

SPECIFICATIONS
(For Construction Contract)
Solicitation Number W9128F23B0003

Gavins Point IDCC
Roads and Ground
Maintenance

Gavins Point Dam, SD

August 2023



US Army Corps
of Engineers
Omaha District

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GAVINS POINT - IDCC ROADS MAINTENANCE

BID SCHEDULE													
CLIN	DESCRIPTION	UNIT	QTY	BASE YEAR		OPTION YEAR 1		OPTION YEAR 2		OPTION YEAR 3		OPTION YEAR 4	
				UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT
0001 CONSTRUCTION SUPPORT ACTIVITIES													
0001	Surveying and Field Work	JOB	1										
0001AA	Temporary Storm Water Pollution Control	JOB	1										
Subtotal for CLIN 0001													
0002 EARTHWORK (31 00 00)													
0002	Mobilization/Demobilization - Surface Prep/Shaping	JOB	1										
0002AA	Existing Surface Preparation	SY	50										
0002AB	Ordinary Roadway Shaping	SY	500										
0002AC	Heavy Roadway Shaping	SY	500										
Subtotal for CLIN 0002													
0003 GEOTEXTILES USED FOR FILTERS AND ROAD CONSTRUCTION (31 05 22)													
0003	Geotextile Fabric - Road Construction	SY	100										
Subtotal for CLIN 0003													
0004 COLD MILLING/PAVEMENT DEMOLITION (32 01 16.71)													
0004	Mobilization/Demobilization - Cold Milling - Removed from Site (Less than 3" Milling Depth)	JOB	1										
0004AA	Cold Milling - Removed from Site (Less than 3" Milling Depth - 2000 SY to 3000 SY)	SY	2,000										
0004AB	Cold Milling - Removed from Site (Less than 3" Milling Depth - Over 3000 SY)	SY	3,001										
0004AC	Mobilization/Demobilization - Cold Milling - Delivered to Maintenance Building (Less than 3" Milling Depth)	JOB	1										
0004AD	For Cold Milling - Delivered to Maintenance Building (Less than 3" Milling Depth 2000 SY to 3000 SY)	SY	2,000										
0004AE	Cold Milling - Delivered to Maintenance Building (Less than 3" Milling Depth - Over 3000 SY)	SY	3,001										
0004AF	Mobilization/Demobilization - Pavement Demolition/Removal	JOB	1										
0004AG	Pavement Demolition/Removal	SY	100										
	Subtotal of CLIN 0004												

CLIN	DESCRIPTION	UNIT	QTY	BASE YEAR		OPTION YEAR 1		OPTION YEAR 2		OPTION YEAR 3		OPTION YEAR 4	
				UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT
	0005 SEALING CRACKS IN ASPHALT PAVEMENTS (32 01 17.61)												
0005	Mobilization/Demobilization - Asphalt Crack Sealing	JOB	1										
0005AA	Asphalt Crack Sealing (1,000 LB to 2,500 LB)	LB	1,000										
0005AB	Asphalt Crack Sealing (Over 2,500 LB)	LB	2,501										
Subtotal for CLIN 0005													
0006 MATERIAL STOCKPILING & CONCRETE & ASPHALT CRUSHING/MIXING (32 11 23)													
0006	Riprap	TON	500										
0006AA	Spalls	TON	500										
0006AB	Filter Rock	TON	100										
0006AC	Subbase Course	TON	500										
0006AD	Gravel Cushion Course	TON	500										
0006AE	Aggregate Base Course	TON	500										
0006AF	Gravel Surfacing	TON	500										
0006AG	Topsoil	TON	100										
Subtotal for CLIN 0006													
0007 BITUMINOUS TACK COATS (32 12 13)													
0007	Tack Coat Asphalt <small>SEE NOTE 1</small>	TON	5										
Subtotal for CLIN 0007													
0008 HOT-MIX ASPHALT (HMA) FOR ROADS (32 12 16)													
0008	Mobilization/Demobilization - Asphalt Concrete Composite	JOB	1										
0008AA	Asphalt Concrete Composite	TON	100										
0008AB	Mobilization/Demobilization - Asphalt Concrete Composite - Blade Laid	JOB	1										
0008AC	Asphalt Concrete Composite - Blade Laid	TON	50										
0008AD	Mobilization/Demobilization - Potholes repair	TON	50										
0008AE	Pothole Repair	TON	50										
Subtotal for CLIN 0008													

CLIN	DESCRIPTION	UNIT	QTY	BASE YEAR		OPTION YEAR 1		OPTION YEAR 2		OPTION YEAR 3		OPTION YEAR 4	
				UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT
0009 ASPHALTIC SEAL AND FOG COAT (32 12 36.13)													
0009	Mobilization/Demobilization - Emulsified Asphalt Seal Coat	JOB	1										
0009AA	Emulsified Asphalt - CRS-2P - For Chip Seal (5-10 TON)	TON	5										
0009AB	Emulsified Asphalt - CRS-2P - For Chip Seal (Over 10 TON)	TON	11										
0009AC	Chip Seal Aggregate - Type 2B (50-100 TON) ^{SEE NOTE 2}	TON	50										
0009AD	Chip Seal Aggregate - Type2B (Over 100 TON) ^{SEE NOTE 2}	TON	101										
0009AE	Emulsified Asphalt - CSS-1h - Flush Seal and Fog Seal (1-5 TON)	TON	1										
0009AF	Emulsified Asphalt - CSS-1h - Flush Seal and Fog Seal (Over 5 TON)	TON	6										
0009AG	Flush Seal Aggregate (10-50 TON) ^{SEE NOTE 2}	TON	10										
0009AH	Flush Seal Aggregate (Over 50 TON) ^{SEE NOTE 2}	TON	51										
0009AI	Mobilization/Demobilization - Vacuum Sweep	JOB	1										
0009AJ	Vacuum Sweep	SY	3,000										
0009AK	Mobilization/Demobilization - Power Broom	JOB	1										
0009AL	Power Broom	SY	3,000										
Subtotal for CLIN 0009													
0010 AGGREGATE BASE & SURFACE COURSE (32 15 00)													
0010	Mobilization/Demobilization - Aggregate Base & Surface Course	JOB	1										
0010AA	Subbase Course	TON	250										
0010AB	Gravel Cushion Course	TON	250										
0010AC	Base Course	TON	250										
0010AD	Gravel Surfacing Course	TON	250										
Subtotal for CLIN 0010													

