FMM DIVERSION REACH 6 CHANNEL
STATION 656+00 - 683+00
RED RIVER OF THE NORTH RIVER BASIN
FARGO - MOORHEAD FLOOD RISK MANAGEMENT
CASS COUNTY, NORTH DAKOTA

***** 95% BID SCHEDULE**
***** ATR SUBMITTAL**

Date: **2/27/2015**

Item	Description	Quantity	Unit	Unit Price	Amount
0001	DEMOLITION	1	LS		
0002	STRIPPING				
0002AA	FIRST 4,300 CUBIC YARDS	4,300	CY		
0002AB	OVER 4,300 CUBIC YARDS	791	CY		
0003	CLEARING AND GRUBBING	1	LS		
0004	TEMPORARY EROSION PROTECTION	1	LS		
0005	DIVERSION CHANNEL EXCAVATION				
0005AA	FIRST 785,000 CUBIC YARDS	785,000	CY		
0005AB	OVER 785,000 CUBIC YARDS	136,972	CY		
0013	DRAINAGE DITCHING - RIGHT DITCH				
0013AA	FIRST 9,000 CUBIC YARDS	9,000	CY		
0013AB	OVER 9,000 CUBIC YARDS	1,572	CY		
0014	DRAINAGE DITCHING - LEFT DITCH				
0014AA	FIRST 11,500 CUBIC YARDS	11,500	CY		
0014AB	OVER 11,500 CUBIC YARDS	1,999	CY		
0006	SHAPING OF RIGHT BANK EMB UNDULATIONS	84,050	SY		
0008	R20 RIPRAP				
0008AA	FIRST 5,100 TONS	5,100	TN		
0008AB	OVER 5,100 TONS	913	TN		
0009	RIPRAP FILTER BLANKET	6,681	SY		
0010	TOPSOIL				
0010AA	FIRST 93,000 CUBIC YARDS	93,000	CY		
0010AB	OVER 93,000 CUBIC YARDS	16,089	CY		
0011	SEEDING - DRY ZONE SEED MIX	67	AC		
0012	SEEDING - WET ZONE SEED MIX	41	AC		
0007	GEOTEXTILE - TYPE 2	13,863	SY		
0015	AGGREGATE BASE MATERIAL				
0015AA	FIRST 2,100 CY	2,100	CY		
0015AB	OVER 2,100 CY	336	CY		

FMM DIVERSION REACH 6 CHANNEL
STATION 656+00 - 683+00
RED RIVER OF THE NORTH RIVER BASIN
FARGO - MOORHEAD FLOOD RISK MANAGEMENT
CASS COUNTY, NORTH DAKOTA

***** 95% BID SCHEDULE**
***** ATR SUBMITTAL**

Date: **2/27/2015**

Item	Description	Quantity	Unit	Unit Price	Amount
0016	PERFORMANCE & PAYMENT BONDS	1	LS		

TOTAL AMOUNT (CLINS 0001 - 0016)

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GENERAL

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SECTION 01 00 00.00 13

GENERAL

PART 1 GENERAL

1.1 ORGANIZATION OF SPECIFICATIONS

The specifications which govern the materials and equipment to be furnished and the work to be performed under this contract are listed in the Table of Contents. No attempt has been made in the specifications to segregate work to be performed by any trade, craft, or subcontractor. Any segregation between the trades or crafts shall be solely a matter for agreement between the Contractor, Contractor's employees, and subcontractors.

1.2 USE OF REFERENCES

Reference to the standards, specifications, or codes of any technical society, organization, or association, or local, State, or Federal authority shall mean the specific edition or revision listed.

Various publications are referenced in other sections of the specifications to establish requirements for the work. Any referenced publication is to be used solely for technical requirements. Measurement and payment and any other matters respecting the administration of this contract shall be governed by the terms of this contract without considering any referenced publication. These references are identified in each section by document number, date and title. The addresses, phone numbers, and Internet addresses (if available) for references cited in these specifications are listed in the Unified Facilities Guide Specification: UFGS 01 42 00 SOURCES FOR REFERENCE PUBLICATIONS. The UFGS 01 42 00 is available on the TECHINFO page of the Corps of Engineers Huntsville District Internet site: http://www.hnc.usace.army.mil/.

1.3 MEASUREMENT AND PAYMENT

The Contractor shall be responsible for the work of this section, without any direct compensation being made other than the payment received for contract line items on the bidding schedule.

PART 2 PRODUCTS

2.1 RECYCLED/RECOVERED MATERIALS

Government procurement policy is to acquire, in a cost effective manner, items containing the highest percentage of recycled and recovered materials practicable consistent with maintaining a satisfactory level of competition without adversely affecting performance requirements or exposing suppliers' employees to undue hazards from the recovered materials. The Environmental Protection Agency (EPA) has designated certain items which must contain a specified percent range of recovered or recycled materials. EPA designated products specified in this contract comply with the stated policy and with the EPA guidelines. The Contractor shall make all reasonable efforts to use recycled and recovered materials in providing the EPA designated products and

in otherwise utilizing recycled and recovered materials in the execution of the work.

PART 3 EXECUTION

3.1 DISPOSAL OF DEBRIS AND WASTE

The Contractor's attention is directed to SECTION 01 57 20.00 13 ENVIRONMENTAL PROTECTION and to the following CONTRACT CLAUSES: 52.236-7 PERMITS AND RESPONSIBILITIES; 52.236-9 PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS; 52.236-10 OPERATIONS AND STORAGE AREAS; and 52.236-12 CLEANING UP. Burning will not be permitted at the project site and debris or waste shall not be left on the site. Disposal of clearing and grubbing debris shall be by one of the following methods:

3.1.1 Burning

Burning will not be permitted at the project site.

3.1.2 Disposal offsite for useful purposes

In the interest of conservation, it is required that the Contractor make a reasonable effort to dispose of the material offsite for some useful purpose. Timber may be cut into convenient lengths and utilized for making saw logs, posts, cordwood, wood chips for paper making or other uses, or other similar use.

3.1.3 Disposal in a locally operated sanitary landfill

Contractor shall select the disposal site with the approval of the Contracting Officer. The Contractor shall secure the required permits for disposal and provide copies of the permit to the Contracting Officer.

3.1.4 Disposal of Solid Construction Debris and Waste

Disposal of Solid Construction Debris and Waste shall consist of removal from the construction site and disposal in compliance with Federal, State, and local requirements for solid waste disposal. Contractor shall select the disposal site with the approval of the Contracting Officer.

3.2 SCHEDULING

3.2.1 General

It shall be the responsibility of the Contractor to schedule and execute the work, incorporating the necessary requirements set forth in these specifications. The Contractor shall develop and submit a schedule in accordance with CONTRACT CLAUSE: 52.236-15 SCHEDULES FOR CONSTRUCTION CONTRACTS.

3.2.2 Notification

The Contractor shall inform the Government in writing within 5 days after

receipt of notice to proceed and before work begins as to which hours of the day and days of the week for which work under this contract will be performed. The Contractor shall notify the Government at least 24 hours before work is to be conducted on overtime, in multiple shifts, on weekends, or on Federal government holidays.

3.3 OTHER CONTRACTS

The Contractor shall coordinate with other contractors in the performance of the work and schedule such work to provide for a minimum of delays and interferences. Coordination shall be through the Contracting Officer. Work listed below is currently required under separate contract or is scheduled to be awarded as a separate contract prior to completion of work under this contract. These contracts will be considered in the application of CONTRACT CLAUSE: 52.236-8 OTHER CONTRACTS.

3.3.1 List other contracts

TBD

-- End of Section –

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WORK RESTRICTIONS
05/2012

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SECTION 01 14 00.00 13

WORK RESTRICTIONS
05/2012

PART 1 GENERAL

1.1 GROUNDS AND ROADWAYS

1.1.1 Parking

Contractor parking will be permitted only in the area(s) shown, including the Contractor's staging area. Contractor parking shall be coordinated with the Government.

1.1.2 Snow Removal

The Contractor shall be responsible for snow removal in the Contractor's access, work, and parking areas.

1.2 BLASTING

Blasting will not be permitted.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 EXISTING UTILITIES

3.1.1 General

The Contractor shall coordinate all utility relocation requirements and make payment to the utility companies for all services, fees, and permits required to relocate and reestablish service. The Contractor shall be responsible for all costs related to protecting existing utilities.

3.1.2 Buried Utilities

The approximate locations of known existing buried utilities are shown on the drawings to the extent of available information at the time the drawings were prepared. All utilities are expected to be relocated prior to commencing channel excavation, however, it is the Contractor’s responsibility to verify that the utilities have been relocated and existing utility infrastructure has been abandoned. As-built utility drawings for the relocated infrastructure shall be provided to the Contractor as the drawings become available. Prior to commencing excavation, the Contractor shall accurately locate all such installations. In the event the Contractor damages any existing utility lines, report thereof shall be made immediately to the Contracting Officer. Repair of damaged utilities shall be in accordance with CONTRACT CLAUSE 52.236-9 PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS.

3.1.3 Interruption of Services

Utility services shall not be interrupted except for brief periods to facilitate cut-ins. The Contractor shall provide temporary service and shall relocate existing utilities as required to construct the work shown and insure uninterrupted service. If interruption of services is unavoidable, the Contractor shall request approval in writing at least 15 calendar days prior to the proposed interruption. This submittal shall fully describe all details of proposed interruption and the reasons why alternatives are not feasible. Information contained in the submittal shall include, but not be limited to, utilities being affected, duration of outage, and any sketches required to support the submittal. The Contractor shall further coordinate with the owner of the utility and notify affected consumers at least 10 calendar days in advance of interruption of services. The Contracting Officer will not in general approve proposals which require interruption of services for more than 4 continuous hours.

3.1.4 North Dakota One Call Excavation Notice System

For contract work performed within the State of North Dakota, the Contractor shall meet the requirements of North Dakota Statutes, Chapter 42-23 "One Call Excavation Notice System." The North Dakota One Call notification center telephone numbers are:

Hotline 1-800-795-0555 or 811

3.2 PROTECTION OF TREES

Trees to be protected shall be determined and staked by the Contracting Officer. The following measures shall be implemented for tree protection and shall be addressed in the Environmental Protection Plan required under SECTION 01 57 20.00 13 ENVIRONMENTAL PROTECTION:

a. The trees shall be protected from wounds to the bark and foliage.

b. The critical root zone shall be protected from compaction and grading.

c. Changes in temporary site drainage and ponding that affect the protected trees shall be minimized to the extent possible.

The critical root zone of trees designated to be protected shall be surrounded by a high visibility fence 4 feet in height, supplied and erected by the Contractor. The critical root zone shall be defined by an area extending 1.5 feet radius from each tree for each inch of Diameter at Breast Height (DBH). The fence shall be securely erected and installed prior to any movement through the project site by construction vehicles or equipment, and remain in place until construction and clean-up are completed. The critical root zone shall remain free of all construction activities including trenching, staging, stockpiling and storage of materials. Vehicles and equipment shall not drive or park within the critical root zone. Variation to the critical root zone size or configuration will only be permitted where it is absolutely necessary for construction of the project, and requires approval of the Contracting Officer. Short duration

alterations of the critical root zone involving wood chips and limited equipment travel shall be submitted in writing for approval.

The Contractor shall not operate equipment in vegetated areas outside the work limits.

3.2.1 Restoration of Damaged Trees

Any existing tree designated to be protected that is damaged by the Contractor's operations shall be replaced. Trees will be considered damaged if the critical root zone in cohesive soils is compacted, if there are significant wounds that could contribute to rot, or if distress (evident by reduced growth or other observations of distress documented by a forester) is observed prior to closing the contract. Trees shall be replaced in kind on a caliper inch per caliper inch basis (DBH) (e.g. one 6-inch red oak shall be replaced with two 3-inch red oaks, three 2-inch red oaks, or six 1-inch red oaks). Replacement tree size and location will be determined and staked by the Contracting Officer. Repair by pruning, aeration, soil conditioning, or other recommendation from a qualified forester will be considered by the Contracting Officer for substitution for replacement.

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MEASUREMENT AND PAYMENT
10/2006

-- End of Section Table of Contents --

MEASUREMENT AND PAYMENT
10/2006

PART 1 GENERAL

1.1 REFERENCES

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

NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY (NIST)

NIST HB 44	(2010) Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION (NDDOT)

ND DOT	Standard Specifications for Road and Bridge Construction (2008 Edition)

1.2 COMPENSATION

The payment provided for in the contract shall constitute full compensation for furnishing all materials and for performing all work under the contract in a complete and acceptable manner. The contract work shall include providing plant, equipment, tools, supplies, labor, supervision, incidental materials, quality control, environmental protection, and meeting safety requirements, and for performing all work required for which separate payment is not otherwise provided. Compensation for all work shown, specified, or essential to completion of the project (whether or not the specific material or operation is indicated) shall be included on the bidding schedule. The payment provided for in the contract includes compensation for all risk, loss, damage, and expense arising out of the nature of the work or its prosecution, subject to conditions of the contract. Payment for each contract line item will constitute full compensation for furnishing the materials and constructing the work complete in place as specified.

1.3 APPROVAL OF MATERIALS OR ALTERNATES

Requests for approval of materials and products, or substitutes thereof, will not be considered prior to award of the contract.

1.4 QUANTITY SURVEYS

The Contractor shall provide quantity surveys for bulk materials measured by volume or weight, unless an alternate method of measurement is specified. Quantity surveys are specified in Section 01 71 23.00 13 CONTRACTOR SURVEYS.

1.5 MEASUREMENT BY WEIGHT

Bulk materials paid for by weight will be measured by weighing each truck load on an approved scale before being placed in the work. Scales shall be

of sufficient length to permit simultaneous weighing of all axle loads and shall be sensitive to a change in load of 0.2 percent throughout the range of the scale. The scale's accuracy shall conform to the applicable requirements of NIST HB 44 and shall be certified by a scale servicing company or by an inspector of the State Inspection Bureau. Each load shall be accompanied by a delivery ticket certified by the weighmaster. Delivery tickets shall be collected by the Contractor, and copies thereof shall be furnished to the Contracting Officer. As a minimum, each ticket shall contain the following information:

(1) Date and time.
(2) Vehicle number.
(3) Gross weight.
(4) Vehicle tare weight.
(5) Net weight.
(6) Job total for material weighed.
(7) Signature of weighmaster.
(8) Signature of Contractor's receiver.

1.6 MEASUREMENT UNITS

When materials are measured in units other than the measurement units specified as the basis of payment, the measured quantities shall be converted to the specified unit of measure. Factors for conversions from one basis or unit of measurement to another shall be approved by the Contracting Officer.

1.7 SUBMITTALS

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

SD-03 Product Data

Delivery Ticket

Submit certified delivery tickets.

1.8 LUMP SUM PAYMENT ITEMS

Payment items for the work of this contract for which contract lump sum payments will be made are listed in the BID SCHEDULE and described below. All costs for items of work, which are not specifically mentioned to be included in a particular lump sum or unit price payment item, shall be included in the listed lump sum item most closely associated with the work involved. The lump sum price and payment made for each item listed shall constitute full compensation for performing all work required for which separate payment is not otherwise provided.

1.8.1 Demolition

1.8.1.1 Payment

Payment will be made for furnishing all materials, equipment, labor and performing all operations necessary for demolition, removal, disposal and salvage of existing structures and equipment, unless the item is specifically covered under a separate bid item. Items to be demolished include, but are not limited to, abandoned storm sewer culverts, abandoned water lines, utility poles, roads, foundations and fences. Debris shall be taken off site and disposed of in accordance with all local, state and federal requirements.

1.8.1.2 Unit of Measurement

Unit of measure: lump sum.

1.8.2 Clearing and Grubbing

1.8.2.1 Payment

Payment will be made for furnishing all materials, equipment, labor and performing all operations necessary to complete Clearing and Grubbing operations as shown and specified. Clearing and grubbing includes, but is not limited to, preparation of areas scheduled for construction of structures, excavations, levees, excavated material berms and roads. Debris shall be removed from the site and disposed of properly. All incidentals required to complete the work shall be included in the bid price. No allowances will be made for clearing and grubbing outside the limits of construction unless authorized.

1.8.2.2 Unit of Measurement

Unit of measure: lump sum.

1.8.3 Temporary Erosion Protection

1.8.3.1 Payment

Payment will be made for furnishing all materials, equipment, labor and performing all operations necessary for Temporary Erosion Protection measures required to install, maintain and to ensure compliance with all permitting requirements and those measures required by the contract documents. Work shall include, but is not limited to, measures such as silt fencing, straw bales, control of runoff and temporary seeding.

1.8.3.2 Unit of Measurement

Unit of measure: lump sum.

1.8.4 Drain Tile Removal

1.8.4.1 Payment

Payment will be made for furnishing all materials, equipment, labor and performing all operations necessary for the removal of any farm field Drain Tile within the project work limits. Work includes, but is not limited to, excavation, removal and disposal of drain tile, back filling and compaction of the excavations.

1.8.4.2 Unit of Measurement

Unit of measure: lump sum.

1.8.5 Performance and Payment Bonds

1.8.5.1 Payment

Payment will be made for the costs associated with obtaining bid, performance and payment bonds in accordance with the contract requirements. Bonds will be paid for on a Lump Sum basis in accordance with CONTRACT CLAUSE 52.232-5 PAYMENTS UNDER FIXED -PRICE CONSTRUCTION CONTRACTS.

1.8.5.2 Unit of Measurement

Unit of measure: lump sum.

1.9 UNIT PRICE PAYMENT ITEMS

Payment items for the work of this contract on which the contract unit price payments will be made are listed in the BID SCHEDULE and described below. The unit price and payment made for each item listed shall constitute full compensation for furnishing all plant, labor, materials, and equipment, and performing any associated Contractor quality control, environmental protection, meeting safety requirements, tests and reports, and for performing all work, including incidental work, required for each of the unit price items.

1.9.1 Stripping

1.9.1.1 Payment

Payment will be made for furnishing all materials, equipment, labor and performing all operations necessary to complete stripping operations as shown and specified. Work shall include, but not be limited to, stripping vegetation, topsoil, and organic material within the stripping limits as shown on the drawings, stockpiling of topsoil for reuse, and disposing of excess stripped materials. No allowances will be made for stripping outside the limits defined by the contract drawings unless authorized.

1.9.1.2 Measurement

Stripping shall be measured for payment by the cubic yard (CY) using the triangle volume method. The basis for payment will be the difference between (1) the digital terrain model (DTM) of the areas prior to stripping and (2) the digital terrain model of the areas after stripping is complete. The Contractor shall be responsible to perform the necessary quantity surveys. Materials removed outside the lines and grades shown will not be measured for payment. Material removed outside the lines and grades shown, but within the specified tolerance shall not be measured for payment. Disposal of excess stripping shall not be measured for payment.

1.9.1.3 Unit of Measure

Unit of measure: cubic yard.

1.9.2 Diversion Channel Excavation

1.9.2.1 Payment

Payment will be made for furnishing all materials, equipment, labor and performing all operations necessary for excavation of Diversion Channel Excavation material as shown and specified. Work shall include, but not be limited to, excavation of the diversion channel material, hauling, placement in the Embedded Levee and Excavated Material Berms, roadways, grading, compaction and restoration following completion of excavation.

1.9.2.2 Measurement

Diversion Channel Excavation shall be measured for payment by the cubic yard (CY) and quantities shall be determined by the triangle volume method. The basis for payment will be the difference between (1) the digital terrain model (DTM) of the areas prior to excavation and (2) the DTM of the areas to the lines and grades shown on the contract drawings. Final surveys shall be used for any authorized over-depth excavation. Except for authorized over-depth excavation, materials removed outside the lines and grades shown on the contract drawings shall not be measured for payment. Material removed outside the lines and grades shown, but within the specified tolerance shall not be measured for payment. The Contractor shall be required to perform the necessary quantity surveys.

1.9.2.3 Unit of Measure

Unit of measure: cubic yard.

1.9.3 Drainage Ditching

1.9.3.1 Payment

Payment will be made for furnishing all materials, equipment, labor and performing all operations necessary for excavation of Drainage Ditching material as shown and specified. Work shall include, but not be limited to, excavation of the drainage ditching material, hauling, placement in the Embedded Levee and Excavated Material Berms, roadways, grading, compaction and restoration following completion of excavation.

1.9.3.2 Measurement

Drainage Ditch excavation shall be measured for payment by the cubic yard (CY) and quantities shall be determined by the triangle volume method. The basis for payment will be the difference between (1) the digital terrain model (DTM) of the areas prior to excavation and (2) the DTM of the areas to the lines and grades shown on the contract drawings. Final surveys shall be used for any authorized over-depth excavation. Except for authorized over-depth excavation, materials removed outside the lines and grades shown shall not be measured for payment. Material removed outside the lines and grades shown, but within the specified tolerance shall not be measured for payment. The Contractor shall be required to perform the necessary quantity surveys.

1.9.3.3 Unit of Measurement

Unit of measure: cubic yard

1.9.4 Shaping of Right Bank EMB Undulations

1.9.4.1 Payment

Payment will be made for furnishing all materials, equipment, labor and performing all operations necessary for Shaping of the Right Bank EMB Undulations as shown and specified. Work shall include, but not be limited to, final grading and shaping of material placed from the excavation of the diversion channel. Excavation, hauling and compaction of material from the diversion channel excavation shall not be paid for under this item but shall be included in the bid item for Diversion Channel Excavation.

1.9.4.2 Measurement

Shaping of the Right Bank EMB Undulations shall be measured for payment by the square yard (SY) in two-dimensional plan view between the landward EMB top of slope and the toe of the EMB slope as shown on the contract drawings.

1.9.4.3 Unit of Measure

Unit of measure: square yard.

1.9.5 Riprap (R20)

1.9.5.1 Payment

Payment will be made for furnishing all materials, equipment, labor and performing all operations necessary for placing riprap of the specified gradations (R20), as shown and within the tolerances specified unless specifically addressed under another bid item. Work shall include, but not be limited to, obtaining, hauling, and final placement of Riprap. No separate payment will be made for stockpiling materials.

Deductions. Payment will be made only for riprap placed within the specified tolerances. All riprap permitted by the Contracting Officer to remain outside the tolerances specified shall be deducted from the quantity for which payment is to be made. Volume of excess riprap shall be computed, using the difference between the digital terrain model of the areas after riprap placement and of the excess above the tolerance line. The excess volume shall be deducted for the payment quantity at the rate of 1.35 tons per cubic yard, regardless of actual weight per cubic yard.

1.9.5.2 Measurement

Riprap shall be measured for payment by the ton (TN) (2,000 pounds avoirdupois) in accordance with paragraph MEASUREMENT BY WEIGHT. Quantities shall be computed to the nearest whole ton. Weight tickets shall include time, date, truck number and net weight. Weight tickets furnished by a public weighmaster shall be acceptable.

1.9.5.3 Unit of Measure

Unit of measure: ton.

1.9.6 Geotextile Fabric

1.9.6.1 Payment

Payment will be made for furnishing all materials, equipment, labor and performing all operations necessary for placement of geotextile fabric as shown and specified. Work shall include, but not be limited to, any preparation work required for surfaces on which geotextile fabric is to be placed; delivery, storage, and installation of geotextile; and furnishing product data attesting that the geotextile fabric meets specification requirements.

1.9.6.2 Measurement

Geotextile Fabric shall be measured for payment by the as-built surface area in square yards (SY) covered by geotextile fabric. No allowance will be made for waste, overlaps, damaged materials, repairs or materials used for the convenience of the Contractor.

1.9.6.3 Unit of Measure

Unit of measure: square yard.

1.9.7 Topsoil

1.9.7.1 Payment

Payment will be made for furnishing all materials, equipment, labor and performing all operations necessary for placement of topsoil material to the proper depth, as specified in the contract documents. Work shall include, but not be limited to, hauling topsoil from the stripping operations, removing required topsoil prior to excavation, stockpiling topsoil, placement of topsoil, grading and preparing the specified areas for turf establishment.

1.9.7.2 Measurement

Topsoil shall be measured for payment by the cubic yard (CY) in place using the triangle volume method based on the original ground lines as determined by the required digital terrain model (DTM) of the areas prior to placement of topsoil and the DTM of the areas to the lines and grades shown after the placement of topsoil with the following limitations or exceptions:

(1) Tolerances are provided only for the convenience of the Contractor and no material removed outside of the lines, grades, and sections shown as a result of the permitted tolerances will be measured for payment.

1.9.7.3 Unit of Measure

Unit of measure: cubic yard.

1.9.8 Seeding (Seed Mixes 1 and 2)

1.9.8.1 Payment

Payment will be made for furnishing all materials, equipment, labor and performing all operations necessary for establishment of the Seeding, for the specified Seed Mixes (Mix 1 and 2), to the areas designated for seeding as shown on the contract drawings. Work shall include, but not be limited to, soil preparation, soil amendments, placement of seed, fertilizer, mulch, watering, maintenance and all other work incidental to seeding. No additional payment will be made for restoration of areas damaged by Contractor operations. Restoration by seeding of disturbed areas not designated on the contract drawings will not be measured for payment and shall be incidental to the work being performed.

1.9.8.2 Measurement

Seeding shall be measured for payment by the acre (AC) in place. The area measured for payment will be limited to the areas designated for seeding as shown on the drawings. Quantities shall be determined by measuring the lengths of the seeded area perimeters and calculating the acres. The Contractor shall be responsible for performing the necessary quantity surveys.

1.9.8.3 Unit of Measure

Unit of measure: acre.

1.9.9 Aggregate Base Course

1.9.9.1 Payment

Payment will be made for furnishing all materials, equipment, labor and performing all operations necessary for constructing the Aggregate Base Course as shown and specified, unless specifically addressed under another bid item. All incidentals shall be included in the bid price.

1.9.9.2 Measurement

Aggregate Base Course shall be measured for payment by the cubic yard (CY) in place, within neat lines and to the compacted thicknesses shown on the drawings. No payment will be made for overfill due to surface or subgrade variations. Material wasted, unused, rejected, or used for the convenience of the Contractor shall not be measured for payment.

1.9.9.3 Unit of Measurement

Unit of measure: cubic yard

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

-- End of Section --

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PROJECT SCHEDULE
01/02

SECTION 01 32 01.00 13

PROJECT SCHEDULE
01/02

PART 1 GENERAL

1.1 SUBMITTALS

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

SD-01 Preconstruction Submittals

Initial Project Schedule; G,COR Periodic Updates; G,COR

Five copies of the initial project schedule shall be submitted. Two copies of periodic project schedule updates shall be submitted.

SD-04 Samples

Software;

The Contractor shall furnish the Government copies of the scheduling software if required under paragraph COMPUTER SOFTWARE REQUIREMENTS.

1.2 QUALIFICATIONS

The Contractor shall designate an authorized representative who shall be responsible for the preparation of all required project schedule reports.

PART 2 PRODUCTS

2.1 COMPUTER SOFTWARE REQUIREMENTS

The Contractor shall furnish the Government with the software to be used, unless waived by the Contracting Officer. The Contactor shall assist in installing the software in the Government resident office. The Contractor shall provide the software complete, including documentation and updates used in the Contractor's system. The software shall remain the property of the Contractor, but shall be in the possession of and for the exclusive use by the Government during the contract period. The Government shall have rights to install the software on 3 computers (resident office, area office, and district office).

PART 3 EXECUTION

3.1 GENERAL

Pursuant to the Contract Clause, SCHEDULES FOR CONSTRUCTION CONTRACTS (FAR 52.236-15), a project schedule as described below shall be prepared. The scheduling of construction shall be the responsibility of the Contractor.

Contractor management personnel shall actively participate in its development. Subcontractors and suppliers working on the project shall contribute in developing and maintaining an accurate project schedule. The approved project schedule shall be used to measure the progress of the work, to aid in evaluating time extensions, and to provide the basis of progress payments.

3.2 BASIS FOR PAYMENT

The project schedule shall be the basis for measuring Contractor progress. The Contracting Officer will use an approved project schedule to evaluate Contractor progress for payment purposes. In the case where project schedule revisions have been directed by the Contracting Officer and those revisions have not been included in the project schedule, then the Contracting Officer may hold retainage up to the maximum allowed by contract, each payment period, until the project schedule updates have been accepted.

3.3 SOFTWARE

Computer software systems utilized by the Contractor to produce the project schedule shall be capable of providing all requirements of this specification.

3.3.1 Use of the Critical Path Method

The project schedule shall clearly show the critical path. If a network analysis system is used, the Critical Path Method (CPM) of network calculation shall be used to generate the project schedule, provided in either the Precedence Diagram Method (PDM) or the Arrow Diagram Method (ADM).

3.3.2 Level of Detail Required

The project schedule shall include an appropriate level of detail. The Contracting Officer will use, but is not limited to, the following conditions to determine the appropriate level of detail to be used in the project schedule.

3.3.2.1 Activity Durations

The Contractor shall breakout lump-sum or sum-job contract line items into subcategories, or activities. The number of activities shall be sufficient to allow the progress to be accurately determined between payment periods.

3.3.2.2 Procurement Activities

Tasks related to the procurement of long lead materials or equipment shall be included as separate activities in the project schedule. Long lead materials and equipment are those materials that have a procurement cycle of over 90 calendar days. Examples of procurement process activities include, but are not limited to: submittals, approvals, procurement, fabrication, and delivery.

3.3.2.3 Critical Activities

The following activities shall be listed as separate line activities on the Contractor's project schedule:

a. Submission and approval of as-built drawings.

b. Prefinal inspection.

c. Correction of punchlist from prefinal inspection.

d. Final inspection.

3.3.2.4 Government Activities

Government and other agency activities that could impact progress shall be shown. These activities include, but are not limited to: approvals, inspections, utility tie-in, Government furnished property, and notice to proceed for phasing requirements.

3.3.2.5 Responsibility

All activities shall be identified in the project schedule by the party (Prime Contractor, subcontractor, Government agency, etc.) responsible to perform the work. Activities shall not belong to more than one responsible party. The responsible party for each activity shall be identified by the Responsibility Code.

3.3.2.6 Feature of Work

All activities shall be identified in the project schedule according to the feature of work to which the activity belongs. Feature of work refers, but is not limited to a work breakdown structure for the project schedule. The feature of work for each activity shall be identified by the Feature of Work Code.

3.3.3 Scheduled Project Completion

The schedule interval shall extend from notice to proceed to the contract completion date. The notice to proceed date shall be taken as the date that notice to proceed was acknowledged.

3.3.3.1 Constraint of Last Activity

Completion of the last activity in the project schedule shall be constrained by the contract completion date. If the early finish of the last activity falls after the contract completion date, then the critical path shall show a negative float.

3.3.3.2 Early Project Completion

If the project schedule shows project completion prior to the contract completion date, the Contractor shall identify activities that have been accelerated and activities that are scheduled in parallel to support the "early" completion. The Contractor shall assist the Contracting Officer in evaluating the Contractor's ability to actually complete prior to the contract completion date.

3.3.4 Interim Completion Dates

Contractually specified interim completion dates shall also be constrained to show negative float if the early finish date of the last activity in that phase falls after the interim completion date.

3.3.5 Default Progress Data Disallowed

The Contractor shall document the actual start and actual finish dates on the daily quality control report for every in-progress or completed activity and ensure that the data contained on the daily quality control reports is the sole basis for project schedule updating. Actual Start and Finish dates shall not be automatically updated by default mechanisms that may be included in CPM scheduling software systems. Actual start and finish dates on the CPM schedule shall match those dates provided from Contractor quality control reports.

3.3.6 Out-of-Sequence Progress

The Contracting Officer shall be notified prior to work on any activities that are out-of-sequence with the project schedule. The Contractor shall update the project schedule to correct any out-of-sequence work.

3.3.7 Extended Non-Work Periods

Non-work periods of over 5 working days shall be identified by addition of activities that represent the delays.

3.3.8 Negative Lags

Lag durations contained in the project schedule shall not have a negative value.

3.4 PROJECT SCHEDULE SUBMISSIONS

The Contractor shall provide the submissions as described below.

3.4.1 Initial Project Schedule Submission

The project schedule shall provide a reasonable sequence of activities which represent work through the entire contract period and shall be at a reasonable level of detail.

3.4.2 Periodic Updates

Based on the result of progress meetings, the Contractor shall submit periodic project schedule updates. The Contractor shall furnish information and project schedule data, which in the judgment of the Contracting Officer, is necessary for verifying the Contractor's progress.

3.4.3 Standard Activity Coding Dictionary

The Contractor shall submit, with the initial project schedule, a coding scheme that shall be used throughout the project schedule for all activity codes contained in the project schedule. The coding scheme submitted shall list the values for each activity code category and translate those values into project specific designations. For example, a responsibility code value, "ELE", may be identified as "Electrical Subcontractor". Activity code

values shall represent the same information throughout the duration of the contract.

