and Airfield Markings, Waterborne

1.3 SUBMITTALS

Provide submittals prior to beginning work on theSubmit the following in accordance with Section 01 33 00, "Submittal Procedures."

SD-01 Preconstruction Submittals

Pavement Marking Plans

SD-03 Product Data

Reflective media for roads and streets; G

Thermoplastic compounds and primer; G

Preformed Retroreflective Thermoplastic Markings and application equipment; G

Paints for roads and streets; G

Equipment; G

Lists of proposed equipment, including descriptive data, and notifications of proposed Contractor actions as specified in this section. List of removal equipment shall include descriptive data indicating area of coverage per pass, pressure adjustment range, tank and flow capacities, and safety precautions required for the equipment operation.

Qualifications

Documentation on personnel qualifications, as specified.

SD-06 Test Reports

Reflective media for roads and streets; G

Thermoplastic compounds and primer; G

Report from sampling and testing made in accordance with paragraph entitled "Sampling and Testing."

Paints for roads and streets; G

Certificate stating that the proposed pavement marking paint meets the VOC regulations of the local Air Pollution Control District having jurisdiction over the geographical area in which the project is located.

Construction equipment list; G

SD-07 Certificates

Reflective media for roads and streets; G

Thermoplastic compounds and primer; G

Construction equipment list; G

SD-08 Manufacturer's Instructions; G

Thermoplastic compounds and primer; G

Preformed Retroreflective Thermoplastic Markings and application equipment

Paints for roads and streets; G

Submit manufacturer's Material Safety Data Sheets.

1.4 DELIVERY AND STORAGE

Deliver paints, thermoplastic compound materials and glass reflective beads in original sealed containers that plainly show the designated name, specification number, batch number, color, date of manufacture, manufacturer's directions, and name of manufacturer. Provide storage facilities at the job site for maintaining materials at temperatures recommended by the manufacturer.

1.5 WEATHER LIMITATIONS AND SEASONAL LIMITATIONS

Reference SSRS, Section 1205-4, Subparagraph (B) for weather and seasonal limitations. Prohibited application dates apply for installation work East of I-95. Pavement moisture shall not be present prior to application. Terminate pavement marking operations should inclement weather threaten during the times required to place and fully cure the new markings. Maintain paint temperature within these same limits.

Apply paint to clean, dry surfaces, and unless otherwise approved, only when the air and pavement surface temperature is at least 5 degrees above the dew point and the air and pavement temperatures are above 50 degrees F and less than 110 degrees F for water-based materials.

1.6 EQUIPMENT

Machines, tools, and equipment used in the performance of the work shall be approved by the Contracting Officer and maintained in satisfactory operating condition. Submit construction equipment list for approval by the Contracting Officer. Only extrusion equipment shall be submitted for general thermoplastic installation work.

1.6.1 Reflective Media Dispenser

Attach dispenser for applying the reflective media to the paint dispenser and operate automatically and simultaneously with the paint applicator through the same control mechanism. Use dispenser capable of adjustment and designed to provide uniform flow of reflective media over the full width of the stripe at the rate of coverage specified herein at all operating speeds of the paint applicator to which it is attached.

1.6.2 Thermoplastic Application Equipment

Application equipment shall be mobile and maneuverable to the extent that straight lines can be followed and normal curves can be made in a true arc. The equipment used for the placement of thermoplastic pavement markings shall be of two general types: mobile applicator and portable applicator.

1.6.2.1 Mobile Application Equipment

The mobile applicator shall be defined as a truck-mounted, self-contained pavement marking machine that is capable of hot applying thermoplastic by either the extrusion or spray method. The mobile unit shall be capable of operating continuously and of installing a minimum of 20,000 lineal feet of longitudinal markings in a 8-hour day. Equip the mobile unit with a melting kettle of such capacity as to hold a minimum of 6000 pounds of molten thermoplastic material. The kettle shall be capable of heating the thermoplastic composition to temperatures of 375 to 425 degrees F. The heating mechanism shall be by means of a thermostatically controlled heat transfer liquid. Heating of the composition by direct flame shall not be allowed. Oil and material temperature gages shall be visible at both ends of the kettle. Equip the mobile unit with a minimum of two extrusion shoes located one on each side of the truck, and shall be capable of marking simultaneous edge line and centerline stripes. Each extrusion shoe shall be a closed, oil-jacketed unit; shall hold the molten thermoplastic at a temperature of 375 to 425 degrees F; and shall be capable of extruding a line of 3 to 8 inches in width; and at a thickness of not less than 0.125 inch nor more than 0.190 inch, and of generally uniform cross section.

1.6.2.2 Portable Application Equipment

The portable applicator shall be defined as hand-operated equipment, specifically designed for placing special markings such as crosswalks, stop bars, legends, arrows, and short lengths of lane, edge and centerlines. The portable applicator shall be capable of applying thermoplastic pavement markings by the extrusion method. It is intended that the portable applicator will be loaded with hot thermoplastic composition from the melting kettles on the mobile applicator. Equip the portable applicator with all the necessary components, including a materials storage reservoir, bead dispenser, extrusion shoe, and heating accessories, so as to be capable of holding the molten thermoplastic at a temperature of 375 to 425 degrees F, of extruding a line of 3 to 12 inches in width, and in thickness of not less than 0.125 inch nor more than 0.190 inch and of generally uniform cross section.

1.6.2.3 Preformed Marking Application Equipment

Refer to SSRS Section 1205-7, subparagraph (A). Topmark brand thermoplastic tactile warning strips manufactured by Flint Trading Company, if used, shall be rolled with a manufacturer's approved roller.

1.6.3 Paint Application Equipment

1.6.3.1 Hand-Operated, Push-Type Machines

Provide hand-operated push-type applicator machine of a type commonly used for application of paint to pavement surfaces. Paint applicator machine shall be acceptable for marking small street and parking areas. Applicator machine shall be equipped with the necessary paint tanks and spraying nozzles, and shall be capable of applying paint uniformly at coverage specified. Applicator for water-based markings shall be equipped with non-stick coated hoses; metal parts in contact with the paint material shall be constructed of grade 302, 304, 316, or equal stainless steel.