CLIN	DESCRIPTION	UNIT	QTY	BASE YEAR		OPTION YEAR 1		OPTION YEAR 2		OPTION YEAR 3		OPTION YEAR 4	
				UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT
0011 CONCRETE PAVEMENTS, SIDEWALKS, AND CURBS AND GUTTERS (32 16 19)													
0011	Mobilization/Demobilization - Curb and Gutter (Cast)	JOB	1										
0011AA	Curb and Gutter Type B (Cast)	LF	50										
0011AB	Curb and Gutter Type P (Cast)	LF	50										
0011AC	Curb and Gutter Valley Gutter (Cast)	LF	50										
0011AD	Mobilization/Demobilization - Curb and Gutter (Slip Form)	JOB	1										
0011AE	Curb and Gutter Type B (Slip form)	LF	750										
0011AF	Curb and Gutter Type P (Slip form)	LF	750										
0011AG	Mobilization/Demobilization – Concrete Pavement	JOB	1										
0011AH	6” Concrete Paving (0-5000 SY)	SY	5,000										
0011AI	6” Concrete Paving (Over 5001 SY)	SY	5,001										
Subtotal for CLIN 0011													
0012 PAVEMENT MARKING (32 17 23)													
0012	Mobilization/Demobilization - Pavement Marking - reflective, non-reflective, and painted symbols	JOB	1										
0012AA	Reflective Paint	LF	300										
0012AB	Non-reflective Paint	LF	300										
0012AC	Non-reflective Painted Symbols - Handicapped	EA	1										
0012AD	Non-reflective Painted Symbols - Turn Arrow	EA	1										
Subtotal for CLIN 0012													
0013 SEEDING (32 92 19)													
0013	Mobilization/Demobilization - Seeding & Mulching	JOB	1										
0013AA	Seed & Mulch	SY	300										
0013AB	Mobilization/Demobilization - Hydroseeding	JOB	1										
0013AC	Hydroseeding	SY	300										
0013AD	Erosion Control Blanket	SY	50										
Subtotal for CLIN 0013													
Total for All CLIN 0001-0013													

CLIN	DESCRIPTION	UNIT	QTY	BASE YEAR		OPTION YEAR 1		OPTION YEAR 2		OPTION YEAR 3		OPTION YEAR 4	
				UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT

CLIN	DESCRIPTION	UNIT	QTY	BASE YEAR		OPTION YEAR 1		OPTION YEAR 2		OPTION YEAR 3		OPTION YEAR 4	
				UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT

BID SCHEDULE NOTES:

¹ The mob/demob for 0007 would be awarded under either 0008 or 0009. Contractor shall price accordingly.

² Contractor shall be aware that pricing items "Chip Seal Aggregate" and "Flush Seal Aggregate" require the Contractor to vacuum sweep and power broom as part of the application of the seal coat. Costs associated with vacuum sweeping and power brooming in accordance with application of a seal coat shall be included in these pricing items. Pricing items "Vacuum Sweep" and "Power Broom" are separate, standalone pricing items.

*Mobilization/Demobilization prices will cover all costs associated with hauling, transporting, and moving any equipment and/or materials to and from the project site. The Contractor is specifically cautioned that he will only receive one (1) mobilization/demobilization payment for similar pricing items on the same task order. For example, if the Contractor is directed to provide non-reflective pavement striping, reflective pavement striping, and non-reflective painted pavement symbols on the same task order, he will only be allowed to charge the Government for one (1) Mobilization/Demobilization fee. Similarly, if the Contractor is directed to place Government Furnished Borrow material in excess of 100 CY, he will only be allowed to charge the Government for one (1) Mobilization/Demobilization fee, instead of charging a fee for both the first 100 CY of Government Furnished Borrow Material and then a fee for the material in excess of 100 CY.

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CONSTRUCTION GENERAL

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PART 2 NOT USED

PART 3 NOT USED

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SECTION 01 12 00

CONSTRUCTION GENERAL

PART 1 GENERAL

1.1 SCOPE

The work covered in this section is outlined as a statement of construction requirements common to all the work. Specific requirements for materials and installations are provided under the Technical Sections herewith. No claims for extras shall be made on account of items presumed to have been omitted from this section.

1.2 CONSTRUCTION RIGHT-OF-WAY

The Contractor will be assigned working areas or working right-of-way limits for use in the prosecution of work under this contract, subject to the SECTION 00 72 00, GENERAL CONDITIONS (CONTRACT CLAUSES) clause entitled "Operations and Storage Areas."

1.3 PROTECTION OF EXISTING FACILITIES AND WORKS

The Contractor shall be responsible for the protection of the work area from damage and upon completion of the work shall leave existing works in a condition equal to that which existed when the work started. All work, storage of materials, and construction plant shall be kept within the limits of the areas assigned. Prior to construction operations, the Contractor shall confer with the Contracting Officer's representative to determine the proximity of any possible under-ground obstructions, pipe or equipment which could be damaged as a result of construction operations. Existing utility lines that are shown on the drawings or the locations are otherwise made known to the Contractor shall be protected from damage, and if damaged, shall be repaired by the Contractor at no additional expense to the Government. In the event that the Contractor damages any existing utility lines that are not shown or the locations of which have not been made known to the Contractor, the Contractor shall immediately notify the Contracting Officer. The Contracting Officer will review the information and discuss with the Contractor how to proceed. The Contractor will be responsible for the protection of structures from any structural damage during the construction operations. Roads and surfaces shall be protected from damage by the work or if damaged shall be repaired with equal materials at no additional expense to the Government. At all times the plant and work areas shall be kept in a condition conducive to safety of workmen and the public and neat in appearance. Waste or surplus materials shall not be allowed to accumulate in the construction areas.

1.3.1 Protection of Appurtenances from Bituminous Material Applications

It shall be the responsibility of the Contractor to cover and protect the surfaces of roadway appurtenances, structures and installations by approved methods in advance of any bituminous material application adjacent thereto. Damages or defacement thereof shall be corrected as directed, by and at the expense of the Contractor.

1.3.2 Flood Protection Works

In all cases where materials in the existing flood protection works are used or connected with the construction of new work under this contract, the work shall be so planned and executed that the new work shall be completed to provide protection equivalent to the existing protection as the existing protection is weakened or removed. These operating restrictions shall be followed in order that the new work may be tied in, or connected promptly, by the Contractor, with the existing facilities so as to furnish a continuous service in an emergency. These ties or connections shall be made during periods of suspended construction operations and the Contractor shall leave incompleting pipe outlets and other structures in such conditions as to not interfere with the natural drainage from areas served by these pipes or structures.

1.4 CARE OF WATER

Full responsibility for care of water shall be borne by the Contractor until completion of work under this contract. The Contractor shall provide the materials and equipment and perform all work necessary to facilitate construction and to protect the work from damage by water. The Contractor shall make the needed investigations and determinations of conditions, both existing and anticipated concerning care of water. Plans for care of water are subject to approval by the Contracting Officer prior to construction. Facilities shall be removed upon completion of the work.

1.5 DISPOSITION OF CONSTRUCTION FACILITIES

All buildings and facilities constructed by the Contractor shall be maintained in a satisfactory condition with strict observance of the rules of sanitation, safety and order as may be established by the Contracting Officer. Prior to final payment under the contract, all buildings and facilities constructed by the Contractor for the Contractor's use shall be removed from the site by the Contractor.

1.6 ACCESS ROADS AND HAUL ROADS

1.6.1 Access Roads

Access roads as required for the prosecution of the work shall be maintained (including sprinkling for dust control, safety personnel, and traffic control) within the work areas assigned to the Contractor. Consideration shall be given to the avoidance of interference with others, safety and frequency of traffic, subject to review and approval prior to construction. Access road areas shall be restored to their original or suitable condition upon completion of this contract. The Contractor shall be responsible for repair of damage to existing roads caused by the Contractor's operation.