3.5 SUBMISSION REQUIREMENTS

The following items shall be submitted for each project schedule submission:

3.5.1 Earnings Report

The Contractor shall submit a compilation of the Contractor's Total Earnings on the project through the most recent Monthly Progress Meeting. Activities shall be grouped by contract line item. The printed report shall contain, for each contract line item: activity number, activity description, original budgeted amount, total quantity, quantity to date, percent complete (based on cost), and earnings to date. A total project percent complete shall also be provided. If necessary to substantiate partial payment and requested by the Contracting Officer, the earnings report shall detail activities within a contract line item.

3.5.2 Network Diagram

A network diagram shall be required on the initial project schedule submission and on periodic submissions when requested by the Contracting Officer (not less than quarterly). The network diagram shall depict and display the order and interdependence of activities and the sequence in which the work is to be accomplished. The network diagram shall be constructed to meet the following conditions:

a. Continuous Flow. Diagrams shall show a continuous flow from left to right with no arrows from right to left. The activity or event number, description, duration, and estimated earned value shall be shown on the diagram.

b. Project Milestone Dates. Dates shall be shown on the diagram for start of project, any contract required interim completion dates, and contract completion dates.

c. Critical Path. The critical path shall be clearly shown.

d. Banding. Activities shall be grouped to assist in the understanding of the activity sequence. Typically, this flow will group activities by category of work, work area and/or responsibility.

e. S-Curves. Earnings curves showing projected early and late earnings and earnings to date.

3.6 PERIODIC PROGRESS MEETINGS

Progress meetings to discuss payment shall include a monthly onsite meeting or other regular intervals mutually agreed to at the preconstruction conference. During this meeting the Contractor shall describe, on an activity by activity basis, all proposed revisions and adjustments to the project schedule required to reflect the current status of the project.

3.6.1 Meeting Attendance

The Contractor's project manager and the Contractor's authorized representative responsible for preparation of the project schedule shall attend the regular progress meeting.

3.6.2 Update Submission Following Progress Meeting

A complete update of the project schedule containing all approved progress, revisions, and adjustments, based on the regular progress meeting, shall be submitted not later than 4 working days after every third monthly progress meeting.

3.6.3 Progress Meeting Contents

Update information, including actual start dates, actual finish dates, remaining durations, and cost-to-date shall be subject to the approval of the Contracting Officer. The Contractor shall address the following minimum set of items, on an activity by activity basis, during each progress meeting.

a. Start and Finish Dates. The actual start and actual finish dates for each completed activity. The actual start and projected finish dates for each activity in-progress.

b. Cost Completion. The earnings for each activity started. Payment will be based on earnings for each in-progress or completed activity. Payment for individual activities will not be made for work that contains defects.

c. Project Schedule Changes. All changes pertaining to notice to proceed on change orders, change orders to be incorporated into the project schedule, Contractor proposed changes in work sequence, corrections to project schedule for out-of-sequence progress, lag durations, and other changes that have been made pursuant to contract provisions shall be specifically identified and discussed.

d. Other Changes. Other changes required due to delays in completion of any activity or group of activities include unusually severe weather, product procurement, or other delays or work stoppages which make re-planning the work necessary.

3.7 REQUESTS FOR TIME EXTENSIONS

In the event the Contractor requests an extension of the contract completion date, the Contractor shall furnish such justification, project schedule data and supporting evidence as the Contracting Officer may deem necessary for a determination as to whether or not the Contractor is entitled to an extension of time under the provisions of the contract.

3.7.1 Justification of Delay

The project schedule shall clearly display that the Contractor has used, in full, all the float time available for the work involved with this request. The Contracting Officer's determination as to the number of allowable days of contract extension shall be based upon an approved project schedule and other factual information. Delays that are caused by the Contractor's own actions will not be a cause for a time extension to the contract completion date.

3.7.2 Submission Requirements

The Contractor shall submit a justification in accordance with the requirements of other appropriate contract clauses and shall include, as a minimum:

a. A list of affected activities, with their associated project schedule activity number.

b. A brief explanation of the cause(s) of the change.

c. An analysis of the overall impact of the changes proposed.

d. If requested by the Contracting Officer, the Contractor shall provide an interim project schedule update with revised activities.

3.8 DIRECTED CHANGES

If notice to proceed is issued for undefinitized work, the Contractor shall submit proposed project schedule revisions to the Contracting Officer within 14 calendar days of the notice to proceed being issued. The proposed revisions to the project schedule must be approved by the Contracting Officer prior to inclusion of those changes within the project schedule. If the Contractor fails to submit the proposed revisions, the Contracting Officer may furnish the Contractor with suggested revisions to the project schedule; and the Contractor shall update the project schedule with the Contracting Officer's revisions until a mutual agreement in the revisions is reached.

3.9 OWNERSHIP OF FLOAT

Float available in the project schedule, at any time, shall not be considered for the exclusive use of either the Government or the Contractor.

-- End of Section --

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10/2006

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SECTION 01 33 00

SUBMITTAL PROCEDURES
10/2006

PART 1 GENERAL

1.1 SUBMITTAL IDENTIFICATION

Submittals required are identified by SD numbers and titles as follows:

SD-01 Preconstruction Submittals

SD-02 Shop Drawings

SD-03 Product Data

SD-04 Samples

SD-06 Test Reports

SD-07 Certificates

SD-08 Manufacturer's Instructions

SD-10 Operation and Maintenance Data

SD-11 Closeout Submittals

1.2 SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

1.2.1 Government Approved

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

1.2.2 Information Only

All submittals not requiring Government approval will be for information only. They are not considered to be "shop drawings" within the terms of the Contract Clause referred to above.

1.3 APPROVED SUBMITTALS

The Contracting Officer's approval of submittals shall not to be construed as a complete check, but will indicate only that the general method of construction, materials, detailing and other information are satisfactory. Approval will not relieve the Contractor of the responsibility for any error

which may exist, as the Contractor under the Contractor Quality Control (CQC) requirements of this contract is responsible for dimensions, the design of adequate connections and details, and the satisfactory construction of all work. After submittals have been approved 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.

1.4 DISAPPROVED SUBMITTALS

The Contractor shall make all corrections required by the Contracting Officer and promptly furnish a corrected submittal in the form and number of copies specified for the initial submittal. If the Contractor considers any correction indicated on the submittals to constitute a change to the contract, a notice in accordance with the CONTRACT CLAUSE 52.243-4 CHANGES shall be given promptly to the Contracting Officer.

1.5 WITHHOLDING OF PAYMENT

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

1.6 MEASUREMENT AND PAYMENT

The work of this section will not be measured for payment. The Contractor shall be responsible for the work of this section, without any direct compensation being made other than the payment received for contract items.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 GENERAL

The Contractor shall make submittals as required by the specifications. The Contracting Officer may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective sections. Units of weights and measures used on all submittals shall be the same as those used in the contract drawings. Each submittal shall be complete and in sufficient detail to allow ready determination of compliance with contract requirements. Prior to submittal, all items shall be checked and approved by the Contractor's Quality Control (CQC) System Manager and each item shall be stamped, signed, and dated by the CQC System Manager indicating action taken. Proposed deviations from the contract requirements shall be clearly identified. Submittals shall include items such as: Contractor's, manufacturer's, or fabricator's drawings; descriptive literature including (but not limited to) catalog cuts, diagrams, operating charts or curves; test reports; test cylinders; samples; O&M manuals (including parts list); certifications; warranties; and other such required submittals. Submittals requiring Government approval shall be scheduled and made prior to the acquisition of the material or equipment covered thereby. Samples remaining upon completion of the work shall be picked up and disposed in accordance with manufacturer's Material Safety Data Sheets (MSDS) and in compliance with existing laws and regulations.

3.2 SUBMITTAL REGISTER

At the end of this section is a sample Submittal Register, showing items of equipment and materials for which submittals are required by the specifications. This list may not be all inclusive and additional submittals may be required. The Contractor shall use QCS to track and transmit all submittals. The Submittal Register shall be produced using RMS. The Contractor shall maintain a submittal register for the project in accordance with Section 01 45 02.00 10 QUALITY CONTROL SYSTEM (QCS).

3.3 SCHEDULING

Submittals covering component items forming a system or items that are interrelated shall be scheduled to be coordinated and submitted concurrently. Certifications to be submitted with the pertinent drawings shall be so scheduled. Adequate time (a minimum of 30 calendar days exclusive of mailing time) shall be allowed and shown on the register for review and approval. No delay damages or time extensions will be allowed for time lost in late submittals. The submittal register shall provide for a reasonable timely distribution of shop drawings as they are prepared (particularly within a specific discipline, i.e.: structural, mechanical).

3.4 TRANSMITTAL FORM (ENG FORM 4025)

A sample transmittal form (ENG Form 4025) is attached to this section, however the ENG Form 4025 shall be produced using QCS and shall be used for submitting both Government approved and information only submittals.

3.5 SUBMITTAL PROCEDURE

3.5.1 Submittal Copies

The Contractor shall submit 6 hardcopies of each submittal (both Government approved and for information only), or 1 hardcopy and 1 electronic copy, unless otherwise indicated. Each transmittal shall address only one submittal item. Transmittals returned for resubmission shall be resubmitted in their entirety. When approved by the Contracting Officer, routine test reports and delivery tickets may be submitted with daily quality control reports in place of following submittal procedures under this section.

3.5.2 Schedule

Shop drawings shall be submitted with ample time to secure Government approval prior to the time the items covered thereby are to be delivered to the site. Additional time should be allowed for possible resubmittal. Materials fabricated or delivered without Government approval of the shop drawing will be subject to rejection. All submittals shall be made prior to commencement of applicable work, and allow adequate time for government review acceptable to the Contracting Officer.

3.5.3 Shop Drawings

Shop drawings shall be reproductions on high quality paper with clear legible print. Drawings shall generally be bordered a minimum of one inch and trimmed to neat lines. Shop drawing quality will be subject to approval.

Each shop drawing, including catalog data, shall be identified with a title block including the name of the Contractor, contract number, name and location of project, and name of the item of work or structure to which the shop drawing applies. Catalog data, including specifications and full descriptive matter, may be submitted as shop drawings. Catalog data must be supplemented as necessary to include all pertinent data to verify conformance to the contract documents. When catalog data includes non applicable data, the applicable data shall be clearly indicated.

3.5.4 Warranties

Any items that are submitted for review or approval of the Contracting Officer should include a copy of the manufacturer's standard warranty if one is available.

3.5.5 Deviations

For submittals which include proposed deviations requested by the Contractor, the column "variation" of ENG Form 4025 shall be checked. The Contractor shall set forth in writing the reason for any deviations and annotate such deviations on the submittal. The Government reserves the right to rescind inadvertent approval of submittals containing unnoted deviations.

3.6 CONTROL OF SUBMITTALS

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

3.7 GOVERNMENT APPROVED SUBMITTALS

Upon completion of review of submittals requiring Government approval, the submittals will be identified as having received approval by being so stamped and dated. Five copies of the submittal will be retained by the Contracting Officer and 1 copy of the submittal will be returned to the Contractor.

3.8 INFORMATION ONLY SUBMITTALS

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

3.9 STAMPS

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

CONTRACTOR

(Firm Name)

_____ Approved

_____ Approved with corrections as noted on submittal data and/or attached sheet(s).

SIGNATURE: _____

TITLE: _____

DATE: _____

-- End of Section --

SECTION 01 35 26

GOVERNMENTAL SAFETY REQUIREMENTS
02/12

1 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 A10.32	(2012) Fall Protection
ASSE/SAFE A10.34	(2001; R 2012) Protection of the Public on or Adjacent to Construction Sites
ASSE/SAFE Z359.1	(2007) Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components

ASME INTERNATIONAL (ASME)

ASME B30.22	(2010) Articulating Boom Cranes
ASME B30.3	(2012) Tower Cranes
ASME B30.5	(2011) Mobile and Locomotive Cranes
ASME B30.8	(2010) Floating Cranes and Floating Derricks

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 10	(2013) Standard for Portable Fire Extinguishers
NFPA 51B	(2009; TIA 09-1) Standard for Fire Prevention During Welding, Cutting, and Other Hot Work
NFPA 70E	(2012; Errata 2012) Standard for Electrical Safety in the Workplace

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2008; Errata 1-2010; Changes 1-3 2010; Changes 4-6 2011; Change 7 2012) Safety and Health Requirements Manual

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

10 CFR 20	Standards for Protection Against Radiation
29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1910.146	Permit-required Confined Spaces
29 CFR 1926	Safety and Health Regulations for Construction
29 CFR 1926.1400	Cranes & Derricks in Construction
29 CFR 1926.16	Rules of Construction
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

b. High Visibility Accident. Any mishap which may generate publicity or high visibility.

c. Medical Treatment. 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.

e. Recordable Injuries or Illnesses. Any work-related injury or illness that results in:

(1) Death, regardless of the time between the injury and death, or the length of the illness;

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

(3) Restricted work;

(4) Transfer to another job;

(5) Medical treatment beyond first aid;

(6) Loss of consciousness; or

(7) A significant injury or illness diagnosed by a physician or other licensed health care professional, even if it did not result in (1) through (6) above.

f. "USACE" property and equipment specified in USACE EM 385-1-1 should be interpreted as Government property and equipment.

[g. Weight Handling Equipment (WHE) Accident. A WHE 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, roll over, etc.) Any mishap meeting the criteria described above shall be documented in both the Contractor Significant Incident Report (CSIR) submitted within five days both as provided by the Contracting Officer.
]

1.3 SUBMITTALS

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

SD-01 Preconstruction Submittals

Accident Prevention Plan (APP)[; G][; G[_____]]

Activity Hazard Analysis (AHA)[; G][; G[_____]]

Crane Critical Lift Plan[; G][; G[_____]]

Proof of qualification for Crane Operators[; G][; G[_____]]

SD-06 Test Reports

Notifications and Reports

Submit reports as their incidence occurs, in accordance with the requirements of the paragraph, "Notifications and Reports."

Accident Reports[; G][; G, [_____]]

Crane Reports

SD-07 Certificates

Confined Space Entry Permit

Hot work permit

License Certificates

1.4 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] [host nation] 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.

1.5 SITE QUALIFICATIONS, DUTIES AND MEETINGS

1.5.1 Personnel Qualifications

1.5.1.1 Site Safety and Health Officer (SSHO)

The SSHO must meet the requirements of EM 385-1-1 section 1 and ensure that the requirements of 29 CFR 1926.16 are met for the project. Provide a Safety oversight team that includes a minimum of one (1) person at each project site to function as the Site Safety and Health Officer (SSHO). The SSHO or an equally-qualified Designated Representative/alternate shall be at the work site at all times to implement and administer the Contractor's safety program and government-accepted Accident Prevention Plan. The SSHO's training, experience, and qualifications shall be as required by EM 385-1-1 paragraph 01.A.17, entitled SITE SAFETY AND HEALTH OFFICER (SSHO), and all associated sub-paragraphs.

A Competent Person shall be provided for all of the hazards identified in the Contractor's Safety and Health Program in accordance with the accepted Accident Prevention Plan, and shall 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 acceptance in consultation with the Safety Office.

1.5.1.1.1 Contractor Quality Control (QC) Person:

The Contractor Quality Control Person [cannot be the SSHO on this project, even though the QC has safety inspection responsibilities as part of the QC duties.][can be the SSHO on this project.]

1.5.1.2 USACE Dredging Contract Requirements

1.5.1.2.1 SSHO Staffing for USACE Dredging Contracts

a. Dredging contracts may include several project sites; this contract will require a minimum of [one] [____] full time SSHO(s) assigned per project site. SSHO may be collateral duty in specific conditions listed below.

b. Example of one dredging project site is reflected in each of the following:

(1) a mechanical dredge, tug(s) and scow(s), scow route, and material placement site; or

(2) a hydraulic pipeline dredge, attendant plant, and material placement site; or,

(3) a hopper dredge (include land-based material placement site - if applicable.)

c. Individual dredging project sites with work force less than 8 employees, the SSHO may be a collateral duty, with the same responsibilities of a full time SSHO.

d. Hopper dredges with USCG-Documented crews may designate an officer as a collateral-duty SSHO instead of having a full-time SSHO if the officer meets the SSHO training and experience requirements.

1.5.1.2.2 SSHO Requirements for Dredging

a. In addition to requirements stated elsewhere in this specification, the SSHO shall be present at the project site, located so they have full mobility and reasonable access to all major work operations, for at least one shift in each 24 hour period when work is being done. The SSHO, or Alternate SSHO, shall be available during all shifts for immediate verbal consultation and notification, either by phone or radio. The SSHO shall be a full-time, dedicated position, except as noted above. The SSHO shall report to a senior project (or corporate) officials.

b. The SSHO shall inspect all work areas and operations during initial set-up and at least monthly observe and provide personal oversight on each shift during dredging operations for projects with many work sites, more often for those with less work sites.

c. For projects with multiple shifts or when SSHO is temporarily off-site, an Alternate SSHO will be assigned to insure SSHO coverage for the project at all times work activities are conducted. The Alternate SSHO must meet the same requirements and assume the responsibilities of the project SSHO. The Alternate SSHO position may be a collateral duty.

d. If the SSHO is off-site for a period longer than 24 hours, a qualified replacement SSHO shall be provided and shall fulfill the same roles and responsibilities as the primary/initial SSHO.

1.5.1.2.3 Designated Representative (DR) Requirements for Dredging

a. Designated Representatives (DR) are collateral duty safety personnel, with safety duties in addition to their full-time occupation, and support and supplement the SSHO efforts in managing, implementing and enforcing the Contractor's Safety and Health Program. DRs shall be individual(s) with work oversight responsibilities, such as masters, mates, fill foremen, and superintendents. DRs should not be positions

requiring continuous mechanical or equipment operations, such as equipment operators.

b. A DR shall be appointed for all remote work locations more than 45 minutes' travel time from the SSHO's duty location, typically including dredged material placement sites, towing and scow operations, and other operations.

c. The DRs will perform safety program tasks as designated by the SSHO and report safety findings to the SSHO/Alternate SSHO. The SSHO shall document results of safety findings and provide information for inclusion in the CQC reports to the Government Representative.

1.5.1.2.4 Safety Personnel Training Requirements for Dredging

a. The SSHO, Alternate SSHO, and Designated Representatives for dredging contracts shall take either the OSHA 30-hour Construction Safety Course or an equivalent 30 hours of formal safety and health training covering the subjects of the OSHA 30-hour Course (see EM 385-1-1 Appendix A, paragraph 4.b) applicable to dredging work and given by qualified instructors.

b. The SSHOs shall also have taken 24 hours of formal classroom or online safety and health related coursework in the past four (4) years. Hours spent as an instructor in such courses will be considered the same as attending them, but each course only gets credit once (ie. Instructing a 1-hour asbestos awareness course 5 times in the past 4 years provides one hour credit for training).

c. The SSHO, Alternate SSHO, and Designated Representatives shall have a minimum of three years' continuous experience within the past 5 years in supervising/ managing dredging, marine or land-based construction, work managing safety programs or processes, or conducting hazard analyses and developing controls in activities or environments with similar hazards. This is in lieu of the construction experience required by paragraph 01.A.17.b, EM 385-1-1.

1.5.1.3 Crane Operators

Meet the crane operators requirements in USACE EM 385-1-1, Section 16 and Appendix I. In addition, for mobile cranes with Original Equipment Manufacturer (OEM) rated capacitates of 50,000 pounds or greater, designate crane operators as 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.

[Also meet the crane operator requirements of the State of Hawaii for Crane certification.
]

1.5.2 Personnel Duties

1.5.2.1 Site Safety and Health Officer (SSHO)

The SSHO shall:

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][quality control] report.

b. Conduct mishap investigations and complete required reports. Maintain the OSHA Form 300 and Daily Production reports for prime and sub-contractors.

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

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

e. Implement and enforce accepted APPS and AHAs.

f. Maintain a safety and health deficiency tracking system that monitors outstanding deficiencies until resolution. Post a list of unresolved safety and health deficiencies on the safety bulletin board.

g. Ensure sub-contractor compliance with safety and health requirements.

h. Maintain a list of hazardous chemicals on site and their material safety data sheets.

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

1.5.3 Meetings

1.5.3.1 Preconstruction Conference

a. Contractor representatives who have a responsibility or significant role in accident prevention on the project shall attend the preconstruction conference. This includes the project superintendent, site safety and health officer, quality control supervisor, or any other assigned safety and health professionals who participated in the development of the APP (including the Activity Hazard Analyses (AHAs) and special plans, program and procedures associated with it).

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

c. Deficiencies in the submitted APP will be brought to the attention of the Contractor at the preconstruction conference, and the Contractor shall revise the plan to correct deficiencies and re-submit it for acceptance. Do not begin work until there is an accepted APP.

d. The functions of a Preconstruction conference may take place at the Post-Award Kickoff meeting for Design Build Contracts.

1.6 ACCIDENT PREVENTION PLAN (APP)

Use a qualified person to prepare the written site-specific APP. Prepare the APP in accordance with the format and requirements of USACE EM 385-1-1 and as supplemented herein. Cover all paragraph and subparagraph elements in USACE EM 385-1-1, Appendix A, "Minimum Basic Outline for Accident Prevention Plan". Specific requirements for some of the APP elements are described below. The APP shall be job-specific and address any unusual or unique aspects of the project or activity for which it is written. The APP shall interface with the Contractor's overall safety and health program. Include any portions of the Contractor's overall safety and health program referenced in the APP in the applicable APP element and made site-specific. 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 shall be signed by the person and firm (senior person) preparing the APP, the Contractor, the on-site superintendent, the designated site safety and health officer, the Contractor Quality control Manager, and any designated CSP or CIH.

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 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 will be cause for stopping of work, at the discretion of the Contracting Officer, until the matter has been rectified.

Once work begins, changes to the accepted APP shall be made with the knowledge and concurrence of the Contracting Officer, project superintendent, SSHO and quality control manager. 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/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.

Copies of the accepted plan will be maintained at the [Contracting Officer's][resident engineer's] office and at the job site. Continuously review and ammend the APP, as necessary, throughout the life of the contract. Incorporate unusual or high-hazard activities not identified in the original APP as they are discovered.

1.6.1 EM 385-1-1 Contents

In addition to the requirements outlined in Appendix A of USACE EM 385-1-1, the following is required:

[d. Crane Critical Lift Plan.
Prepare and sign weight handling critical lift plans for lifts over 75 percent of the capacity of the crane or hoist (or lifts over 50 percent of the capacity of a barge mounted mobile crane's hoists) at any radius of lift; lifts involving more than one crane or hoist; lifts of personnel; and lifts involving non-routine rigging or operation, sensitive equipment, or unusual safety risks. Submit 15 calendar days prior to on-site work and include the requirements of USACE EM 385-1-1, paragraph 16.H. and the following:

(1) For lifts of personnel, demonstrate compliance with the requirements of 29 CFR 1926.1400.

(2) For barge mounted mobile cranes, barge stability calculations identifying barge list and trim based on anticipated loading; and load charts based on calculated list and trim. The amount of list and trim shall be within the crane manufacturer's requirements.]

[f. Occupant Protection Plan. The safety and health aspects of lead-based paint removal, prepared in accordance with Section 02 83 19.00 10 LEAD BASED PAINT HAZARD ABATEMENT, TARGET HOUSING & CHILD OCCUPIED FACILITIES.

][h. Asbestos Hazard Abatement Plan. The safety and health aspects of asbestos work, prepared in accordance with Section 02 82 14.00 10 ASBESTOS HAZARD CONTROL ACTIVITIES.

][i. Site Safety and Health Plan. The safety and health aspects prepared in accordance with Section 01 35 29.13 HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES FOR CONTAMINATED SITES.

][j. PCB Plan. The safety and health aspects of Polychlorinated Biphenyls work, prepared in accordance with Sections 02 84 33 REMOVAL AND DISPOSAL OF POLYCHLORINATED BIPHENYLS (PCBs) and 02 61 23 REMOVAL AND DISPOSAL OF PCB CONTAMINATED SOILS.]

[k. Site Demolition Plan. The safety and health aspects prepared in accordance with Section 02 41 00 [DEMOLITION] [AND] [DECONSTRUCTION] and referenced sources. Include engineering survey as applicable.

][l. Excavation Plan. The safety and health aspects prepared in accordance with Section 31 00 00 EARTHWORK.]

1.7 ACTIVITY HAZARD ANALYSIS (AHA)

The Activity Hazard Analysis (AHA) format shall be in accordance with USACE EM 385-1-1, Section 1. Submit the AHA for review at least [15][_____] calendar days prior to the start of each phase. Format subsequent AHAs as amendments to the APP. The analysis should be used during daily inspections

to ensure the implementation and effectiveness of the activity's safety and health controls.

The AHA list will be reviewed periodically (at least monthly) at the Contractor supervisory safety meeting and updated as necessary when procedures, scheduling, or hazards change.

Develop the activity hazard analyses using the project schedule as the basis for the activities performed. Any activities listed on the project schedule will require an AHA. The AHAs will be developed by the contractor, supplier or subcontractor and provided to the prime contractor for submittal to the Contracting Officer.

1.8 DISPLAY OF SAFETY INFORMATION

Within [one][_____] calendar day(s) 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, shall 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 SITE SAFETY REFERENCE MATERIALS

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

1.10 EMERGENCY MEDICAL TREATMENT

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

1.11 NOTIFICATIONS AND REPORTS

1.11.1 Accident Notification

Notify the Contracting Officer as soon as practical, but no more than four hours after any accident meeting the definition of Recordable Injuries or Illnesses or High Visibility Accidents, property damage equal to or greater than $2,000, or any weight handling equipment accident. 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 (to include type of construction equipment used, PPE used, etc.). Preserve the conditions and

evidence on the accident site until the Government investigation team arrives on-site and Government investigation is conducted.

1.11.2 Accident Reports

a. Conduct an accident investigation for recordable injuries and illnesses, for Medical Treatment defined in paragraph DEFINITIONS, property damage accidents resulting in at least $20,000 in damages, and near misses as defined in EM 385-1-1, to establish the root cause(s) of the accident. Complete the applicable [USACE Accident Report Form 3394, and provide the report to the Contracting Officer within [5][_____] calendar day(s) of the accident.] The Contracting Officer will provide copies of any required or special forms.

[c. Conduct an accident investigation for any weight handling equipment accident (including rigging gear accidents) to establish the root cause(s) of the accident, complete the WHE 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.

] 1.11.3 Crane Reports

Submit crane inspection reports required in accordance with USACE EM 385-1-1, Appendix I and as specified herein with Daily Reports of Inspections.

[1.11.4 Certificate of Compliance

Provide a Certificate of Compliance for each crane entering an activity under this contract (see Contracting Officer for a blank certificate). State within the certificate that the crane and rigging gear meet applicable OSHA regulations (with the Contractor citing which OSHA regulations are applicable, e.g., cranes used in construction, demolition, or maintenance comply with 29 CFR 1926 and USACE EM 385-1-1 Section 16 and Appendix I. Certify on the Certificate of Compliance that the crane operator(s) is qualified and trained in the operation of the crane to be used.[For cranes at DOD activities in foreign countries, certify that the crane and rigging gear conform to the appropriate host country safety standards.] Also certify that all of its crane operators working on the DOD activity have been trained in the proper use of all safety devices (e.g., anti-two block devices). Post certifications on the crane.

]1.12 HOT WORK

Submit and obtain a written permit prior to performing "Hot Work" (welding, cutting, etc.) or operating other flame-producing/spark producing devices, from the [Fire Division][_____]. 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 (2) twenty (20) pound 4A:20 BC rated extinguishers for normal "Hot Work". All extinguishers shall be current inspection tagged, 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 shall be trained in accordance with NFPA 51B and remain on-site for a minimum of 30 minutes 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 Division][_____] phone number. ANY FIRE, NO MATTER HOW SMALL, SHALL BE REPORTED TO THE RESPONSIBLE [FIRE DIVISION][_____] IMMEDIATELY.

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

] 1.13 RADIATION SAFETY REQUIREMENTS

License Certificates for radiation materials and equipment shall be submitted to the Contracting Officer and Radiation Safety Office (RSO)for all specialized and licensed material and equipment that could cause fatal harm to construction personnel or to the construction project.

Workers shall be protected from radiation exposure in accordance with 10 CFR 20. Standards for Protection Against Radiation

Loss of radioactive material shall be reported immediately to the Contracting Officer.

Actual exposure of the radiographic film or unshielding the source shall not be initiated until after 5 p.m. on weekdays.

In instances where radiography is scheduled near or adjacent to buildings or areas having limited access or one-way doors, no assumptions shall be made as to building occupancy. Where necessary, the Contracting Officer will direct the Contractor to conduct an actual building entry, search, and alert. Where removal of personnel from such a building cannot be accomplished and it is otherwise safe to proceed with the radiography, a fully instructed employee shall be positioned inside such building or area to prevent exiting while external radiographic operations are in process. Transportation of Regulated Amounts of Radioactive Material will comply with 49 CFR, Subchapter C, Hazardous Material Regulations. Local Fire authorities and the site Radiation Safety officer (RSO) shall be notified of any Radioactive Material use.

Transmitter Requirements: The base policy concerning the use of transmitters such as radios, cell phones, etc., must be adhered to by all contractor personnel. They must also obey Emissions control (EMCON) restrictions.

1.14 FACILITY OCCUPANCY CLOSURE

Streets, walks, and other facilities occupied and used by the Government shall not be closed or obstructed without written permission from the Contracting Officer.

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.

1.16 CONFINED SPACE ENTRY REQUIREMENTS.

Contractors entering and working in confined spaces while performing general industry work are required to follow the requirements of OSHA 29 CFR 1926 and comply with the requirements in Section 34 of EM 385-1-1, OSHA 29 CFR 1910, and OSHA 29 CFR 1910.146.

2 PART 2 PRODUCTS

Not used.

3 PART 3 EXECUTION

3.1 CONSTRUCTION AND OTHER WORK

3.1.1 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 USACE 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-isocynates, lead-based paint 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.

3.1.2 Unforeseen Hazardous Material

The design should have identified 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 [additional] material, not indicated, that may be hazardous to human health upon disturbance during construction operations is encountered, 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 [_____] days in advance. As a minimum, the request should 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 [and the[Installation representative][Public Utilities representative]] 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)

Ensure that each employee is familiar with and complies with these procedures and USACE EM 385-1-1, Section 12, Control of Hazardous Energy.

3.4 FALL HAZARD PROTECTION AND PREVENTION PROGRAM

Establish a fall protection and prevention program, for the protection of all employees exposed to fall hazards. Within the program include company policy, identify 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 Z359.1.

3.4.1 Training

Institute a fall protection training program. As part of the Fall Hazard Protection and Prevention 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 USACE EM 385-1-1, Section 21.B.

3.4.2 Fall Protection Equipment and Systems

Enforce use of the fall protection equipment and systems designated for each specific work activity in the Fall Protection and Prevention Plan and/or 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. In addition to the required fall protection systems, safety skiff, personal floatation devices, life rings etc., are required when working above or next

to water in accordance with USACE EM 385-1-1, Paragraphs 21.N through 21.N.04. Personal fall arrest systems are required when working from an articulating or extendible boom, swing stages, or suspended platform. In addition, personal fall arrest systems are required when operating other equipment such as scissor lifts if the work platform is capable of being positioned outside the wheelbase. The need for tying-off in such equipment is to prevent ejection of the employee from the equipment during raising, lowering, or travel. Fall protection must comply with 29 CFR 1926.500, Subpart M, USACE EM 385-1-1 and ASSE/SAFE A10.32.

3.4.2.1 Personal Fall Arrest Equipment

Personal fall arrest equipment, systems, subsystems, and components shall meet ASSE/SAFE Z359.1. Only a full-body harness with a shock-absorbing lanyard or self-retracting lanyard is an acceptable personal fall arrest body support device. Body belts may only be used as a positioning device system (for uses such as steel reinforcing assembly and in addition to an approved fall arrest system). Harnesses shall 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. Only locking snap hooks and carabiners shall be used. Webbing, straps, and ropes shall be made of synthetic fiber. The maximum free fall distance when using fall arrest equipment shall not exceed 6 feet. The total fall distance and any swinging of the worker (pendulum-like motion) that can occur during a fall shall always be taken into consideration when attaching a person to a fall arrest system.

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 low-slope roofs, protect personnel from falling by use of personal fall arrest systems, guardrails, or safety nets.

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

b. Steep-Sloped Roofs: Work on steep-sloped roofs requires a personal fall arrest system, guardrails with toe-boards, or safety nets. This requirement also includes residential or housing type construction.

3.4.4 Horizontal Lifelines

Design, install, certify and use under the supervision of a qualified person horizontal lifelines for fall protection as part of a complete fall arrest system which maintains a safety factor of 2 (29 CFR 1926.500).