1.6.3.2 Self-Propelled or Mobile-Drawn Pneumatic Spraying Machines

Provide self-propelled or mobile-drawn pneumatic spraying machine with suitable arrangements of atomizing nozzles and controls to obtain the specified results. Provide machine having a speed during application capable of applying the stripe widths indicated at the paint coverage rate specified herein and of even uniform thickness with clear-cut edges. Provide equipment used for marking streets and highways capable of placing the prescribed number of lines at a single pass as solid lines, intermittent lines, or a combination of solid and intermittent lines using a maximum of three different colors of paint as specified. Provide paint applicator with paint reservoirs or tanks of sufficient capacity and suitable gages to apply paint in accordance with requirements specified. Equip tanks with suitable air-driven mechanical agitators. Equip spray mechanism with quick-action valves conveniently located, and include necessary pressure regulators and gages in full view and reach of the operator. Install paint strainers in paint supply lines to ensure freedom from residue and foreign matter that may cause malfunction of the spray guns. The paint applicator shall be readily adaptable for attachment of an air-actuated dispenser for the reflective media approved for use. Provide pneumatic spray guns for hand application of paint in areas where the mobile paint applicator cannot be used. Applicator for water-based markings shall be equipped with non-stick coated hoses; metal parts in

contact with the paint material shall be constructed of grade 302, 304, 316, or equal stainless steel.

1.7 MAINTENANCE OF TRAFFIC

1.7.1 Lighting

When night operations are necessary, all necessary lighting and equipment shall be provided. Lighting shall be directed or shaded to prevent interference with aircraft, the air traffic control tower, and other base operations. The Government reserves the right to accept or reject night work on the day following night activities by the Contractor.

1.7.2 Roads, Streets, and Parking Areas

When traffic must be rerouted or controlled to accomplish the work, the necessary warning signs, flagpersons, and related equipment for the safe passage of vehicles shall be provided.

1.8 WEATHER LIMITATIONS FOR REMOVAL

Pavement surface shall be free of snow, ice, or slush. Surface temperature shall be at least 40 degrees F and rising at the beginning of operations, except those involving shot or sand blasting. Operation shall cease during thunderstorms. Operation shall cease during rainfall, except for waterblasting and removal of previously applied chemicals. Waterblasting shall cease where surface water accumulation alters the effectiveness of material removal.

1.9 QUALIFICATIONS

The Contractor shall submit documentation certifying that pertinent personnel are qualified for equipment operation and handling of chemicals.

1.10 PAVEMENT MARKING PLANS

New pavement markings are shown on the contract drawings. Differing site conditions that can affect the plan must be brought to the attention of the Contracting Officer for resolution during the premarking phase of the work.

1.11 PREMARKING PRIOR TO INSTALLING FINAL MARKINGS

Premarking shall be performed by the Contractor's pavement marking crew in advance of the final pavement marking construction. Obtain approval from the Contracting Officer once premarking is complete. Premarking operations shall be considered incidental to the cost of installing new pavement markings.

PART 2 PRODUCTS

2.1 MATERIALS

Provide materials conforming to the requirements specified herein.

2.1.1 Reflective Media for Roads and Streets

TT-B-1325, Type I, Gradation A.

2.1.2 Thermoplastic Compounds

The thermoplastic reflectorized pavement marking compound shall be extruded in a molten state onto a primed pavement surface. Following a surface application of glass beads and upon cooling to normal pavement temperatures, the marking shall be an adherent reflectorized strip of the specified thickness and width that is capable of resisting deformation by traffic. Material composition and color shall conform to the North Carolina Department of Transportation (NCDOT) SSRS, Section 1087 for hot applied thermoplastic pavement marking products. As required by SSRS, Section 1087-8, submit copies of NCDOT accepted material certifications validated within the past 12 months.

2.1.2.1 Primer

- a. Asphalt concrete primer: The primer for asphalt concrete pavements shall be a thermosetting adhesive with a solids content of pigment reinforced synthetic rubber and synthetic plastic resin dissolved or dispersed in a volatile organic solvent. The solids content shall not be less than 10 percent by weight at 70 degrees F and 60 percent relative humidity. A wet film thickness of 0.005 inch, plus or minus 0.001 inch, shall dry to a tack-free condition in less than 5 minutes.

2.1.2.2 Preformed Retroreflective Thermoplastic Markings

At no additional cost to the Government, the Contractor may substitute preformed hot applied thermoplastic markings as a substitute for hot applied molten thermoplastic markings. Refer to SSRS Section 1205-7, subparagraph (C) for minimum marking thickness. Preformed markings are available from Flint Trading Company, P. O. Box 0160 Thomasville, North Carolina. 27361-0160. (336)-475-6600.

2.1.3 Paints for Roads and Streets

FS TT-P-1952E, Type I or II, color as indicated by on the contract drawings. Paint shall cured sufficiently to preclude pickup from traffic in 10 minutes or less.

2.1.4 Raised Pavement Markers

SSRS, Section 1086-2. Either metallic or nonmetallic markers, prismatic reflector type for permanent installations may be used. Base size shall be 4 inches by 4 inches and shall have double lenses of the appropriate colors. Plastic shell, if used, shall be manufactured from high impact plastic and shall be tightly filled with a compatible impact resistant compound. Markers shall be of permanent colors as specified for pavement marking, and shall retain the color and brightness under the action of traffic. Provide lense colors in the color combinations indicated on RSD, Pavement markers and adhesive epoxy shall conform to SSRS, Section 1081-7.

PART 3 EXECUTION

3.1 TRAFFIC CONTROL AND PROTECTION

Place warning signs near the beginning of the work site and well ahead of the work site for alerting approaching traffic from both directions. Place small markers along newly painted lines to control traffic and prevent damage to newly painted surfaces. Mark painting equipment with large

warning signs indicating slow-moving painting equipment in operation. Do not use foil-backed material for temporary pavement marking because of its potential to conduct electricity during accidents involving downed power lines.

3.2 SURFACE PREPARATION

Allow new pavement surfaces to cure for a period of not less than 3 days before application of marking materials. Thoroughly clean surfaces to be marked before application of the paint. Remove dust, dirt, and other granular surface deposits by sweeping, blowing with compressed air, rinsing with water, or a combination of these methods as required. Remove existing paint markings adhering to the pavement by water blasting, sand or shot blasting using approved methods indicated in specification section 32 17 23.00 30. Scrub affected areas, where oil or grease is present on old pavements to be marked, with several applications of trisodium phosphate solution or other approved detergent or degreaser and rinse thoroughly after each application. After cleaning oil-soaked areas, seal with shellac or primer recommended by the manufacturer to prevent bleeding through the new paint. Do not commence painting in any area until pavement surfaces are dry and clean. Preparation work shall be considered incidental to the cost of

3.3 Testing for Moisture

Apply pavement markings to dry pavement only. The Contractor shall test the pavement surface for moisture before beginning work after each period of rainfall, fog, high humidity, or cleaning, or when the ambient temperature has fallen below the dew point. Do not commence marking until the pavement is sufficiently dry and the pavement condition has been approved by the CO or authorized representative. Employ the "plastic wrap method" to test the pavement for moisture as follows: Cover the pavement with a 300 mm by 300 mm (12 inch by 12 inch) section of clear plastic wrap and seal the edges with tape. After 15 minutes, examine the plastic wrap for any visible moisture accumulation inside the plastic. Do not begin marking operations until the test can be performed with no visible moisture accumulation inside the plastic wrap.