1.7 PUBLIC ROADS

1.7.1 Lane Closure

One lane of the road must remain open at all times. The Contractor shall determine an appropriate method for the specific Temporary Traffic Control (TTC) zone one-lane, two-ways traffic control method in accordance with MUTCD requirements. The Contractor shall furnish all necessary personnel and traffic control devices, perform routine day and night inspections of TTC elements, and maintain all furnished traffic control devices to provide safety for motorists, bicyclists, pedestrians, workers, enforcement/emergency officials, and equipment as required by MUTCD. The Contractor is required to coordinate the road/lane closure with the SDDOT and USACE.

1.7.2 Traffic Control Devices

All traffic control devices (signs, arrow boards, barricades, lighting etc) by the Contractor, must conform with the U.S. Department of Transportation, Federal Highway Administration, Manual on Uniform Traffic Control Devices.

1.7.3 Temporary Traffic Control (TTC)

The Contractor shall be responsible for the safe control of traffic on all haul and access roads used primarily for the work under these specifications and at their crossings with roads used by others. The Contractor shall, at the Contractor's own expense, furnish all personnel, and traffic control devices necessary for the safe movement of all road users through or around Temporary Traffic Control zone. Traffic control plans, including a listing of equipment and its employment, shall be submitted for review and approval prior to construction.

1.7.4 Operations

When operations are being conducted near a U. S. or State Highway or when construction equipment is being used on or adjacent to such highway, the Contractor shall furnish all necessary traffic control devices and personnel to provide safe and effective movement of all road users through or around Temporary Traffic Control zone as required by MUTCD. All required state and/or local permits shall be obtained at the Contractor's expense in advance and shall be provided to the COR. The highways and streets shall be kept open at all times.

1.7.4.1 Flaggers

The Contractor shall provide flaggers when:

- a) Construction equipment and/or vehicles are blocking the roadway making it difficult for vehicles to pass or see or due to terrain.
- b) One-way traffic is required thru a construction zone.
- c) Trucks are pulling onto and/or off of a roadway or operating at a reduced speed causing a hazardous situation for drivers.

d) Anytime the Contractor feels that drivers are at risk due to Construction activity.

Flagger shall have all qualifications, high-visibility safety apparel, and appropriate hand-signaling devices in accordance with MUTCD requirements. The flagger shall be properly trained as required by the state. The Contractor shall furnish all necessary traffic control devices to establish appropriate TTC zone when the Flagger Control is utilized.

1.7.5 Road Closure

At each location designated by the Contracting Officer and where safe operation requires the closing of roads, streets or other travel arteries leading to the work under this contract, the Contractor shall furnish all appropriate traffic control devices to provide safety for motorists, bicyclists, pedestrians, workers, enforcement/emergency officials, and equipment during construction as required by MUTCD. Arrangements for closure of roads, streets or other travel arteries shall be made by the Contractor with local State, County or City officials. The Contractor shall notify the appropriate official in writing at least ten (10) days in advance of the date desired to close a road to traffic and shall furnish a copy of the agreement and approved Temporary Traffic Control plans to the Contracting Officer prior to closure.

1.7.6 State and Federal Highways

Where the Contractor hauls across or on State or Federal highways, the Contractor shall enter into all agreements with the State Highway Commission and shall comply with any restrictions they may impose relative to load limits, care of traffic and cleanup. Such agreements shall clearly relieve the Government of any responsibility for damages resulting from hauling across or on State highways. Copies of such agreements shall be furnished to the Contracting Officer before the Contractor begins hauling on these highways.

1.7.7 State and Local Public Roads

(a) Load Limits:

The South Dakota Department of Transportation and local County Road Commissions restrict the load weights of haul vehicles using highways and county roads during the spring thaw period. The load restrictions are usually imposed from 1 April through June depending on actual weather conditions.

(b) Hauling Regulations:

Prior to start of hauling operations on public roads, the Contractor shall furnish evidence to the Contracting Officer that an agreement has been consummated with State and County officials on the use of public roads and bridges. Such agreements shall clearly relieve the Government of any responsibility for damage resulting from hauling across or on these roads.

1.7.8 City Streets

Where the Contractor intends to cross or to use city streets for haul roads the Contractor shall enter into an agreement with the City and shall comply with any restrictions the City may impose relative to load limits, care of traffic and cleanup. Such agreements shall clearly relieve the

Government of any responsibility for damage resulting from hauling across or on these highways. A copy of all such agreements shall be furnished the Contracting Officer before the Contractor begins hauling in city streets.

1.7.9 Utility Lines

It shall be the responsibility and obligation of the Contractor to make all arrangements with the affected companies for the necessary moving and alterations of utility lines and the continuation of service during construction as covered by the plans and specifications.

1.8 COOPERATION WITH OTHER CONTRACTORS

The Contractor shall cooperate and coordinate work with that of the State and others working in the area during the life of this contract. The Contractor shall coordinate work with others to avoid undue interference and shall conduct operations, other than approved required access, within the limits of the assigned construction area or construction right-of-way limits. The Contractor shall cooperate with others as necessary in the interest of timely completion of all work and in the event of disagreement the decision of the Contracting Officer shall be final.

1.9 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

Progress Charts; G-PO

Construction Right-of-Way

(Right-of-Way Agreements)

State and Federal Highways

(Agreements for hauling on highways)

State and Local Public Roads

(Agreements for hauling on roads)

Temporary Traffic Control (TTC); G, AO

SD-02 Shop Drawings

Care of Water; G-AO

SD-11 Closeout Submittals

Warranty of Construction

(List of warranties with copy of each)

1.10 SPECIAL INSTRUCTIONS FOR PROGRESS CHARTS

To be submitted in accordance with the SECTION 00 72 00, GENERAL CONDITIONS (CONTRACT CLAUSES) clause entitled "Schedule for Construction Contracts" shall indicate the required data for each of the principal features of the work. Contract changes or modifications will not include extensions of time unless the updated progress chart shows that the contract completion date is delayed due to the affect of the change on one or more principal features of the work.

1.11 WARRANTY OF CONSTRUCTION (MAR 1994)

(a) In addition to any other warranties in this contract, the Contractor warrants, except as provided in paragraph (i) of this clause, that work performed under this contract conforms to the contract requirements and is free of any defect in equipment, material, or design furnished, or workmanship performed by the Contractor or any subcontractor or supplier at any tier.

(b) This warranty shall continue for a period of 1 year from the date of final acceptance of the work. If the Government takes possession of any part of the work before final acceptance, this warranty shall continue for a period of 1 year from the date the Government takes possession.

(c) The Contractor shall remedy at the Contractor's expense any failure to conform, or any defect. In addition, the Contractor shall remedy at the Contractor's expense any damage to Government-owned or controlled real or personal property, when that damage is the result of--

(1) The Contractor's failure to conform to contract requirements; or

(2) Any defect of equipment, material, workmanship, or design furnished.

(d) The Contractor shall restore any work damaged in fulfilling the terms and conditions of this clause. The Contractor's warranty with respect to work repaired or replaced will run for 1 year from the date of repair or replacement.