3.4.5 Guardrails and Safety Nets

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

3.4.6 Rescue and Evacuation 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; equipment used; training requirement; specialized training for the rescuers; procedures for requesting rescue and medical assistance; and transportation routes to a medical facility. Include the Rescue and Evacuation Plan within the Activity Hazard Analysis (AHA) for the phase of work, in the Fall Protection and Prevention (FP&P) Plan, and the Accident Prevention Plan (APP).

3.5 EQUIPMENT

3.5.1 Material Handling Equipment

a. Material handling equipment such as forklifts shall not be modified with work platform attachments for supporting employees unless specifically delineated in the manufacturer's printed operating instructions.

b. The use of hooks on equipment for lifting of material must be in accordance with manufacturer's printed instructions.

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

3.5.2 Weight Handling Equipment

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

c. Comply with the crane 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, and ASME B30.8 for floating cranes and floating derricks.

e. Under no circumstance shall 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 shall be alert to this special hazard and follow the requirements of USACE EM 385-1-1 Section 11 and ASME B30.5 or ASME B30.22 as applicable.

g. Do not 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.

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 from entering the counterweight swing (tail swing) area of the crane.

m. Certification records which include the date of inspection, signature of the person performing the inspection, and the serial number or other identifier of the crane that was inspected shall always be available for review by Contracting Officer personnel.

n. Written reports listing the load test procedures used along with any repairs or alterations performed on the crane shall be available for review by Contracting Officer personnel.

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

3.5.3 USE OF EXPLOSIVES

Explosives shall not be used or brought to the project site without prior written approval from the Contracting Officer. Such approval shall 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, shall be only where directed and in approved storage facilities. These facilities shall be kept locked at all times except for inspection, delivery, and withdrawal of explosives.

3.6 EXCAVATIONS

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

3.6.1 Utility Locations

All underground utilities in the work area must be positively identified by a third party, independent, private utility locating company in addition to any station locating service and coordinated with the station utility department.

3.6.2 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.

3.6.3 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 shall 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.

3.7 ELECTRICAL

3.9.1 Portable Extension Cords

Size portable extension cords in accordance with manufacturer ratings for the tool to be powered and protected from damage. Immediately removed from service all damaged extension cords. Portable extension cords shall meet the requirements of EM 385-1-1, NFPA 70E, and OSHA electrical standards.

3.8 WORK IN CONFINED SPACES

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

a. 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. (See Section 34 of USACE EM 385-1-1 for entry procedures.) All hazards pertaining to the space shall be reviewed with each employee during review of the AHA.

b. 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.

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

-- End of Section --

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DIVISION 01 – GENERAL REQUIREMENTS

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NORTH DAKOTA POLLUTANT DISCHARGE ELIMINATION SYSTEM
01/02

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SECTION 01 41 26.00 13

NORTH DAKOTA POLLUTANT DISCHARGE ELIMINATION SYSTEM
01/02

PART 1 GENERAL

1.1 GENERAL

This section covers best management practices to be implemented for prevention of storm water pollution as required by the National Pollutant Discharge Elimination System (NPDES). The North Dakota Department of Health is responsible for administering permits for NPDES in the state of North Dakota. The Government has determined that the project work included under this contract requires NPDES permitting. The requirements herein supplement those covered in Section 01 57 20.00 13 ENVIRONMENTAL PROTECTION.

1.1.1 Definitions

The following terms apply to this specification and the general permit, unless redefined in subsequent paragraphs.

a. "EPA" means the United States Environmental Protection Agency.
b. "NPDES" means the National Pollutant Discharge Elimination System.
c. "BMP" means Best Management Practices.
d. "General Permit" means the general permit authorization to discharge storm water associated with a construction activity under the National Pollutant Discharge Elimination System/State Disposal System Permit Program.
e. "Owner" as referred to in the general permit shall mean the Federal Government.
f. "NDPDES" means the North Dakota Pollutant Discharge Elimination System.
g. "Notice of Intent (NOI)" means the application to be filed with the state to receive a general permit for storm water discharges associated with a construction activity.

1.1.2 Contract Drawings

The following features are shown on or can be determined from the contract drawings:

a. The drainage patterns and approximate slopes anticipated after the major grading activities.
b. Areas of soil disturbance.
c. The location(s) where stabilization practices are expected to occur.
d. Typical details showing suggested Best Management Practices (BMP's) for erosion and sediment control.
e. Waters of the State.
f. Final site stabilization.

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 basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM D 6461	(1999) Silt Fence Materials
ASTM D 6462	(1999) Silt Fence Installation

ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA/832/R-92/005	Storm Water Management for Construction Activities - Developing Pollution Prevention Plans and Best Management Practices

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION (NDDOT)

NDDOT 856	Standard Specifications for Road and Bridge Construction (2008 Edition), Erosion Control Blanket and Turf Reinforcement Mat

1.3 SUBMITTALS

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

SD-01 Preconstruction Submittals

Notice of Intent (NOI);

A copy of the NOI (ND Form SFN 19145) shall be submitted to the Contracting Officer at the same time it is transmitted to the state.

SD-02 Shop Drawings

Temporary Erosion And Sediment Control Plan;

A specific Temporary Erosion and Sediment Control Plan shall be submitted in accordance with PARAGRAPH: PERMIT COMPLIANCE AND ADDITIONAL REQUIREMENTS.

SD-11 Closeout Submittals

1.4 PERMIT COMPLIANCE AND ADDITIONAL REQUIREMENTS

The Contractor shall comply with the requirements of General Permit No. NDR10-0000. The following define additional requirements and clarify which requirements of the General Permit are to be performed by either the Contractor, the Government, or both.

1.4.1 Schedule

No contract project construction activities which require an NPDES permit may commence until the state's general permit is effective.

1.4.2 Storm Water Pollution Prevention (SWPP) Plan

The contract drawings show typical details of suggested best management practices (BMP's) for erosion and sediment control taken from EPA/832/R-92/005. The BMP's, together with applicable portions of the site drawings and specifications form an initial plan for temporary erosion and sediment control. The Contractor shall finalize and implement the plan. The finalized plan, together with documentation, shall be in accordance with the general permit. The plan shall be maintained at the site and made available to federal, state, and local officials as requested. The Contractor shall determine the specific BMP's for erosion and sediment control (including the types, locations, and installation scheduling of erosion and sediment controls). These BMP's and corresponding material specifications and shop drawings shall be included in the Plan.

Attached at the end of this section is a template for the Storm Water Pollution Prevention Plan for the convenience of the Contractor to use. The Contractor is not required to use this template but may develop the Contractor's own Storm Water Pollution Prevention Plan.

1.4.3 Notice of Intent (NOI)

The NOI shall be signed by the Contractor. A blank copy of the Application form is included at the end of this section. Immediately after contract award, the Contractor shall prepare the SWPP plan, complete the Notice of Intent, and submit the form with the SWPP plan to the state. The NOI shall be submitted to the State 30 days in advance of ground breaking activities. The Contractor is responsible for payment of the application fee.

1.5 MEASUREMENT AND PAYMENT

The Contactor shall be responsible for the work of this section, without any direct compensation being made other than the payment received for contract items.

PART 2 PRODUCTS

2.1 SILT FENCE

Silt fence shall be manufactured and installed as shown on drawings. On level sites with minimal potential for sediment loading, the wire fabric may be omitted. Silt fence shall conform to ASTM D 6461 and shall be installed in accordance with ASTM D 6462.

2.2 STRAW BALES

Straw shall be baled from oats, wheat, rye, barley, rice, or other coarse fiber vegetation that will percolate water. Hay baled from grass, alfalfa and clover is not acceptable.

2.3 OTHER PRODUCTS

Any products proposed for use that are not included on drawing Z2-22 shall be described fully, with catalog cuts and manufacturer's instructions for use, in the temporary erosion and sediment control plan. Other products, if proposed in the final plan, shall meet the following requirements:

Soil retention blankets shall meet NDDOT 856

PART 3 EXECUTION

As between the Government and the Contractor, the Contractor shall be responsible for fulfilling the obligations of the General Permit.

3.1 IMPLEMENTATION

The Contractor shall install the sediment and erosion control system in accordance with the plan submitted to the Contracting Officer. The BMP's shall be modified if inspection indicates distress to the system or reveals unforeseen circumstances, or if directed by the Contracting Officer. Any updates to the plan shall be recorded. Permanent stabilization shall be initiated as soon as practicable in any portion of the site where construction activities are complete.

3.2 MAINTENANCE

The Contractor shall be responsible for implementing and managing the erosion and sediment control BMPs before and during the construction activities; and ensure that the Plan will be implemented and stay in effect until the work has been completed, the entire work site has undergone final stabilization, and a Notice of Termination has been submitted to the Contracting Officer and the state permitting authority.

3.3 RECORDS

The Contractor shall record on CQC reports: (1) dates when major stripping and grading activities occur, (2) dates when construction activities temporarily or permanently cease on a portion of the site, (3) when permanent stabilization practices are initiated, and (4) activities associated with inspection and maintenance.

3.4 ATTACHMENTS

NORTH DAKOTA DEPARTMENT OF HEALTH NDPDES PROGRAM - Construction Storm Water Pollution Prevention Plan Guidance Forms (SFN 19388) 9 Pages

APPLICATION (NOTICE OF INTENT)TO OBTAIN COVERAGE UNDER NDPDES GENERAL PERMIT FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY (NDR10-0000), NORTH DAKOTA DEPARTMENT OF HEALTH (SFN 19145) 1 Page

NDPDES General Permit No. NDR10-0000 23 Pages

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QUALITY CONTROL SYSTEM (QCS)
04/2006

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SECTION 01 45 02.00 10

QUALITY CONTROL SYSTEM (QCS)
04/2006

PART 1 GENERAL

1.1 GENERAL

The Government will use the Resident Management System for Windows (RMS) to assist in its monitoring and administration of this contract. The Contractor shall use the Government-furnished Construction Contractor Module of RMS, referred to as QCS, to record, maintain, and submit various information throughout the contract period. The Contractor module, user manuals, updates, and training information can be downloaded from the RMS web site at rmssupport.com. This joint Government-Contractor use of RMS and QCS will facilitate electronic exchange of information and overall management of the contract. QCS provides the means for the Contractor to input, track, and electronically share information with the Government in the following areas:

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

1.1.1 Correspondence and Electronic Communications

For ease and speed of communications, both Government and Contractor will, to the maximum extent feasible, exchange correspondence and other documents in electronic format. Correspondence, pay requests and other documents comprising the official contract record shall also be provided in paper format, with signatures and dates where necessary. Paper documents will govern, in the event of discrepancy with the electronic version.

1.1.2 Other Factors

Particular attention is directed to other clauses which have a direct relationship to the reporting to be accomplished through QCS:

52.236-15 SCHEDULES FOR CONSTRUCTION CONTRACTS,
52.232-5 PAYMENTS UNDER FIXED-PRICE CONSTRUCTION CONTRACTS,
SECTION 01 32 01.00 13 PROJECT SCHEDULE,
SECTION 01 33 00 SUBMITTAL PROCEDURES,
SECTION 01 45 04.00 13 CONTRACTOR QUALITY CONTROL

There is no separate payment for establishing and maintaining the QCS database; all costs associated therewith shall be included in the contract pricing for the work.

1.2 QCS SOFTWARE

QCS is a Windows-based program that can be run on a stand-alone personal computer or on a network. The Government will make available the QCS software to the Contractor after award of the construction contract. Prior to the Pre-Construction Conference, the Contractor shall be responsible to download, install and use the latest version of the QCS software from the Government's RMS Internet Website. The Contractor shall be required to use any program updates of QCS that occur during the contract period. These updates will be made available to the Contractor via the Government RMS Website as they become available.

1.3 SYSTEM REQUIREMENTS

The following listed hardware and software is the minimum system configuration that the Contractor shall have to run QCS:

Hardware

IBM-compatible PC with 1000 MHz Pentium or higher processor

256+ MB RAM for workstation / 512+ MB RAM for server

1 GB hard drive disk space for sole use by the QCS system

Compact Disk (CD) Reader 8x speed or higher

SVGA or higher resolution monitor (1024x768, 256 colors)

Mouse or other pointing device

Windows compatible printer. (Laser printer must have 4 MB+ of RAM)

Connection to the Internet, minimum 56k BPS

Software

MS Windows 2000 or higher

QAS-Word Processing software: MS Word 2000 or newer

Latest version of: Netscape Navigator, Microsoft Internet Explorer, or other browser that supports HTML 4.0 or higher

Electronic mail (E-mail) MAPI compatible

Virus protection software that is regularly upgraded with all issued manufacturer's updates

1.4 RELATED INFORMATION

1.4.1 QCS User Guide

After contract award, the Contractor shall download instructions for the installation and use of QCS from the Government RMS Internet Website; the Contractor can obtain the current address from the Government. In case of justifiable difficulties, the Government will provide the Contractor with a CD-ROM containing these instructions.

1.4.2 Contractor Quality Control(CQC) Training

The use of QCS will be discussed at the Contractor's CQC System Manager training classes (Reference SECTION 01 45 04.00 13 CONTRACTOR QUALITY CONTROL, PARAGRAPH: QUALITY CONTROL ORGANIZATION).

1.5 CONTRACT DATABASE

Prior to the pre-construction conference, the Government shall provide the Contractor with basic contract award data to use for QCS. Data updates will be provided by the Government by imports and exports to and from the RMS and QCS. These updates will generally consist of submittal reviews, correspondence status, QA comments, and other administrative and QA data.

1.6 DATABASE MAINTENANCE

The Contractor shall establish, maintain, and update data for the contract in the QCS database throughout the duration of the contract. The Contractor shall establish and maintain the QCS database. Data updates to the Government shall be submitted by a QCS data export to the RMS ftp site. Examples include daily reports, schedule updates, and payment requests. If permitted by the Contracting Officer, a CD-ROM may be used instead of E-mail (see Paragraph DATA SUBMISSION VIA CD-ROM). The QCS database typically shall include current data on the following items:

1.6.1 Administration

1.6.1.1 Contractor Information

The database shall contain the Contractor's name, address, telephone numbers, and management staff and other required items. The Contractor shall deliver Contractor administrative data in electronic format prior to the preconstruction conference.

1.6.1.2 Subcontractor Information

The database shall contain the name, trade, address, phone numbers, and other required information for all subcontractors. A subcontractor must be listed separately for each trade to be performed. Each subcontractor and trade shall be assigned a unique Responsibility Code, provided in QCS. The Contractor shall deliver subcontractor administrative data in electronic format prior to the preconstruction conference.

1.6.1.3 Correspondence

All Contractor correspondence to the Government shall be identified with a serial number. Correspondence initiated by the Contractor's site office shall be prefixed with "S". Letters initiated by the Contractor's home (main) office shall be prefixed with "H". Letters shall be numbered starting from 0001. (e.g., H-0001 or S-0001). The Government's letters to the Contractor will be prefixed with "C".

1.6.1.4 Equipment

The Contractor's QCS database shall contain a current list of equipment planned for use or being used on the jobsite, including the most recent and planned equipment inspection dates.

1.6.1.5 Management Reporting

QCS includes a number of reports that Contractor management can use to track the status of the project. The value of these reports depends on the quality of the data input. The reports are to be maintained in the various sections of QCS. Among these reports are: Progress Payment Request worksheet, QA/QC comments, Submittal Register Status, Three-Phase Inspection checklists.

1.6.2 Finances

1.6.2.1 Pay Activity Data

The QCS database shall include a list of pay activities that the Contractor shall develop in conjunction with the construction schedule. Pay activities shall be grouped by Contract Line Item Number (CLIN), and the sum of the activities shall equal the amount of each CLIN. The total of all CLINs equals the Contract Amount.

1.6.2.2 Payment Requests

All progress payment requests shall be prepared using QCS. The Contractor shall complete the payment request worksheet and include it with the payment request. The work completed under the contract, measured as percent or as specific quantities, shall be updated at least monthly. After the update, the Contractor shall generate a payment request report using QCS. The Contractor shall submit the payment requests with supporting data. A signed paper copy of the approved payment request is also required, which shall govern in the event of discrepancy with the electronic version.

1.6.3 Quality Control (QC)

QCS provides a means to track implementation of the 3-phase QC System, prepare daily reports, identify and track deficiencies, document progress of work, and support other contractor QC requirements. The Contractor shall maintain this data on a daily basis. Entered data will automatically output to the QCS generated daily report. The Contractor shall provide the Government a Contractor Quality Control (CQC) Plan within the time required in Section 01 45 04.00 13 CONTRACTOR QUALITY CONTROL. Within seven calendar days of Government acceptance, the Contractor shall update QCS with the information contained in the accepted CQC Plan: schedule, pay activities, features of work, submittal register, QC requirements, and equipment list.

1.6.3.1 Daily Contractor Quality Control (CQC) Reports.

QCS includes the means to produce the Daily CQC Report. The Contractor may use other formats to record basic QC data. However, the Daily CQC Report generated by QCS shall be the Contractor's official report. Data from any supplemental reports by the Contractor shall be summarized and consolidated onto the QCS-generated Daily CQC Report. Daily CQC Reports shall be submitted as required by SECTION 01 45 04.00 13 CONTRACTOR QUALITY CONTROL. Reports shall be submitted electronically to the Government by QCS export

within 24 hours after the date covered by the report. The Contractor shall also provide the Government a signed, printed copy of the daily CQC report.

1.6.3.2 Deficiency Tracking.

The Contractor shall use QCS to track deficiencies. Deficiencies identified by the Contractor will be numerically tracked using QC punch list items. The Contractor shall maintain a current log of its QC punch list items in the QCS database. The Government will log the deficiencies it has identified using its QA punch list items. The Government's QA punch list items will be included in its export file to the Contractor. The Contractor shall regularly update the correction status of both QC and QA punch list items.

1.6.3.3 Three-Phase Control Meetings

The Contractor shall maintain scheduled and actual dates and times of preparatory and initial control meetings in QCS.

1.6.3.4 Accident/Safety Tracking.

The Government will issue safety comments, directions, or guidance whenever safety deficiencies are observed. The Government's safety comments will be included in its export file to the Contractor. The Contractor shall regularly update the correction status of the safety comments. In addition, the Contractor shall utilize QCS to advise the Government of any accidents occurring on the jobsite. This brief supplemental entry is not to be considered as a substitute for completion of mandatory reports, e.g., ENG Form 3394 and OSHA Form 300.

1.6.3.5 Features of Work

The Contractor shall include a complete list of the features of work in the QCS database. A feature of work may be associated with multiple pay activities. However, each pay activity (see subparagraph "Pay Activity Data" of paragraph "Finances") will only be linked to a single feature of work.

1.6.3.6 QC Requirements

The Contractor shall develop and maintain a complete list of QC testing, transferred and installed property, and user training requirements in QCS. The Contractor shall update all data on these QC requirements as work progresses, and shall promptly provide this information to the Government via QCS.

1.6.4 Submittal Management

The Government will provide the initial submittal register, ENG Form 4288, SUBMITTAL REGISTER, in electronic format. Thereafter, the Contractor shall maintain a complete list of all submittals, including completion of all data columns. The listing of submittals is general and not all-inclusive. The Contractor shall review the contract documents and incorporate additional required submittals, complete the columns for contractor schedule dates and submit the updated register to the Contracting Officer for approval within 7 calendar days after Notice to Proceed. The approved submittal register will be used to manage submittals throughout the life of the contract. The submittal register and construction schedule shall be coordinated. Dates on

which submittals are received and returned by the Government will be included in its export file to the Contractor. The Contractor shall use QCS to track and transmit all submittals. ENG Form 4025, submittal transmittal form, and the submittal register update, ENG Form 4288, shall be produced using QCS. RMS will be used to update, store and exchange submittal registers and transmittals, but will not be used for storage of actual submittals.

1.6.5 Schedule

The Contractor shall develop a construction schedule consisting of pay activities, in accordance with CONTRACT CLAUSE 52.236-15 SCHEDULES FOR CONSTRUCTION CONTRACTS, and SECTION 01 32 01.00 13 PROJECT SCHEDULE. This schedule shall be input and maintained in the RMS-QCS database either manually or by using the Standard Data Exchange Format (SDEF) (see SECTION 01 32 01.00 13 PROJECT SCHEDULE). The updated schedule data shall be included with each pay request submitted by the Contractor.

1.6.6 Import/Export of Data

QCS includes the ability to export Contractor data to the Government and to import submittal register and other Government-provided data, and schedule data using SDEF.

1.7 IMPLEMENTATION

Contractor use of QCS as described in the preceding paragraphs is mandatory. The Contractor shall ensure that sufficient resources are available to maintain its QCS database, and to provide the Government with regular database updates. QCS shall be an integral part of the Contractor's management of quality control.

1.8 DATA SUBMISSION VIA CD-ROM

The Government preferred method for Contractor's submission of updates, payment requests, correspondence and other data is by QCS export. For locations where this is not feasible, the Contracting Officer may permit the use of CD-ROM for data transfer. Data on the CD-ROM shall be exported using the QCS built-in export function. If used, CD-ROMs will be submitted in accordance with the following:

1.8.1 File Medium

The Contractor shall submit required data on CD-ROMs. They shall conform to industry standards used in the United States. All data shall be provided in English.

1.8.2 CD-ROM Labels

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

1.8.3 File Names

The Government will provide the file names to be used by the Contractor with the QCS software.

1.9 MONTHLY COORDINATION MEETING

The Contractor shall update the QCS database each workday. At least monthly, the Contractor shall generate and submit an export file to the Government with schedule update and progress payment request. At least one week prior to submittal, the Contractor shall meet with the Government representative to review the planned progress payment data submission for errors and omissions. The Contractor shall make all required corrections prior to Government acceptance of the export file and progress payment request. Payment requests accompanied by incomplete or incorrect data submittals will be returned. The Government will not process progress payments until an acceptable QCS export file is received.

1.10 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the requirements of this specification. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification.

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CONTRACTOR QUALITY CONTROL (CQC)
10/2006

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CONTRACTOR QUALITY CONTROL (CQC)
10/2006

PART 1 GENERAL

1.1 REFERENCES

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

ASTM INTERNATIONAL (ASTM)

ASTM D 3740	(2011) Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
ASTM E 329	(2011b) Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction

1.2 SUBMITTALS

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

SD-01 Preconstruction Submittals

Quality Control Plan (QCP); G

Quality Management Manual; G

1.3 QUALITY CONTROL ORGANIZATION

1.3.1 Personnel Requirements

The requirements for the CQC organization are a CQC System Manager and alternate(s) and sufficient number of additional qualified personnel to ensure safety and contract compliance. The Safety and Health Manager shall receive direction and authority from the CQC System Manager and shall serve as a member of the CQC staff. The Contractor's CQC staff shall maintain a presence at the site at all times during progress of the work and have complete authority and responsibility to take any action necessary to ensure contract compliance. The CQC staff shall be subject to acceptance by the Contracting Officer. The Contractor shall provide adequate office space, filing systems and other resources as necessary to maintain an effective and fully functional CQC organization. Complete records of all letters, material submittals, shop drawing submittals, schedules and all other project

documentation shall be maintained at the site at all times, except as otherwise acceptable to the Contracting Officer.

1.3.2 CQC System Manager

The Contractor shall identify as CQC System Manager an individual within the onsite work organization who shall be responsible for overall management of CQC and have the authority to act in all CQC matters for the Contractor. The CQC System Manager shall be a graduate engineer, or a graduate of construction management, with a minimum of 5 years experience in related duties on construction similar to this contract. This CQC System Manager shall be on the site at all times during construction and shall be employed by the prime Contractor. The CQC Manager shall have no other duties unless approved by the Contracting Officer or allowed elsewhere in the specification. An alternate for the CQC System Manager shall be identified in the plan to serve in the event of the System Manager's absence. The requirements for the alternate shall be the same as for the designated CQC System Manager.

1.3.3 Additional Requirement

In addition to the above qualifications, the CQC System Manager shall have completed the course entitled "Construction Quality Management For Contractors". This course is periodically offered through the Government in the Minneapolis - St. Paul, Minnesota metropolitan area.

1.3.4 Organizational Changes

The Contractor shall maintain the CQC staff at full strength at all times. When it is necessary to make changes to the CQC staff, the Contractor shall revise the CQC Plan to reflect the changes and submit the changes to the Contracting Officer for acceptance.

1.4 PAYMENT

The Contractor shall be responsible for the work of this section, without any direct compensation being made other than the payment received for contract items.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

The Contractor is responsible for quality control and shall establish and maintain an effective quality control system in compliance with CONTRACT CLAUSE 52.246-12 INSPECTION OF CONSTRUCTION. The quality control system shall consist of plans, procedures, and organization necessary to produce an end product which complies with the contract requirements. The system shall cover all construction operations, both onsite and offsite, and shall be keyed to the proposed construction sequence. The site project superintendent will be held responsible for the quality of work on the job and is subject to removal by the Contracting Officer for non-compliance with the quality

requirements specified in the contract. The site project superintendent in this context shall be the highest level manager responsible for the overall construction activities at the site, including quality and production. The site project superintendent shall maintain a physical presence at the site at all times, except as otherwise acceptable to the Contracting Officer, and shall be responsible for all construction and construction related activities at the site.

3.2 QUALITY CONTROL PLAN

3.2.1 General

The Contractor shall furnish for review by the Government, not later than 15 days after receipt of notice to proceed, the Contractor Quality Control (CQC) Plan proposed to implement the requirements of CONTRACT CLAUSE 52.246-12 INSPECTION OF CONSTRUCTION. The plan shall identify personnel, procedures, control, instructions, tests, records, and forms to be used. The Government will consider an interim plan for the first 30 days of operation. Construction will be permitted to begin only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the particular feature of work to be started. Work outside of the features of work included in an accepted interim plan will not be permitted to begin until acceptance of a CQC Plan or another interim plan containing the additional features of work to be started.

3.2.2 Content of the CQC Plan

The CQC Plan shall include, as a minimum, the following to cover all construction operations, both onsite and offsite, including work by subcontractors, fabricators, suppliers, and purchasing agents:

a. A description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff shall implement the three phase control system for all aspects of the work specified. The staff shall include a CQC System Manager who shall report to the project superintendent or someone higher in the Contractor's organization.

b. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function.

c. A copy of the letter to the CQC System Manager signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC System Manager, including authority to stop work which is not in compliance with the contract. The CQC System Manager shall issue letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities. Copies of these letters shall also be furnished to the Government.

d. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, offsite fabricators, suppliers, and purchasing agents. These procedures shall be in accordance with SECTION 01 33 00 SUBMITTAL PROCEDURES and in

accordance with SECTION 01 45 02.00 10 QUALITY CONTROL SYSTEM (QCS).

e. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test. (Laboratory facilities will be approved by the Contracting Officer.)

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

g. Procedures for tracking construction deficiencies from identification through acceptable corrective action in RMS.

h. Reporting procedures, including proposed reporting formats.

i. A list of the definable features of work. A definable feature of work is a task which is separate and distinct from other tasks, has separate control requirements, and may be identified by different trades or disciplines, or it may be work by the same trade in a different environment. Although each section of the specifications may generally be considered as a definable feature of work, there are frequently more than one definable features under a particular section. This list will be agreed upon during the coordination meeting.

3.2.3 Acceptance of Plan

Acceptance of the Contractor's plan is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the construction. The Government reserves the right to require the Contractor to make changes in the CQC Plan and operations including removal of personnel, as necessary, to obtain the quality specified.

3.2.4 Notification of Changes

After acceptance of the CQC Plan, the Contractor shall notify the Contracting Officer in writing of any proposed change. Proposed changes are subject to acceptance by the Contracting Officer.

3.3 COORDINATION MEETING

After the Preconstruction Conference, before start of construction, and prior to acceptance by the Government of the CQC Plan, the Contractor shall meet with the Contracting Officer or Authorized Representative and discuss the Contractor's quality control system. The CQC Plan shall be submitted for review a minimum of 10 calendar days prior to the Coordination Meeting. During the meeting, a mutual understanding of the system details shall be developed, including the forms for recording the CQC operations, control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship of Contractor's Management and control with the Government's Quality Assurance. Minutes of the meeting shall be prepared by the Government and signed by both the Contractor and the Contracting

Officer. The minutes shall become a part of the contract file. There may be occasions when subsequent conferences will be called by either party to reconfirm mutual understandings and address deficiencies in the CQC system or procedures which may require corrective action by the Contractor.

3.4 SUBMITTALS AND DELIVERABLES

Submittals, if needed, shall be made as specified in Section 01 33 00 SUBMITTAL PROCEDURES. The CQC system manager shall be responsible for certifying that all submittals and deliverables are in compliance with the contract requirements.

3.5 CONTROL

Contractor Quality Control is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. At least three phases of control shall be conducted by the CQC System Manager for each definable feature of work as follows:

3.5.1 Preparatory Phase

This phase shall be performed prior to beginning work on each definable feature of work, after all required plans, documents, and materials are approved or accepted. Copies of the plans shall be available at the preparatory meeting. This phase shall include:

a. A review of each paragraph of applicable specifications, reference codes, and standards. A copy of those sections of referenced codes and standards applicable to that portion of the work to be accomplished in the field shall be made available by the Contractor at the preparatory inspection. These copies shall be maintained in the field and available for use by Government personnel until final acceptance of the work.

b. A review of the contract drawings.

c. A check to assure that all materials and equipment have been tested, submitted, and approved.

d. Review of provisions that have been made to provide required control inspection and testing.

e. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the contract.

f. A physical examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.

g. A review of the appropriate activity hazard analyses to assure safety requirements are met.

h. Discussion of procedures for controlling quality of the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that feature of work.

i. A check to ensure that the portion of the plan for the work to be performed has been accepted by the Contracting Officer.

j. Discussion of the initial control phase.

k. The Government shall be notified at least 48 hours in advance of beginning the preparatory control phase. This phase shall include a meeting conducted by the CQC System Manager and attended by the superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. The results of the preparatory phase actions shall be documented by separate minutes prepared by the CQC System Manager and attached to the daily CQC report. The Contractor shall instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

3.5.2 Initial Phase

This phase shall be accomplished at the beginning of a definable feature of work. The following shall be accomplished:

a. A check of work to ensure that it is in full compliance with contract requirements. Review minutes of the preparatory meeting.

b. Verify adequacy of controls to ensure full contract compliance. Verify required control inspection and testing.

c. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare workmanship with required sample panels as appropriate.

d. Resolve all differences.

e. Check safety to include compliance with and upgrading of the safety plan and activity hazard analysis. Review the activity analysis with each worker.

f. The Government shall be notified at least 48 hours in advance of beginning the initial phase. Separate minutes of this phase shall be prepared by the CQC System Manager and attached to the daily CQC report. Exact location of initial phase shall be indicated for future reference and comparison with follow-up phases.

g. The initial phase should be repeated for each new crew to work onsite, or any time acceptable specified quality standards are not being met.

3.5.3 Follow-up Phase

Daily checks shall be performed to assure control activities, including control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. The checks

shall be made a matter of record in the CQC documentation. Final follow-up checks shall be conducted and all deficiencies corrected prior to the start of additional features of work which may be affected by the deficient work. The Contractor shall not build upon nor conceal non-conforming work.

3.5.4 Additional Preparatory and Initial Phases

Additional preparatory and initial phases shall be conducted on the same definable features of work if the quality of on-going work is unacceptable; if there are changes in the applicable CQC staff, onsite production supervision or work crew; if work on a definable feature is resumed after a substantial period of inactivity; or if other problems develop.

3.6 TESTS

3.6.1 Testing Procedure

The Contractor shall perform specified or required tests to verify that control measures are adequate to provide a product which conforms to contract requirements. Upon request, the Contractor shall furnish to the Government duplicate samples of test specimens for possible testing by the Government. Testing includes operation and/or acceptance tests when specified. The Contractor shall procure the services of a testing laboratory meeting the requirements listed under PARAGRAPH: CAPABILITY CHECK, or establish a testing laboratory at the project site meeting those requirements. The Contractor shall perform the following activities and record and provide the following data:

a. Verify that testing procedures comply with contract requirements.

b. Verify that facilities and testing equipment are available and comply with testing standards.

c. Check test instrument calibration data against certified standards.

d. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.

e. Results of all tests taken, both passing and failing tests, shall be recorded on the CQC report for the date taken. Specification paragraph reference, location where tests were taken, and the sequential control number identifying the test shall be given. If approved by the Contracting Officer, actual test reports may be submitted later with a reference to the test number and date taken. An information copy of tests performed by an offsite or commercial test facility shall be provided directly to the Contracting Officer. Failure to submit timely test reports as stated may result in nonpayment for related work performed and disapproval of the test facility for this contract.