3.4 THERMOPLASTIC APPLICATION

3.4.1 Rate of Application

3.4.1.1 Thermoplastic Compound

After surface preparation has been completed, prime the asphalt or concrete pavement surface with spray equipment. Allow primer materials to "set-up" prior to applying the thermoplastic composition. Allow the asphalt concrete primer to dry to a tack-free condition, usually occurring in less than 10 minutes. Apply asphalt concrete primer to all asphalt concrete pavements at a wet film thickness of 0.005 inch, plus or minus 0.001 inch 265 to 400 square feet per gallon. After the primer has "set-up", apply the thermoplastic at temperatures no lower than 375 degrees F nor higher than 425 degrees F at the point of deposition. Immediately after installation of the marking, apply drop-on reflective glass spheres mechanically at the rate of one pound per 20 square feet such that the spheres are held by and imbedded in the surface of the molten material. Apply all extruded thermoplastic markings at the specified width and at a thickness of not less than 0.125 inch nor more than 0.190 inch.

3.4.2 Thermoplastic Compound

Place thermoplastic pavement markings upon dry pavement. At the time of installation the pavement surface temperature shall be a minimum of 40 degrees F and rising. Thermoplastics, as placed, shall be free from dirt or tint. Apply all centerline, skip line, edge line, and other longitudinal type markings with a mobile applicator. Place all special markings, crosswalks, stop bars, legends, arrows, and similar patterns with a portable applicator, using the extrusion method.

3.4.3 Reflective Media

Application of reflective surface media shall be an integral part of the thermoplastic application process. Application equipment shall apply the reflective media immediately after the the thermoplastic marking. Accomplish drop-on application of the glass spheres to ensure even distribution at the specified rate of coverage. Should there be malfunction of either paint applicator or reflective media dispenser, discontinue operations until deficiency is corrected.

3.4.4 Application of Heat Applied Preformed Thermoplastic Markings

Layout locations for preformed markings in similar fashion to formed-in-place thermoplastic markings. Layout materials and install utilizing a hand held heat torch conforming to the manufacturer's recommendations. Heating operations shall be performed in such a manner to insure that the markings are not scorched and to insure full adhesion. Perform a pick test upon completion of each word and symbol recommended by the manufacturer to insure good adhesion of the product. Roll preformed raised tactile warning strips applied to concrete sidewalks as recommended by the marking manufacturer.

3.5 PAINT APPLICATION

Painted marking may only be used on intermmEDIATE pavement layers and not on the final pavement surface.

3.5.1 Early Painting of Asphalt Pavements

For asphalt pavement systems requiring painting application at less than 30 days, apply the paint and beads at half the normal application rate, followed by a second application at the normal rate after 30 days.

3.5.2 Rate of Application

3.5.2.1 Reflective Markings

Apply paint evenly to the pavement area to be coated at a rate of 105 plus or minus 5 square feet per gallon. Apply glass spheres uniformly to the wet paint on road and street pavement at a rate of (6) plus or minus (0.5) pounds of glass spheres per gallon.

3.5.3 Painting

Apply paint pneumatically with approved equipment at rate of coverage specified herein. Provide guidelines and templates as necessary to control paint application. Take special precautions in marking numbers, letters, and symbols. Manually paint numbers, letters, and symbols. Sharply

outline all edges of markings. The maximum drying time requirements of the paint specifications will be strictly enforced, to prevent undue softening of bitumen, and pickup, displacement, or discoloration by tires of traffic. Discontinue painting operations if there is a deficiency in drying of the markings until cause of the slow drying is determined and corrected.

3.6 PAVEMENT MARKER APPLICATIONS

Install markers at the spacing shown on RSD 1250.01. Red lenses shall be used in intersections for viewing by drivers looking from an opposing travel lanes (See note 2, drawing 1250.01 noted below in this regard). Markings shall be cemented in-place with hot bituminous adhesive required by SSRS, Section 1081-7.

3.6.1 Marker Layouts

Layouts shall be shown on the Contractor's approved pavement marking plans. Markers shall be shown as diamond shaped entities. In general, markers shall have double faced lenses. On the approved pavement marking plans, indicate by coloring half of the diamond as red and the remaining half white (black). Double sided yellow markers will be indicated by all black diamond. Crystal/ crystal markers shall be shown as an empty diamond frame. Refer to the marker spacing chart shown on RSD 1250.01.

Layout marker locations in the field prior to installation of the markers. Prefabricated markers shall be aligned carefully at the required spacing or as directed and permanently fixed in place by means of epoxy adhesives. To ensure good bond, areas where markers will be set shall be thoroughly cleaned thru the use of compressed air prior to applying adhesive. Place markers at 3 feet intervals for tight intersection radii with markers facing towards traffic. Place blue fire hydrant markers on roadway centerlines perpendicular to the hydrant.

3.6.2 Pavement Markers General Installation Requirements

Markers shall be placed in accordance with the Contractor's approved pavement marking plan. Prisms that show the wrong color or prisms that are damaged or obscured in any way by adhesive materials will be rejected. Rejected markers shall be removed and replaced by the Contractor at no additional cost to the Government.

3.7 GENERAL FIELD TESTING AND INSPECTION

Final pavement markings will be inspected to insure that the markings conform to the Contractor's approved pavement marking plan. Deviations from the plan that the Government finds as unacceptable will be removed and replaced at no additional expense to the Government.

3.7.1 Sampling and Testing

3.7.2 Inspection

Examine material at the job site to determine that it is the material referenced in the report of test results or certificate of compliance. A certificate of compliance shall be accompanied by test results substantiating conformance to the specified requirements.

3.7.2.1 Surface Preparations and Application Procedures

Surface preparations and application procedures will be examined by the Contracting Officer to determine conformance with the requirements specified. Approve each separate operation prior to initiation of subsequent operations.