(e) The Contracting Officer shall notify the Contractor, in writing, within a reasonable time after the discovery of any failure, defect, or damage.

(f) If the Contractor fails to remedy any failure, defect, or damage within a reasonable time after receipt of notice, the Government shall have the right to replace, repair, or otherwise remedy the failure, defect, or damage at the Contractor's expense.

(g) With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this contract, the Contractor shall--

(1) Obtain all warranties that would be given in normal commercial practice;

(2) Require all warranties to be executed, in writing, for the benefit of the Government, if directed by the Contracting Officer; and

(3) Enforce all warranties for the benefit of the Government, if directed by the Contracting Officer.

(h) In the event the Contractor's warranty under paragraph (b) of this clause has expired, the Government may bring suit at its expense to enforce a subcontractor's, manufacturer's, or supplier's warranty.

(i) Unless a defect is caused by the negligence of the Contractor or subcontractor or supplier at any tier, the Contractor shall not be liable for the repair of any defects of material or design furnished by the Government nor for the repair of any damage that results from any defect in Government-furnished material or design.

(j) This warranty shall not limit the Government's rights under the Inspection and Acceptance clause of this contract with respect to latent defects, gross mistakes, or fraud. (FAR 52.246-21)

1.12 TELEPHONE/INTERNET

The Contractor is responsible for arranging telephone/Internet service for the Contractor's trailer through the local telephone company.

1.13 PORTABLE TOILETS

Toilet facilities will not be available for Contractor's use. The Contractor shall provide and maintain portable toilets for use by the Contractor's staff. Toilet(s) shall be placed at the location directed by the Contracting Officer. To prevent overturning by high winds, all portable toilets shall be anchored down.

1.14 FEDERAL HOLIDAYS AND WORKING HOURS

The Contractor will have access to the facility for work during normal plant business hours from 0700 to 1700 hrs Monday through Friday, excluding any federally recognized holidays or observance days. The Contractor shall plan all work accordingly. These hours will be strictly adhered to unless the Government determines work outside this time is beneficial to the Government or a bilateral modification for extended

working hours is executed.

The following Federal legal holidays are observed by this installation:

New Year's Day	1 January
Martin Luther King's Birthday	Third Monday in January
President's Day	Third Monday in February
Memorial Day	Last Monday in May
Juneteenth	19 June
Independence Day	4 July
Labor Day	First Monday in September
Columbus Day	Second Monday in October
Veterans Day	11 November
Thanksgiving Day	Fourth Thursday in November
Christmas Day	25 December

If the wage determination has a discrepancy with the above list of observed Federal holidays, then the wage determination takes precedence.

PART 2 NOT USED

PART 3 NOT USED

-- End of Section --

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SECTION 01 22 00.00 10

MEASUREMENT AND PAYMENT

PART 1 GENERAL

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- 1.1.1.1.1 Reduced Mobilization and Demobilization Payments

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1.3 UNIT PRICE PAYMENT ITEMS

- 1.3.1 EXISTING SURFACE PREPARATION (CLIN 0002AA)

- 1.3.1.1 Payment

- 1.3.1.2 Measurement

- 1.3.2 ORDINARY ROADWAY SHAPING (CLIN 0002AB)

- 1.3.2.1 Payment

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- 1.3.3 HEAVY ROADWAY SHAPING (CLIN 0002AC)

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MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.1 SUBSIDIARY ITEMS

All costs for items of work, which are either stated to be subsidiary to a specific item or are not specifically mentioned to be included in a particular item, shall be included in the cost of the item most closely associated with the work involved. Payment made for each item and any subsidiary items shall constitute full compensation for furnishing all plant, labor, materials, mobilization, demobilization, and equipment, and performing any associated Contractor quality control, environmental protection, meeting safety requirements, tests, samples, submittals, and reports, and for performing all work required for which separate payment is not otherwise provided.

1.1.1 MOBILIZATION AND DEMOBILIZATION (CLINS 0002, 0004, 0004AC, 0004AF, 0005, 0008, 0008AB, 0008AD, 0009, 0009AI, 0009AK, 0010, 0011, 0011AD, 0011AG, 0012, 0013, 0013AB)

1.1.1.1 Payment

Payment will be made for costs associated with mobilization and demobilization, as defined below.

1.1.1.1.1 Reduced Mobilization and Demobilization Payments

The amount paid for mobilization and demobilization in a task order will be included in the payment item's price indicated on the Pricing Schedule for that item. Mobilization/Demobilization will not be paid for succeeding task orders when the offeror's equipment is or will be in the area due to the execution of a previous task order. If the Contractor's equipment is in the Gavins Point area for other work, a reduced mobilization will be negotiated based on the Contractor's actual costs to mobilize to the site of the work to be performed.

Furthermore, payment items for Mobilization/Demobilization will cover all costs associated with hauling, transporting, and moving any equipment and/or materials to and from the project site. The Contractor is specifically cautioned that he will only receive one (1) Mobilization/Demobilization payment for similar payment items on the same task order. For example, if the Contractor is directed to provide non-reflective pavement striping, reflective pavement striping, and painted pavement symbols on the same task order, he will only be allowed to charge the Government for one (1) Mobilization/Demobilization fee.

Similarly, if the Contractor is directed to place Government Furnished Borrow material in excess of 500 Cubic Yards, he will only be allowed to charge the Government for one (1) Mobilization/Demobilization fee, instead of charging a fee for both the first 500 Cubic Yards of Government Furnished Borrow material and then a fee for the material in excess of 500 Cubic Yards.

1.1.1.1.2 Unit of Measure

Unit of measure: Unless a specific payment item is provided on the pricing schedule, mobilization and demobilization fees will be considered subsidiary to each payment item. No additional mobilization or demobilization fees will be agreed upon outside the scope of this specification, as all mobilization and demobilization fees are either provided as a specific payment item on the pricing schedule or shall be considered subsidiary to payment items where no corresponding Mobilization/Demobilization payment item has been provided.

1.2 JOB PAYMENT ITEMS

Payment items for the work of this contract on which the contract job payments will be made are listed in the PRICING SCHEDULE and described below. All costs for items of work, which are not specifically mentioned to be included in a particular job payment item, must be included in the listed job payment item most closely associated with the work involved. The job payment price and payment made for each item listed will constitute full compensation for furnishing all labor, materials, and equipment; performing all associated Contractor quality control, environmental protection, commissioning, preparation of as-builts, O&M manuals, tests and reports, meeting safety requirements; and for performing all work required for which separate payment is not included otherwise. A schedule of values for job payment items shall be provided with each payment request.

1.2.1 SURVEYING AND FIELD WORK (CLIN 0001)

1.2.1.1 Payment

The work performed under this job item, as specified below, will be paid for at the respective contract job price shown in the pricing schedule. Payment for "Surveying and Field Work" will include the cost for the services of a licensed surveyor(s) to make a minimum of two (2) trips to the project site to perform necessary services such as setting up benchmarks, staking out stations, and other related surveying tasks that is required to complete work. The job price shall include the cost for all equipment, materials, labor, transportation, and other incidentals necessary for completing work under this item.