3.6.2 Testing Laboratories

3.6.2.1 Capability Check

The Government reserves the right to check laboratory equipment in the proposed laboratory for compliance with the standards set forth in the contract specifications and to check the laboratory technician's testing procedures and techniques. Laboratories utilized for testing soils, concrete, asphalt, and steel shall meet criteria detailed in ASTM D 3740 and ASTM E 329. The Contractor shall submit a Quality Management Manual meeting the requirements of ASTM D 3740 and ASTM E 329 for each laboratory to be used, including onsite project laboratories.

3.6.2.2 Capability Recheck

If the selected laboratory fails the capability check, the Contractor will be assessed a charge of $1,000.00 to reimburse the Government for each succeeding recheck of the laboratory or the checking of a subsequently selected laboratory. Such costs will be deducted from the contract amount due the Contractor.

3.6.3 Onsite Laboratory

The Government reserves the right to utilize the Contractor's control testing laboratory and equipment to make assurance tests and to check the Contractor's testing procedures, techniques, and test results at no additional cost to the Government.

3.6.4 Furnishing or Transportation of Samples for Testing

Costs incidental to the transportation of samples or materials shall be borne by the Contractor. Samples of materials for test verification and acceptance testing by the Government shall be delivered to the Contracting Officer. Coordination for each specific test, exact delivery location, and dates will be made with the Contracting Officer.

3.7 COMPLETION INSPECTION

3.7.1 Punch-Out Inspection

Near the end of the work, or any increment of the work established by a time stated in CONTRACT CLAUSE 52.211-10 COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK, or by the specifications, the CQC Manager shall conduct an inspection of the work and update the deficiency list in RMS to include all items which do not conform to the approved drawings and specifications. The deficiency listing in RMS shall be edited to reflect the estimated date by which the deficiencies shall be corrected. The CQC System Manager shall make a second inspection to ascertain that all deficiencies have been corrected. Once this is accomplished, the Contractor shall notify the Government that the facility is ready for the Government Pre-Final inspection.

3.7.2 Pre-Final Inspection

The Government will perform the pre-final inspection to verify that the facility is complete and ready to be occupied. The Government will update the deficiency list in RMS. The Contractor's CQC System Manager shall ensure that all items on this list have been corrected before notifying the Government, so that a Final inspection with the customer can be scheduled. Any items noted on the Pre-Final inspection shall be corrected in a timely manner. These inspections and any deficiency corrections required by this

paragraph shall be accomplished within the time slated for completion of the entire work or any particular increment of the work if the project is divided into increments by separate completion dates.

3.7.3 Final Acceptance Inspection

The Contractor's quality control inspection personnel, plus the superintendent or other primary management person, and the Contracting Officer's Representative shall be in attendance during the final acceptance inspection. Additional Government personnel may also be in attendance. The final acceptance inspection shall be formally scheduled by the Contractor based upon results of the Pre-Final inspection. Notice shall be given to the Contracting Officer at least 14 days prior to the final acceptance inspection, provided that the Contracting Officer receives the Contractor's assurance that all specific items previously identified to the Contractor as being unacceptable, along with all remaining work performed under the contract, will be complete and acceptable by the date scheduled for the final acceptance inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the Contracting Officer to bill the Contractor for the Government's additional inspection cost in accordance with the CONTRACT CLAUSE 52.246-12 INSPECTION OF CONSTRUCTION.

3.8 DOCUMENTATION

The Contractor shall maintain current records providing factual evidence that required quality control activities and/or tests have been performed. These records shall include the work of subcontractors and suppliers and shall be submitted through RMS. The Contractor may use other formats to record basic QC data. However, the Daily CQC Report generated by QCS shall be the Contractor's official report. The reports shall include, as a minimum, the following information:

a. Contractor or subcontractor and its area of responsibility.

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

c. Work performed each day, giving location, description, and by whom. When Network Analysis (NAS) is used, identify each phase of work performed each day by NAS activity number.

d. Test and control activities performed with results and references to specifications/drawings requirements. The control phase shall be identified (Preparatory, Initial, Follow-up). List of deficiencies noted, along with corrective action.

e. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawings requirements.

f. Submittals and deliverables reviewed, with contract reference, by whom, and action taken.

g. Offsite surveillance activities, including actions taken.

h. Job safety evaluations stating what was checked, results, and instructions or corrective actions.

i. Instructions given/received and conflicts in plans and/or specifications.

j. Contractor's verification statement.

These records shall indicate a description of trades working on the project, the number of personnel working, weather conditions encountered, and any delays encountered. These records shall cover both conforming and deficient features and shall include a statement that equipment and materials incorporated in the work and workmanship comply with the contract. Reports shall be submitted electronically to the Government by the QCS export within 24 hours after the date covered by the report. The Contractor shall also provide the Government a signed, printed copy of the daily CQC report. Reports need not be submitted for days on which no work is performed. As a minimum, one report shall be prepared and submitted for every 7 days of no work and on the last day of a no work period. All calendar days shall be accounted for throughout the life of the contract. The first report following a day of no work shall be for that day only. Reports shall be signed and dated by the CQC System Manager. The signed, printed copy of the daily CQC Report shall include copies of test reports and copies of reports prepared by all subordinate quality control personnel.

3.9 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the 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 shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

-- End of Section --

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TEMPORARY CONSTRUCTION FACILITIES
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SECTION 01 50 02.00 13

TEMPORARY CONSTRUCTION FACILITIES
01/02

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 (2008) Safety and Health Requirements Manual

1.2 SUBMITTALS

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

SD-02 Shop Drawings

Site Plan;

The Contractor shall prepare a site plan indicating the proposed location and dimensions of any area to be fenced and used by the Contractor, the number of trailers to be used, avenues of ingress/egress to the fenced area and details of the fence installation. Any areas which may have to be graveled to prevent the tracking of mud shall also be identified. The Contractor shall also indicate if the use of a supplemental or other staging area is desired.

Government Field Office;

The Contractor shall submit a preliminary plan and description of the mobile office facilities which it proposes to furnish prior to proceeding with procurement thereof.

SD-06 Test Reports

Formaldehyde Emission Test Results

The Contractor shall submit formaldehyde emission test results for any administrative or Government field offices as specified in this section.

1.3 GROUNDS AND ROADWAYS

1.3.1 Availability of Grounds

The boundary limits of the grounds made available for the Contractor's use during the life of the contract are shown on the drawings. Any additional rights-of-entry or grounds desired by the Contractor shall be obtained by the Contractor at its own expense, and copies of agreements for the use of such rights-of-entry shall be furnished to the Contracting Officer before entering thereon. Such agreements shall clearly relieve the Government of any responsibility for damages resulting from the use of the grounds.

1.3.2 Drainage Facilities

Insofar as natural drainage from the protected areas is obstructed by contract operations, it shall be the Contractor's responsibility to make adequate provision for accommodating such drainage in a satisfactory manner during the life of this contract, either by temporary means or by use of the permanent construction and operation of the permanent facilities.

1.4 PAVEMENT REMOVAL AND REPLACEMENT

Where roads are cut, removed, or otherwise damaged in the prosecution of the work the Contractor shall replace all pavements or other surfacings so removed or damaged to their preconstruction condition. After backfill is completed on streets to be paved, a temporary surface shall be laid down and the street opened to the traffic in order to provide access to abutting property. Restoration of the original street surface shall be completed no later than 60 calendar days after starting excavation. Should weather conditions preclude the restoration of the original surface material, temporary resurfacing utilizing a bituminous mixture shall be installed with the final surface constructed no later than June 1 of the following construction season.

1.5 AVAILABILITY AND USE OF UTILITY SERVICES

1.5.1 Temporary Electrical Facilities

The Contractor shall be responsible for coordination and costs for electrical power required for the Contractor's operations, including all costs for utility company hookup, installation/dismantling of transformers and distribution lines. In general, the Contractor shall establish its own service connection with the utility company.

1.5.2 Sanitation

The Contractor shall provide and maintain within the construction area field-type sanitary facilities in accordance with EM 385-1-1. These facilities shall include but not be limited to toilet, washing, and drinking water facilities.

1.5.3 Telephone

The Contractor shall make arrangements and pay all costs for their telephone facilities desired. Government personnel will not take or deliver messages for the Contractor.

1.6 PROTECTION AND MAINTENANCE OF TRAFFIC

During construction the Contractor shall provide access and temporary relocated roads as necessary to maintain traffic. The Contractor shall maintain and protect traffic on all affected roads during the construction period except as otherwise specifically directed by the Contracting Officer. Measures for the protection and diversion of traffic, including the provision of watchmen and flagmen, erection of barricades, placing of lights around and in front of equipment and the work, and the erection and maintenance of adequate warning, danger, and direction signs, shall be as required by the State and local authorities having jurisdiction. The traveling public shall be protected from damage to person and property. The Contractor's traffic on roads selected for hauling material to and from the site shall interfere as little as possible with public traffic. The Contractor shall investigate the adequacy of existing roads and the allowable load limit on these roads. Dust control shall be provided as stated in SECTION 01 57 20.00 13 ENVIRONMENTAL PROTECTION.

1.6.1 Off-Site Haul routes

The Contractor shall be responsible for securing all permits required along haul routes. The Contractor shall be the sole permittee and shall be responsible for meeting all obligations of the permits. A copy of each permit shall be submitted to the Contracting Officer. The Contractor, as between the Government and the Contractor, has sole responsibility for damage or deterioration of the Contractor's haul routes.

1.6.2 On-Site Haul Roads

The Contractor shall, at its own expense, construct access and haul roads necessary for proper prosecution of the work under this contract. Haul roads shall be constructed with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic shall be avoided. The Contractor shall provide necessary lighting, signs, barricades, and distinctive markings for the safe movement of traffic. The method of dust control chosen by the Contractor shall be adequate to ensure safe operation at all times. Location, grade, width, and alignment of construction and hauling roads shall be subject to approval by the Contracting Officer. Lighting shall be adequate to assure full and clear visibility for full width of haul road and work areas during any night work operations. Upon completion of the work, haul roads designated by the Contracting Officer shall be removed and the area restored to its pre-construction condition.

1.6.3 Barricades

The Contractor shall erect and maintain temporary barricades to limit public access to hazardous areas. Such barricades shall be required whenever safe public access to paved areas such as roads, parking areas or sidewalks is prevented by construction activities or as otherwise necessary to ensure the safety of both pedestrian and vehicular traffic. Barricades shall be securely placed, clearly visible with adequate illumination to provide sufficient visual warning of the hazard during both day and night.

1.7 CONTRACTOR'S TEMPORARY FACILITIES

1.7.1 Administrative Field Offices

The Contractor shall provide and maintain administrative field office facilities within the construction area at the designated site.

1.7.2 Formaldehyde Emission Requirements

Any administrative field offices the Contractor proposes to use shall be tested for formaldehyde emission by a state certified laboratory prior to being brought on site. The formaldehyde emission level shall not exceed 0.016 ppm. If this level is exceeded for any administrative field office, the Contractor shall take appropriate action to reduce the formaldehyde emission concentration to an acceptable level or shall provide another administrative field office that meets the requirements. No Luan, MDF, vinyl gypsum, or products that contain urea-formaldehyde will be allowed.

1.7.3 Staging Area

The boundary limits of the grounds made available for the Contractor's use during the life of the contract are shown on the drawings as “Limits of Work”, "Work Limits", "Construction Limits", and/or staging area(s). Trailers, materials, or equipment shall not be placed or stored outside the work limits.

1.8 PLANT COMMUNICATION

Whenever the Contractor has the individual elements of its plant so located that operation by normal voice between these elements is not satisfactory, the Contractor shall install a satisfactory means of communication, such as telephone or other suitable devices. The devices shall be made available for use by Government personnel.

1.9 TEMPORARY PROJECT SAFETY FENCING

As soon as practicable, but not later than 15 days after the date established for commencement of work, the Contractor shall furnish and erect temporary project safety fencing at the work site to limit public access to hazardous areas. The safety fencing shall be a high visibility orange colored, high density polyethylene grid or approved equal, a minimum of 42 inches high, supported and tightly secured to steel posts located on maximum 10 foot centers, generally located to encompass the active construction areas. The safety fencing shall be maintained by the Contractor during the life of the contract and, upon completion and acceptance of the work, shall become the property of the Contractor and shall be removed from the work site.

PART 2 PRODUCTS

2.1 BULLETIN BOARD, PROJECT SIGN, AND PROJECT SAFETY SIGN

2.1.1 Bulletin Board

Immediately upon beginning of work, the Contractor shall provide a weatherproof glass-covered bulletin board not less than 36 by 48 inches in size for displaying the Equal Employment Opportunity poster, a copy of the wage decision contained in the contract, Wage Rate Information poster, and other information approved by the Contracting Officer. The bulletin board shall be located at the project site in a conspicuous place easily accessible to all employees, as approved by the Contracting Officer. Legible copies of the aforementioned data shall be displayed until work is completed. Upon

completion of work the bulletin board shall be removed by and remain the property of the Contractor.

2.1.2 Project and Safety Signs

The Contractor shall furnish and erect a Project sign and a Safety sign in a location selected by the Contracting Officer at the project site within 15 days after receipt of the notice to proceed. The requirements for the signs and their content shall be as shown on the drawings at the end of this section. The data required by the safety sign shall be corrected daily. Signs shall be maintained throughout the construction period, and upon completion of the project, the signs shall be removed from the site. The PROJECT DESCRIPTION and PROJECT NAME shall be as follows:

PROJECT DESCRIPTION: FLOOD RISK MANAGMENT

PROJECT NAME: FARGO-MOORHEAD DIVERSION
REACH 6

2.2 GOVERNMENT FIELD OFFICE

The Contractor shall provide and maintain for the life of the contract an approved mobile office (mobile home style) meeting the following requirements as to space and facilities for the exclusive use of the government. The unit shall be ready for occupancy within 30 calendar days after notice to proceed. The unit shall provide a minimum of 400 square feet of floor area and shall include two private offices, each having approximately 100 square feet of floor area and a storage closet. The unit shall have two entrance doors. The remaining space shall be utilized as one large office, a toilet room, a chest of drawers and a storage area for coats, etc. The unit shall be provided with a toilet room consisting of a stool and lavatory and an electric heater. The unit interior headroom shall be no less than 8’-0”.

2.2.1 Formaldehyde Emission Requirements

The Government field office the Contractor proposes to use shall be tested for formaldehyde by a state certified laboratory prior to be brought on site. The formaldehyde emission level shall not exceed 0.016 ppm. If this level is exceeded the Contractor shall take appropriate action to reduce the formaldehyde emission concentration to an acceptable level or shall provide another Government field office that meets the requirements. No Luan, MDF, vinyl gypsum, or products that contain urea-formaldehyde will be allowed.

2.2.2 Location

The Contractor shall locate the portable mobile home type field office at or near the Contractor’s field office site at a location approved by the Contracting Officer. Four parking spaces shall be reserved for Government vehicles at the Government trailer.

2.2.3 Construction

The Government field office shall be similar in quality and age as the Contractor’s field office, if provided. Exterior and interior finishes shall be free from color fade, chipping, or peeling. The unit shall be set level on blocking, be provided with plywood skirting, and be anchored to the ground

for protection against wind damage. Exterior doors shall be provided with screens and outside hasps for use with padlocks. The unit shall be electrically wired for fluorescent ceiling lighting fixtures and weather proof porch lights at each entrance door, along with switches, duplex convenience outlets, and a master switch and fuse box, as required. The entire unit shall be adequately insulated with fiberglass insulation and vapor barrier. Dead air crawl space shall be properly ventilated. Heating and air conditioning facilities shall be provided to maintain an ambient inside temperature of 68 degrees F. The unit shall be weather proof, and furnished with a forced air type heating plant, either gas or oil with hot and cold air ducts adequate to supply even heat throughout the unit. Air conditioning shall be furnished with capacity as recommended by the manufacturer for the trailer size. A central air conditioning system shall be provided.

2.2.4 Utilities

The Contractor shall be responsible for service fees in connection with electrical power and heating (natural gas or oil service). The Contractor shall also be responsible for service fees in connection with the water supply, sanitary waste system, and telephone as indicated below. When available, city water and sewer system connections are preferred.

a. Sanitary Facilities. In the absence of a city sewer connection, holding tanks shall be provided. The lavatory shall discharge into an outside underground holding tank with a capacity of not less than 400 gallons and a vented drain. The Contractor shall provide year-round pumping of the holding tank as required. Subject to approval, a serviced chemical toilet may be used.

b. Potable Water. In the absence of a city water connection, a potable water storage tank of not less than 300 gallons capacity shall be furnished with adequate supply filling connections and screened vent, and shall be stainless steel or plastic with a drain cock of not less than ½ inch size. Upon completion of the job, the Contractor shall remove the underground holding tank and backfill the excavation. The Contractor shall provide potable water for the storage tank if service connections are not provided.

c. Telephone. The Contractor shall be responsible for installation of a telephone service, or wireless service with internet capability, at the Government field office. The telephone hook-up should be placed on a separate account from the Contractor’s phone so that it can be transferred to the Government after installation. The Government will be responsible for the telephone service to the Government field office after installation.

2.2.5 Furnishings

The following furnishings shall be provided for the Government office:

a. A hot and cold drinking water dispenser

b. Bulletin board, minimum size 6 square feet

c. A cabinet shall be supplied along a side wall with minimum nominal dimensions 2 feet wide, 3 feet high, and 6 feet long. The cabinet

shall include a finished wood or laminate counter. Two shelves, one above and one below the cabinet shall be provided for storage.

d. Sign. The Contractor shall securely attach to the unit exterior and adjacent to the main entrance door, as approved, a 24 inch by 36 inch sign with the Corps of Engineers castle insignia with wording as specified.

e. Stoop. A stoop with 8 inch risers and handrails shall be provided at each entrance door.

f. Windows. All windows shall be provided with sash and security screens along with shades, blinds, or similar features that allow for the complete coverage of the windows on the inside.

g. Lavatory. A 5 by 24 inch metal shelf and 15 by 20 inch wood or metal framed plate glass mirror shall be provided above the lavatory.

2.2.6 Furniture

Office furniture shall be coordinated with respect to style, color, and upholstery. The following furniture shall be provided:

a. Two desks either wood or steel, double pedestal type, top approximately 60 inches by 34 inches, with lock.

b. Two swivel armchairs with tilting seat and adjustable spring back.

c. Two filing cabinets, four-drawer legal size, with lock.

d. One drafting table stool, non-tilting rotary type with back and circular footrest.

e. One drafting table, metal and/or wood, 36 inches by 48 inches.

f. One conference table, ¾ inch thick by 72 inches long by 36 inches wide with solid core construction top.

g. Eight chairs for conference table, either wood or steel construction, with cushioned seat and backrest.

h. One rack for hanging full size drawings.

2.2.7 Office Equipment

The following equipment shall be provided:

a. One desk top copying machine with an indirect dual component dry tone process. Paper copy sizes shall be a maximum of 11 inches by 17 inches and a minimum of 4.25 inches by 5.5 inches. The machine shall have a halogen lamp light source and an automatic sheet feed (single cassette). Initially supply four reams of 8 ½" x 11" (500 sheets per ream) of white copying paper and furnish complete maintenance service contract/agreement for the machine.

2.2.8 Maintenance

The Contractor shall maintain the field office for the life of the contract. The Contractor shall be responsible for maintaining and paying for all costs associated with the following services.

a. Supplies. Toilet paper, paper toweling, paper and supplies for the copy machine shall be provided. Supply water for the drinking water dispenser. Supply water for the lavatory if a service connection is not provided for potable water.

b. Maintenance of Office Equipment. Includes a maintenance service contract/agreement for operation of the Copy machine.

c. Janitorial Service. The Contractor shall provide daily janitorial service and provide all janitorial and sanitary supplies as well as trash removal service.

d. Snow removal. Maintenance of site access including snow removal service is the responsibility of the Contractor.

PART 3 EXECUTION

3.1 MAINTENANCE OF GROUNDS

Borrow areas, stockpiles, and other grounds stripped of natural vegetation or disturbed by the Contractor's operations shall be kept free of noxious weeds, debris, and unnecessary materials and supplies. Control of vegetation shall comply with local ordinances.

3.2 CLEANUP

Construction debris, waste materials, packaging material and the like shall be removed from the work site. Any dirt or mud which is tracked onto paved or surfaced roadways shall be cleaned away. Materials resulting from demolition activities which are salvageable shall be stored within the fenced area described above. Stored material not in trailers, whether new or salvaged, shall be neatly stacked when stored.

3.3 RESTORATION

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

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DIVISION 01 – GENERAL REQUIREMENTS

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ENVIRONMENTAL PROTECTION
10/2006

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ENVIRONMENTAL PROTECTION
10/2006

PART 1 GENERAL

1.1 REFERENCES

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

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

33 CFR 328	Definitions of Waters of the United States
40 CFR 68	Chemical Accident Prevention Provisions
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 279	Standards for the Management of Used Oil
40 CFR 302	Designation, Reportable Quantities, and Notification
40 CFR 355	Emergency Planning and Notification
49 CFR 171 - 178	Hazardous Materials Regulations

ENGINEERING MANUALS (EM)

EM 385-1-1	(2008) Safety -- Safety and Health Requirements

US ARMY CORPS OF ENGINEERS TECHNICAL REPORT

WETLAND MANUAL	Corps of Engineers Wetlands Delineation Manual Technical Report Y-87-1

1.2 DEFINITIONS

1.2.1 Environmental Pollution and Damage

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

1.2.2 Environmental Protection

Environmental protection is the prevention/control of pollution and habitat disruption that may occur to the environment during construction. The

control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.2.3 Contractor Generated Hazardous Waste

Contractor generated hazardous waste means materials that, if abandoned or disposed, 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 (e.g. methyl ethyl ketone, toluene etc.), waste thinners, excess paints, excess solvents, waste solvents, excess pesticides, and contaminated pesticide equipment rinse water.

1.2.4 Land Application for Discharge Water

The term "Land Application" for discharge water means that the Contractor shall discharge water at a rate which allows the water to percolate into the soil. No sheeting action, soil erosion, discharge into storm sewers, discharge into defined drainage areas, or discharge into the "waters of the United States" shall occur. Land Application shall be in compliance with all applicable Federal, State, and local laws and regulations.

1.2.5 Pesticide

Pesticide is defined as any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest, or intended for use as a plant regulator, defoliant or desiccant.

1.2.6 Pests

The term "pests" means arthropods, birds, rodents, nematodes, fungi, bacteria, viruses, algae, snails, marine borers, snakes, weeds and other organisms (except for human or animal disease-causing organisms) that adversely affect readiness, military operations, or the well-being of personnel and animals; attack or damage real property, supplies, equipment, or vegetation; or are otherwise undesirable.

1.2.7 Surface Discharge

The term "Surface Discharge" means that the water is discharged with possible sheeting action and subsequent soil erosion may occur. Waters that are surface discharged may terminate in drainage ditches, storm sewers, creeks, and/or "waters of the United States" and would require a permit from the governing agency to discharge water.

1.2.8 Waters of the United States

All waters which are under the jurisdiction of the Clean Water Act, as defined in 33 CFR 328.

1.2.9 Wetlands

Wetlands means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, and bogs. Official determination of whether or not an area is classified as a wetland must be done in accordance with the WETLAND MANUAL.

1.3 GENERAL REQUIREMENTS

The Contractor shall minimize environmental pollution and damage that may occur as the result of construction operations. The environmental resources within the project boundaries and those affected outside the limits of permanent work shall be protected during the entire duration of this contract. The Contractor shall be responsible for any delays resulting from failure to comply with environmental laws and regulations.

1.4 SUBCONTRACTORS

The Contractor shall ensure compliance with this section by subcontractors.

1.5 PAYMENT

No separate payment will be made for work covered under this section. The Contractor shall be responsible for payment of fees associated with environmental permits, application, and/or notices obtained by the Contractor. All costs associated with this section shall be included in the contract price. The Contractor shall be responsible for payment of all fines/fees for violation or non-compliance with Federal, State, regional and local laws and regulations.

1.6 SUBMITTALS

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

SD-01 Preconstruction Submittals

Environmental Protection Plan; G,ENV

The environmental protection plan.

1.7 ENVIRONMENTAL PROTECTION PLAN

Prior to commencing construction activities or delivery of materials to the site, the Contractor shall submit an Environmental Protection Plan for review and approval by the Contracting Officer. The purpose of the Environmental Protection Plan is to present a comprehensive overview of known or potential environmental issues which the Contractor must address during construction. Issues of concern shall be defined within the Environmental Protection Plan as outlined in this section. The Contractor shall address each topic at a level of detail commensurate with the environmental issue and required construction task(s). Topics or issues

which are not identified in this section, but which the Contractor considers necessary, shall be identified and discussed after those items formally identified in this section. Before the start of construction, the Contractor shall meet with the Contracting Officer for the purpose of discussing the implementation of the initial Environmental Protection Plan, possible subsequent additions and revisions to the plan including any reporting requirements, and methods for administration of the Contractor's Environmental Plans. The Environmental Protection Plan shall be current and maintained onsite by the Contractor.

1.7.1 Compliance

No requirement in this Section shall be construed as relieving the Contractor of any applicable Federal, State, and local environmental protection laws and regulations. During construction, the Contractor shall be responsible for identifying, implementing, and submitting for approval any additional requirements to be included in the Environmental Protection Plan.

1.7.2 Contents

The environmental protection plan shall include, but shall not be limited to, the following:

a. Name(s) of person(s) within the Contractor's organization who is(are) responsible for ensuring adherence to the Environmental Protection Plan.

b. Name(s) and qualifications of person(s) responsible for manifesting hazardous waste to be removed from the site, if applicable.

c. Name(s) and qualifications of person(s) responsible for training the Contractor's environmental protection personnel.

d. Description of the Contractor's environmental protection personnel training program.

e. An erosion and sediment control plan which identifies the type and location of the erosion and sediment controls to be provided. The plan shall include monitoring and reporting requirements to assure that the control measures are in compliance with the erosion and sediment control plan, and Federal, State, and local laws and regulations. A Storm Water Pollution Prevention Plan (SWPPP) may be substituted for this plan.

f. Drawings showing locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on the site.

g. Traffic control plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Plan shall include measures to minimize the amount of mud transported onto paved public roads by vehicles or runoff.

h. Work area plan showing the proposed activity in each portion of the area and identifying the areas of limited use or nonuse. Plan should include measures for marking the limits of use areas including methods for protection of features to be preserved within authorized work areas.

i. Drawing showing the location of borrow areas.

j. The Spill Control plan shall include the procedures, instructions, and reports to be used in the event of an unforeseen spill of a substance regulated by 40 CFR 68, 40 CFR 302, 40 CFR 355, and/or regulated under State or local laws and regulations. The Spill Control Plan supplements the requirements of EM 385-1-1. This plan shall include as a minimum:

1. The name of the individual who will report any spills or hazardous substance releases and who will follow up with complete documentation. This individual shall immediately notify the Contracting Officer, and the local Fire Department for flammable materials, in addition to the legally required Federal, State, and local reporting channels (including the National Response Center 1-800-424-8802) if a reportable quantity is released to the environment. The plan shall contain a list of the required reporting channels and telephone numbers.

2. The name and qualifications of the individual who will be responsible for implementing and supervising the containment and cleanup.

3. Training requirements for Contractor's personnel and methods of accomplishing the training.

4. A list of materials and equipment to be immediately available at the job site, tailored to cleanup work of the potential hazard(s) identified.

5. The names and locations of suppliers of containment materials and locations of additional fuel oil recovery, cleanup, restoration, and material-placement equipment available in case of an unforeseen spill emergency.

6. The methods and procedures to be used for expeditious contaminant cleanup.

k. A non-hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris. The plan shall include schedules for disposal. The Contractor shall identify any subcontractors responsible for the transportation and disposal of solid waste. Licenses or permits shall be submitted for solid waste disposal sites that are not a commercial operating facility. Evidence of the disposal facility's acceptance of the solid waste shall be attached to this plan during the construction.

l. A recycling and solid waste minimization plan with a list of measures to reduce consumption of energy and natural resources. The plan shall detail the Contractor's actions to comply with and to

participate in Federal, State, regional, and local government sponsored recycling programs to reduce the volume of solid waste at the source.

m. An air pollution control plan detailing provisions to assure that dust, debris, materials, trash, etc., do not become air borne and travel off the project site.

n. A contaminant prevention plan that: identifies potentially hazardous substances to be used on the job site; identifies the intended actions to prevent introduction of such materials into the air, water, or ground; and details provisions for compliance with Federal, State, and local laws and regulations for storage and handling of these materials. In accordance with EM 385-1-1, a copy of the Material Safety Data Sheets (MSDS) and the maximum quantity of each hazardous material to be on site at any given time shall be included in the contaminant prevention plan. As new hazardous materials are brought on site or removed from the site, the plan shall be updated.

o. A waste water management plan that identifies the methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines. If a settling/retention pond is required, the plan shall include the design of the pond including drawings, removal plan, and testing requirements for possible pollutants. If land application will be the method of disposal for the waste water, the plan shall include a sketch showing the location for land application along with a description of the pretreatment methods to be implemented. If surface discharge will be the method of disposal, a copy of the permit and associated documents shall be included as an attachment prior to discharging the waste water. If disposal is to a sanitary sewer, the plan shall include documentation that the Waste Water Treatment Plant Operator has approved the flow rate, volume, and type of discharge.

p. A historical, archaeological, cultural resources, biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands known to be on the project site: and/or identifies procedures to be followed if historical, archaeological, cultural resources, biological resources or wetlands not previously known to be onsite or in the area are discovered during construction. The plan shall include methods to assure the protection of known or discovered resources and shall identify lines of communication between Contractor personnel and the Contracting Officer.

q. A pesticide treatment plan shall be included and updated, as information becomes available. The plan shall include: sequence of treatment, dates, times, locations, pesticide trade name, EPA registration numbers, authorized uses, chemical composition, formulation, original and applied concentration, application rates of active ingredient (e.g. pounds per acre), equipment used for application and calibration of equipment. The Contractor is responsible for Federal, State, regional and local pest management record keeping and reporting requirements.

1.7.3 Appendix

Copies of all environmental permits, permit application packages, approvals to construct, notifications, certifications, reports, and termination documents shall be attached, as an appendix, to the Environmental Protection Plan.

1.8 PROTECTION FEATURES

This paragraph supplements the CONTRACT CLAUSE 52.236-9 PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS. Prior to start of any onsite construction activities, the Contractor and the Contracting Officer shall make a joint condition survey. Immediately following the survey, the Contractor shall prepare a brief report including a plan describing the features requiring protection under the provisions of the Contract Clauses, which are not specifically identified on the drawings as environmental features requiring protection along with the condition of trees, shrubs and grassed areas immediately adjacent to the site of work and adjacent to the Contractor's assigned storage area and access route(s), as applicable. This survey report shall be signed by both the Contractor and the Contracting Officer upon mutual agreement as to its accuracy and completeness. The Contractor shall protect those environmental features included in the survey report and any indicated on the drawings, regardless of interference which their preservation may cause to the Contractor's work under the contract.

1.9 ENVIRONMENTAL ASSESSMENT OF CONTRACT DEVIATIONS

Any deviations, requested by the Contractor, from the drawings, plans and specifications which may have an environmental impact will be subject to approval by the Contracting Officer and may require an extended review, processing, and approval time. The Contracting Officer reserves the right to disapprove alternate methods, even if they are more cost effective, if the Contracting Officer determines that the proposed alternate method will have an adverse environmental impact.

1.10 NOTIFICATION

The Contracting Officer will notify the Contractor in writing of any observed noncompliance with Federal, State or local environmental laws or regulations, permits, and other elements of the Contractor's Environmental Protection plan. The Contractor shall, 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 (suspending) all or part of the work until satisfactory corrective action has been taken. No time extensions shall be granted or equitable adjustments allowed to the Contractor 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. The failure of the Contracting Officer to notify the Contractor of any noncompliance with Federal, State, or local environmental laws or regulations, permits, or the Contractor's Environmental Protection Plan shall not relieve the Contractor of the duty to comply with those laws or regulations, permits, or the Contractor's Environmental Protection Plan.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 PERMITS

Permits obtained by the Government related to the work of this contract are attached at the end of this Section. The Contractor is responsible for obtaining all applicable permits or licenses, except those obtained by the Government. The Contractor shall be responsible for implementing the terms and requirements of the permits held by the Contractor or the Government.

3.2 LAND RESOURCES

The Contractor shall confine all activities to areas defined by the drawings and specifications. Prior to the beginning of any construction, the Contractor shall identify any land resources to be preserved within the work area. Except in areas indicated on the drawings or specified to be cleared, the Contractor shall not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, and land forms without approval. No ropes, cables, or guys shall be fastened to or attached to any trees for anchorage unless specifically authorized. The Contractor shall provide effective protection for land and vegetation resources at all times as defined in the following subparagraphs. Stone, soil, or other materials displaced into uncleared areas shall be removed by the Contractor.