The Facilities Engineer in the presence of the Contracting Officer will inspect premark layouts for conformance with the contract drawings before the application of the marking materials. Failure to observe this requirement will result in the removal and replacement of out of place markings at no additional cost to the Government.

3.8 INSPECTION AND TESTING FOR THERMOPLASTIC PAVEMENT MARKINGS

The Contractor shall perform the following test on thermoplastic markings installed under this contract.

3.8.1 Initial and Residual Reflectivity Test

Initial retroreflectivity for pavement markings shall not be less than the values indicated in SSRS Section 1205-4 paragraph (C). Test with an approved reflectometer noted in paragraph (C).

After the required 180 day observation period noted in paragraph SSRS Section 1205-4 paragraph (D), markings shall be retested. Retroreflective values shall meet the minimum values noted in paragraph (D). Markings that fail the final test shall be removed and replaced at no additional cost to the Government.

3.8.2 Final Inspection and Acceptance

Final markings and pavement markings shall be placed so as to produce a crisp clean installation. Remove spills and runs that may occur by means that are approved by the Contracting Officer. Where microsurfacing has been damaged, repair the new surfacing prior to the satisfaction of the Contracting Officer at no additional cost to the Government.

3.9 INSPECTION AND TESTING FOR LATEX PAVEMENT MARKINGS

Demonstrate success of bond of reflective media, new paint marking and the pavement surface, vacuum cured surface of new marking after a seven (7) day dry time. Inspect newly applied markings for signs of bond failure based on visual inspection and comparison to results from Test Stripe Demonstration paragraph.

3.9.1 Reflective Media and Coating Bond Verification

Within seven (7) days after pavement marking application, use industrial vacuum to sweep new markings. Visually inspect the pavement markings and the material captured by the vacuum. Verify that no significant loss of reflective media has occurred to the pavement marking due to the vacuum cleaning.

3.9.2 Reflective Media and Coating Application Verification

Use a wet film thickness gauge to measure the application of wet paint.

Inspect sample markings where identified by the Contracting Officer. Use a

microscope or magnifying glass to evaluate the embedment of glass beads in the paint. Verify the glass bead embedment with approximately 50% of the beads embedded and 50% of the beads exposed.

3.9.3 Final Inspection and Acceptance

Final markings and pavement markings shall be placed so as to produce a crisp clean installation. Remove spills and runs that may occur by means that are approved by the Contracting Officer. Where microsurfacing has been damaged, repair the new surfacing prior to the satisfaction of the Contracting Officer at no additional cost to the Government.

3.10 FIELD TESTING, INSPECTION, AND DEMONSTRATIONS

-- End of Section --

SECTION 32 17 23.00 30

TRAFFIC CONTROL SIGNS

04/16

PART 1 GENERAL

1.1 REFERENCES

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

FEDERAL SPECIFICATION PUBLICATIONS (FS)

FF-W-84 Washers, Lock (Spring)

Military Specifications (MS)

DOD-P-21035 Paint, High Zinc Dust Content, Galvanizing Repair

North Carolina Department of Transportation (NCDOT) Publication:

NCDOT SSRS 2012 Edition, North Carolina Department of Transportation Standard Specifications for Roads and Structures (English)

U.S. FEDERAL HIGHWAY ADMINISTRATION (FHWA)

Color Tolerance Charts "Color Tolerance Charts"

MUTCD (Latest Version) Manual of Uniform Traffic Control Devices

AMERICAN SOCIETY FOR TESTING AND MATERIALS STANDARDS (ASTM)

ASTM A123 Zinc (Hot-Galvanized) Coatings on Products Fabricated from Rolled, Pressed and Forged Steel Shapes, Plates, Bars and Strips

ASTM A153 Zinc Coated (Hot-Dip) on Iron and Steel Hardware

ASTM B209 Aluminum and Aluminum-Alloy Sheet and Plate

ASTM A354 Quenched and Tempered Alloy Steel Bolts, Studs and Other Externally Threaded Fasteners

1.2 SUBMITTALS

Submit the following in accordance with Section 01 33 00, "Submittals."

1.2.1 SD-03 Product Data

a. Frangible Sign Post Base; G

1.2.2 SD-07, Certificates

- a. Sign supports and hardware G
- b. Signs, complete assembly G
- c. Manufacturer's Warranty for Reflective Sheeting

1.2.3 SD-08, Manufacturer's Data

- a. Frangible Sign Post Base; G

PART 2 PRODUCTS

2.1 SIGN POSTS

2.1.1 Steel Posts

Steel posts shall be fabricated from 2" and 2 1/4" square steel tubing conforming to ASTM A1011, Grade 50, and shall be hot-dip galvanized after fabrication in compliance with ASTM A123. Tubing shall be fabricated from 12 gauge steel sheet complete with welded corners. Posts shall be manufactured with punched or drilled to produce 7/16 inch diameter holes with a center alignment on each side of the post and spaced one inch apart. Start holes one inch from the top of the post. Galvanize posts after fabrication. Repair galvanized coatings in accordance with DOD-P-21035. Provide sufficient length to permit mounting signs as shown in the MUTCD, Section 2A.18 and figure 2A-2.

Minimum length for the 2 1/4" steel tubing anchor sleeves will be 3 feet.

2.2 HARDWARE

2.2.1 Bolts and Nuts

Provide Hex bolts and nuts for sign mounting applications. Provide galvanized corner bolts for mounting sign posts to the frangible base units. Items shall conform to ASTM A354 and galvanized in accordance with ASTM A153.

2.2.2 Lock Washers

Items shall conform to FS FF-W-84 and shall be galvanized in accordance with ASTM A153.

2.2.3 Shims

Shims shall be of the same material as the sign panel.

2.3 Frangible Base Units

For each new sign post, provide a Model S200 Snap'n Safe frangible base unit as manufactured by Designovations, Incorporated, 7339 Wildwood Road Stillman Valley, IL 61084. Provide units appropriately sized for the new post. Include "L" shaped mounting bolt hardware with each unit.

2.4 SIGN PANELS

Signs shall be made from 0.125 inch thick aluminum sheet. The metal shall conform to ASTM B209, alloy G061-T6.