1.2.1.2 Measurement

The unit of measurement shall be job for "Surveying and Field Work". The work under this item includes the minimum required services the Contractor shall provide. Any additional services, outside the scope of this specification, will not be agreed upon for payment unless approved by the Contracting Officer.

1.2.2 TEMPORARY STORM WATER POLLUTION CONTROL (CLIN 0001AA)

1.2.2.1 Payment

The work performed under this job item, as specified below, will be paid for at the respective contract job price shown in the pricing schedule. Payment for "Temporary Storm Water Pollution Control" will include the cost for supplying, installing, and maintaining temporary storm water pollution control devices and materials required for construction work as

specified in Section 01 57 23 TEMPORARY STORM WATER POLLUTION CONTROL.

Storm water control devices include silt fences, wattles, inlet protection devices and sediment traps. Payment shall also include the remove of installed devices once work is complete or when they are no longer needed. The job price shall also include the cost for all equipment, materials, labor, transportation, and other incidentals necessary for completing work under this pay item.

1.2.2.2 Measurement

The unit of measurement shall be job for "Temporary Storm Water Pollution Control". The work under this item includes the minimum required services the Contractor shall provide. Any additional services, outside the scope of this specification, will not be agreed upon for payment unless approved by the Contracting Officer.

1.3 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 PRICING SCHEDULE and described below. The unit price and payment made for each item listed shall constitute full compensation for furnishing all plant, labor, materials, equipment, and performing any associated Contractor quality control, environmental protection, meeting safety requirements, tests and reports, construction administration work (submittals, plans, etc.), and for performing all work required for each of the unit price items. If a specific payment item for Mobilization/Demobilization has not been provided for a corresponding task on the pricing schedule, then any fees associated with Mobilization/Demobilization shall be included in the price for each payment item.

1.3.1 EXISTING SURFACE PREPARATION (CLIN 0002AA)

1.3.1.1 Payment

The quantities of materials, determined as specified below, will be paid for at the respective contract unit price in the pricing schedule. Payment for "Existing Surface Preparation" will be made at the applicable unit price per square yard. The unit price for this item will include the cost for all equipment, materials, labor, testing, and other incidentals necessary to perform "Existing Surface Preparation" in accordance requirements shown in Section 31 00 00 EARTHWORK.

1.3.1.2 Measurement

The unit of measurement shall be square yards. The quantity of "Existing Surface Preparation" will be the number of square yards shown on the task order's plan quantity for "Existing Surface Preparation".

1.3.2 ORDINARY ROADWAY SHAPING (CLIN 0002AB)

1.3.2.1 Payment

The quantities of materials, determined as specified below, will be paid for at the respective contract unit price in the pricing schedule. Payment for "Ordinary Roadway Shaping" will be made at the applicable unit price per square yard. The unit price for this item will include the cost for all equipment, materials, labor, testing, and other incidentals

necessary to perform "Ordinary Roadway Shaping" in accordance requirements shown in Section 31 00 00 EARTHWORK.

1.3.2.2 Measurement

The unit of measurement shall be square yards. The quantity of "Ordinary Roadway Shaping" will be the number of square yards shown on the task order's plan quantity for 'Ordinary Roadway Shaping'.

1.3.3 HEAVY ROADWAY SHAPING (CLIN 0002AC)

1.3.3.1 Payment

The quantities of materials, determined as specified below, will be paid for at the respective contract unit price in the pricing schedule. Payment for "Heavy Roadway Shaping" will be made at the applicable unit price per square yard. The unit price for this item will include the cost for all equipment, materials, labor, testing, and other incidentals necessary to perform "Heavy Roadway Shaping" in accordance requirements shown in Section 31 00 00 EARTHWORK.

1.3.3.2 Measurement

The unit of measurement shall be square yards. The quantity of "Heavy Roadway Shaping" will be the number of square yards shown on the task order's plan quantity for "Heavy Roadway Shaping".

1.3.4 GEOTEXTILE FABRIC - Road Construction (CLIN 0003)

1.3.4.1 Payment

Geotextile installed and accepted will be paid for at the respective contract unit price in the pricing schedule. This unit price will include the cost of materials, equipment, installation, testing, and other costs associated with placement of the geotextile for road construction. Mobilization and demobilization fees associated with providing and installing geotextile fabric for road construction shall be included in the unit price for this item.

1.3.4.2 Measurement

The unit of measurement shall be square yards. Measure the as-built surface area, covered by geotextile, in square yards. Allowance will be made for geotextile in anchor and/or drainage trenches but no allowance will be made for waste, overlaps, damaged materials, repairs, or materials used for the convenience of the Contractor.

1.3.5 COLD MILLING - REMOVED FROM SITE (CLINS 0004AA & 0004AB)

1.3.5.1 Payment

Payment will be made at the respective contract unit prices, shown in the pricing schedule, to the nearest square yard of cold milled pavement. No payment will be made for cold milling outside the specified area of work or below the specified milling depth. No stockpiling of milled material at the project site is allowed and the contractor shall dispose of material at their expense. Payment for cold milling shall include all costs associated with materials, equipment, labor, traffic control, stockpiling, and other incidentals necessary to complete work under the listed

applicable items as specified in Section 32 01 16.71 COLD MILLING/PAVEMENT DEMOLITION.

1.3.5.2 Measurement

The unit of measurement shall be square yards. The quantity of cold milled pavement will be the number of square yards as requested by the task order, and the number of completed and accepted square yards as determined by the Contracting Officer.

1.3.6 COLD MILLING- DELIVERED TO MAINTENANCE FACILITY (CLINS 0004AD & 0004AE)

1.3.6.1 Payment

Payment will be made at the respective contract unit prices, shown in the pricing schedule, to the nearest square yard of cold milled pavement. No payment will be made for cold milling outside the specified area of work or below the specified milling depth. Milled materials shall be hauled to the Gavins Point Outside Maintenance facility. Payment for cold milling shall include all costs associated with materials, equipment, labor, traffic control, stockpiling, and other incidentals necessary to complete work under the listed applicable items as specified in Section 32 01 16.71 COLD MILLING/PAVEMENT DEMOLITION.

1.3.6.2 Measurement

The unit of measurement shall be square yards. The quantity of cold milled pavement will be the number of square yards as requested by the task order, and the number of completed and accepted square yards as determined by the Contracting Officer.

1.3.7 PAVEMENT DEMOLITION/REMOVAL (CLIN 0004AG)

1.3.7.1 Payment

Payment will be made at the respective contract unit price, shown in the pricing schedule, to the nearest square yard of demolished/removed pavement. This pay item applies to the demolition and removal of both asphalt and concrete pavements. No payment will be made for any demolition/removals outside the specified area of work. Payment for pavement demolition/removal shall include all costs associated with materials, equipment, labor, full depth saw cutting, stockpiling, and other incidentals necessary to complete work under this item as specified in Section 32 01 16.71 COLD MILLING/PAVEMENT DEMOLITION.

1.3.7.2 Measurement

The unit of measurement shall be square yards. The quantity of pavement demolition/removal will be the number of square yards as requested by the task order, and the number of completed and accepted square yards as determined by the Contracting Officer.