3.2.1 Work Area Limits

Prior to commencing construction activities, the Contractor shall mark the areas that need not be disturbed under this contract. Isolated areas within the general work area which are not to be disturbed shall be marked or fenced. Monuments and markers shall be protected before construction operations commence. Where construction operations are to be conducted during darkness, any markers shall be visible in the dark. The Contractor's personnel shall be knowledgeable of the purpose for marking and/or protecting particular objects.

3.2.2 Landscape

Trees, shrubs, vines, grasses, land forms and other landscape features indicated and defined on the drawings to be preserved shall be clearly identified by marking, fencing, or wrapping with boards, or any other approved techniques. The Contractor shall restore landscape features damaged or destroyed during construction operations outside the limits of the approved work area.

3.2.3 Erosion and Sediment Controls

The Contractor shall be responsible for providing erosion and sediment control measures in accordance with Federal, State, and local laws and regulations. The erosion and sediment controls selected and maintained by the Contractor shall be such that water quality standards are not violated as a result of the Contractor's construction activities. The area of bare soil exposed at any one time by construction operations should be kept to a

minimum. The Contractor shall construct or install temporary and permanent erosion and sediment control best management practices (BMPs). BMPs may include, but not be limited to, vegetation cover, stream bank stabilization, swale and slope stabilization, silt fences, construction of terraces, interceptor channels, sediment traps, inlet and outfall protection, diversion channels, and sedimentation basins. Any temporary measures shall be removed after the area has been stabilized.

3.2.4 Contractor Facilities and Work Areas

The Contractor's field offices, staging areas, stockpile storage, and temporary buildings shall be placed in areas designated on the drawings or as directed by the Contracting Officer. Temporary movement or relocation of Contractor facilities shall be made only when approved. Erosion and sediment controls shall be provided for on-site borrow and spoil areas to prevent sediment from entering nearby waters. Temporary excavation and embankments for plant and/or work areas shall be controlled to protect adjacent areas.

3.3 WATER RESOURCES

The Contractor shall monitor construction activities to prevent pollution of surface and ground waters. Toxic or hazardous chemicals shall not be applied to soil or vegetation unless otherwise indicated. All water areas affected by construction activities shall be monitored by the Contractor. For construction activities immediately adjacent to impaired surface waters, the Contractor shall be capable of quantifying sediment or pollutant loading to that surface water when required by State or Federally issued Clean Water Act permits.

3.3.1 Cofferdams, Diversions, and Dewatering Operations

Construction operations for dewatering, water return for hydraulic dredging, removal of cofferdams, tailrace excavation, and tunnel closure shall be controlled at all times to maintain compliance with existing State water quality standards and designated uses of the surface water body. The Contractor shall plan its operations and perform all work necessary to minimize adverse impact, such as water turbidity, on the habitat for wildlife and on water quality for downstream use.

3.3.2 Stream Crossings

Stream crossings shall allow movement of materials or equipment without violating water pollution control standards of the Federal, State, and local governments.

3.3.3 Wetlands

The Contractor shall not enter, disturb, destroy, or allow discharge of contaminants into any wetlands, unless authorized herein. The Contractor shall be responsible for the protection of wetlands shown on the drawings. Authorization to enter specific wetlands identified shall not relieve the Contractor from any obligation to protect other wetlands within, adjacent to, or in the vicinity of the construction site and associated boundaries.

3.4 AIR RESOURCES

Equipment operation, activities, or processes performed by the Contractor shall be in accordance with all Federal and State air emission and performance laws and standards.

3.4.1 Particulates

Dust particles; aerosols and gaseous by-products from construction activities; and processing and preparation of materials, such as from asphaltic batch plants; shall be controlled at all times, including weekends, holidays and hours when work is not in progress. The Contractor shall 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 which would cause the Federal, State, and local air pollution standards to be exceeded or which 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 at all times. The Contractor must have sufficient, competent equipment available to accomplish these tasks. Particulate control shall be performed as the work proceeds and whenever a particulate nuisance or hazard occurs. The Contractor shall comply with all State and local visibility regulations.

3.4.2 Odors

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

3.4.3 Sound Intrusions

The Contractor shall keep construction activities under surveillance and control to minimize environment damage by noise. The Contractor shall comply with State rules.

3.5 CHEMICAL MATERIALS MANAGEMENT AND WASTE DISPOSAL

Disposal of wastes shall be as directed below, unless otherwise specified in other sections and/or shown on the drawings.

3.5.1 Solid Wastes

Solid wastes (excluding dredge material and clearing debris) shall be placed in containers which are emptied on a regular schedule. Handling, storage, and disposal shall be conducted to prevent contamination. Segregation measures shall be employed so that no hazardous or toxic waste will become co-mingled with solid waste. The Contractor shall transport solid waste off the construction site and dispose of it in compliance with Federal, State, and local requirements for solid waste disposal. A Subtitle D RCRA permitted landfill shall be the minimum acceptable off-site solid waste disposal option. The Contractor shall verify that the selected transporters and disposal facilities have the necessary permits and licenses to operate.

3.5.2 Chemicals and Chemical Wastes

Chemicals shall be dispensed ensuring no spillage to the ground or water. Periodic inspections of dispensing areas to identify leakage and initiate corrective action shall be performed. Chemical waste shall be collected in corrosion resistant, compatible containers. Collection drums shall be monitored and removed to a staging or storage area when contents are within 6 inches of the top. Wastes shall be classified, managed, stored, and disposed in accordance with Federal, State, and local laws and regulations.

3.5.3 Contractor Generated Hazardous Wastes/Excess Hazardous Materials

Hazardous wastes are defined in 40 CFR 261, or are as defined by applicable State and local regulations. Hazardous materials are defined in 49 CFR 171 - 178. The Contractor shall, at a minimum, manage and store hazardous waste in compliance with 40 CFR 262. The Contractor shall take sufficient measures to prevent spillage of hazardous and toxic materials during dispensing. The Contractor shall segregate hazardous waste from other materials and wastes, shall protect it from the weather by placing it in a safe covered location, and shall take precautionary measures such as berming or other appropriate measures against accidental spillage. The Contractor shall be responsible for storage, describing, packaging, labeling, marking, and placarding of hazardous waste and hazardous material in accordance with 49 CFR 171 - 178, State, and local laws and regulations. The Contractor shall transport Contractor generated hazardous waste off the construction site in accordance with the Environmental Protection Agency and the Department of Transportation laws and regulations. The Contractor shall dispose of hazardous waste in compliance with Federal, State and local laws and regulations. Spills of hazardous or toxic materials shall be immediately reported to the Contracting Officer. Cleanup and cleanup costs due to spills shall be the Contractor's responsibility. The disposition of Contractor generated hazardous waste and excess hazardous materials are the Contractor's responsibility.

3.5.4 Fuel and Lubricants

Storage, fueling and lubrication of equipment and motor vehicles shall be conducted in a manner that affords the maximum protection against spill and evaporation. Fuel, lubricants and oil shall be managed and stored in accordance with all Federal, State, regional, and local laws and regulations. Used lubricants and used oil to be discarded shall be stored in marked corrosion-resistant containers and recycled or disposed in accordance with 40 CFR 279, State, and local laws and regulations.

3.5.5 Waste Water

Waste water from construction activities, such as onsite material processing, concrete curing, foundation and concrete clean-up, water used in concrete trucks, forms, etc. shall not be allowed to enter water ways.

3.6 RECYCLING AND WASTE MINIMIZATION

The Contractor shall participate in State and local government sponsored recycling programs.

3.7 HISTORICAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

Existing historical, archaeological, and cultural resources within the Contractor's work area are shown on the drawings, or will be designated by

the Contracting Officer, if any have been identified. The Contractor shall protect these resources and shall 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, all activities that may damage or alter such resources shall be temporarily 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, the Contractor shall 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. The Contractor shall cease all activities that may result in impact to or the destruction of these resources. The Contractor shall secure the area and prevent employees or other persons from trespassing on, removing, or otherwise disturbing such resources.

3.8 BIOLOGICAL RESOURCES

The Contractor shall minimize interference with, disturbance to, and damage to fish, wildlife, and plants including their habitat. The Contractor shall be responsible for the protection of threatened and endangered animal and plant species including their habitat in accordance with Federal, State, regional, and local laws and regulations.

3.9 PESTICIDES

3.9.1 Pesticide Delivery and Storage

Pesticides shall be delivered to the site in the original, unopened containers bearing legible labels indicating the EPA registration number and the manufacturer's registered uses. Pesticides shall be stored according to manufacturer's instructions and under lock and key when unattended.

3.9.2 Qualifications

For the application of pesticides, the Contractor shall use the services of a subcontractor whose principal business is pest control. The subcontractor shall be licensed and certified in the state where the work is to be performed.

3.9.3 Pesticide Handling Requirements

The Contractor shall formulate, treat with, and dispose of pesticides and associated containers in accordance with label directions and shall use the clothing and personal protective equipment specified on the labeling for use during all phases of the application. Material Safety Data Sheets (MSDS)shall be available for all pesticide products.

3.9.4 Application

Pesticides shall be applied by a State Certified Pesticide Applicator in accordance with EPA label restrictions and recommendation. The Certified Applicator shall wear clothing and personal protective equipment as specified

on the pesticide label. Water used for formulating shall only come from locations designated by the Contracting Officer. The Contractor shall not allow the equipment to overflow. Prior to application of pesticide, all equipment shall be inspected for leaks, clogging, wear, or damage and shall be repaired prior to being used.

3.10 PREVIOUSLY USED EQUIPMENT

The Contractor shall clean all previously used construction equipment prior to bringing it onto the project site. The Contractor shall ensure that the equipment is free from soil residuals, egg deposits from plant pests, noxious weeds, and plant seeds. The Contractor shall consult with the USDA jurisdictional office for additional cleaning requirements.

3.11 MAINTENANCE OF POLLUTION FACILITIES

The Contractor shall maintain permanent and temporary pollution control facilities and devices for the duration of the contract or for that length of time construction activities create the particular pollutant.

3.12 TRAINING OF CONTRACTOR PERSONNEL

The Contractor's personnel shall be trained in all phases of environmental protection and pollution control. The Contractor shall conduct environmental protection/pollution control meetings for all Contractor personnel prior to commencing construction activities. Additional meetings shall be conducted for new personnel and when site conditions change. The training and meeting agenda shall include: methods of detecting and avoiding pollution; familiarization with statutory and contractual pollution standards; installation and care of devices, vegetative covers, and instruments required for monitoring purposes to ensure adequate and continuous environmental protection/pollution control; anticipated hazardous or toxic chemicals or wastes, and other regulated contaminants; recognition and protection of archaeological sites, artifacts, wetlands, and endangered species and their habitat that are known to be in the area.

3.13 POST CONSTRUCTION CLEANUP

The Contractor shall clean up all areas used for construction in accordance with CONTRACT CLAUSE 52.236-12 CLEANING UP. The Contractor shall, unless otherwise instructed in writing by the Contracting Officer, obliterate all signs of temporary construction facilities such as haul roads, work area, structures, foundations of temporary structures, stockpiles of excess or waste materials, and other vestiges of construction prior to final acceptance of the work. The disturbed area shall be graded, filled and the entire area seeded unless otherwise indicated.

-- End of Section --

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05/12

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SECTION 01 71 23.01 13

CONTRACTOR SURVEYS AND REMOTE SENSING DATA COLLECTION
05/12

PART 1 GENERAL

1.1 SCOPE

The work provided for herein consists of furnishing all plant, labor, equipment, materials, and documentation; and performing all operations necessary for geospatial data collection as specified herein and as indicated on the contract documents.

1.2 DEFINITIONS

Construction Surveying: accurately providing all necessary computations, stakes and marks to establish lines, slopes, elevations, points, and continuous profile grades in accordance with the requirements and tolerances of the project so that the construction Contractors are able to perform all required construction work for the project in accordance with the Contract requirements; and so that the Contracting Officer or the Contracting Officer's Representative can perform all necessary contract administration duties.

Digital Elevation Model (DEM): a surface model that uses elevation values at regularly spaced intervals across the terrain without regard to breaklines or significant topographic features.

Digital Terrain Model (DTM): a surface model that incorporates the elevation of significant topographic features on the land and mass points and breaklines that are irregularly spaced to better characterize the true shape of the bare-earth terrain. The net result of DTMs is that the distinctive terrain features are more clearly defined and precisely located, and contours generated from DTMs more closely approximate the real shape of the terrain. DTMs are technically superior to standard DEMs for many applications.

Geospatial Data: information that includes, but is not limited to, survey data, maps, aerial photography, aerial imagery, and biological, ecological and hydrological modeling coverages; information of or relating to the relative position of things on the earth's surface; information that identifies the geographic location and characteristics of natural or constructed features and boundaries on the earth. This information may be derived from, among other things, remote sensing, mapping, and surveying technologies.

Positioning Equipment: devices that produce (directly or indirectly) geographic coordinates or elevation values as an output. See paragraph POSITIONING EQUIPMENT for examples.

1.3 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 1110-1-1002	(2012) Survey Markers and Monumentations
EM 1110-1-1003	(2011) NAVSTAR Global Positioning System SurveyingRef Title
EM 1110-1-1005	(2007) Control and Topographic Surveying
EM 1110-1-2909	(2012) Geospatial Data and Systems
EM 1110-2-6056	(2010) Standards and Procedures for Referencing Project Elevation Grades to Nationwide Vertical Datums

1.4 SUBMITTALS

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

SD-01 Preconstruction Submittals

Construction Surveying Work Plan and Schedule; G, SURV

Quality Control Plan; G, SURV

Preliminary Survey; G, SURV

The data from this data collection shall be plotted on a layout sheet and submitted to the Contracting Officer for determination of the final channel alignment (if applicable) or the final location of design elements.

Professional Certification

SD-11 Closeout Submittals

As-Built Survey; G,SURV

Final Digital Terrain Model (DTM) of the as-built conditions with accuracy sufficient for 1-foot contour mapping compatible with Bentley InRoads® software.

Final Digital Elevation Model (DEM) of the as-built conditions derived from the aforementioned Final DTM compatible with the ESRI ArcGIS® software.

Final ESRI Shapefile™ of as-built planimetric features. All point and vector (non-raster) data shall be compliant with Spatial Data Standards for Facilities, Infrastructure, and Environment (SDSFIE).

Geospatial Data

Information as defined in Paragraph: GEOSPATIAL DATA.

1.5 GEOSPATIAL DATA

1.5.1 Metadata

All geospatial information submitted must include Federal Geographic Data Committee (FGDC) compliant metadata. See EM 1110-1-2909 for more information. The Contractor shall submit metadata in an .xml, .gen, or .met file format as an email attachment to: mvpgismetadata@usace.army.mil. The Government will provide metadata software, documentation, and samples upon request. At a minimum, the metadata shall include the following information:

1.0 Identification Information
- 1.1 Citation
- 1.2 Description
- 1.3 Time Period of Content
- 1.4 Status
- 1.5 Spatial Domain
- 1.6 Keywords
- 1.7 Access Constraints
- 1.8 Use Constraints
- 1.9 Point of Contact

2.0 Data Quality Information
- 2.1 Logical Consistency Report
- 2.2 Completeness Report
- 2.3 Positional Accuracy

3.0 Spatial Data Organization Information
- 3.1 Direct Spatial Reference Method
- 3.2 Point and Vector Object information (if applicable)
- 3.3 Raster Object Information (if applicable)

4.0 Spatial Reference Information
- 4.1 Horizontal Coordinate System Definition
- 4.2 Vertical Coordinate System Definition

5.0 Entity and Attribute Information
- 5.1 Detailed Description of Entity Type and Attributes (repeatable)
- 5.2 Overview Description of Entity and Attribute with Detailed Citation (repeatable)

Projects involving engineering CAD drawings may be composed of multiple files each containing a specific data theme or covering a specified geographic area of the same theme. Because metadata for each of these individual files would contain significant repetitive information, it is appropriate to document groups of files that form a well defined dataset with a single metadata file. Pursuant to this fact, it is mandatory that all CAD-related data submitted

have at least one collection metadata file describing the project and individual data layers generated within the project.

1.5.2 General Geospatial Information

Geospatial data may include any of the following information: GIS drawings/maps, hydrographic surveys, topographic mapping, georeferenced digital drawings generated from hard copy maps/drawings, high-order geodetic control (horizontal and vertical) surveys using Global Navigation Satellite System (GNSS) or Global Positioning System (GPS) and conventional survey techniques for control and property/boundary surveys, controlled and non-controlled aerial photography (film, photos, and digital output), photogrammetric mapping including aero-triangulation, digital-orthophotography image file and map production, remote sensing, radar and satellite imagery and/or aerial imagery products.

1.5.2.1 GNSS/GPS Data

The Contractor shall collect and submit to the Contracting Officer the GNSS observables (L1/L2) in both the GNSS receiver's native format and the Receiver Independent Exchange Format (RINEX) for all Real Time Kinematic, Static, and Differential Surveys. A completed observation log sheet is required for each base station occupation/session. All GNSS/GPS control surveys shall be “closed” observation campaigns. A “closed” campaign consists of more than one observation of each control point. The observation times shall be appropriate for the level of accuracy required for the type of work.

1.5.2.2 Survey Mark/Monumentation Documentation

The Contractor shall submit documentation following EM 1110-1-1002 that shows and describes all recovered and/or established survey/ground control points, property boundary monuments (including Public Land Survey System corner monuments), and gage reference points (if applicable), using the latest U-SMART form available at:

https://rsgis.crrel.usace.army.mil/apex/f?p=493.

Location maps shall be included that show sufficient detail such as street names and significant land marks to adequately display the general location of each survey mark. Location maps may show single or multiple survey mark locations. The image of the mark if possible should show the stamping and where possible, the horizon/setup image should show the actual setup. The image sizes shall be kept small enough to limit the size of the resultant document to 4 megabytes.

1.5.2.3 Field Notes/Books

The Contractor shall submit all original field books/notes/computation sheets that fully describe the geospatial data collect and all significant events related to said event. This will allow the Contracting Officer to apply quality assurance measures to the data collect. The format and content of field notes/books shall be compiled according to EM 1110-1-1005.

1.5.2.4 Final Report

The Contractor shall submit a final report of the geospatial data collection that includes, at minimum, the following information:

1. Certification from the responsible individual in charge (Licensed/Registered Professional, Principal, or equivalent) of the data collection that satisfies jurisdictional requirements or states that the data collect follows all applicable standards, requirements, and specifications.

2. General Project Description: Overview of the project including location, purpose, and parties involved.

3. Background: Reason for project (more detailed description) and more specific location description including a map. Accuracy should be discussed in this section. Attach or include a copy of the original Scope of Work prepared by the originator. Add funding information if applicable.

4. Project Planning: How the project was planned including but not limited to: reconnaissance results; control establishment; datums; DGPS method(s) selected; topographic survey techniques; feature and attribute standards selected; etc.

5. Data Collection: Overview of how data was collected including but not limited to: date of survey, weather conditions, equipment used (make and model); data collection method(s) and/or techniques used; control points used; amount of data collected; number of crews and personnel per crew including names of crew personnel; how long the data collection took; data processing/error checking performed in field; documentation of quality control measures; etc.

6. Project Summary and Conclusion: This section shall include overall results of the processing, products produced, listing of information being submitted, list of metadata files submitted, overall accuracy of the data collection (based on results from data processing section), problems encountered during data collection and data processing, recommendations for future data collection efforts of this type or in this area (lessons learned).

7. Output and Reports from Software: This section shall include the detailed reports and output from software packages used during the data processing. This section might have multiple subsections--e.g., one for each step in the processing that has output that is critical in evaluating results.

1.6 DATUMS AND UNITS OF MEASURE

The Contractor shall use the spatial reference information on the drawings. The Contractor shall ensure all geospatial data submitted is in the defined coordinate system, projection, and elevation datum (including GEOID model).

1.7 MEASUREMENT AND PAYMENT

The Contactor shall be responsible for the work of this section, without any direct compensation being made other than the payment received for contract items.

1.8 QUALITY CONTROL

The Contractor shall establish and maintain quality control for the work specified in this section to assure compliance with the contract requirements and shall maintain records of his quality control for all geospatial data collection including but not limited to the following:

1.8.1 Quality Control Plan

The Contractor shall submit a plan for conducting quality control for the work to be performed under this specification. This plan shall be reviewed and accepted by the Contracting Officer before field work commences. This plan should outline the personnel, equipment, and activities scheduled by the Contractor or subcontractor(s) to meet contract requirements. It is the responsibility of the Contractor to determine and use the appropriate procedures and techniques for the required tasks.

1.8.2 Layouts and Surveys (ALTERNATE 2)

A daily log shall be kept for the layout work and surveys consisting of type and location using the Government-furnished control system as stated in the CONTRACT CLAUSE 52.236-17 LAYOUT OF WORK. All Contractor-furnished control shall be approved for use by the Contracting Officer before commencing field work.

1.8.3 Reporting

The original as well as the records of corrective actions taken shall be furnished to the Contracting Officer daily with the daily QC Report. The report shall include a record of times and dates the geospatial data collection was run, the horizontal control stations used and their coordinates, the vertical control points used and their elevations, and weather conditions. Format of report shall be as prescribed in SECTION 01 45 04.00 13 CONTRACTOR QUALITY CONTROL (CQC).

1.9 PROFESSIONAL CERTIFICATION

All geospatial data collections producing geospatial data that will be used for the construction of any project feature shall be performed under the direction of and certified by a Professional Surveyor currently licensed/registered by the state in which the work is done. The Contractor shall provide documentation verifying that the certified professional surveyor has at least three years of experience performing similar types of work. Additionally, for hydrographic surveys, the Professional Surveyor shall provide documentation for at least three years of experience in hydrographic surveying of navigable channels and shall possess a current hydrographic certification from the American Congress for Surveying and Mapping (ACSM).

1.10 GEOSPATIAL DATA COLLECTION EQUIPMENT

1.10.1 Positioning Equipment

Positioning equipment for geospatial data collection shall be capable of achieving the required accuracy for the work being performed. Initial calibration and subsequent checks shall be in accordance with the manufacturer's instructions or the latest guidance documents (see paragraph GUIDANCE). Documentation of all calibrations and subsequent checks shall be

provided to the Contracting Officer. Positioning equipment includes, but is not limited to the following: conventional/robotic total stations, GNSS/GPS systems, and digital levels. The use of a "topo shoe" or "rod point" shall be appropriate for the work being performed.

1.10.2 Remote Sensing Equipment

Remote sensing equipment, which allows for passive geospatial data collection, shall be capable of achieving the required accuracy of the work being performed. Initial calibration and subsequent checks shall be in accordance with the manufacturer's instructions or the latest reference documents. Documentation of all calibrations and subsequent checks shall be provided to the Contracting Officer. Remote sensing equipment employs positioning equipment (see paragraph POSITIONING EQUIPMENT) to georeference each measurement. Remote sensing equipment includes, but is not limited to the following: aerial LiDAR, terrestrial LiDAR (laser scanning), ground penetrating radar, interferometry, and aerial/satellite imagery.

1.10.3 GPS/GNSS Machine Control Equipment

Machine control systems are automated systems used on construction equipment to assist the operator in constructing the project features to the design grade. Machine control systems consist of a GPS/GNSS receiver, receiver mast, a control box, a display, and actuators, if the construction equipment is automated. The mast holds the receiver on top and, if the equipment is automated, has a connection to the earth moving parts on the bottom. The receiver takes in information from satellites and the base station and sends it to the control box, which in turn computes the information required to construct the project feature. If the construction equipment is automated, the actuators receive information from the control box and move the hydraulics to grade.

1.10.3.1 Automated System

For automated systems, the hydraulics for the construction equipment are controlled by the machine control equipment. The system automatically determines where grade is and maintains the bucket/blade position on the construction equipment as the operator concentrates on driving while performing the necessary quality control measures to ensure the automated system is performing properly.

1.10.3.2 Indicate System

An indicate system shows the operator what grade to maintain. The operator is responsible for moving the hydraulic actuators to maintain the requisite grade.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 COMMENCEMENT, PERFORMANCE, AND COMPLETION

3.1.1 General

All surveys and remote sensing data collections shall be executed in accordance with EM 1110-1-1002, EM 1110-1-1003, EM 1110-1-1005, EM 1110-1-2909, and EM 1110-2-6056. The Contractor shall layout the work from the Government furnished benchmarks in accordance with CONTRACT CLAUSE 52.236-17 LAYOUT OF WORK. The construction of each feature of work shall follow the alignments as indicated on the drawings. The Contractor shall have in place, at least 7 calendar days prior to commencing construction operations, sufficient stakes and markings to enable the Contracting Officer to observe the field layout of the alignment and limits of each feature of work. For each feature of work, these stakes shall define area limits such that the Contracting Officer can easily determine, without additional surveys, if alignment and/or limit adjustments need to be made. For embankments, levees, floodwalls, and similar work, these stakes shall define centerline, stationing, outermost fill/cut limits, and work limits. For structures and similar work, the structure corners and grid lines shall be staked. General site work shall be staked to define staging areas, storage areas, and other area limits as directed. The Contracting Officer may waive these requirements for certain areas. The layout shall be sufficient for the Contracting Officer to mark trees, vegetation and other features to be left undisturbed. No work shall take place without approval of field layout by the Contracting Officer.

Observations of all control points shall be performed in accordance with the accuracy level appropriate for the type of work being performed. Prior to initiating positioning surveys using geospatial data collection equipment, a calibration test of the device shall be performed according to the manufacturer's instructions in the presence of the Contracting Officer. Calibration checks shall be run at the beginning and completion of each day's data collection or portion thereof. Results shall be furnished daily to the Contracting Officer. All geospatial data collections shall be tied to a fixed control point, which is published in the National Spatial Reference System. The station may be a Government-furnished point or a temporary point established by the Contractor and approved by the Contracting Officer. All existing control points under Government control will be provided by the Contracting Officer upon request.

Should the electronic measuring device fail to indicate the known distance within the factory defined error range for the device, the device shall not be used for determining geospatial positions.

3.1.2 Alignment Changes

The Contracting Officer reserves the right to make changes in the alignment of any feature of work as may be found necessary during the course of the contract. If it becomes necessary, through no fault of the Contractor, to abandon a line, location or feature on which work has been done, an equitable adjustment for completed work will be made. No alignment changes or abandonment shall take place without prior written notice from the Contracting Officer.

3.1.3 Geospatial Data Collection

The Contracting Officer reserves the right to be present for all geospatial data collection field work.

3.1.3.1 Positioning Surveys (ALTERNATE 1)

Information and data to establish or reestablish the Government design elements or the Government baseline or to establish the relationship between the control system, the Government baseline and the channel centerline will be furnished by the Government upon request.

The Contractor shall perform all necessary positioning surveys as a stand alone task or in conjunction with other geospatial data collection tasks. The positioning surveys require a level of accuracy appropriate to the type of work and shall follow the applicable guidance (see paragraph GUIDANCE).

3.1.3.2 Preliminary Surveys

The Contractor shall be prepared to make all necessary surveying checks for field verification of actual conditions and shall make the necessary minor surveying and staking adjustments to fit the construction to actual field conditions. In addition, some plan details may be dependent upon actual field conditions at the time of construction. It may be necessary to perform some field survey or office computations in order to stake these components. All work referred to in this paragraph is considered part of the work of Construction Surveying and no additional payment will be made for this work.

The Contractor shall run a preliminary survey, locating the baseline (if applicable), all other significant features that may affect the design and/or construction of the project within the limits of the work and all existing conditions from which construction of the design features will be based.

3.1.3.3 Layout Surveys

The layout surveys shall include, but not be limited to: [clearing and grubbing, removals, grading, culverts, embankments, borrow, aggregate base course, pavements, bridges, utilities, signs, pavement markings, erosion control and turf establishment items] to complete the project as represented in the plans. The surveys must be done in a way that is timely, and that is reflective of the continuing and ongoing nature of construction and inspection activities which will generally require frequent, separate site visits by the Contractor's survey crew to the project location to accommodate the various stages of construction and inspection activities that will occur.

The Contractor shall:

1. Be responsible for the preservation of all reference points, monuments, government land corners (Public Land Survey System corner monuments), horizontal and vertical control points, stakes, and marks that are established by the Government or others within the project limits. If the Contractor fails to preserve these items and if they must be reestablished by the Government, the Contracting Officer will deduct a charge from monies due or becoming due the Contactor.

2. Be responsible to review, balance, adjust, correct, and investigate Government-furnished data and to perform work on survey data and control points that may be necessary to use the survey points

and data, all at no extra cost to the Government, unless it is determined by the Contracting Officer that latent errors existed in the information provided by the Government.

3. Start and end all level runs, traverses, or GNSS/GPS control surveys, from known control.

4. Unless otherwise agreed to, set all stakes and marks in such a manner that is highly visible and notations thereon legible and sufficiently descriptive.

5. Perform all construction surveying for all project construction and shall install reference points as needed for the use of any public utility crews that are staking or accomplishing utility relocation or construction associated with this Contract.

a. From Horizontal and Vertical Control Points established by the Government.

b. According to the Plan, Proposal and Standard Specifications.

c. According to actual existing field conditions.

6. Bear all costs, including but not limited to the cost of actual reconstruction of Contract work that may be incurred due to errors in Contractor's Construction Surveying.

7. Document surveying during construction in a form acceptable to the Government and allow the Government access to surveying notes and calculations. The survey documentation includes:

a. Control Point monumentation with reference ties.

b. Field notes that were used to set construction stakes, control the Project, and document monument locations. The Contractor shall use bound, hard cover field books for recording survey data and field notes; store field notes on an electronic medium; or use both methods. If an electronic medium is used, the raw field data files must be available. When using an electronic medium, the Contractor shall make all files and data available in the Standard formats used by the Department.

c. Present the Government with the as-built documentation. The as-built documentation shall include the following:

i. Changes from the Plan

1. Alignment

2. Profile

3. Locations of utilities relocated or emplaced as part of the project.

ii. Identification of any alignment, right-of-way, property, or control monumentation destroyed during the project.

iii. Any alignment, right-of-way, property, or control monumentation that was placed during the project and that still exists at project completion.

iv. The Easting, Northing, and, if applicable, the elevation coordinates in the project datum. If the original item had no coordinate reference, show the revised centerline station and offset.

v. In the case of new monumentation, a report shall be provided that describes how the monumentation was placed. This will include copies of any fieldwork (traverse or leveling) as well as any adjustments used. It will also include tie sheets that include a description of the physical object placed as the monument.

vi. Other information that may be required.

d. Furnish documentation to the Contracting Officer within the time limits indicated in the surveying work schedule.

8. Surveying Activities

a. The Contractor shall give the Contracting Officer a 14 calendar day written notice before the Contractor needs the Government to establish any horizontal and vertical control points shown in the construction documents.

b. Before surveying work commences the Contractor shall submit to the Contracting Officer for approval a written Construction Surveying Work Plan and Schedule detailing:

i. Pertinent information as to how the requirements in these specifications are being met by the Contractor.

ii. A project specific Construction Surveying Work Schedule for the Construction Surveying and how it relates to the time frame for construction activities and the Government inspection needs.

iii. A proposed method of communications between the Contractor and Government Personnel.

iv. How and when the Contractor will make delivery of the as-built Survey Data to the Contracting Officer.

c. During the course of construction, the Contractor shall give notice of commencement of any Construction Surveying activities.

3.1.3.4 As-Built Surveys

3.1.3.4.1 Project Elements and Features

An as-built survey of all project elements and features shall be conducted after construction to accurately document the relationship between the design location and construction location. All geospatial data (raw and processed) used to derive as-built documentation shall be provided as evidence of performance and reviewed accordingly by the Contracting Officer for compliance with applicable standards and guidance. At minimum, all as-built surveys of project elements and features shall be electronically collected using the appropriate positioning equipment (paragraph GEOSPATIAL DATA COLLECTION EQUIPMENT) for the accuracy level required and produce sufficient documentation of the as-built conditions. All geospatial data shall be delivered according to paragraph GEOSPATIAL DATA. The as-built surveys shall meet the following criteria:

1. Perform a breakline and grid style survey of the project area at sufficient spacing to accurately define the as-built conditions.

2. Produce (1) a digital terrain model surface file (.dtm) compatible with Bentley InRoads® software, (2) a digital elevation model surface file compatible with ESRI ArcGIS® (version 10) software, and (3) an ESRI Shapefile™ of as-built planimetric features. This file shall be submitted to the Contracting Officer within 10 calendar days after completion of the survey.

3.1.3.4.2 Utilities

An as-built field survey of all utilities shall be conducted after installation to determine the final locations and elevations of all utility structures such as manholes, catch basins, hydrants, gate valves, cleanouts, service connections, and other special controls or structures. Final elevations shall be determined for all sewer inverts and castings. Locations shall be shown using the same convention as the original contract drawings (typically stationing and offset from known centerline). If no convention is used in the contract drawings, locations shall be tied to at least 2 permanent landmarks. This information shall be included on the Contractor Record Drawings in Section 01 78 02.00 10 CLOSEOUT SUBMITTALS.