2.5 SIGN REFLECTORIZATION

All signs shall be reflectorized with an high intensity grade level of reflectivity. Reflectorized sheeting shall be adhesive backed and conform to ASTM D4956-09, Type VIII 3M "diamond grade" prismatic sheeting for stop and yield signs. Traffic signs shall conform in appearance to MUTCD sign requirements and Color Tolerance Charts. Apply reflective sheeting as recommended by the manufacturer. Reflectorized sheeting shall be supported by the manufacturer's extended warranty as required by NCDOT NCDOT SSRS, Section 1093-2, Subparagraph (F). Signs must be fabricated using all of the sheeting manufacturer's recommended means and methods that will insure that the sheeting manufacturer's warranty will remain in full effect. Include engraved date of sign manufacture on the back of each sign.

Each sign shall include the original sign identification number placed on the back of the sign with a permanent aluminum Marine Corps Property sticker with a sign identification number and associated bar code. The identification number will be assigned by the Air Station traffic engineer indelible black marker. Each sign shall also include a long wearing sign maintenance decal sticker designed for long term outdoor use. The both stickers must have a self-adhesive backing. The Contractor shall punch out the installation date, type of sheeting, warranty period and anticipated replacement date.

2.5.1 Stop Signs

All signs shall be reflectorized with an ultra-high intensity microprismatic grade retroreflective sheeting. Reflectorized sheeting shall be adhesive backed and conform to ASTM D4956-09, Type VIII 3M "diamond grade" prismatic sheeting for stop and yield signs. Provide a 12 year sheeting manufacturer's warranty.

2.5.2 Regulatory, Warning and Informational Signs

All signs shall be reflectorized with a high intensity microprismatic grade retroreflective sheeting. Reflectorized sheeting shall be adhesive backed and conform to ASTM D4956-09, Type III 3M 3930 series sheeting or approved equal for signs other than stop and yield sign applications. Provide a 10 year sheeting manufacturer's warranty.

2.6 SIGN MESSAGE

Sign message shall be applied by silk screening or reverse silk screening. Message fabrication procedures shall be as recommended by the manufacturer of the reflective sheeting.

PART 3 EXECUTION

3.1 LOCATING EXISTING TRAFFIC OR OTHER SIGNS

Signs to be removed and salvaged are indicated on the contract drawings. The Contractor's CQC surveyor will locate existing sign posts by coordinate. Relocate existing traffic sign assemblies to meet MUTCD offset requirements (measured from the near edge of sign to the new edge of

pavement).

3.2 SIGN LOCATION

Where new signs or sign assemblies are required, place units at the locations shown on the contract drawings. Height and offsets from the roadway shall be as required by the MUTCD. When directed by the Contracting Officer, signs shall be relocated to improve sign visibility or improve vehicle and pedestrian safety. Such direction shall be provided by stakeout methods using Contractor supplied stakes. Bid on one stake for each sign. It will be the Contractor's responsibility to maintain stakeouts until the work is complete. Stakes in good condition may be salvaged and reused. Before installing any sign, the location must be scanned for underground utilities by the Contractor. Report any conflicts to the Contracting Officer immediately. The Contracting Officer's representative and the Air Station traffic engineer will indicate an alternative location for the sign. Rescan the alternative location for underground utilities.

3.3 SIGN POST ANCHORAGE IN SOILS

Drive 2 1/4" base post to a minimum depth of 4 feet. Insure base post is set plumb. Provide a 2" exposure of the base post above finished grade. Set the Snap'n Safe frangible base on top of the exposed base post and anchor with 2 "L" shaped mounting bolts. Align bolts to the same corner as directed by the frangible base manufacturer.

3.4 [Enter Appropriate Subpart Title Here]

3.5 SIGN POST INSTALLATIONS

New posts (and existing posts to be relocated) shall be installed in a plumb condition. Compact soil around wood posts on all sides while checking plumb conditions. Check sign heights to insure compliance with the MUTCD height requirements if the sign is left on the post during the installation. Adjust sign heights as required to meet the MUTCD.

3.5.1 Sign Installation

Place new signs or reinstall existing signs with new stainless steel anchor bolts, washers and nuts. Protect sign sheeting from damage during shipping, storage and handling as damaged sheeting will be rejected upon completion of any sign installation. Transfer sign identification markings to the back of any new replacement signs. Include the hole punched sign management decal on the back of each new sign. Do not install the decal to existing signs that are indicated on the contract drawings for reuse.

3.6 RECORDING INSTALLED SIGN LOCATIONS

Each new or relocated sign location must be recorded by the CQC surveyor when producing final as-built drawings. Include the unique sign number as part of the survey. Transfer the existing sign number to replacement signs. New signs will be assigned a sign number by the Air Station traffic engineer once the sign has been erected.

-- End of Section --

SECTION 32 92 23

TURF (SOD)

04/16

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN SOD PRODUCERS ASSOCIATION (ASPA)

ASPA GSS Guideline Specifications for Sodding

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 602 Agricultural Liming Materials

COMMERCIAL ITEM DESCRIPTIONS (CID)

CID A-A-1909 Fertilizer

1.2 DEFINITIONS

1.2.1 Stand of Turf

95 percent ground cover of the established species.

1.3 SUBMITTALS

Submit the following in accordance with Section 01 33 00, "Submittal Procedures."

SD-03 Product Data

Fertilizer; G

Turf Reinforcement Mat; G

Include physical characteristics, and recommendations.

SD-07 Certificates

Sod farm certification for sods; G. Indicate type of sod in accordance with ASPA GSS.

Fertilizer; G

SD-08 Manufacturer's Instructions

Turf Reinforcement Mat; G

1.4 DELIVERY, STORAGE, AND HANDLING

1.4.1 Delivery

1.4.1.1 Sod Protection

Sod shall be delivered on a daily basis. Do not order more sod than can be installed during a normal day's construction schedule. Protect from drying out and from contamination during delivery, on-site storage, and handling.

1.4.1.2 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 lime may be furnished in bulk with certificate indicating the above information.

1.4.2 Storage

1.4.2.1 Sod Storage

Lightly sprinkle with water, cover with moist burlap, straw, or other approved covering; and protect from exposure to wind and direct sunlight until planted. Provide covering that will allow air to circulate so that internal heat will not develop. Do not store sod longer than 24 hours. Do not store directly on concrete or bituminous surfaces.

1.4.2.2 Fertilizer and Lime Storage

Store in cool, dry locations away from contaminants.

1.4.2.3 Handling

Do not drop or dump materials from vehicles.

1.5 TIME RESTRICTIONS AND PLANTING CONDITIONS

1.5.1 Restrictions

Do not order or place sod when the ground is frozen, snow covered, muddy, or when air temperature exceeds 90 degrees Fahrenheit. Work planning shall consider weather forecasts for the day when ordering sod.