1.3.8 ASPHALT CRACK SEALING (CLINS 0005AA & 0005AB)

1.3.8.1 Payment

Payment will be made at the respective contract unit prices, shown in the

pricing schedule, per pound (LB) for the quantity of sealing specified by the task order. The unit prices listed for crack sealing shall include the cost of all labor, materials, traffic control, and the use of all equipment and tools required to complete work for crack sealing as specified in Section 32 01 17.61 SEALING CRACKS IN ASPHALT PAVEMENTS.

1.3.8.2 Measurement

The unit of measurement shall be per U.S. pound (LB). The quantity of crack sealing will be the number of pounds as requested by the task order, and the number of completed and accepted linear feet as determined by the Contracting Officer.

1.3.9 PROCURE MATERIALS (CLINS 0006, 0006AA, 0006AB, 0006AC, 0006AD, 0006AE, 0006AF, 0006AG)

1.3.9.1 Payment

The quantities of procured materials, determined as specified below, will be paid for at their respective contract unit price. Payment for procured materials shall be based on the applicable unit price per ton, as indicated on the pricing schedule, multiplied by the amount specified by the task order. Procured materials exceeding the specified task order amount will not result in any additional payment. The unit prices for "Procure Material" pay items shall include the cost for all equipment, materials, sampling, testing, labor, submittals, and other incidentals necessary for supplying material, transporting the material to a specified location within 5 miles of the Gavins Point Powerhouse, and stockpiling the material at the specified location. Any mobilization/demobilization associated with procuring and stockpiling materials within 5 miles of the Gavins Point Powerhouse shall also be included in the unit prices for the corresponding pay items.

1.3.9.2 Measurement

The unit of measurement shall be tons of procured material as specified by the task order. Measurement of procured materials shall be by approved weight scales and based on submitted certified waybills and delivery tickets, in accordance with Section 32 11 23 MATERIAL STOCKPILING AND CONCRETE AND ASPHALT CRUSHING/MIXING.

1.3.10 TACK COAT ASPHALT (CLIN 0007)

1.3.10.1 Payment

The quantities of bituminous material, determined as specified below, will be paid for at the respective contract unit price in the pricing schedule. Payment shall constitute full compensation for all operations, testing, labor, equipment, tools, and materials required to complete the work as specified.

1.3.10.2 Measurement

The unit of measurement shall be tons. The bituminous material paid for will be the measured quantities in tons used in the accepted work, provided that the measured quantities are not 10 percent over the specified application rate. Measurement of materials shall be by approved weight scale.

1.3.11 ASPHALT CONCRETE COMPOSITE (CLIN 0008AA)

1.3.11.1 Payment

The quantities of material, determined as specified below, will be paid for at the respective contract unit price in the pricing schedule. Payment shall constitute full compensation for all operations, testing, labor, equipment, tools, and materials, including asphalt binder, mineral aggregate, and asphalt for tack coat, required for furnishing, placing, and compacting material in place.

1.3.11.2 Measurement

The unit of measurement shall be tons. The bituminous material paid for will be the measured quantities in tons used in the accepted work. Measurement of material shall be by approved weight scale and submitted certified waybills and delivery tickets.

1.3.12 ASPHALT CONCRETE COMPOSITE - BLADE LAID (CLIN 0008AC)

1.3.12.1 Payment

The quantities of material, determined as specified below, will be paid for at the respective contract unit price in the pricing schedule. Payment shall constitute full compensation for all operations, testing, labor, equipment, tools, materials, and asphalt, required for furnishing, placing, and compacting material in place. Reference SDDOT section 320 for placement details.

1.3.12.2 Measurement

The unit of measurement shall be tons. The bituminous material paid for will be the measured quantities in tons used in the accepted work. Measurement of material shall be by approved weight scale and submitted certified waybills and delivery tickets.

1.3.13 POTHOLE REPAIR - DEEP PATCH (CLIN 0008AE)

1.3.13.1 Payment

The quantities of materials, determined as specified below, will be paid for at the respective contract unit price in the pricing schedule. Payment shall constitute full compensation for all operations, labor, materials, equipment, traffic control, and tools required to prepare potholes for repair and to place deep patch repair materials.

1.3.13.2 Measurement

The unit of measurement will be per ton as listed on the task order.

1.3.14 EMULSIFIED ASPHALT (CLINS 0009AA, 0009AB, 0009AE, 0009AF)

1.3.14.1 Payment

Emulsified asphalt will be paid for at the respective contract unit prices, shown in the pricing schedule, per ton of placed material. This unit price will include the cost of all materials, equipment, labor,

testing, traffic control, and other incidentals associated with the procurement and placement of emulsified asphalt for seal coats applications. No payment will be made for any water that is used to dilute emulsified asphalt, when dilution is specified by the Contracting Officer.

1.3.14.2 Measurement

The unit of measurement shall be tons of material placed. Measurements shall be adjusted accordingly if the emulsified asphalt is diluted with water. Measurement of material shall be by approved weight scales. Scales shall be accurate to the first decimal and the cost per ton will be pro-rated in order to pay accordingly.

1.3.15 CHIP SEAL AGGREGATE-TYPE 2B (CLINS 0009AC & 0009AD)

1.3.15.1 Payment

Chip seal aggregate will be paid for at the respective contract unit prices in the pricing schedule, per ton of placed material. This unit price will include the cost of all materials, equipment, labor, brooming, vacuum sweeping, sampling, testing, traffic control, and other incidentals associated with the procurement and placement of chip seal aggregate for seal coat applications.

1.3.15.2 Measurement

The unit of measurement shall be tons of dry aggregate placed. Measurement of material shall be by approved weight scales and submitted certified waybills and delivery tickets.

1.3.16 FLUSH SEAL AGGREGATE (CLINS 0009AG & 0009AH)

1.3.16.1 Payment

Flush seal aggregate will be paid for at the respective contract unit prices shown in the pricing schedule, per ton of placed material. This unit price will include the cost of all materials, equipment, labor, installation, brooming, vacuuming, sampling, testing, traffic control, and other incidentals associated with the procurement and placement of flush seal aggregate for seal coat applications.

1.3.16.2 Measurement

The unit of measurement shall be tons of dry aggregate placed. Measurement of material shall be by approved weight scale and submitted certified waybills and delivery tickets.

1.3.17 VACUUM SWEEP (CLIN 0009AJ)

1.3.17.1 Payment

Payment will be made at the respective contract unit price, shown in the pricing schedule, to the nearest square yard of pavement to be vacuum swept. This unit price will include all costs associated with materials, equipment, labor, traffic control, and other incidentals necessary to vacuum sweep the areas designated by the task order.

1.3.17.2 Measurement

The unit of measurement shall be per square yards. The quantity of pavement to be vacuumed swept will be as designated on the task order.

1.3.18 POWER BROOM (CLIN 0009AL)

1.3.18.1 Payment

Payment will be made at the respective contract unit price, shown in the pricing schedule, to the nearest square yard of pavement to be power broomed. This unit price will include all costs associated with materials, equipment, labor, traffic control, and other incidentals necessary to power broom the areas designated by the task order.

1.3.18.2 Measurement

The unit of measurement shall be square yards. The quantity of pavement to be power broomed will be as designated on the task order.