3.1.3.5 Quantity Surveys for Measurement and Payment

The Contractor shall perform quantity surveys in accordance with CONTRACT CLAUSE 52.236-16 QUANTITY SURVEYS--ALTERNATE I. Quantity surveys shall be completed for all features of work necessary to establish measurement for partial and final payments. Surveys shall be completed in enough detail to accurately determine quantities and verify the required section. Tasks required to be completed by the Contractor include the following:

1. Perform a breakline and grid style survey of the area prior to initiation of construction of the feature of work at sufficient spacing to accurately define the site conditions from which quantity measurements will be derived.

2. Produce a surface file (.dtm) compatible with Bentley InRoads® software and submit to the Contracting Officer within 10 calendar days after completion of the survey.

3. From the resultant surface file, extract cross-section data at locations consistent with the requirements of the design documentation or at intervals specified by the Contracting Officer.

4. At measurement periods, perform breakline and grid style survey of the area where construction of the feature of work is complete at sufficient spacing to accurately define the interval conditions from which quantity measurements will be based.

5. Produce a surface file (.dtm) compatible with Bentley InRoads® software and submit to the Contracting Officer within 10 calendar days after completion of the survey.

6. From the resultant surface file, extract cross-section data at locations consistent with the requirements of the design documentation or at intervals specified by the Contracting Officer.

7. Provide documentation and all associated files to the Contracting Officer showing all calculations, notes, determinations, and a statement of accuracy of resultant quantity and plot all cross-section information from the survey notes and/or data at a minimum scale of 1 inch = 10 feet.

8. Complete partial surveys and surface files as necessary to supplement payment requests.

9. Complete final breakline and grid style survey upon completion of each feature of work and produce a surface file (.dtm) compatible with Bentley InRoads® software. Submit the file to the Contracting Officer within 10 calendar days after completion of the survey.

10. From the resultant surface file, extract cross-section data at locations consistent with the requirements of the design documentation or at intervals specified by the Contracting Officer.

The Contracting Officer may use the surveys for tolerance verification purposes. Additionally, the Contracting Officer may authorize an independent verification of any surveys using Government personnel.

3.1.3.6 Surveys for Verification of Design Section

For bid items where the unit of measure for payment is not in units of volume but where the work required is based on achieving specific section requirements, the Contractor shall perform surveys as defined in this paragraph to verify that the design section requirements have been satisfactorily achieved. The method by which the Contractor performs the surveys outlined herein shall be appropriate for the verification of the thickness and geometry of the materials placed as required by the contract documents. Tasks required to be completed by the Contractor include the following:

1. Perform a breakline and grid style survey of the area prior to initiation of construction of the feature of work at sufficient spacing to accurately define the site conditions from which section measurements will be derived.

2. Produce a surface file (.dtm) compatible with Bentley InRoads® software and submit to the Contracting Officer within 10 calendar days after completion of the survey.

3. From the resultant surface file, extract cross-section data at locations consistent with the requirements of the design documentation or at intervals specified by the Contracting Officer.

4. At measurement periods, perform breakline and grid style survey for areas where construction of the feature of work is complete at sufficient spacing to accurately define the interval conditions from which section measurements will be based.

5. Produce a surface file (.dtm) compatible with Bentley InRoads® software and submit to the Contracting Officer within 10 calendar days after completion of the survey.

6. From the resultant surface file, extract cross-section data at locations consistent with the requirements of the design documentation or at intervals specified by the Contracting Officer.

7. Provide documentation and all associated files to the Contracting Officer showing all calculations, notes, determinations, and a statement of accuracy of resultant quantity and plot all cross-section information from the survey notes and/or data at a minimum scale of 1 inch = 10 feet.

8. Complete partial surveys and surface files as necessary to verify section.

9. Complete final breakline and grid style survey upon completion of each feature of work and produce a surface file (.dtm) compatible with Bentley InRoads® software. Submit the file to the Contracting Officer within 10 calendar days after completion of the survey.

10. From the resultant surface file, extract cross-section data at locations consistent with the requirements of the design documentation or at intervals specified by the Contracting Officer.

The Contracting Officer may use the surveys for tolerance verification purposes. Additionally, the Contracting Officer may authorize an independent verification of any surveys using Government personnel.

[3.1.3.7 Machine Control Data Collection

If a machine control data collection system is used, the Contractor shall ensure that the system collects positional data (data logging) throughout operation of the machine control system. This information shall be provided to the Contracting Officer at the end of the contract or as specified by the Contracting Officer. All necessary quality control measures shall be addressed in the Quality Control Plan.

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SECTION 01 78 02.00 10

CLOSEOUT SUBMITTALS
11/99

PART 1 GENERAL

1.1 SUBMITTALS

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

SD-11 Closeout Submittals

As-Built Drawings; G,GEN

Contractor record drawings showing final as-built conditions of the project.

1.2 AS-BUILT DRAWINGS

Paper prints and reproducible drawings will become the property of the Government upon final approval. Failure to submit final as-built drawings and marked prints, as required herein, will be cause for withholding payment due the Contractor under this contract. These drawings shall be furnished to the Contracting Officer within 30 days after the required contract completion date. Approval and acceptance of final as-built drawings shall be accomplished before final payment is made to the Contractor.

1.3 CONTRACTOR RECORD DRAWINGS

The Contractor shall maintain a separate set of marked-up full-scale contract drawings indicating as-built conditions. These drawings shall show all changes and revisions made up to the time the work is completed and accepted. These drawings shall be maintained in a current condition at all times until completion of the work and shall be available for review by Government personnel at all times. All variations from the contract drawings, for whatever reason, including those occasioned by modifications, optional materials, and the required coordination between trades, shall be indicated.

1.3.1 Changes and Corrections

The working and final as-built drawings shall show, but shall not be limited to, the following information:

a. Correct grade, elevations, cross section, or alignment of roads, earthwork, structures or utilities if any changes were made from contract plans.
b. Changes in details of design.
c. The topography, invert elevations and grades of drainage installed or affected as part of the project construction.

1.3.2 Drawing Standards

a. Deleted items shall be indicated in red.
b. Added items or changed locations shall be shown in green.
c. Variations shall be shown in the same general detail utilized in the contract drawings.
d. Revisions shall be shown on all drawings and details related to the changed feature.
e. All markups shall be neat, clean and legible.
f. Where contract drawings or specifications present options, only the option selected for construction shall be shown.

1.4 PAYMENT

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

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

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SECTION 02 41 00

DEMOLITION
07/06

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 NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI A10.6	(1990; R 1998) Safety Requirements for Demolition Operations

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2008) Safety -- Safety and Health Requirements

1.2 GENERAL REQUIREMENTS

Do not begin demolition until authorization is received from the Contracting Officer. The work includes demolition, salvage of identified items and materials, and removal of resulting rubbish and debris. Remove rubbish and debris from the project work areas daily, unless otherwise directed. Materials that cannot be removed daily shall be stored in areas specified by the Contracting Officer. In the interest of occupational safety and health, perform the work in accordance with EM 385-1-1, Section 23, Demolition, and other applicable Sections.

1.3 SUBMITTALS

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

SD-01 Preconstruction Submittals

Demolition Work Plan; G, STR

The procedures proposed for the accomplishment of the demolition work shall be submitted at least 30 days prior to the planned commencement of work and must be approved before commencement of the work. The procedures shall provide for safe conduct of the work, including procedures and methods to provide necessary supports, lateral bracing and shoring when required, careful removal and disposition of materials specified to be salvaged, protection of property which is to remain undisturbed, coordination with other work in progress, and anticipated disconnections of utility services.

The procedures shall include a detailed description by location of the methods and equipment to be used for each operation, and the sequence of operations in accordance with EM 385-1-1.

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," conform to the safety requirements contained in ANSI A10.6.

1.5 DUST CONTROL

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

1.6 PROTECTION

1.6.1 Traffic Control Signs

Where pedestrian and driver safety is endangered in the area of removal work, use properly anchored traffic barricades with flashing lights. Notify the Contracting Officer prior to beginning such work.

1.6.2 Existing Work

Before beginning any demolition work, survey the site and examine the drawings and specifications to determine the extent of the work. Record existing work in the presence of the Contracting Officer showing the condition of structures and other facilities adjacent to areas of alteration or removal. Photographs sized 4 inch will be acceptable as a record of existing conditions.

1.6.3 Trees

Protect trees within the project site which might be damaged during demolition or deconstruction, and which are indicated to be left in place, by a 6 foot high fence. Erect and secure fence following the outer perimeter of branches or clumps of trees. Replace any tree designated to remain that is damaged during the work under this contract with like-kind or as approved by the Contracting Officer.

1.6.4 Utility Service

Maintain existing utilities indicated to stay in service and protect against damage during demolition operations.

1.6.5 Facilities

Protect electrical and mechanical services and utilities. Where removal of existing utilities and pavement is specified or indicated, provide approved barricades, temporary covering of exposed areas, and temporary services or connections for electrical and mechanical utilities. Ensure that no elements determined to be unstable are left unsupported and place and secure bracing,

shoring, or lateral supports as may be required as a result of any cutting, removal, deconstruction, or demolition work performed under this contract.

1.6.6 Protection of Personnel

Before, during and after the demolition work the Contractor shall continuously evaluate the condition and take immediate action to protect all personnel working in and around the project site. No area, section, component or other structural element will be allowed to be left standing without sufficient bracing, shoring, or lateral support to prevent collapse or failure while workmen remove debris or perform other work in the immediate area.

1.7 BURNING

The use of burning at the project site for the disposal of refuse and debris will not be permitted.

1.8 USE OF EXPLOSIVES

Use of explosives will not be permitted.

1.9 RELOCATIONS

Perform the removal and reinstallation of relocated items as indicated with workmen skilled in the trades involved. Items to be relocated which are damaged by the Contractor shall be repaired or replaced with new undamaged items as approved by the Contracting Officer.

1.10 ENVIRONMENTAL PROTECTION

The work shall comply with the requirements of SECTION 01 57 20.00 13 ENVIRONMENTAL PROTECTION.

PART 2 PRODUCTS

2.1 FILL MATERIAL

Comply with excavating, backfilling, and compacting procedures for soils used as backfill material to fill basements, voids, depressions or excavations resulting from demolition of structures.

PART 3 EXECUTION

3.1 EXISTING FACILITIES TO BE REMOVED

3.1.1 Structures

Completely remove existing structures indicated to be removed.

3.1.2 Utilities and Related Equipment

3.1.2.1 General Requirements

Do not interrupt existing utilities serving occupied facilities, except when authorized in writing by the Contracting Officer.

3.1.2.2 Disconnecting Existing Utilities

Remove existing underground utilities, as indicated in the plans, and terminate in a manner conforming to the nationally recognized code covering the specific utility and approved by the Contracting Officer. All overhead power lines will be removed by the utility companies prior to the start of diversion channel excavation. When utility lines are encountered that are not indicated on the drawings, the Contracting Officer shall be notified prior to further work in that area.

3.1.3 Chain Link Fencing

Remove chain link fencing, gates and other related salvaged items scheduled for removal.

3.1.4 Paving and Slabs

Remove concrete and asphaltic concrete paving and slabs as indicated. Provide neat sawcuts at limits of pavement removal as indicated.

3.1.5 Miscellaneous Metal

Salvage and recycle scrap metal as part of demolition operations. Provide separate containers to collect scrap metal and transport to a scrap metal collection or recycling facility.

3.2 CONCURRENT EARTH-MOVING OPERATIONS

Do not begin excavation, filling, and other earth-moving operations that are sequential to demolition work in areas occupied by structures to be demolished until all demolition in the area has been completed and debris removed. Holes and other hazardous openings shall be filled.

3.3 DISPOSITION OF MATERIAL

3.3.1 Title to Materials

Except for items, materials or equipment scheduled for salvage, all materials and equipment removed and not reused or salvaged, shall become the property of the Contractor and shall be removed from the project work area. 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 Unsalvageable and Non-Recyclable Material

Unsalvageable and non-recyclable material shall be disposed of in an approved disposal area, located off site, obtained and arranged by the Contractor.

3.4 CLEANUP AND DISPOSAL

Debris shall be removed and transported in a manner that prevents spillage on streets or adjacent areas. Dispose of debris, rubbish, scrap, and other nonsalvageable materials resulting from removal operations in accordance with all Federal, State and local regulations regarding hauling and disposal.

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SECTION 03 22 70.01 13

CONTROLLED LOW-STRENGTH MATERIAL (CLSM)
04/12

PART 1 GENERAL

1.1 REFERENCES

All publications referenced shall be the most current version, edition, standard, latest revision, or reapproval unless otherwise stated. The following publications and standards listed below will be referred to only by the basic designation thereafter, and shall form a part of this specification to the extent indicated by the references thereto:

ASTM INTERNATIONAL (ASTM)

ASTM C 33/C 33M	(2011a) Standard Specification for Concrete Aggregates
ASTM C 94	(2011b) Ready-Mixed Concrete
ASTM C 150	(2011) Standard Specification for Portland Cement
ASTM C 220	(1991; R 2009) Standard Specification for Flat Asbestos-Cement Sheets
ASTM C 618	(2008) Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete
ASTM C 685	(2010) Concrete Made by Volumetric Batching and Continuous Mixing
ASTM C 940	(2010a) Expansion and Bleeding of Freshly Mixed Grouts for Preplaced-Aggregate Concrete in the Laboratory
ASTM D 4832	(2010) Preparation and Testing of Controlled Low Strength Material (CLSM) Test Cylinders
ASTM D 5971	(2007) Standard Practice for Sampling Freshly Mixed Controlled Low-Strength Material
ASTM D 6023	(2007) Standard Test Method for Density (Unit Weight), Yield, Cement Content, and Air Content (Gravimetric) of Controlled Low-Strength Material (CLSM)
ASTM D 6103	(2004) Standard Test Method for Flow Consistency of Controlled Low Strength Material (CLSM)

1.2 DESIGN REQUIREMENTS

Controlled Low-Strength Material (CLSM) mixture proportion shall consist of 100 pounds or less of portland cement plus fly ash per cubic yard; pozzolan; sand; water; and a fluidifier, if required to obtain the required slump. The CLSM fill mixture proportion shall have a flow consistency of more than 8 inches. The flow consistency shall be determined in accordance with ASTM D 6103. CLSM fill shall have a compressive strength of 100 psi at 28 days. The compressive strength of the CLSM shall be determined in accordance with ASTM D 4832 after being made and cured in accordance with ASTM D 4832. The mixture proportions shall be reported in accordance with ASTM C 94. If the CLSM is to be placed using a concrete pump, the mixture proportions shall be designed so that it will not segregate in the pump line under pressure or when there is an interruption in flow.

1.3 SUBMITTALS

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

SD-01 Data

On-Site Batching and Mixing

Water Reducing

Concrete Mixture Proportions

The Contractor shall submit manufacturer's literature from suppliers which demonstrates compliance with applicable specifications for all equipment and materials.

SD-07 Schedules

Placing

The methods and equipment for transporting, handling, and depositing the CLSM backfill and CLSM fill shall be submitted to the Contracting Officer prior to the first placement.

SD-08 Statements

Concrete Mixture Proportions

CLSM mixture proportions shall be the responsibility of the Contractor and shall be designed in accordance with the criteria in paragraph DESIGN REQUIREMENTS. Ten days prior to placement of CLSM, the Contractor shall submit to the Contracting Officer the mixture proportions that will produce CLSM of the qualities required. Mixture proportions shall include the dry weights of cementitious material(s); and saturated surface-dry weights of the fine aggregate; the quantities, types, and names of admixtures; and quantity of water per

cubic yard of concrete. All materials included in the mixture proportions shall be of the same type and from the same source as will be used on the project.

SD-09 Reports

CLSM Mixture Proportions Tests

Applicable test reports shall be submitted to verify that the CLSM mixture proportions selected will produce CLSM of the quality specified. The results of all tests and inspections conducted at the project site shall be reported informally at the end of each shift and in writing weekly and shall be delivered to the Contracting Officer within 3 days after the end of each weekly reporting period.

SD-13 Certificates

Cement

Cementitious Material will be accepted on the basis of a manufacturer's certificate of compliance.

Aggregates

Aggregates will be accepted on the basis of certificate of compliance that the aggregates meet the requirements of the specifications under which it is furnished.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Ready-Mixed Concrete

Ready-mixed concrete shall conform to ASTM C 94, except as otherwise specified.

2.1.1.1 Volumetric Batching and Continuous Mixing

Volumetric batching and continuous mixing shall conform to ASTM C 685.

2.1.1.2 On-Site Batching and Mixing

The Contractor shall have the option of using an on-site batching and mixing facility. The method of measuring materials, batching operation, and mixer shall be submitted for review by the Contracting Officer. On-site plant shall conform to the requirements of either ASTM C 94 or ASTM C 685.

2.1.2 Portland Cement

Portland Cement shall conform to ASTM C 150, Type I or II, low alkali.

2.1.3 Pozzolan

Pozzolan shall be Class F or C fly ash conforming to ASTM C 618.

2.1.4 Sand

Sand shall meet the requirements of fine aggregate of ASTM C 33/C 33M.

2.1.5 Fluidifier

The fluidifier shall give the CLSM fill the following salient characteristics:

a. must have less than 1 percent bleed water in accordance with ASTM C 940

b. have an initial set time of more than 5 hours in accordance with ASTM C 220 modified by using a Ferioli apparatus

c. have a flow consistency equal to or more than 8 inches in accordance with ASTM D 6103

d. have a compressive strength of 100 psi at 28 days in accordance with ASTM D 4832

e. maintain a homogeneous mixture during pumping

1. Quantity of admixture(s) required in the mixture proportion is governed by the salient characteristics specified.

2. The admixture shall be added as directed by the manufacturer, in most cases it added to the CLSM at the job site and mixed for a minimum of 5 minutes at mixing speed.

f. Required maximum field permeability of $5x10^{-6}$ cm/sec.

2.1.6 Water

Water shall be potable water that is fresh, clean, and free from sewage, oil, acid, alkali, salts, or organic matter.

2.2 MIXING AND TRANSPORTING

The CLSM shall be mixed and transported in accordance with ASTM C 94.

PART 3 EXECUTION

3.1 TRENCH PREPARATION

Once the trench has been dug it shall be cleaned of all loose material and debris to the satisfaction of the Contracting Officer before any CLSM fill is placed. The new utility pipeline shall be placed on firm ground at the bottom of the trench, CLSM fill shall be placed between the trench walls and the sides of the pipe, and a minimum of 1 foot of CLSM fill shall be placed above the top of the pipeline. The pipeline shall be securely anchored to maintain its position and prevent it from any movement during placement of the CLSM.

3.2 PLACEMENT

3.2.1 General

CLSM placement shall not be permitted when, in the opinion of the Contracting Officer, weather conditions prevent proper placement. When CLSM is mixed and/or transported by a truck mixer, the CLSM shall be delivered to the site of the work and discharge shall be completed within 1-1/2 hours (or 45 minutes when the placing temperature is 85 degrees F or greater unless a retarding admixture is used). The fluidifier shall not be added to the Ready Mix trucks until they have arrived onsite. The fluidifier shall be added to each truck at the proper dosage rate and mixed for 5 minutes and no more than 15 minutes before it is placed. CLSM shall be conveyed from the mixer to point of placement as rapidly as practicable by methods which prevent segregation or loss of ingredients.

3.2.2 Consolidation

Consolidation of the CLSM will not be required.

3.3 TESTS

3.3.1 General

The individuals who sample and test CLSM as required in this specification shall have demonstrated a knowledge and ability to perform the necessary test procedures equivalent to ACI minimum guidelines for certification of concrete Field Testing Technicians, Grade I.

3.3.2 Inspection Details and Frequency of Testing

3.3.2.1 Flow Consistency

Flow consistency shall be checked once during each shift that CLSM is produced for each class of concrete required. Samples shall be obtained in accordance with ASTM D 5971 and tested in accordance with ASTM D 6103. Whenever a test result is outside the specifications limits, the CLSM shall not be delivered to the placement and an adjustment should be made in the batch weights of water and fine aggregate. The adjustments are to be made so that the water-cement ratio does not exceed that specified in the submitted CLSM mixture proportion.

3.3.2.2 Compressive-Strength Specimens

At least one set of test specimens shall be made each day on CLSM placed during the day or every 10 cubic yards placed. Additional sets of test cylinders shall be made, as directed by the Contracting Officer, when the mixture proportions are changed or when low strengths are detected. A random sampling plan shall be developed by the Contractor and approved by the Contracting Officer prior to the start of construction. The plan shall assure that sampling is accomplished in a completely random and unbiased manner. A set of test specimens for concrete with strength as specified in paragraph DESIGN REQUIREMENTS shall consist of six cylinders, one tested at 7 days, one tested at 14 days, and two tested at 28 days. Two cylinders shall be tested as directed. Test specimens shall be molded and cured in accordance with ASTM D 4832 and tested in accordance with ASTM D 4832. All

compressive strength tests shall be reported immediately to the Contracting Officer.

3.3.3 Density

At least one set of test specimens shall be made each day on CLSM placed during the day or every 20 cubic yards placed. A random sampling plan shall be developed by the Contractor and approved by the Contracting Officer prior to the start of construction. The plan shall assure that sampling is accomplished in a completely random and unbiased manner. Test procedures and calculations shall be in accordance with ASTM D 6023.

3.3.4 Reports

The Contractor shall prepare reports of all tests and inspections conducted at the project site.

-- End of Section --

SECTION 31 00 00.00 13

EARTHWORK
01/02

PART 1 GENERAL

1.1 REFERENCES

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

ASTM INTERNATIONAL (ASTM)

ASTM C 117	(2004) Standard Test Method for Materials Finer than 75-um (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C 136	(2006) Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM D 422	(1963; R 2007) Particle Size Analysis of Soils
ASTM D 698	(2007e1) Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3) (600 KN-m/m3)
ASTM D 1556	(2007) Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D 2487	(2010) Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D 2488	(2009a) Description and Identification of Soils (Visual-Manual Procedure)
ASTM D 4318	(2010) Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D 6938	(2010) Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

1.2 SUBMITTALS

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

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

SD-01 Preconstruction Submittals

Dewatering Plan

Submit plan for accomplishing dewatering work.

Earthwork and Grading Plan; G, Geo

Submit a work plan detailing the proposed construction sequence, methodology, and schedule of all earthwork and grading.

SD-06 Test Reports

Initial Test Results; G, Geo

Prior to placement of material for use in fill or backfill initial testing shall be completed and the results provided to the Government to verify that material meets the requirements for which it is specified.

Testing;

A summary of testing results indicated in paragraph TESTING shall be submitted when the site work is substantially complete. The Contracting Officer shall be informed of test results daily for direction on corrective action required. Draft copies of field testing results shall be furnished to the Contracting Officer on a frequent and regular basis as directed, but do not need to be formally transmitted through the submittal process.

Daily Report Forms;

A compilation of the daily report forms for earthwork observation ordered by date shall be submitted when the work is substantially complete. Preliminary copies shall be furnished to the Contracting Officer on a weekly or monthly basis as directed, but do not need to be formally transmitted through the submittal process.

1.3 SUBSURFACE INFORMATION

1.3.1 Boring Logs

Boring logs obtained for this project are shown in the contract drawings. The borings are representative of subsurface conditions at their respective locations. Variations in the stratigraphy and characteristics of the soil are known to occur between borings. Normal variations in site geology will not be considered as differing materially within the purview of CONTRACT CLAUSE 52.236-2, DIFFERING SITE CONDITIONS. Ground water elevations measured in borings are not constant and will fluctuate.

PART 2 PRODUCTS

2.1 DEFINITIONS

2.1.1 Satisfactory Materials

All material placed as compacted fill, semi-compacted fill, or backfill shall consist of material classified by ASTM D 2487 as GW, GP, GC, GM, SP, SM, SC, CL, CH or SW. The material shall be free of ice, snow, frozen earth, trash, debris, sod, roots, organic matter, and stones larger than 3 inches in any dimension. All materials shall be of a character and quality satisfactory for the purpose intended, and meet the applicable material specifications.

2.1.2 Unsatisfactory Materials

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

2.1.3 Cohesionless and Cohesive Materials

Cohesionless materials include materials classified in ASTM D 2487 as GW, GP, SW, or SP. Cohesive materials include materials classified as GC, SC, ML, CL, MH, or CH. Materials classified as GM and SM will be identified as cohesionless only when the fines are nonplastic.

2.1.4 Proctor

Degree of compaction required is expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D 698. The maximum density is hereafter abbreviated as the "Standard Proctor" or "Proctor" value. The optimum moisture content, w_o, is the water content at which the soil is compacted to the maximum density as determined during the test procedure presented in ASTM D 698.

2.2 MATERIALS

2.2.1 Select Granular Fill

Select granular material shall contain not more than 5 percent by weight of material passing the No. 200 sieve and no less than 95 percent by weight passing the 3/4 inch sieve. The maximum allowable aggregate size shall be 1-1/2 inches.

2.2.2 Granular Fill

Granular material shall contain not more than 12 percent by weight of material passing the No. 200 sieve.

2.2.3 Impervious Fill

Impervious fill shall meet requirements for satisfactory cohesive material and shall have a plasticity index less than 55, and be classified by ASTM D 2487 as CL or CH.

2.2.4 Select Impervious Fill

Select impervious fill shall meet requirements for satisfactory cohesive material, shall have a plasticity index less than 30, and a clay fraction less than 40 percent by weight finer than 0.002 mm, and be classified by ASTM D 2487 as CL or CH.

2.2.5 Random Fill

Random fill shall consist of native materials meeting the requirements for satisfactory material.

2.2.6 Topsoil

Material suitable for topsoil shall be obtained from stripping operations. Topsoil used in the project shall be natural, friable soil, free of subsoil, stumps, rocks larger than one inch diameter, brush, weeds, toxic substances, and other material detrimental to plant growth.

2.3 COMPACTION CONSTRUCTION EQUIPMENT

Compaction equipment shall consist of sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, or other approved equipment well suited to the soil type being compacted. Water flooding or jetting methods of compaction will not be permitted for any soil types. Sprinkling equipment for cohesive soils shall apply water uniformly, in controlled quantities, and be capable of variable application widths.

2.3.1 Compaction of Embedded Levees and Levees

Use of sheepsfoot rollers (vibratory or non-vibratory), or scarification between lifts, is required for construction of embedded levees and levees. Construction equipment and methods shall avoid poor bonding between lifts, characterized by layered or laminated texture at the lift interfaces. Smooth surfaces (such as produced from smooth drum rollers, rubber tired rollers, and construction traffic) shall be scarified prior to placing subsequent lifts.

2.3.2 Compaction of Excavated Material Berms

Compaction of the excavated material berms shall be by the means and methods to meet the required density specified.

2.3.3 Compaction of Excavated Material Piles

Compaction of the excavated material piles is not required. Placement shall be spread uniformly and in layers not exceeding 24 inches.

PART 3 EXECUTION

3.1 CLASSIFICATION OF SOIL MATERIALS

Classification of soil materials shall be performed by the Contractor in accordance with ASTM D 2488. The Contracting Officer reserves the right to revise the Contractor classifications. In the case of disagreement, the Contracting Officer's classification will govern unless the soils are classified in accordance with ASTM D 2487. Not withstanding provisions of CONTRACT CLAUSE 52.246-12 INSPECTION OF CONSTRUCTION, testing completed by the Contractor in conjunction with soil material classification will be considered incidental to the contract work.

3.2 EARTHWORK AND GRADING PLAN

The submitted earthwork and grading work plan shall include early and late start and finish dates as well as float, and each item shall be broken down into sub-activities with a maximum one-month duration. The plan shall identify excavation and placement areas anticipated for each month of the scheduled work. The plan should include details on each of the work activities as well as the estimated quantities on a monthly basis for each item. Show proposed haul routes between the stripping and stockpile locations, and also between the Diversion Channel Excavation and placement in the Excavated Material Berms (EMB) or in the excavated material piles.

3.3 STOCKPILES

Stockpiles shall be kept in a neat and well drained condition, giving due consideration to drainage at all times. The ground surface at stockpile locations shall be cleared, grubbed, and sealed. Satisfactory and unsatisfactory materials shall be separately stockpiled. Stockpiles of satisfactory materials shall be protected from contamination which may destroy the quality and fitness of the stockpiled material.

3.4 STRIPPING OF TOPSOIL

Topsoil shall be stripped from the areas and to the depth indicated on the contract drawings or as instructed by the Contracting Officer. Topsoil shall be spread on areas already graded and prepared for topsoil, or transported and deposited in stockpiles convenient to areas that are to receive topsoil later, or at locations indicated or specified. Topsoil shall be kept separate from other excavated materials, brush, litter, objectionable weeds, roots, stones larger than 1 inch in diameter, and other materials that would interfere with planting and maintenance operations. Any surplus of topsoil from excavations and grading shall be spread on the EMB's or as directed by the Contracting Officer.

3.4.1 Stripping of EMB

Stripping or removal of topsoil or vegetation from the area under the EMB footprint is not required prior to placement of excavated material. The Contractor may strip areas within the EMB footprint to obtain the required

topsoil. Clearing and grubbing within the limits of the EMB footprint shall be performed prior to placement of excavated material.

3.4.2 Stripping under Embedded Levees and Levees

Topsoil shall be stripped from all areas to the depth shown on the drawings upon which embedded levees or levees will be constructed.

3.5 EXCAVATION

After topsoil removal has been completed, excavation of every description, regardless of material encountered, within the grading limits of the project shall be performed to the lines and grades indicated. Excavation material suitable for use as fill shall be transported to and placed in fill areas within the limits of the work. All unsatisfactory material, including any soil which is disturbed by the Contractor's operations or softened due to exposure to the elements and water, shall be placed in the **designated areas** of the Excavated Material Berms or Excavated Material Piles. Excavations carried below the depths indicated shall be refilled to the proper grade with satisfactory material. During construction, excavation and fill shall be performed in a manner and sequence that will provide proper drainage at all times.

The Contractor shall be sensitive to water ponding on fields adjacent to the project throughout construction. Due to the large Excavated Material Berms that will negatively impact existing drainage measures, the Contractor shall take all steps necessary to maintain drainage flow from the fields. This work includes, but is not limited to, installation of side ditch inlets and ditching to maintain sufficient drainage from the fields. Additional steps shall be taken at the direction of the Contracting Officer.

3.5.1 Changes and Differing Site Conditions

Any excavation subgrades that are unstable, pump, rut excessively, reveal soil conditions that are substantially different from that indicated in the contract, or are unsuitable for proceeding with the work shall immediately be reported to the Contracting Officer. In the event that it is necessary to remove material to a depth greater than specified, the Contracting Officer will provide direction for changed work; and an adjustment in the contract price will be considered in accordance with the contract. Unsatisfactory material encountered below the grades shown shall be removed as directed. Determination of elevations and measurements of approved overdepth excavation of unsatisfactory material below grades indicated shall be done under the direction of the Contracting Officer. The Contracting Officer shall be notified prior to proceeding with any unauthorized work. Additional work not authorized by the Contracting Officer shall be at the Contractor's expense.

3.6 WINTER CONSTRUCTION

3.6.1 Excavation During Winter Conditions

For any excavation work completed during winter conditions when freezing conditions would cause the placement of material that has become frozen, the Contractor may temporarily stockpile frozen material in the landward third

of the EMB or in a location as approved by the Contracting Officer. At no time shall frozen material be stockpiled closer to the diversion channel than the **landward one third of the EMB**. As soon as conditions permit, frozen stockpiled material that has thawed shall be placed and graded in not more than the maximum lift thicknesses allowed.

3.6.1.1 Operation During Winter Conditions

The Contractor shall be required to maintain a 24 hour per day, seven day a week operation during winter conditions to minimize the amount of excavated material from becoming frozen. The Contractor shall utilize equipment and labor forces that are sufficient in size and number and in a manner that results in minimal issues with freezing of the excavation material. **Winter operation shall be defined as when frost depth of the excavated material is greater than 3 inches.**

3.6.1.2 Snow Removal During Winter Conditions

Snow cover shall be cleared from the areas of work prior to construction and be kept clear of snow during construction. Disposal of snow within the Excavated Material Berms shall not be permitted. The methodology to clear and dispose of the snow shall be subject to the acceptance of the Contracting Officer. The Contractor will also be responsible for all snow clearing of the site work roads within the limits of the work.