1.6 TIME LIMITATIONS

1.6.1 Sod

Place sod a maximum of twentyfour hours after initial harvesting, in accordance with ASPA GSS as modified herein.

PART 2 PRODUCTS

2.1 SODS

Sod planting dates for locally available sod shall be based on factors such as climate conditions and availability from local producers. The Contractor should keep abreast of factors controlling availability and adjust construction schedules to accommodate these factors. The Government

shall not be held liable for Contractor delays due to shortages or unavailable sources of sod.

2.1.1 Classification

Nursery grown or Field grown as classified in the ASPA GSS. Machine cut sod at a uniform thickness of 3/4 inch within a tolerance of 1/4 inch, excluding top growth and thatch. Each individual sod piece shall be strong enough to support its own weight when lifted by the ends. Broken pads, irregularly shaped pieces, and torn or uneven ends will be rejected. Wood pegs and wire staples for anchorage shall be as recommended by sod supplier.

2.1.2 Composition

Proportion grass species as follows.

Botanical and Common Name	Percent:
Centipede	100

2.2 TOPSOIL

2.2.1 Existing Soil

Modify existing soil with the addition of pH adjusters listed below. Apply at rates required by paragraphs 3.1.2, "Soil Preparation" below.

2.2.2 On-Site Topsoil

Reusable surface soil stripped and stockpiled on site if requirements specified for topsoil in paragraph entitled "Composition" are met.

2.2.3 Off-Site Topsoil

Shall be well drained black friable sandy loam from off-station sources.

2.3 pH ADJUSTERS

2.3.1 Lime

ASTM C 602, commercial agricultural limestone containing a minimum of 94 percent of total carbonates, 80 percent calcium, and 14 percent magnesium. Provide the following ASTM E 11 gradation: minimum 86 percent passing the No. 20 sieve and 28 percent passing the No. 100 sieve.

2.4 FERTILIZER

2.4.1 Controlled Release Fertilizer

Nitrogen-phosphorous-potassium ration of 15-0-15 plus 2 percent iron, composed of pills coated with plastic resin to provide continuous release of fertilizer for at least 6 months.

2.4.2 Pre-Plant Fertilizer Mixture

Fertilizer mixtures not to exceed one percent granular dust and CID A-A-1909, as specified below.

2.5 SURFACE TOPDRESSING

Free from, noxious weeds, mold, and other deleterious materials.

2.6 WATER

Source of water to be approved by Contracting Officer, suitable quality for irrigation.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 EXTENT OF WORK

Provide soil preparation, fertilizing, temporary seeding (if required) and surface top dressing of all newly graded earth surfaces. Treat all areas inside or outside the limits of construction that are disturbed by the Contractor's operations. Ditches, Swales, roadside shoulders and filled surfaces behind curb lines shall be sodded. In accordance with best practices for sedimentation and erosion control, do not disturb turfed surfaces unless final earthwork can be completed quickly and sod installed. **Contractor shall plan work so that disturbed surfaces are sodded on the same day that soils are brought to final elevations and fine graded.**

3.1.2 Soil Preparation

Till existing shoulder to minimum depth of 6 inches by scarifying, disking, harrowing, or other methods approved by the Contracting Officer. Remove debris and stones larger than one inch in any dimension remaining on surface after tillage. Provide off-site topsoil to meet finish grade indicated on the contract drawings. Spread stockpiled topsoil evenly to provide positive drainage. Do not spread and topsoil when frozen or excessively wet or dry. Thoroughly mix subgrade, soil amendments and topsoil to a depth of 3 inches by tilling or other method approved by the Contracting Officer. Correct irregularities in finished surfaces to eliminate depressions. Protect finished prepared soil areas from damage by vehicular or pedestrian traffic.

Fine grade sod beds to insure that the finished sod surface will be 0" to 1/2" below finished paved (concrete and bituminous) surfaces. Sod surfaces placed above the grade of finished pavement surfaces shall be removed and reworked to meet the above stated requirements.

3.1.2.1 pH Adjuster Application Rates

Apply pH adjuster at rates as determined by laboratory soil analysis of the soils at the job site. For bidding purposes only apply at rates for the following:

Lime 20 pounds per 1000 square feet.

3.1.2.2 Fertilizer Application Rates

Apply fertilizer at rates as determined by laboratory soil analysis of the soils at the job site. For bidding purposes only apply at rates for the following:

Synthetic Fertilizer applied at a rate of 0.75 pounds of nitrogen per 1000 square feet.

3.2 [Enter Appropriate Subpart Title Here]

3.3 SODDING

3.3.1 Placing

Place sod a maximum of 24 hours after initial harvesting, in accordance with ASPA GSS as modified herein. Thoroughly moisten areas to be sodded immediately prior to placing sod. Dormant sod may be placed; however, the Contractor will be responsible for providing proper anchorage until the sod has fully rooted in the spring. Sod that fails to "green-up" in the spring must be replaced by the Contractor at no additional cost to the Government.

3.3.2 Sodding Slopes and Ditches

For slopes 2:1 and greater, lay sod with long edge parallel to slope. For V-ditches and flat bottomed ditches, lay sod with long edge parallel to flow of water. Anchor each piece of sod with wood pegs or wire staples maximum 2 feet on center. On slope areas, start sodding at bottom of the slope.

3.3.3 Finishing

After completing sodding, blend edges of sodded area smoothly into surrounding area.

3.3.4 Rolling

Immediately after sodding, firm entire area except for slopes in excess of 3 to 1 with a roller not exceeding 90 pounds for each foot of roller width.

3.3.5 Watering

Start watering areas sodded as required by daily temperature and wind conditions. Apply water at a rate sufficient to ensure thorough wetting of soil to minimum depth of 6 inches.

3.4 PROTECTION OF TURF AREAS

Immediately after turfing, protect area against traffic and other use. **Provide steel stakes, signs and ropes to prevent vehicles from driving on the sod.**

3.5 RESTORATION

Restore to original condition existing turf areas which have been damaged during turf installation operations. Keep clean at all times at least one paved pedestrian access route and one paved vehicular access route to each building. Clean other paving when work in adjacent areas is complete.