1.3.19 SUBBASE COURSE (CLIN 0010AA)

1.3.19.1 Payment

The quantities of materials, determined as specified below, will be paid for at the respective contract unit price in the pricing schedule. Payment shall constitute full compensation for furnishing, transportation, placement, labor, equipment, shaping, testing, and all incidentals required. Subbase course will be as defined in Section 882 of the 2015 SDDOT Standard Specifications for Roads and Bridges.

1.3.19.2 Measurement

The unit of measurement shall be tons of dry aggregate placed and compacted. Measurement of material shall be by approved weight scales and submitted certified waybills and delivery tickets.

1.3.20 GRAVEL CUSHION COURSE (CLIN 0010AB)

1.3.20.1 Payment

The quantities of materials, determined as specified below, will be paid for at the respective contract unit price in the pricing schedule. Payment shall constitute full compensation for furnishing, transportation, placement, labor, equipment, shaping, testing, and all incidentals required. Gravel cushion course will be as defined in Section 882 of the 2015 SDDOT Standard Specifications for Roads and Bridges.

1.3.20.2 Measurement

The unit of measurement shall be tons of dry aggregate placed and compacted. Measurement of material shall be by approved weight scales and submitted certified waybills and delivery tickets.

1.3.21 BASE COURSE (CLIN 0010AC)

1.3.21.1 Payment

The quantities of materials, determined as specified below, will be paid

for at the respective contract unit price in the pricing schedule. Payment shall constitute full compensation for furnishing, transportation, placement, labor, equipment, shaping, testing, and all incidentals required. Base course will be as defined in Section 882 of the 2015 SDDOT Standard Specifications for Roads and Bridges.

1.3.21.2 Measurement

The unit of measurement shall be tons of dry aggregate placed and compacted. Measurement of material shall be by approved weight scales and submitted certified waybills and delivery tickets.

1.3.22 GRAVEL SURFACING COURSE (CLIN 0010AD)

1.3.22.1 Payment

The quantities of materials, determined as specified below, will be paid for at the respective contract unit price in the pricing schedule. Payment shall constitute full compensation for furnishing, transportation, placement, labor, equipment, shaping, testing, and all incidentals required. Gravel surfacing course will be as defined in Section 882 of the 2015 SDDOT Standard Specifications for Roads and Bridges.

1.3.22.2 Measurement

The unit of measurement shall be tons of dry aggregate placed and compacted. Measurement of material shall be by approved weight scales and submitted certified waybills and delivery tickets.

1.3.23 CURB AND GUTTER - TYPE B (CLIN 0011AA & 0011AE)

1.3.23.1 Payment

The quantities of materials, determined as specified below, will be paid for at the respective contract price shown on the pricing schedule. Payment shall constitute full compensation for the placement of curb and gutter including all labor, equipment, tools, materials, curing compound, joint sealants, saw cutting, and testing required.

1.3.23.2 Measurement

The unit of measurement shall be per linear foot of curb and gutter as required by the task order. Type B curb and gutter shall be as defined in 2020 SDDOT Standard Plate 650.01.

1.3.24 CURB AND GUTTER - TYPE P (CLIN 0011AB & 0011AF)

1.3.24.1 Payment

The quantities of materials, determined as specified below, will be paid for at the respective contract price shown on the pricing schedule. Payment shall constitute full compensation for the placement of curb and gutter including all labor, equipment, tools, materials, curing compound, joint sealants, saw cutting, and testing required.

1.3.24.2 Measurement

The unit of measurement shall be per linear foot of curb and gutter as required by the task order. Type P curb and gutter shall be as defined in

the 2020 SDDOT Standard Plate 650.30.

1.3.25 CURB AND GUTTER - VALLEY GUTTER (CLIN 0011AC)

1.3.25.1 Payment

The quantities of materials, determined as specified below, will be paid for at the respective contract price shown on the pricing schedule. Payment shall constitute full compensation for the placement of curb and gutter including all labor, equipment, tools, materials, curing compound, joint sealants, saw cutting, and testing required.

1.3.25.2 Measurement

The unit of measurement shall be per linear foot of curb and gutter as required by the task order. Valley gutter shall be as defined in 2020 SDDOT Standard Plate 650.40.

1.3.26 6" Concrete Paving (CLIN 011AH, 0011AI)

1.3.26.1 Payment

The quantities of materials, determined as specified below, will be paid for at the respective contract price shown on the pricing schedule. Payment shall constitute full compensation for the placement of 6" Concrete Paving including all labor, equipment, tools, materials, including reinforcement, curing compound, joint sealants, saw cutting, and testing required.

1.3.26.2 Measurement

The measurement shall be per square yard of 6" Concrete Pavement as required by the task order.

1.3.27 RELFECTIVE PAINT (CLIN 0012AA)

1.3.27.1 Payment

The quantities of materials, determined as specified below, will be paid for at the respective contract unit price in the pricing schedule. Payment shall constitute full compensation for all labor, equipment, tools, materials, traffic control, and testing required for the removal of existing pavement markings, preparing pavement surfaces for painting, and the painting of new roadway reflective pavement markings.

1.3.27.2 Measurement

The unit of measurements shall be linear foot per 4-inch width of painting completed as listed on the task order.

1.3.28 NON-REFLECTIVE PAINT (CLIN 0012AB)

1.3.28.1 Payment

The quantities of materials, determined as specified below, will be paid for at the respective contract unit price in the pricing schedule. Payment shall constitute full compensation for all labor, equipment, tools, materials, traffic control, and testing required for the removal of existing pavement markings, preparing pavement surfaces for painting, and

the painting of new roadway non-reflective pavement markings.

1.3.28.2 Measurement

The unit of measurements shall be linear foot per 4-inch width of painting completed as listed on the task order.

1.3.29 NON-REFLECTIVE PAINTED SYMBOLS - HANDICAPPED (CLIN 0012AC)

1.3.29.1 Payment

The quantities of materials, determined as specified below, will be paid for at the respective contract unit price in the pricing schedule. Payment shall constitute full compensation for all labor, equipment, tools, materials, traffic control, and testing required for the removal of existing pavement markings, preparing pavement surfaces for painting, and the painting of new roadway symbols.

1.3.29.2 Measurement

The unit of measurement shall be per each handicapped parking symbol painted and completed as listed on the task order.

1.3.30 NON-REFLECTIVE PAINTED SYMBOLS - TURN ARROW (CLIN 0012AD)

1.3.30.1 Payment

The quantities of materials, determined as specified below, will be paid for at the respective contract unit price in the pricing schedule. Payment shall constitute full compensation for all labor, equipment, tools, materials, traffic control, and testing required for the removal of existing pavement markings, preparing pavement surfaces for painting, and the painting of new roadway symbols.

1.3.30.2 Measurement

The unit of measurement shall be per each turn arrow symbol painted and completed as listed on the task order.

1.3.31 SEED & MULCH (CLIN 0013AA)

1.3.31.1 Payment

Quantities of seeding will be paid for at the respective contract unit price in the pricing schedule. Payment will not be made for quantities of completed seeding when actual application rate is more than 20 percent below the approved application rate until deficiency is corrected. Payment for Seed and Mulch shall constitute full compensation for all equipment, materials, labor, seed, mulch, topsoil, fertilizer, and watering.