3.7 DITCHES AND CHANNEL

Ditches and the diversion channel shall be cut accurately to the cross sections and grades indicated. Ditches shall be finished in a manner that will result in effective drainage. All roots, stumps, rock, and foreign matter in the sides and bottom of ditches and the diversion channel shall be trimmed and dressed or removed to conform to the slope, grade and shape of the section indicated. Care shall be taken not to excavate below the grades indicated. Excessive excavation shall be backfilled to grade with properly placed and compacted material. The diversion channel and all ditches excavated under this section shall be maintained until final acceptance of the work. Satisfactory material excavated from ditches and the diversion channel shall be placed in fill areas of the Excavated Material Berms.

3.8 BORROW MATERIAL

Borrow material shall be selected to meet the requirements and conditions of the particular fill or embankment for which it is to be used. All cohesive borrow material shall be obtained from the diversion channel excavation. Necessary clearing, grubbing, and drainage of the diversion channel excavation and the disposal of debris thereon shall be considered related operations to the borrow excavation.

3.8.1 Utilization of Excavated Materials

Material removed from diversion channel excavations shall be incorporated in the work insofar as practicable. No excavated material that is satisfactory for use as fill shall be wasted without specific written authorization.

3.9 EMBANKMENTS

Fills and embankments shall be constructed at the locations and to lines and grades indicated. Fill shall meet the material specifications for the zones indicated on the drawings. The material shall be placed in successive horizontal layers for the full width of the cross section and shall be compacted as specified. Each layer shall be compacted before the overlaying lift is placed. Fill material needed to create the Excavated Material Berm configuration shall be placed to balance the excavation quantity.

3.10 STRUCTURES

3.10.1 General

Excavation shall conform to the dimensions and elevations indicated for each structure and footing including necessary oversizing. Excavations shall extend a sufficient distance from walls and footings to allow for placing and removal of forms.

3.10.2 Overdepth Excavation

Excavations below indicated depths will not be permitted except to remove unsatisfactory material. Material removed below the depths indicated or beyond the tolerances specified shall be replaced with properly placed and compacted fill at no additional cost to the Government, except that concrete footings may be increased in thickness to the bottom of the overdepth excavation if approved by the Contracting Officer.

3.10.3 Drainage

Surface water shall be directed away from excavation and construction sites so as to prevent erosion and undermining of foundations. Drainage shall not be redirected into any areas that adversely affect others. Diversion ditches, dikes and grading shall be provided and maintained as necessary during construction. Excavated slopes and backfill surfaces shall be protected to prevent erosion and sloughing. Excavation shall be performed so that the site and the area immediately surrounding the site and affecting operations at the site shall be continually and effectively drained.

3.10.4 Footing Excavation

Excavation to final grade of all surfaces to support concrete shall not be made until just before concrete is to be placed. In areas of structures with shallow foundations, granular subgrades shall be surface compacted with at least two passes using a vibratory compactor. High plasticity clays shall be protected to avoid desiccation prior to concrete placement.

3.10.5 Backfilling

Backfilling shall not begin until construction below finish grade has been approved, concrete forms have been removed and the excavation cleaned of frost, trash and debris. Backfill shall not be placed against foundation walls prior to 7 days after completion of the walls. As far as practicable, backfill shall be brought up evenly on each side of the wall. Trenches not immediately backfilled to grade shall be sloped to drain if practicable.

Heavy equipment for spreading and compacting backfill shall not be operated closer to a foundation or other underground structural element than a distance equal to the height of backfill above the top of footing; the area remaining shall be compacted with power driven hand tampers suitable for the material being compacted.

3.11 LEVEES

3.11.1 Embedded Levees and Levees

Embedded Levees and Levees shall be constructed at the locations and to lines and grades indicated. Fill shall meet the material specifications for the zones indicated on the drawings. The material shall be placed in successive horizontal layers for the full width of the cross section and shall be compacted as specified. Each layer shall be compacted as specified in paragraph COMPACTION before the overlaying lift is placed.

3.12 SUBGRADE PREPARATION

All areas upon which Embedded Levee and Levee fill is to be placed shall be stripped before the fill is started. Material shall not be placed on surfaces that are muddy, frozen, contain frost, or where unsatisfactory material remains in or under the fill. For cohesionless soils, the subgrade surface shall be compacted to at least 100 Percent of the Standard Proctor density. For cohesive soils, the subgrade shall be proof rolled with rubber tired equipment and any soft areas shall be brought to the Contracting Officer's attention. Sloped ground surfaces steeper than one vertical to four horizontal on which fill is to be placed shall be stepped such that the fill material will bond with the existing surface. The existing surface shall also be scarified prior to placement of the first lift of fill to enhance the bonding between the two materials.

3.12.1 Subgrade Correction

Soft or otherwise unsatisfactory material shall generally be removed and replaced with satisfactory excavated material or other approved material as directed. Low areas resulting from removal of unsatisfactory material shall be brought up to required grade with satisfactory materials, and the entire subgrade shall be shaped to line, grade, and cross section and compacted as specified.

3.13 FINISHING

All areas covered by the project, including excavated and filled sections and adjacent transition areas, shall be uniformly smooth-graded. The finished surface shall be reasonably smooth, compacted, and free from irregular surface changes. The degree of finish shall be that ordinarily obtainable from blade-grader operations, except as otherwise specified. Ditches shall be finished to permit adequate drainage. The surface of areas to be turfed shall be finished to a smoothness suitable for the application of turfing.

3.13.1 Roadway Subgrade Tolerances

When the final layer of base has been completed, and at the time any additional construction is to be placed thereon, the finished surface of the base shall not vary more than 0.05 feet from the plan elevation.

3.13.2 Diversion Channel Tolerance

The finished surface of the diversion channel bottom and side slopes including the low flow channel, shall not vary more than 0.25 feet from the plan elevation.

3.13.3 Right Bank Excavated Material Berm

The finished surface of the Right Bank Excavated Material Berm shall not be greater than or less than 0.5 feet from the line and grades shown on the contract drawings.

3.13.4 Left Bank Excavated Material Berm

The finished surface of the Left Bank Excavated Material Berm shall not be greater than maximum neatline nor less than the minimum neatline shown on the contract drawings. The Contractor shall finish the Left Bank EMB with the same general configuration between the neatlines (same approximate elevation for the top of slopes on each side of the EMB and a 2% slope to the crest).

3.14 PLACING TOPSOIL

Topsoil placement shall be staged such that construction traffic for hauling material does not travel over the topsoil after it is placed. Topsoil shall be spread with a low ground pressure dozer, skid steer loaders, or other equipment capable of lightly compacting the soil and approved by the Contracting Officer.

3.15 COMPACTION

3.15.1 Moisture Control

Control of moisture in the fill shall be maintained to provide acceptable compaction. The moisture content after compaction shall be within the limits of 3 percentage points above the optimum and 2 percentage points below the optimum moisture content as determined by field moisture density tests. Dried or crusted cohesive soils shall be plowed, disked or otherwise broken up before compaction. If water is added to fills, the layer shall be spread in even lifts, moistened as necessary, thoroughly mixed, and compacted. Fill too wet to achieve proper compaction shall require drying prior to placement. Possible drying methods include spreading and disking of soil prior to placing in fill.

3.15.2 Placement And Compaction

Each layer shall be spread uniformly on an acceptable soil surface. The type of fill, its maximum uncompacted lift thickness, and the minimum

compaction requirements (Percent of Standard Proctor density) to which each type of fill shall be compacted shall be as listed below.

Fill Zone	Maximum Uncompacted Lift Thickness (inches)	Percent of Standard Proctor Density	Moisture Control Required
General Grading	12	90	No
Structure Subgrades and Foundation Slabs	9	100	Yes
Structure Backfill	12	95	Yes
Levees	9	95	Yes
Embedded Levees	12	90	No
Excavated Material Berms	18	85	No
Utility Backfill	Use specification for zone where utility is located.		

a. Fill materials shall be placed in horizontal layers not exceeding 6 inches loose depth when hand operated compactors are used.

b. Embankments and subgrade under roadways shall be compacted to at least the Percent of Standard Proctor density as follows:

(1) For fill sections the top 36 inches below the aggregate base course shall be placed in uncompacted lifts not exceeding 9 inches and compacted to at least 100 Percent of the Standard Proctor density.

(2) For cut sections in cohesionless soils the subgrade surface shall be compacted to at least 100 Percent of the Standard Proctor density. For cut sections in cohesive soils, the subgrade shall be proof rolled and any soft areas shall be brought to the Contracting Officer's attention.

3.16 TESTING

3.16.1 General

All testing expenses shall be the Contractor's responsibility. Prior to sampling and testing the work, testing laboratories shall be inspected and approved in accordance with SECTION 01 45 04.00 13 CONTRACTOR QUALITY CONTROL. The Contracting Officer reserves the right to direct the location and select the material for samples to be tested and to direct where and when tests shall be performed.

3.16.2 Field Density Tests

Report forms for summaries of field density tests shall include, at a minimum, information shown below. Additional data required by the applicable ASTM test methods shall be kept on file by the Contractor. Tests shall be numbered sequentially throughout the job, and retests shall reference the original test number (1A, 1B, etc.).

1. Test Number
2. Dry density, water content and gravel content of field test
3. Proctor Number, maximum dry density, optimum water content, and gravel content of Proctor test
4. Percent of Standard Proctor density
5. Each test shall be plotted on the graphic presentation of the applicable Proctor test. Multiple field test results may be on one graph, provided each test is clearly marked, the Proctor test results are clearly marked and distinguishable from the field test results, and only one Proctor test applies to all the field tests.

3.16.3 Proctor Tests

Report forms for summaries of Proctor tests shall include the minimum information. A Proctor test includes sufficient individual samples (at least 4) of varying moisture content to generate a plot showing the maximum density and corresponding moisture content. Additional data required by the applicable ASTM test methods shall be kept on file by the Contractor. Jar samples shall be retained by the testing laboratory for each Proctor test until field testing is completed.

1. Test Number and method
2. Sample location and visual soil description
3. maximum dry density, and optimum water content
4. gravel contents in sample and test specimens
5. A graph of the moisture-density relationship

3.16.4 Corrective Action

Tests of materials which do not meet the contract requirements (failing test) will not be counted as part of the required testing. Each such failing test must be retaken at the same location as the failing test was taken. If testing indicates material does not meet the contract requirements, the material represented by the failing test shall not be placed in the contract work or shall be recompacted or removed. The quantity of material represented by the failing test shall be determined by the Contracting Officer up to the quantity represented by the testing frequency. The Contractor may increase testing frequency in the vicinity of a failing test in order to reduce removal requirements, as approved by the Contracting Officer. Such increases in testing frequency shall be at the Contractor's expense and at no additional cost to the Government.

3.16.5 Testing Schedule

a. Moisture-Density Relations (ASTM D 698)

   One test for each material variation and one test per 20,000 cubic yards of excavation.

b. In-Place Densities (ASTM D 1556 or ASTM D 6938)

(1) Embedded Levee. One test per 1,000 linear feet, or fraction thereof, of each lift of select impervious fill in the embedded levee.

(2) Excavated Material Berm. One test per 20,000 square yards, or fraction thereof, of each lift of fill of the excavated material berms. Test shall be distributed over the footprint of the EMB.

(3) Structure foundations, not less than 1 test for each 2 vertical feet of fill.

(4) Utility trench backfill below pavements, not less than 1 test per 2 vertical feet per 300 linear feet.

c. Percent Passing No. 200 sieve (ASTM C 117)

(1) Select Granular Fill, 1 test per [1,000 CY] of fill placed, not less than 1 test for each source placed.

(2) Granular Fill, 1 test per [5,000 CY] of fill placed, not less than 1 test for each source.

d. Sieve Analysis, (ASTM C 136)

(1) Select Granular Fill, 1 test for each source

e. Plasticity Index (ASTM D 4318)

(1) Cohesive soils, 1 test for each Proctor test.

f. Clay Faction (percent smaller than 0.002 mm, determined in accordance with ASTM D 422)

(1) Select impervious fill, 1 test per 5,000 CY of fill

3.17 NUCLEAR DENSITY TESTING EQUIPMENT

Nuclear density testing equipment shall be used in general accordance with ASTM D 6938. In addition, the following conditions shall apply:

a. Prior to using the nuclear density testing equipment on the site, the Contractor shall submit to the Contracting Officer a certification that the operator has completed a training course approved by the nuclear density testing equipment manufacturer, the most recent data sheet from the manufacturer's calibration, and a copy of the most recent statistical check of the standard count precision.

b. The first test and every tenth test thereafter shall include a sand cone correlation test. The sand cone test shall be centered over the prepared surface for the nuclear test, shall include a nominal 6 inch diameter sand cone, and shall include a minimum wet soil weight of 6 pounds extracted from the hole. In addition, testing of aggregate

base soils shall include a minimum of 3 sand cone correlations for each day of testing; and testing of bituminous shall include a minimum of 3 core densities for each day of testing. The density correlations shall be submitted with test results. Each transmittal including density test data shall include a summary of all density correlations for the job neatly prepared on a summary sheet including at a minimum:

(1) date, meter serial number and operators initials.
(2) standard count and adjustment data for each test.
(3) material type.
(4) probe depth.
(5) moisture content by each test method and the deviation.
(6) wet density by each test method and the deviation.

c. The nuclear density testing equipment shall be capable of extending a probe a minimum of 6 inches down into a hole. The probe shall generally be extended to the maximum depth obtainable.

d. Nuclear density testing equipment used within 2 vertical feet from the existing ground water level, 5 horizontal feet from a vertical wall or massive concrete structure, or in a trench shall have the standard count changed before and after each test, or the manufacturers published correction procedure shall be followed.

e. Nuclear density testing equipment shall not be used during rain.

3.18 SUBGRADE AND EMBANKMENT PROTECTION

Compacted subgrades that are disturbed by the Contractor's operations or adverse weather shall be scarified and compacted as specified herein to the required density prior to further construction thereon. Subgrades not meeting the specifications for finish, material type and density at the time of surface material placement shall be corrected at the Contractor's expense. Cohesive embankments and subgrades shall be kept crowned or sloped for drainage. Newly graded areas shall be protected from traffic and erosion. Any settlement or washing away that may occur from any cause shall be repaired. No base course or pavement shall be laid until the subgrade has been checked and approved by the Contracting Officer. Ditches and drains along subgrade shall be maintained to provide effective drainage. All work shall implement best management practices for erosion control.

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CLEARING AND GRUBBING
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SECTION 31 11 00

CLEARING AND GRUBBING
04/06

PART 1 GENERAL

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 PROTECTION

3.1.1 Roads

Keep roads free of dirt and debris at all times.

3.1.2 Trees, Shrubs, and Existing Facilities

Trees and vegetation to be left standing shall be protected from damage incident to clearing, grubbing, and construction operations by the erection of barriers or by such other means as the circumstances require.

3.1.3 Utility Lines

Protect existing utility lines that are indicated to remain free from damage. Notify the Contracting Officer immediately of damage to or an encounter with an unknown existing utility line. The Contractor shall be responsible for the repairs of damage to existing utility lines that are indicated or made known to the Contractor prior to start of clearing and grubbing operations.

3.2 CLEARING

Clearing shall consist of the felling, trimming, and cutting of trees into sections and the satisfactory disposal of the trees and other vegetation designated for removal, including downed timber, snags, brush, and rubbish occurring within the areas to be cleared. Clearing operations shall include complete removal and disposal of all obstructions six inches or more above the ground and of any other objectionable matter above the ground surface. Clearing limits are determined by the limits of work.

3.3 GRUBBING

Grubbing shall consist of the removal and disposal of stumps, roots larger than 3 inches in diameter, matted roots and the removal and disposal of other objectionable organic material below the ground surface from the designated grubbing areas. Grubbing limits are determined by the limits of work.

3.4 DISPOSAL OF CLEARING AND GRUBBING DEBRIS

3.4.1 Burning

Burning will not be permitted at the project site.

3.4.2 Saleable Timber

In the interest of conservation, the Contractor shall make a reasonable effort to utilize timber for some useful purpose, including saw logs, pulpwood, posts, poles, ties, firewood or mulch.

3.4.3 Nonsaleable Materials

Logs, stumps, roots, brush, rotten wood, and other refuse from the clearing and grubbing operations, except for salable timber, shall be disposed of in an approved disposal area outside the project work area.

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EXCAVATION, TRENCHING AND BACKFILLING FOR UTILITY SYSTEMS

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SECTION 31 23 33.00 13

EXCAVATION, TRENCHING AND BACKFILLING FOR UTILITY SYSTEMS

PART 1 GENERAL

1.1 REFERENCES

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

ASTM INTERNATIONAL (ASTM)

ASTM D 698	(2007e1) Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/cu. ft. (600 kN-m/cu. m.))
ASTM D 1556	(2007) Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D 2487	(2011) Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D 6938	(2010) Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2008; Errata 1-2010; Changes 1-3 2010; Changes 4-6 2011) Safety and Health Requirements Manual

1.2 MEASUREMENT AND PAYMENT

The work of this section will not be measured for payment. The Contractor shall include compensation for excavating, trenching and backfilling in the most applicable contract line items in the bidding schedule.

1.3 RELATED WORK OF OTHER SECTIONS

Material definitions, backfill compaction and testing requirements are covered in SECTION 31 00 00.00 13 EARTHWORK.

1.4 DEFINITIONS

Reference to pipes shall include conduits, cables, or other utility systems. Appurtenant structures include manholes, catch basins, inlets, outlets, energy dissipators, or similar structures.

PART 2 PRODUCTS

2.1 MATERIALS

In addition to the definitions below, material definitions shall be as specified in SECTION 31 00 00.00 13 EARTHWORK.

2.1.1 Unyielding Material

Unyielding material shall consist of rock and gravelly soils with stones greater than 3 inches in any dimension or as defined by the pipe manufacturer, whichever is smaller.

2.1.2 Unstable Material

Unstable material shall consist of materials too soft and/or compressible to properly support the pipe or appurtenant structure.

2.1.3 Select Granular Material

Select granular material shall consist of well-graded sand, gravel, crushed gravel, crushed stone or crushed slag composed of hard, tough and durable particles, and shall contain not more than 5 percent by weight of material passing a No. 200 mesh sieve and no less than 95 percent by weight passing the 3/4 inch sieve.

2.2 PLASTIC MARKING TAPE

Plastic marking tape shall be acid and alkali-resistant polyethylene film, 6 inches wide with minimum thickness of 0.004 inch. Tape shall have a minimum strength of 1750 psi lengthwise and 1500 psi crosswise. The tape shall be manufactured with integral wires, foil backing or other means to enable detection by a metal detector when the tape is buried up to 3 feet deep. The tape shall be of a type specifically manufactured for marking and locating underground utilities. The metallic core of the tape shall be encased in a protective jacket or provided with other means to protect it from corrosion. Tape color shall be as specified in TABLE 1 and shall bear a continuous printed inscription describing the specific utility.

TABLE 1. Tape Color

Red:	Electric
Yellow:	Gas, Oil, Dangerous Materials
Orange:	Telephone, Telegraph, Television, Police, and Fire Communications
Blue:	Water Systems
Green:	Sewer Systems

PART 3 EXECUTION

3.1 EXCAVATION

Unless otherwise indicated, trench excavation shall be by open cut except that short sections may be jacked or bored if the utility can be safely and properly installed and ground loss can be properly controlled. All

excavation shall be constructed in accordance with the Safety and Health Requirements Manual (EM 385-1-1) and/or OSHA Standards. Allowable trench widths, depths, side slopes, sheet and bracing requirements, and other considerations are given in the OSHA Standard; and an abbreviated version is given in the Safety and Health Requirements Manual. Provide full access to public/private premises and fire hydrants so as to prevent serious disruption of travel. Protect and maintain benchmarks and monuments during excavations.

3.1.1 Trench Excavation

Excavation shall be performed to the lines and grades indicated. During excavation, material satisfactory for backfilling shall be stockpiled in a neat and orderly manner at a sufficient distance from the banks of the trench to avoid overloading and to prevent slides or caving. Topsoil shall be stockpiled separately from suitable backfill material. Grading shall be done as may be necessary to prevent surface water from flowing into the excavation, and any water accumulating therein shall be removed to maintain the stability of the bottom and sides of the excavation. Unauthorized over excavation shall be backfilled at no additional cost to the Government.

3.1.1.1 Bottom Preparation

The bottoms of trenches shall be accurately graded to provide uniform bearing and support for the bottom quadrant of each section of the pipe. Pipe shall rest on undisturbed or properly placed and compacted soil along its entire length. Bell holes shall be excavated to the necessary size at each joint or coupling to eliminate point bearing. Stones of 3 inches or greater in any dimension, or as recommended by the pipe manufacturer, whichever is smaller, shall be removed to avoid point bearing.

3.1.1.2 Unyielding Material

Where unyielding material is encountered in the bottom of the trench, such material shall be removed 8 inches below the required grade and replaced with material matching the surrounding soils, except as provided below.

For levees or dikes, the replaced fill shall meet the requirements for the zone where it is located. Use of material more pervious than surrounding soils is not acceptable.

3.1.1.3 Unstable Material

Where wet, soft, unsuitable or otherwise unstable soil incapable of properly supporting pipe is encountered in the bottom of a trench or excavation, the Contractor shall immediately contact the Contracting Officer prior to proceeding with the associated work. When removal of unstable material is required due to inadequate shoring and sheeting, water removal, control of ground water or other similar operations, such unstable material shall be excavated and replaced with satisfactory material as directed at no additional cost to the Government.

3.1.1.4 Excavation for Appurtenances

Excavation for appurtenances shall be of sufficient size to permit the placement and removal of forms for the full length and width of structure

footings and foundations as shown. Removal of unstable material shall be as specified above. When concrete or masonry is to be placed in an excavated area, special care shall be taken not to disturb the bottom of the excavation. Excavation to the final grade level shall not be made until just before the concrete or masonry is to be placed.

3.1.2 Stockpiles

Stockpiles of satisfactory material shall be placed and graded as specified. Stockpiles shall be kept in a neat and well drained condition, giving due consideration to drainage at all times. The ground surface at stockpile locations shall be cleared, grubbed, and sealed. Excavated satisfactory and unsatisfactory materials shall be separately stockpiled. Stockpiles of satisfactory materials shall be protected 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, such material shall be removed and replaced with satisfactory material from approved sources at no additional cost to the Government.

3.2 BACKFILLING AND COMPACTION

Backfilling shall not begin until construction below finish grade has been approved, storm drainage systems have been inspected, tested and approved; concrete forms have been removed and the excavation cleaned of frost, trash and debris. Backfill shall not be placed against foundation walls prior to 7 days after completion of the walls. As far as practicable, backfill shall be brought up evenly on each side of the wall. Trenches not immediately backfilled to grade shall be sloped to drain if practicable. Heavy equipment for spreading and compacting backfill shall not be operated closer to a foundation or other underground structural element than a distance equal to the height of backfill above the top of footing; the area remaining shall be compacted with power driven hand tampers suitable for the material being compacted.

Backfill shall consist of satisfactory material meeting the requirements shown and specified. Compaction and testing requirements for backfill shall be as stated in Section 31 00 00.00 13 EARTHWORK.

3.2.1 Levees

Where pipes are located within the right of way of levees or dikes, all fill materials shall meet the type and classification for the fill zone where the trench is located. At the discretion of the US Army Corps of Engineers, new utility lines may be required to be encased in Controlled Low-Strength Material (CLSM). The portion of the trench in native soils shall be backfilled with the excavated material that matches the surrounding soils.

3.2.2 Bedding and Initial Backfill

Bedding shall be of the type and thickness shown. Initial backfill material shall be placed and compacted with manual tampers to a height above the pipe necessary to prevent damage, but not less than one foot. The backfill shall be brought up evenly on both sides of the pipe for the full length of the pipe. Care shall be taken to ensure thorough compaction of the fill under the haunches of the pipe.

3.2.3 Backfill for Appurtenances

After the structure has been constructed and the concrete has been allowed to cure for 7 days, backfill shall be placed in such a manner that the structure will not be damaged by the shock of falling earth. The backfill material shall be deposited and compacted as specified for final backfill, and shall be brought up evenly on all sides of the structure to prevent eccentric loading and excessive stress.

3.3 SPECIAL REQUIREMENTS

3.3.1 Burial Depth

Burial Depth of specific utilities is given below:

a. Water lines. Trenches shall be of a depth to provide a minimum cover of 7 feet from the existing ground surface or from the indicated finished grade (whichever is lower) to the top of the pipe, unless otherwise indicated.

3.3.2 Plastic Marking Tape

Warning tapes shall be installed directly above the pipe, at a depth of 18 inches below finished grade unless otherwise shown.

3.4 TESTING

Testing shall be the responsibility of the Contractor and shall be performed at no additional cost to the Government. Testing shall be performed in accordance with SECTION 01 45 04.00 13 CONTRACTOR QUALITY CONTROL (QCS).

3.4.1 Testing of Backfill Materials

Classification of backfill materials shall be determined in accordance with ASTM D 2487 and the moisture-density relations of soils shall be determined in accordance with ASTM D 698. A minimum of one soil classification and one moisture-density relation test shall be performed on each different type of material used for bedding and backfill.

3.4.2 Field Density Tests

Tests shall be performed in sufficient numbers to ensure that the specified density is being obtained. A minimum of one field density test for each 2 vertical feet of backfill for every 300 feet of installation shall be performed. One moisture density relationship shall be determined for every 1,500 cubic yards of material used. Field in-place density shall be determined in accordance with ASTM D 1556 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 publication. 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. 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, at intervals as directed by the Contracting Officer. Copies of calibration curves, results

of calibration tests, and field and laboratory density tests shall be furnished to the Contracting Officer. Trenches improperly compacted shall be reopened to the depth directed, then refilled and compacted to the density specified at no additional cost to the Government.

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AGGREGATE BASE COURSE
10/2006

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SECTION 32 11 16.00 13

AGGREGATE BASE COURSE
10/2006

PART 1 GENERAL

1.1 REFERENCES

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION (NDDOT) Standard Specifications for Road and Bridge Construction

NDDOT 151	(2008) General Equipment
NDDOT 302	(2008) Salvaged Base Course, Aggregate Base Course, or Aggregate Surface Course
NDDOT 709	(2008) Geotextile Fabrics (Installation)
NDDOT 816	(2008) Aggregates
NDDOT 858	(2008) Geotextile Fabrics (Materials)

ASTM INTERNATIONAL (ASTM)

ASTM C 117	(2004) Standard Test Method for Materials Finer than 75-um (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C 136	(2006) Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates

1.2 SUBMITTALS

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

SD-01 Preconstruction Submittals

Aggregate Sources

Material sources as specified in Paragraph MATERIAL SOURCES.

SD-03 Product Data

Geotextile Data;

Catalog cuts or technical data sheet shall be submitted for the geotextile showing that the product meets the specifications.

SD-04 Samples

Aggregate Samples

Samples of aggregate as specified in Paragraph MATERIAL SOURCES.

SD-06 Test Reports

Testing

Testing results as specified in Paragraph TESTING.

PART 2 PRODUCTS

2.1 AGGREGATE BASE

NDDOT 816, gradation for aggregate base.

2.2 MATERIAL SOURCES

It shall be the responsibility of the Contractor to make its own investigations for a source of suitable materials and to make its own arrangements with the owners of the pits for procuring the required quantity of suitable material. The Contractor shall designate in writing only one source or one combination of sources from which it proposes to furnish aggregate. A 50 pound sample shall be provided to the Contracting Officer. Approval of samples from a source of aggregate is not to be construed as approval of all materials from that source. The right is reserved to reject materials from certain localized areas, zones, strata, or channels when such materials are unsuitable for aggregate as determined by the Contracting Officer. Materials produced from an approved source shall meet all the requirements of this section.

2.3 GEOTEXTILE

Geotextile shall meet the requirements of NDDOT 858, separation geotextile fabric (Type S1).

PART 3 EXECUTION

3.1 GENERAL

Aggregate base course shall be constructed in accordance with the requirements of NDDOT 302 unless specified otherwise.

3.1.1 Definitions

The term "Engineer" referenced in the state standard specifications shall mean the Contracting Officer.

3.2 EQUIPMENT

All plant, equipment, and tools used in the performance of the work will be subject to approval and shall be maintained in satisfactory working condition at all times. The equipment shall meet the requirements of the referenced state standard specification sections. The base course shall be compacted using a steel-wheeled roller, vibratory smooth drum roller, pneumatic-tired roller, unless other special compaction equipment is approved.

3.3 WEATHER LIMITATION

Base courses shall be placed when the atmospheric temperature is above 35 degrees F. Base shall not be constructed on subgrades that are frozen or contain frost. Areas of completed base course that are damaged by freezing, rainfall, or other weather conditions shall be corrected to meet specified requirements.

3.4 STOCKPILING MATERIAL

Prior to stockpiling of material, storage sites shall be cleared and leveled by the Contractor. Materials obtained from different sources shall be stockpiled separately.

3.5 PREPARATION OF SUBGRADE

Prior to constructing the aggregate base course, the subgrade shall be cleaned of all foreign substances. Ruts or soft, yielding spots in the subgrade, areas having inadequate compaction, and deviations of the surface from the requirements specified shall be corrected by loosening and removing soft or unsatisfactory material and by adding satisfactory material with a consistency and texture similar to the surrounding subgrade, reshaping to line and grade, and recompacting to specified density requirements. The finished subgrade shall not be disturbed by traffic or other operations and shall be maintained by the Contractor in a satisfactory condition until the base course is placed.

3.6 PROOF-ROLLING

The subgrade shall be proof-rolled prior to placing aggregate base. Proof-rolling shall be scheduled at a time when the Contracting Officer can observe, unless waived. Proof-rolling shall be accomplished within the limits of the work by passing a loaded 25 ton dump truck or rubber tired heavy equipment over the entire subgrade at a slow rate of speed. Proof-rolling shall be observed by a qualified observer not riding in the vehicle. Soft or loose areas identified by the proof-rolling and occurring in previously placed fill shall be tested for compaction where directed by the Contracting Officer. Isolated areas of soft cohesive soils shall be subcut and replaced with satisfactory fill of a texture similar to surrounding subgrade soil. Loose zones of non-saturated granular soil shall be compacted. The Contracting officer has the option to direct subgrade correction. Payment will be authorized for subgrade correction of native soils identified as suitable subgrade material in the project documents. Such payment or schedule changes will be negotiated in accordance with CONTRACT CLAUSE 52.243-4: CHANGES. Correction of fill soils not meeting compaction specifications shall be corrected at the Contractor's expense.

3.7 GRADE CONTROL

During construction, the lines and grades, including crown and cross slope indicated for the base course, shall be maintained by means of line and grade stakes placed by the Contractor. Grade stakes shall be in lines parallel to the centerline of the area under construction and suitably spaced for string lining. The Contractor may use an approved laser system in lieu of a grade stake system. Adequate drainage shall be provided during the entire period of construction to prevent water from collecting or standing on the area to be constructed.

3.7.1 Grade and Cross Section Tolerances

Subgrade. 0.05 foot above or below prescribed elevation.

Base Courses. 0.05 foot below prescribed elevation.

3.8 PLACEMENT OF GEOTEXTILE

Placement of geotextile shall be in accordance with NDDOT 709.

3.8.1 Covering Geotextile

Overlying aggregate layers shall be spread uniformly to the full lift thickness on the geotextile by methods that do not tear, puncture, or reposition the fabric. Sudden braking and sharp turning shall be avoided. Tracked equipment shall not turn to prevent tracks from shearing the geotextile. Construction equipment shall not be operated directly upon the geotextile.

3.9 AGGREGATE PLACEMENT

The mixed material shall be placed on the prepared subgrade or subbase in loose lifts not exceeding 9 inches in thickness. The layers, when compacted, shall be true to the grades or levels required, with the least possible surface disturbance. If base course becomes contaminated by traffic or sedimentation, the surface shall be cleaned prior to completing subsequent work by sweeping with power sweepers, power brooms, or hand brooms.

3.10 COMPACTION

3.10.1 Requirements

Compaction shall follow the compaction requirements of NDDOT 302 and shall be carried out simultaneously with laydown operations, and the compacted depth of a single course shall not exceed 8 inches. All equipment shall be operated to produce uniform density throughout the entire section. Pneumatic-tired rollers of the type specified in NDDOT 151 shall be used. The desired degree of compaction will be considered obtained when the surface is tightly bound and shows no rutting or displacement under roller operation.

3.10.2 Finishing

The surface of the top layer shall be finished to grade and cross section shown. Finished surface shall be of uniform texture. Light blading during compaction may be necessary for the finished surface to conform to the lines,

grades, and cross sections. Should the surface for any reason become rough, corrugated, uneven in texture, or traffic marked prior to completion, such unsatisfactory portion shall be scarified, reworked, or replaced as directed.

3.11 SMOOTHNESS TEST

The surface of the top layer shall not deviate more than 1/2 inch when tested with a 10 foot straightedge applied parallel with and at right angles to the centerline of the area to be paved. Deviations exceeding 1/2 inch shall be corrected.