-- End of Section --

SECTION 33 40 00

STORM DRAINAGE UTILITIES

04/16

PART 1 GENERAL

1.1 REFERENCES

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

ASTM INTERNATIONAL (ASTM)

- ASTM C 231 (2004) Air Content of Freshly Mixed Concrete by the Pressure Method
- ASTM C 270 (2008a) Standard Specification for Mortar for Unit Masonry
- ASTM C 877 (2008) External Sealing Bands for Concrete Pipe, Manholes, and Precast Box Sections
- ASTM D 1751 (2004; R 2008) Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
- ASTM D 1752 (2004a; R 2008) Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion

North Carolina Department of Transportation

- SSRS 2012 Edition, Standard Specifications for Roads and Structures
- QPL 2012 Edition, Qualified Purchase List

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-03 Product Data

Concrete Pipe

SD-07 Certificates

NCDOT QC/QA Program Certification

1.3 DELIVERY, STORAGE, AND HANDLING

1.3.1 Delivery and Storage

Materials delivered to site shall be inspected for damage, unloaded, and stored with a minimum of handling. Materials shall not be stored directly on the ground. The inside of pipes and fittings shall be kept free of dirt and debris. Before, during, and after installation, plastic pipe and fittings shall be protected from any environment that would result in damage or deterioration to the material. Keep a copy of the manufacturer's instructions available at the construction site at all times and follow these instructions unless directed otherwise by the Contracting Officer. Solvents, solvent compounds, lubricants, elastomeric gaskets, and any similar materials required to install plastic pipe shall be stored in accordance with the manufacturer's recommendations and shall be discarded if the storage period exceeds the recommended shelf life. Solvents in use shall be discarded when the recommended pot life is exceeded.

1.3.2 Handling

Materials shall be handled in a manner that ensures delivery to the trench in sound, undamaged condition. Pipe shall be carried to the trench, not dragged.

PART 2 PRODUCTS

2.1 CONCRETE CULVERT PIPE

2.1.1 Concrete Culvert Pipe

Manufactured in accordance with and conforming to ASTM C76, Class III.

Reinforced concrete pipe for culverts and storm drains shall be of the sizes indicated on the contract drawings.

Submit the pipe manufacturer's NCDOT QC/QA Program Certification covering all new pipe components. If possible, pipe shall be purchased from the NCDOT QPL. Concrete culvert pipe will meet the requirements of NCDOT SSRS, section 1032-9, Subsection (C).

2.2 DRAINAGE STRUCTURES

2.2.1 Beveled End Sections

Sections shall be fabricated in the field by the Contactor in accordance with the contract drawings.

2.3 MISCELLANEOUS MATERIALS

2.3.1 Concrete

Unless otherwise specified, concrete and reinforced concrete shall conform

to the requirements for 3000 psi concrete. The concrete mixture shall have air content by volume of concrete, based on measurements made immediately after discharge from the mixer, of 5 to 7 percent when maximum size of coarse aggregate exceeds 1-1/2 inches. Air content shall be determined in accordance with ASTM C 231. The concrete covering over steel reinforcing shall not be less than 1 inch thick for covers and not less than 1-1/2 inches thick for walls and flooring. Concrete covering deposited directly against the ground shall have a thickness of at least 3 inches between steel and ground. Expansion-joint filler material shall conform to ASTM D 1751, or ASTM D 1752, or shall be resin-impregnated fiberboard conforming to the physical requirements of ASTM D 1752.

2.3.2 Mortar and Grout

Mortar for pipe joints, connections to other drainage structures, and brick or block construction shall conform to ASTM C 270, Type M, except that the maximum placement time shall be 1 hour. The quantity of water in the mixture shall be sufficient to produce a stiff workable mortar. Water shall be clean and free of harmful acids, alkalies, and organic impurities. The mortar shall be used within 30 minutes after the ingredients are mixed with water. The inside of the joint shall be wiped clean and finished smooth. The mortar head on the outside shall be protected from air and sun with a proper covering until satisfactorily cured. Grout for vertical surface shall be non shrink and non sag.

2.3.3 Joints

2.3.3.1 Exterior Joint Seals

For polyethylene pipe and concrete pipe, provide a 6 ounce per square yard nonwoven needle punched geotextile fabric for wrapping joints. Provide a suitable adhesive tape to secure the fabric during construction. As an alternative to field fabricated seals, provide a fabric preformed seal conforming to ASTM C 877 with a minimum width of 12 inches.

2.3.3.2 Reinforced Concrete Pipe

Gaskets for Concrete Pipe: When infiltration or exfiltration is a concern for pipe lines, the couplings may be required to have gaskets. The closed-cell expanded rubber gaskets shall be a continuous band approximately 7 inches wide and approximately 3/8 inch thick, meeting the requirements of ASTM D1056, Type 2 A1, and shall have a quality retention rating of not less than 70 percent when tested for weather resistance by ozone chamber exposure, Method B of ASTM D1171. O-rings shall meet the requirements of ASTM C990 or ASTM C443. Preformed flexible joint sealants shall conform to ASTM C990, Type B.

2.4 EROSION CONTROL RIPRAP

Riprap shall only be used if required by the North Carolina Department of Environment and Natural Resources. Use riprap only as an alternative for concrete aprons (not for flumes). **Provide granite riprap.** Gradation shall meet SSRS Section 1042, Class B. Minimum mat thickness shall be 8 inches and shall be placed over a nonwoven geotextile fabric.

PART 3 EXECUTION

3.1 EXCAVATION FOR PIPE CULVERTS, STORM DRAINS, AND DRAINAGE STRUCTURES

Excavation of trenches, and for appurtenances and backfilling for culverts and storm drains, shall be in accordance with the applicable portions of Section 31 23 00.00 20, "Excavation and Fill" and the requirements specified below.

3.1.1 Trenching

The width of trenches at any point below the top of the pipe shall be not greater than the outside diameter of the pipe plus the width necessary to permit satisfactory jointing and thorough tamping of the bedding material under and around the pipe. Refer to the contract drawings for minimum trench widths outside of paving limits. Trench widths shall be decreased under roadways where flowable cement fill will be employed. Sheeting and bracing, where required, shall be placed within the trench width as specified, without any overexcavation.

3.1.2 Removal of Unstable Material

Where wet or otherwise unstable soil incapable of properly supporting the pipe, as determined by the Contracting Officer, is unexpectedly encountered in the bottom of a trench, such material shall be removed to the depth required and replaced to the proper grade with select granular material, compacted as provided in paragraph BACKFILLING. When removal of unstable material is due to the fault or neglect of the Contractor while performing shoring and sheeting, water removal, or other specified requirements, such removal and replacement shall be performed at no additional cost to the Government.