3.12 THICKNESS CONTROL

The thickness of the base course shall be measured at intervals of one measurement for at least each 500 square yards of base course. The depth measurement shall be made by test holes at least 3 inches in diameter. The work shall be scheduled when the Contracting Officer can observe the testing; and the Contracting Officer shall select the locations of the test holes, unless waived.

3.13 TESTING

The following tests shall be performed by and at the expense of the Contractor. Samples shall be taken when and where directed. Tests of materials not meeting the requirements specified will not be counted as part of the required tests. Copies of test results shall be submitted to the Contracting Officer.

Sieve Analysis (ASTM C 117 and ASTM C 136)

Aggregate Base. One test prior to placing or hauling and one test per 1,000 CY or fraction thereof (in place measure)

3.13.1 Correction

When any source of materials is changed or deficiencies are found, the initial analysis shall be repeated and the material already placed shall be retested to determine the extent of unacceptable material. All in-place unacceptable material shall be replaced.

3.14 MAINTENANCE

The base course shall be maintained in a condition that will meet specification requirements until accepted.

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SEEDING

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SECTION 32 92 19.01 13

SEEDING

PART 1 GENERAL

The drawings contain landscape plans which indicate the locations for seeding the various seed mixes. Turfed areas which have been damaged during the contract operations, shall be restored following the requirements in this section, at no additional cost to the Government.

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.

U.S. DEPARTMENT OF AGRICULTURE (USDA)

AMS Seed Act (1995) Federal Seed Act Regulations Part 201

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION (NDDOT) Standard Specifications for Road and Bridge Construction

NDDOT 708 (2008) Erosion Control

1.2 SUBMITTALS

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

SD-03 Product Data

Manufacturer's Literature;

The Contractor shall submit manufacturer's literature discussing physical characteristics, applications, guarantees, and installation of the seed, mulch, and fertilizer. The Contractor shall submit manufacturer's literature for equipment showing application and installation instructions.

SD-06 Test Reports

Seed Test;

The Contractor shall submit test reports for a purity and germination test following the Association of Official Seed Analysts (AOSA) rules for each seed mixture. The test reports shall indicate the purity percentage and germination percentage for each species.

Quantity Check;

Bag count or bulk weight measurements of material used compared with area covered to determine the application rate and quantity installed.

Maintenance Record;

Maintenance work performed, area repaired or reinstalled, diagnosis for unsatisfactory stand of grass plants.

SD-07 Certificates

Certificates of Compliance;

Prior to the delivery of materials, certificates of compliance attesting that materials meet the specified requirements. Certified copies of the material certificates shall include the following:

a. Seed. Mixture percentage, percent pure live seed, percent germination, weed seed content, and date tested.

b. Mulch. Composition and source.

1.3 DELIVERY, INSPECTION, STORAGE, AND HANDLING

1.3.1 Inspection

Seed shall be inspected upon arrival at the job site for conformity to species and quality. Seed materials shall be delivered in manufacturer's original, unopened containers with labels and tags intact and legible. The Contractor shall certify that all seed materials received proper handling during delivery (including moisture content and temperature control), especially grasses and forbs that need special attention between gathering to planting. Materials that do not conform with the requirements of this paragraph shall be removed from the jobsite at no additional cost to the Government. Seed that is wet, moldy, or bears a test date more than five months old, shall be rejected. The Contracting Officer reserves the right to inspect seed from each bag prior to mixing and to take samples from each seed lot for independent testing of the seed.

1.3.2 Storage

Materials shall be stored in areas provided by the Contractor. The storage areas shall be made accessible to the Contracting Officer so that application rates can be verified. Seed, lime, and fertilizer shall be stored in cool, dry locations away from contaminants. Chemical treatment materials shall be stored according to manufacturer's instructions and not with seed.

1.3.3 Handling

Except for bulk deliveries, materials shall not be dropped or dumped from vehicles.

1.3.4 Soil Amendments

Soil amendments shall be delivered to the site in the original, unopened containers bearing the manufacturer's chemical analysis. In lieu of containers, soil amendments may be furnished in bulk. A chemical analysis shall be provided for bulk deliveries.

1.3.5 Invasive Species

In order to limit the possible spread of invasive plant species to the site, the Contractor shall ensure that equipment to be used is decontaminated prior to entry on the site. Decontamination shall consist of removal of dirt, debris, etc. through high-powered washing or an equivalent method approved by the Contracting Officer.

PART 2 PRODUCTS

2.1 SEED

Substitutions will not be allowed without written request from the Contractor and approval from the Contracting Officer. The mixing of seed may be done by the seed supplier prior to delivery, or on site in the presence of the Contracting Officer.

2.1.1 Seed Classification

All seed weights are given as Pure Live Seed (PLS) State-certified seed of the latest two season's crop shall be provided in original sealed packages bearing the producer's guaranteed analysis for mixture percentage, purity, germination, weed seed content, and inert material. Labels shall be in conformance with AMS Seed Act and applicable state seed laws. Native grass seed (all species except oats and winter wheat) must be of local genotype from within 300 miles of the jobsite.

2.1.2 Seed Species and Mixtures

Turf shall be established in two seeding zones: a Dry Zone and a Wet Zone. This cover crop will serve as erosion protection during further site preparation.

2.1.2.1 Dry Zone

If seeded between April 1 and August 1, the turf seed mix in the Dry Zone shall consist of 100 pounds PLS per acre of oats, 4 pounds PLS per acre of slender wheatgrass (Elymus trachycaulus) and 10 pounds PLS per acre of Canada wild rye (Elymus Canadensis).

If seeded after August 1, the turf grass mix shall consist of 90 pounds PLS per acre of winter wheat, 4 pounds PLS per acre of slender wheatgrass (Elymus trachycaulus) and 10 pounds PLS per acre of Canada wild rye (Elymus Canadensis).

2.1.2.2 Wet Zone

If seeded between April 1 and August 1, the turf seed mix in the Wet Zone shall consist of 100 pounds PLS per acre of oats, 10 pounds PLS per acre of Virginia wild rye (Elymus virginicus) and 6 pound PLS per acre of fowl

bluegrass (Poa palustris) and 6 pounds PLS per acre of American sloughgrass (Beckmannia syzigachne). .

If seeded after August 1, the turf grass mix shall consist of 90 pounds PLS per acre of winter wheat, 10 pounds PLS per acre of Virginia wild rye (Elymus virginicus) and 6 pounds PLS per acre of fowl bluegrass (Poa palustris) and 6 pounds PLS per acre of American sloughgrass (Beckmannia syzigachne).

2.1.3 Quality

Seed shall be free of prohibited and restricted noxious weed seeds and not greater than 1% by weight of common weed seeds. Inoculants shall consist of the proper bacteria applied in the amount and manner recommended by the manufacturer to all legumes in the seed mix.

2.2 MULCH

2.2.1 Straw Mulch

Mulches shall be free from weeds, mold, and other deleterious materials. Mulch shall meet the requirements of NDDOT 708, and consist of native hay or straw from cereal grain (i.e., oats, wheat) and shall be seed free to prevent introduction of weeds as defined by the rules and regulations of the North Dakota Department of Agriculture. All mulch bales shall be in an air-dried condition at the time of delivery and be relatively dry when applied. Dry mulching material which breaks and does not bend is unacceptable. Mulch shall have a consistency for placing with commercial mulch blowing equipment.

2.3 WATER

Water shall be the responsibility of the Contractor, unless otherwise noted. Water shall not contain elements in concentrations toxic to plant life.

2.4 SPECIAL SEEDING AND MULCHING EQUIPMENT

2.4.1 Equipment

Only pneumatic-tired tractors shall be permitted on areas having topsoil. Special equipment such as mulch spreaders may be used if approved by the Contracting Officer. The request for approval shall be made well in advance of the planned planting date and shall include full information on equipment and materials.

2.5 TOPSOIL

Surface soil stripped and stockpiled on site and modified as necessary to meet requirement specified for topsoil in SECTION 31 00 00.00.13 EARTHWORK.

PART 3 EXECUTION

3.1 INSTALLING SEED TIME AND CONDITIONS

3.1.1 Notification

The Contractor shall notify the Contracting Officer 48 hours in advance of beginning seeding or any changes in turf establishment operations.

3.1.2 Seeding Time

Turf species shall be seeded within 48 hours of topsoil placement.

3.2 SITE PREPARATION

The Contractor shall verify that the finished grades are as indicated on the drawings.

3.2.1 Tillage

After the clay subsoil has been shaped to the design specifications, it shall be deep disked to a depth of 6 to 8 inches. Topsoil shall be replaced over the disked clay subsoil to a depth as indicated on the plans. The topsoil shall be incorporated to a depth of two inches into the clay subpsoil but not excessively mixed. Tillage operations shall be conducted only during periods when, in the opinion of the Contracting Officer, beneficial results are likely to be obtained. Soil compacted by construction equipment or soil on compacted slopes or grades shall be tilled to a minimum depth of four inches by disking or tilling before applying seed.

3.3 SEEDING

The seedbed soil density shall be checked for appropriate compaction to ensure sufficient seed/soil contact. Seeding shall not occur on a seedbed that is too loose or too compact. The seedbed shall have a friable structure that allows infiltration of moisture; does not puddle or become compacted by seeding equipment or rainfall; can be easily worked to incorporate seed into the soil; and has a firm soil beneath the seeding depth. When preparing for drill seeding, footprints shall not leave an indentation of more than one inch deep. Soil can be firmed with a cultipacker or roller to prevent seed from being buried too deep. Seeding operations shall not take place when the wind velocity will prevent uniform seed distribution.

3.3.1 Equipment

Gravity feed applicators, which drop seed directly from a hopper onto the prepared soil, shall not be used because of the difficulty in achieving even coverage. Any vehicle or equipment that is pulling drill or broadcast seeding equipment shall have dual (two) tires at each end of the axle.

3.3.2 Drill Seeding

Drill seeding shall be accomplished with approved equipment with drills set not more than 6 inches apart. Seed shall be uniformly drilled to a depth of 1/4 inch at the rate specified for the mix. Row markers shall be used with the drill seeder. The drilling equipment shall be maintained with half full seed boxes during the seeding operations. When slopes exceed 1 vertical on 5 horizontal, baffle plates spaced not more than 6 inches apart shall be installed in the seed box.

3.3.3 Broadcast Seeding

In areas inaccessible to drill seeding, seeding shall be accomplished with approved broadcast equipment. If broadcast seeding is necessary, seeding rates shall be increased by 15%. Seed shall be uniformly broadcast at the rate specified for the mix. Half the total rate of seed application shall be sown with sower moving in one direction, and the remainder with sower moving at right angles to first sowing. Seed shall be covered a maximum 1/4 inch depth by disk harrow, steel mat drag, culti-packer, or other approved device. Seed shall not be broadcast when wind speed exceeds 5 miles per hour.

3.3.4 Applying and Anchoring Mulch

Immediately after the seeding has been completed, mulch shall be spread uniformly in a continuous blanket at a rate of 1-1/2 tons per acre. Mulch shall be spread by hand, manure spreader, modified grain combine with straw-spreader attachment, or a blower-type mulch spreader. Mulching shall be started at the windward side of relatively flat areas, or at the upper part of a steep slope, and continued uniformly until the area is covered. Mulch shall not be bunched. Immediately following the spreading, the mulch shall be anchored to the soil by a V-type wheel land packer, a scalloped-disk land packer designed to force mulch into the soil surface, or other suitable equipment. The number of passes needed, not to exceed three, will be determined by the Contracting Officer. All areas seeded on any given day must be mulched on that same day. If for whatever reason seeding is not possible on all or any portion of the project site, mulch shall still be applied to aid in erosion control and to prepare the site for the future native prairie planting by others.

3.3.5 Initial Watering

Watering shall be started immediately after completing the seeding of an area. Water shall be applied to supplement rainfall at a rate sufficient to ensure moist soil conditions to a minimum 3 inch depth. Run-off and puddling shall be prevented. Watering equipment shall not be driven over turf areas, unless otherwise directed.

3.4 RESTORATION AND CLEAN UP

Immediately upon completion of the seeding operation in an area, the area shall be protected against traffic or other use by erecting barricades, providing signage, or as directed. Excess and waste material shall be removed from the seeded areas and shall be disposed offsite.

3.5 TURF ESTABLISHMENT PERIOD

The Contractor shall be responsible for the proper care of seeded areas during the turf establishment period. The turf establishment period shall extend for one year after completion of the seeding operations on the entire project, unless the desired growth is established in a shorter period of time and shortening the period of Contractor's responsibility for acceptably established turf areas is authorized by the Contracting Officer.

3.6 MAINTENANCE

3.6.1 Mowing

Mowing will be used to control pioneering weeds and other competition. For the purposes of this project a weed is defined as any plant not native to prairies in this part of North Dakota. Following the seeding of the temporary turf, mowing shall be conducted before the weed height is 14 inches, or when the weed species begin to flower, whichever is earlier. Mowing shall occur before the weed species set seed. Mowing shall be conducted as needed, depending on weed growth. Multiple mowings may be necessary. Mowing shall be at a height of 6 to 12 inches, depending on conditions and species of the weeds. Mowing must not be done to a height lower than 6 inches, as that would be detrimental to the establishment of grass. The site shall be mowed additional times for weed control, as needed.

3.6.2 Herbicide

Perennial or aggressive invasive species and noxious weeds shall be spot treated with herbicide. If aggressive perennial weed species are present in areas too large to be spot treated, large-scale herbicide treatments will be necessary.

3.6.3 Maintenance During Establishment Period

Seeded and mulched areas shall be maintained until all work or designated portions thereof have been completed and accepted. Any damage shall be repaired, and mulch material that has been removed by wind or other causes shall be replaced and secured. All areas that are not exhibiting the start of turf growth within 30 days shall be re-seeded as specified. Maintenance shall include protecting the site from erosion and maintaining erosion control material. Maintenance shall include spot treatment herbicide sprays if necessary to control invasive species and noxious weeds. Multiple sprays may be required. The maintenance period is defined as beginning when seed/mulch have been placed onto the site and terminating at the end of the contract performance period.

3.6.4 Erosion Control

The Contractor shall control erosion during the maintenance period by using ditch checks, sod swales, silt fences or other methods.

3.6.4.1 Repair

If any portion of the surface becomes rilled, gullied, damaged, or destroyed, that portion shall be repaired to re-establish the area without additional cost to the Government.

3.7 QUALITY CONTROL

The Contractor shall establish and maintain a quality control system for the work under this section, in accordance with SECTION 01 45 04.00 13, CONTRACTOR QUALITY CONTROL, including but not limited to the following:

(1) Materials:
    (a) Seed
    (b) Mulch

(2) Seeding and Mulching

(3) Turf Establishment and Maintenance

(4) Repair of Damaged Areas.

(5) Soil Erosion Control

A copy of the records of inspections and tests, as well as the records of corrective action taken, shall be furnished to the Government as directed by the Contracting Officer.

3.8 FINAL ACCEPTANCE

3.8.1 Preliminary Inspection

Prior to the completion of the turf establishment period, a preliminary site inspection will be held by the Contracting Officer. The date for the inspection(s) will be established in writing. At least 70% of the entire pervious surface shall be stabilized by a uniform vegetative cover. There shall be no bare spots in the seeded areas larger than 4 inches in diameter. There shall be at least 1 plant of the seeded perennial grass species (Canada wild rye, Virginia wild rye, rice cutgrass, and slender wheatgrass) per square foot of planted area. The acceptability period of the established turf shall be determined in accordance with PARAGRAPH: TURF ESTABLISHMENT PERIOD. All unacceptable stands of turf shall be repaired as soon as turfing conditions permit and repaired section will be accepted upon meeting the criteria of one seeded perennial plant per square foot. No more than 15% of the site area shall be occupied by invasive species. No more than 5% of the site shall be occupied by noxious weeds.

3.8.2 Final Inspection

A final inspection will be held by the Contracting Officer in order to determine that deficiencies noted in the above preliminary inspection(s) have been acceptably corrected. The time for the inspection will be established in writing.

-- End of Section --

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STONE PROTECTION (RIPRAP)
10/2006

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO M 288	(2006; R 2001) Standard Specification for Geotextile Specification for Highway Applications

ASTM INTERNATIONAL (ASTM)

ASTM C 33/C 33M	(2011a) Standard Specification for Concrete Aggregates
ASTM C 127	(2012) Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Coarse Aggregate
ASTM C 136	(2006) Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM C 295	(2012) Petrographic Examination of Aggregates for Concrete
ASTM D 75/D 75M	(2009) Standard Practice for Sampling Aggregates
ASTM D 4791	(2010) Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate
ASTM D 4992	(2007) Evaluation of Rock to be Used for Erosion Control
ASTM D 5312	(2004) Evaluation of Durability of Rock for Erosion Control Under Freezing and Thawing Conditions
ASTM D 6825	(2002; R 2008) Standard Guide for Placement of Riprap Revetments

CORPS OF ENGINEERS (COE)

EM 1110-2-2302 (1990) Construction with Large Stone

NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY (NIST)

NIST HB 44 (2010) Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices

North Dakota Department of Transportation (NDDOT) Standard Specifications for Road and Bridge Construction

NDDOT 709 (2008) Geotextile Fabrics (Installation)

NDDOT 858 (2008) Geotextile Fabrics (Materials)

1.2 MEASUREMENT

1.2.1 Measurement by Weight

Materials paid for by weight will be measured by weighing each truck load on approved scales before being placed in the work. Scales shall be of sufficient length to permit simultaneous weighing of all axle loads and shall be sensitive to a change in load of 0.2 percent throughout the range of the scales. The scale's accuracy shall conform to the applicable requirements of NIST HB 44 and shall be certified by scale servicing company or by an inspector of the State Inspection Bureau. Each load shall be accompanied by a delivery ticket certified by the weighmaster. Delivery tickets shall be collected by the Contractor, and copies thereof shall be furnished to the Contracting Officer. As a minimum, each ticket shall contain the following information:

(1) Date and time.
(2) Vehicle number.
(3) Gross weight.
(4) Vehicle tare weight.
(5) Net weight.
(6) Job total for material weighed.
(7) Signature of weighmaster. 1.2.3.1 Barge Loads

1.3 SUBMITTALS

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

SD-01 Preconstruction Submittals

Material Sources; G, GT

The Contractor shall designate in writing only one source or one combination of sources from which he proposes to furnish stone. The Contractor shall state in writing methods of processing and handling riprap, and shall notify the Contracting Officer when production methods are changed.

Survey Plan for Verification of Section; G, GT

The Contractor shall provide a plan for obtaining surveys as defined in the paragraph SURVEYS FOR VERIFICATION OF SECTION. Approval of the plan and initial survey is required before material may be placed in the project.

SD-02 Shop Drawings

Survey Sections for Verification of Section

The Contractor shall provide surveyed cross sections for verification of design section for each step of the work as specified in the paragraph SURVEYS FOR VERIFICATION OF SECTION.

SD-03 Product Data

Geotextile Data;

Catalog cuts or technical data sheet shall be submitted for the geotextile showing that the product meets the specifications.

SD-06 Test Reports

Gradation Test;

Gradation Test Results for Riprap. Riprap gradation testing results shall be submitted on the WORKSHEET FOR GRADATION ANALYSIS OF RIPRAP and the gradation curve (ENG FORM 4055). A copy of each form is included at the end of this section.

Bedding gradation testing results shall be submitted on Contractor's standard laboratory report form and the gradation curve (ENG FORM 2087). A copy of ENG FORM 2087 is included at the end of this section.

SD-07 Certificates

Certified Weight Scale Tickets;

Copies of all certified weight scale tickets shall be furnished to the Contracting Officer at a frequency as directed. The tickets do not need to be formally submitted through the submittal process.

PART 2 PRODUCTS

2.1 STONE SOURCES AND EVALUATION

Stone and aggregate materials shall be produced from the sources listed in the attachments at the end of this section. If the Contractor proposes to furnish materials from a source not listed, the Government geologist will make such investigations and evaluations as necessary to determine whether or not materials with acceptable durability can be produced from the proposed source. The rock supplied shall be produced from one rock

formation to provide a product of uniform appearance. The Contractor shall not supply rock from various formations, or mix field-stone with quarried rock, unless approved by the Contracting Officer. It is the Contractor's responsibility to determine that the stone source or combination of sources selected is capable of providing the quality, quantities and gradation needed and at the rate needed to maintain the scheduled progress of the work.

2.1.1 Alternate Sources

a. Evaluation by Site Inspection. If the Contractor proposes to furnish stone from an unlisted source, the Government will evaluate the alternate source and reply within 30 days. A quarry investigation shall be performed by a Government geologist or engineer. If the source is an undeveloped quarry or if the operation has been dormant for more than one year such that the quarry face is weathered, the Contractor shall expose fresh rock for20 feet horizontally and for the full height of the face proposed for production, prior to the field evaluation. The Government will consider service records for stone of a similar size, placed in a similar thickness and exposed to weathering under similar conditions as are anticipated for this contract. The Government may choose to accept the source based on rock classification, geologic evaluation, and service records show that the stone is durable to the satisfaction of the Government.

b. Evaluation by Test Data. If sufficient information is not available, the Government will reconsider the alternate source if evaluation is supplemented by sampling and testing. This will require an additional 60 day evaluation period. If the Contractor wishes to pursue the alternate source, the Government will notify the Contractor of required testing and evaluation criteria. Criteria for acceptance will consider criteria in EM 1110-2-2302, but will also consider characteristics of rock found in nearby quarries. Some common test procedures that may be considered include:

Unit Weight and Absorption (ASTM C 127).
Petrographic Examination (ASTM C 295 and ASTM D 4992).
Resistance to Freezing and Thawing (ASTM D 5312).

c. Sampling and Testing. Samples from alternate sources shall be taken by a representative of the quarry under the supervision of the Contracting Officer. Information provided with the samples shall include the location and stratigraphy within the quarry from which the sample was taken. The Contractor shall ship the samples to a laboratory identified by the Contracting Officer. The Government will be responsible for testing costs associated with one quarry per project; and the Contractor shall be responsible for testing costs for additional sources.

2.1.2 Acceptance of Materials

Acceptance of a source of stone is not to be construed as acceptance of all material from that source. The right is reserved to reject materials from certain localized areas, zones, strata, or channels, when such materials are unsuitable for stone as determined by the Contracting Officer. The Contracting Officer also reserves the right to reject individual units of produced specified materials in stockpiles at the quarry, all transfer points, and at the project construction site when such materials are determined to be unsuitable.

2.2 RIPRAP

Riprap gradation shall meet the requirements for R20 riprap indicated on the attached ENG FORM 4055. The stone shall be well graded within the limits specified.

2.2.1 General

All stone shall be durable material. Stone for riprap shall have a specific gravity not less than 2.55. Stone shall be of a suitable quality to ensure permanence in the structure and in the climate in which it is to be used. It shall be free from cracks, blast fractures, bedding, seams and other defects that would tend to increase its deterioration from natural causes. A crack is considered to be detrimental if it is more than 4 mil wide and is continuous for one-third the dimension of at least two sides of the stone. The stone shall be clean and reasonably free from soil, quarry fines, and shall contain no refuse. Any foreign material adhering to or combined with the stone as a result of stockpiling shall be removed prior to placement. The maximum aspect ratio (greatest dimension:least dimension) of any piece of stone for size ranges shall be not greater than 3:1 when measured across mutually perpendicular axis. ASTM D 4791 shall be used as a guide to perform the test.

2.2.2 Production

Riprap shall be handled and selectively loaded onto trucks in a manner to avoid segregation and provide a distribution of stone sizes consistent with the gradation band and test samples. Each truck load shall be representative of the gradation requirements.

2.3 GEOTEXTILE

Geotextile shall meet the requirements of NDDOT 858, riprap geotextile fabric (RR1).

2.4 SOURCE QUALITY CONTROL

Gradation tests shall be performed by the methods and at the frequency listed below. A satisfactory gradation test shall be obtained prior to any hauling and delivery of materials. All tests, including failing tests shall be submitted. Tests performed on material which does not meet gradation and shape requirements will not be counted as part of the tests required. The Contracting Officer shall be informed immediately of test results and draft copies of test results shall be furnished at the Contracting Officers request.

2.4.1 Sampling Requirements

The Contracting Officer shall direct the time and location of sampling, unless waived. Samples shall be taken from stockpiles or loaded trucks, and not directly from conveyers or chutes.

2.4.2 Riprap Gradation Testing

a. Notification. The Contracting Officer shall be informed 24 hours before each riprap test.

b. Testing Frequency. At least 1 gradation test shall be performed per 5,000 tons.

c. Sample Size. The sample shall have a minimum gross weight not less than 25 times the maximum stone size in the specified gradation (25 * W_{100}).

2.4.2.1 Riprap Test Method A

Test method A shall consist of weighing all stones larger than 5 pounds in a sample. Five to seven weight classes shall be selected within the range of stone sizes. Each stone shall be weighed and recorded on the Work Sheet for Gradation Analysis of Riprap Method A; and the calculations on the worksheet shall be performed and recorded. A plot of the gradation shall be completed on ENG FORM 4055 in accordance with accepted practice for soil and aggregate gradations.

2.4.2.2 Riprap Test Method B

Test method B shall consist of separating the stones into 5 to 7 piles, ordered by size. The sample shall be separated on a clean, hard surface that is free of smaller stones that could become mixed with the sample. The stones shall be visually screened to place them into appropriate piles. All stones shall be separated and placed into a pile before weighing. After separating, the smallest and largest rock in each pile shall be weighed and recorded. The stones shall be adjusted as necessary so that the weight classes do not overlap. After adjustment is adequate and weight classes have been established, each pile of stone shall be weighed and recorded on the Work Sheet for Gradation Analysis of Riprap Method B; and the calculations on the worksheet shall be performed and recorded. A plot of the gradation shall be completed on ENG FORM 4055 in accordance with accepted practice for soil and aggregate gradations.

2.5 STOCKPILES

Stockpiles shall be formed by a series of layers or truckload dumps, where the rock essentially remains where it is placed. Subsequent layers shall be started 10 feet from the edge of the previous layer so that the rock will not roll down the edges of the pile. Any stone which has become contaminated with soil or refuse shall not be put into the work unless the contaminating material has been removed prior to placement.

PART 3 EXECUTION

Riprap shall generally be placed in general accordance with ASTM D 6825. Where discrepancies occur, this specification shall govern.

3.1 CONSTRUCTION TOLERANCES

Work shall generally meet the required elevations, slope and grade; and the outer surfaces shall be even and present a neat appearance.

a. Subgrades. Areas on which stone protection will be placed shall be graded and/or dressed to conform to cross sections shown on the contract

drawings within 2 inches above or below the neat lines. The surface shall be reasonably smooth to match tolerances normally obtained by rough grading with bladed equipment. For subaqueous construction in greater than 3 feet of water, the tolerance shall be 6 inches.

b. Layer Thickness. Any layers found to be less than 80% of the specified thickness shall be corrected. This tolerance shall only be exceeded on isolated spot checks, and if the tolerance is commonly exceeded, the Contractor shall change construction methods to improve the quality control. If it is necessary to estimate riprap quantities for changes, the volume shall be based on neat line dimensions and the plan dimension for thickness. A conversion factor of 1.4 tons/CY shall be used to determine quantity requirements, unless otherwise directed by the Contracting Officer.

c. Surface Tolerances. The finished surface tolerance above the neat line shall generally not deviate from the lines and grades shown by more than half (1/2) the average stone dimension of the gradation range. Riprap that has a rough and uneven surface shall be reworked by hand to stabilize stones that wobble and are out of tolerance, except where the Contracting Officer approves use of equipment. Rearranging of individual stones shall be required to the extent necessary to obtain a well-graded distribution of stone sizes. The Contracting Officer may elect to use Contractor surveys as defined in paragraph SURVEYS FOR VERIFICATION OF SECTION to verify that tolerance requirements have been met.

3.2 FOUNDATION PREPARATION

Foundation areas shall be excavated or filled to the lines and grades shown. Filling shall be with earth similar to the adjacent material and shall be well compacted. Immediately prior to placing riprap, the prepared subgrade will be inspected by the Contracting Officer unless waived; and no material shall be placed thereon until that area has been approved.

3.3 PLACEMENT OF GEOTEXTILE

Placement of geotextile shall be in accordance with NDDOT 709.

3.3.1 Covering Geotextile

Sudden braking and sharp turning shall be avoided. Tracked equipment shall not turn to prevent tracks from shearing the geotextile. Construction equipment shall not be operated directly upon the geotextile.

3.4 PLACEMENT OF RIPRAP

3.4.1 Layer Requirements

Riprap shall be placed in a manner which will produce a well-graded mass of rock with the minimum practicable percentage of voids. The large stones shall be well distributed. The finished riprap shall be free from objectionable pockets of small stones and clusters of larger stones.

3.4.2 Construction Methods

Unsegregated stone shall be placed in a systematic manner. Riprap shall be placed to its full course thickness in one operation and in such manner as to avoid displacing underlying material. Placement shall typically begin at the bottom of the area to be covered and continue up slope. Subsequent loads of material shall be placed against previously placed material in such a manner as to ensure a relatively homogenous mass. Final finish of slope shall be performed as the material is placed.

Placing riprap in layers will not be permitted. Placing riprap by dumping it into chutes, or by any method likely to cause segregation of the various sizes, shall not be permitted. Placing riprap by dumping it at the top of the slope and pushing it down the slope shall not be permitted. No equipment shall be operated directly on the completed stone protection system. Dump trucks shall be equipped with bottom hinged tailgates if rock is directly placed into position with the trucks.

3.4.3 Riprap Placement on Geotextile

Riprap shall be placed over the geotextile by methods that do not tear, puncture, or reposition the fabric. Equipment shall be operated so as to minimize the drop height of the stone without contacting and damaging the geotextile. Generally this will be about 1 foot of drop from the bucket to the placement surface. Riprap shall be placed so that stones do not roll downhill.

3.4.4 Riprap Placement in Water

Riprap to be placed under water shall be placed in a systematic manner so as to ensure a continuous uniform layer of well-graded stone of the required thickness. Riprap to be placed under water shall be placed with a drop height less than 2 feet. Riprap shall not be cast across the surface of the water. The equipment shall be capable of reaching the placed material to monitor the water depth and surface coverage.

3.5 MAINTENANCE

The Contractor shall maintain the stone protection and underlying works until accepted by the Contracting Officer. When appropriate, the Contractor shall place stone protection in a timely manner to reduce risk of scour. Any material displaced prior to acceptance shall be replaced at the Contractor's expense.

3.6 CONTRACTOR QUALITY CONTROL

The Contractor shall establish and maintain quality control for all work performed at the job site under this section to assure compliance with contract requirements. The Contractor shall maintain records of quality control tests, inspections and corrective actions. Quality control measures shall cover all construction operations including, but not limited to, the placement of all materials to the slope and grade lines shown and in accordance with this section.

In addition to the Contractor's system to establish and maintain quality control for stone placement operations, the following information shall be recorded and promptly provided to the Contracting Officer on request:

a. Record tonnage of stone placed in completed sections of the work and check quantity for compliance with design sections.

b. Check for uniform thickness and geometry of material layers.

3.7 SURVEYS FOR VERIFICATION OF SECTION

Contractor surveys are required for riprap to verify that materials are placed to the thickness and geometry required by the contract documents. The Contractor shall make surveys as the work progresses to verify lines, grades and thicknesses established for completed work. The surveys shall be conducted in the presence of an authorized representative of the Contracting Officer, unless this requirement is waived by the Contracting Officer. Following placement of riprap, the required cross sections shall be provided to the Contracting Officer. Review and approval of the surveys by the Contracting Officer is required before proceeding with the next step of the work. Approval of cross sections shall not constitute final acceptance of the work. The surveys shall meet the following criteria:

a. Two separate surveys shall be completed for each material placed. The initial survey shall be completed prior to commencement of work on the feature. The second survey shall be completed after work on the feature has been completed.

b. Space cross sections at 200 foot maximum intervals parallel to the placement slope. Include additional cross sections as necessary or as directed by the Contracting Officer to define the geometry.

c. Data points obtained for individual surveyed cross sections will be spaced at a maximum distance of 10 feet apart and shall be obtained at all slope breaks. Additional data points shall be obtained as deemed necessary by the Contracting Officer.

d. The elevation of stone above the water surface shall be determined by the use of a leveling instrument and a rod having a base 12 inches in diameter. If approved by the Contracting Officer other means may also be used.

e. For portions of the work that are under water, sounding surveys shall be performed either by means of a sounding pole or a sounding basket weighing about 8 1/2 pounds, each of which has a base measuring 12 inches in diameter.

d. Each cross section from the survey notes shall be plotted at a minimum scale of 1" = 10'.

e. Provide a copy of the survey notes and cross sections to the Contracting Officer within 10 days after completion of the survey.

-- End of Section --