3.2 BEDDING

The bedding surface for the pipe shall provide a firm foundation of uniform density throughout the entire length of the pipe. Over excavate the trench depth to allow for the installation of granular bedding materials in accordance with the contract drawings.

3.2.1 Concrete Pipe

Install granular Class IB or II bedding materials in accordance with the American Concrete Pipe Association Installation Type 2 recommendations. Haunching and initial backfill shall be completed utilizing flowable cement fill under roads and shoulders. Complete backfilling with the installation of additional flowable cement fill to the top of subgrade.

3.3 PLACING PIPE

Submit printed copies of the manufacturer's recommendations for installation procedures of the material being placed, prior to installation.

Each pipe shall be thoroughly examined before being laid; defective or damaged pipe shall not be used. Pipelines shall be laid to the grades and alignment indicated on the Contractor's approved contract drawings. Grade control shall be provided by the Contractor's CQC surveyor. Proper facilities shall be provided for lowering sections of pipe into trenches. Lifting lugs in vertically elongated metal pipe shall be placed in the same vertical plane as the major axis of the pipe. Pipe shall not be laid in

water, and pipe shall not be laid when trench conditions or weather are unsuitable for such work. Diversion of drainage or dewatering of trenches during construction shall be provided as necessary. Deflection of installed flexible pipe shall not exceed the following limits:

TYPE OF PIPE	MAXIMUM ALLOWABLE DEFLECTION (%)
Plastic (PVC & HDPE)	5

Note post installation requirements of paragraph 'Deflection Testing' in PART 3 of this specification for all pipe products including deflection testing requirements for flexible pipe.

3.4 JOINTING

Install joint gaskets and exterior joint seals as work progresses. If prefabricated exterior joint seals are utilized, install such seals using procedures recommended by the seal manufacturer. Utilize lubricants to install rubber gaskets and O rings to prevent damage. Protect seals from accumulated foreign debris.

3.5 DRAINAGE STRUCTURES

3.5.1 Concrete Pipe Collars

Seal new pipe to existing pipes with a cast in place concrete pipe collar. Excavate soils around the existing pipe and provide formwork as needed to install a new NCDOT the headwall in accordance with NCDOT Standard Drawing 840.72. Wrap the joint between existing and new pipe with an approved exterior seal prior to placing the concrete.

3.5.2 Beveled Pipe Ends

Once pipe has been installed, field cut HDPE pipe with a reciprocating saw at a slope of not more than 3 (horizontal) to 1 (vertical). Refer to the contract drawings for details.

3.6 BACKFILLING

3.6.1 Backfilling Pipe in Trenches

After the pipe has been properly bedded, selected material from excavation or borrow, at a moisture content that will facilitate compaction, shall be placed along both sides of pipe in layers not exceeding 6 inches in compacted depth. The backfill shall be brought up evenly on both sides of pipe for the full length of pipe. The fill shall be thoroughly compacted under the haunches of the pipe. Each layer shall be thoroughly compacted with mechanical tampers or rammers. This method of filling and compacting shall continue until the fill has reached an elevation equal to the midpoint (spring line) of RCP or has reached an elevation of at least 12 inches above the top of the pipe for flexible pipe. The remainder of the trench shall be backfilled and compacted by spreading and rolling or compacted by mechanical rammers or tampers in layers not exceeding 12 inches. Tests for density shall be made as necessary to ensure conformance to the compaction requirements specified below. Where it is necessary, in the opinion of the Contracting Officer, that sheeting or portions of bracing used be left in place, the contract will be adjusted accordingly. Untreated sheeting shall not be left in place beneath structures or

pavements.

3.6.2 Backfilling Pipe in Fill Sections

For pipe placed in fill sections, backfill material and the placement and compaction procedures shall be as specified below. The fill material shall be uniformly spread in layers longitudinally on both sides of the pipe, not exceeding 6 inches in compacted depth, and shall be compacted by rolling parallel with pipe or by mechanical tamping or ramming. Prior to commencing normal filling operations, the crown width of the fill at a height of 12 inches above the top of the pipe shall extend a distance of not less than twice the outside pipe diameter on each side of the pipe or 12 feet, whichever is less. After the backfill has reached at least 12 inches above the top of the pipe, the remainder of the fill shall be placed and thoroughly compacted in layers not exceeding 12 inches. Use select granular material for this entire region of backfill for flexible pipe installations.

3.6.3 Backfilling Trenches Under Roadways and Curbing

Trenches under roadways shall be backfilled with flowable cement backfill to the depths indicated on the Contractor's approved drawings. Refer to the contract drawings for the minimum heavy duty road crossing section. Flowable cement fill shall extend beyond the edge of pavement for a distance equal to the depth of the excavation. Install flowable fill in lifts; weighting the pipe to prevent flotation.

3.6.4 Backfilling Trenches Under Driveway Crossings

Trenches under roadways shall be backfilled with structural fill material to the depths indicated on the Contractor's approved drawings. Refer to the contract drawings for the minimum driveway crossing section. Use structural fill around the entire pipe length except where topsoil or concrete apron is required.

3.6.5 Movement of Construction Machinery

When compacting by rolling or operating heavy equipment parallel with the pipe, displacement of or injury to the pipe shall be avoided. Movement of construction machinery over a culvert or storm drain at any stage of construction shall be at the Contractor's risk. Any damaged pipe shall be repaired or replaced.

3.6.6 Compaction

3.6.6.1 General Requirements

Refer to specification section 31 23 00.00 20, "Excavation and Fill."

3.7 PIPELINE TESTING

3.7.1 Post-Installation Inspection

One hundred percent of all HDPE pipe shall be checked for rips, tears, joint separations, soil migration through the joint, cracks, localized bucking, bulges, settlement and alignment.

- a. Repair or replace any pipe with crack exhibiting displacement across the crack, exhibiting bulges, creases, tears, spalls, or delamination.

- b. Reports: The deflection results and final post installation inspection report shall include: a copy of all video taken, pipe location identification, equipment used for inspection, inspector name, deviation from design, grade, deviation from line, deflection and deformation of flexible pipe systems, inspector notes, condition of joints, condition of pipe wall (e.g. distress, cracking, wall damage dents, bulges, creases, tears, holes, etc.).

3.8 FIELD PAINTING

After installation, clean cast-iron frames, covers, gratings, and steps not buried in masonry or concrete to bare metal of mortar, rust, grease, dirt, and other deleterious materials and apply a coat of bituminous paint.

-- End of Section --