1.3.31.2 Measurement

The actual application rate will be determined by the Contracting Officer and applied to the number of square yards of seeding and mulching. The quantity of seeding and mulching to be paid for will be the number of square yards as required on the task order.

1.3.32 HYDROSEEDING (CLIN 0013AC)

1.3.32.1 Payment

Quantities of hydroseeding will be paid for at the respective contract unit price in the pricing schedule. Payment will not be quantities of completed hydroseeding when actual application rate is more than 20 percent below the approved application rate until deficiency is corrected. Payment for Hydroseeding shall constitute full compensation for all equipment, materials, seed, fiber mulch, tackifier, fertilizer, labor, topsoil, and water.

1.3.32.2 Measurement

The actual application rate will be determined by the Contracting Officer and applied to the number of square yards of hydroseeding. The quantity of hydroseeding to be paid for will be the number of square yards as required on the task order.

1.3.33 EROSION CONTROL BLANKET (CLIN 0013AD)

1.3.33.1 Payment

Erosion control blanket, installed and accepted, will be paid for at the respective contract unit price in the pricing schedule. This unit price will constitute full compensation for all materials, erosion control blanket, anchors, equipment, and labor associated with furnishing and installing erosion control blanket. Any mobilization/demobilization fees associated with furnishing and installing erosion control blanket shall be included in the unit price for this item.

1.3.33.2 Measurement

The quantity of erosion control blanket to be paid for will be the number of square yards as required on the task order. No allowance will be made for waste, overlaps, damaged materials, repairs, or materials used for the convenience of the Contractor.

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OTHER ADMINISTRATIVE AND SPECIAL REQUIREMENTS

PART 1 GENERAL

Attachments:

1.1 EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE

In accordance with FAR 31.105(d)(2)(i)(b), for the predetermined schedule of construction equipment use rates, use Engineer Pamphlet (EP) 1110-1-8, Construction Equipment Ownership and Operating Expense Schedule. Copies of each regional schedule may be obtained through the following internet site:

<https://www.publications.usace.army.mil/USACE-Publications/Engineer-Pamphlets/> on pages 10 and 11 of 13.

1.2 CONTRACTOR SUPPLY AND USE OF ELECTRONIC SOFTWARE FOR PROCESSING CONSTRUCTION WAGE RATE REQUIREMENTS STATUTE CERTIFIED LABOR PAYROLLS

a. Use a commercially-available electronic system to process and submit certified payrolls electronically to the Government. The requirements for preparing, processing and providing certified labor payrolls are established by the Wage Rate Requirements statute.

b. Obtain and provide for all access, licenses, and other services required to provide for receipt, processing, certifying, electronically transmitting to the Government, and storing weekly payrolls and other data required for the Contractor to comply with the Wage Rate Requirements statute. Use the electronic payroll service to prepare, process, and maintain the relevant payrolls and basic records during all work under this construction contract. The electronic payroll service must be capable of preserving these payrolls and related basic records for the required three years after contract completion. Obtain and provide electronic system access to the Government, as required to comply with the Wage Rate Requirements over the duration of the construction contract.

(c) The Contractor's provision and use of an electronic payroll processing system must meet the following basic functional criteria:

(1) commercially available;

(2) compliant with appropriate Wage Rate Requirements statute payroll provisions in the FAR;

- (3) able to accommodate the required numbers of employees and subcontractors planned to be employed under the contract;
 - (4) capable of producing an Excel spreadsheet-compatible electronic output of weekly payroll records for export into an Excel spreadsheet to be imported into the contractor's mode of Resident Management System 3.0;
 - (5) demonstrated security of data and data entry rights;
 - (6) ability to produce Contractor-certified electronic versions of weekly payroll data;
 - (7) ability to identify erroneous entries and track the data/time of all versions of the certified Wage Rate Requirements statute payrolls submitted to the government over the life of the contract;
 - (8) capable of generating a durable record copy in a Compact Disc (CD) or Digital Versatile Disc (DVD) and Portable Document Format (PDF) file record of data from the system database at the end of the contract closeout. This durable record copy of data from the electronic payroll processing system must be provided to the Government during contract closeout.
- d. All Contractor-incurred costs related to the Contractor's provision and use of an electronic payroll processing service must be included in the Contractor's price for the overall work under the contract. The costs for compliance with the Wage Rate Requirements statute by using electronic payroll processing services must not be a separately bid or reimbursed item under this contract.

1.3 VETERANS EMPLOYMENT EMPHASIS FOR U.S. ARMY CORPS OF ENGINEERS CONTRACTS

In addition to complying with the requirements outlined in FAR Part 22.13, FAR Provision 52.222-38, FAR Clause 52.222-35, FAR Clause 52.222-37, DFARS 222.13 and Department of Labor regulations, U.S. Army Corps of Engineers (USACE) contractors and subcontractors at all tiers are encouraged to promote the training and employment of U.S. veterans while performing under a USACE contract. While no set-aside, evaluation preference, or incentive applies to the solicitation or performance under the resultant contract, USACE contractors are encouraged to seek out highly qualified veterans to perform services under this contract. The following resources are available to assist USACE contractors in their outreach efforts:

- U.S. Department of Labor Veterans' Employment and Training Service (VETS):
<https://www.dol.gov/vets/>
- Federal Veteran Employment Information: <https://www.fedshirevets.gov/>
- Veterans Opportunity to Work (VOW) Program:
<https://www.benefits.va.gov/vow/>
- U.S. Army Warrior Transition Command Employment Index:
<https://wct.army.mil/modules/employers/index.html>
- Hiring Our Heroes: <https://www.uschamberfoundation.org/hiring-our-heroes>

1.4 COMPLETION OF WORK

See Section 00 73 00 SUPPLEMENTARY CONDITIONS (SPECIAL CONTRACT REQUIREMENTS), FAR 52.211-10 COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK (APR 1984).

1.5 CONTRACTOR PERFORMANCE EVALUATIONS

See Federal Acquisition Regulation (FAR) Subpart 42.1502(e) for the requirements on past performance evaluations for construction contracts. For construction contracts valued at or above \$750,000.00, including all modifications, the USACE will evaluate Contractor's performance using the web-based Contractors Performance Assessment Reporting System (CPARS). After the USACE drafts an evaluation (interim or final), the Contractor will have the opportunity to access, review, comment and either concur or non-concur with the evaluation in the CPARS system for a period of 60 days. Access to the CPARS system requires either specific software called PKI certification (recommended method) or a username and password. The PKI certification is a Department of Defense recommendation and to provide security in electronic transactions. The certification software could cost approximately \$110 - \$125 per certificate per year and may be purchased from an External Certificate Authorities (ECA) vendor. Current information about the PKI certification process and contacting vendors can be found on the web site: <https://www.cpars.gov>.

1.6 LIQUIDATED DAMAGES-CONSTRUCTION

See Section 00 73 00 SUPPLEMENTARY CONDITIONS (SPECIAL CONTRACT REQUIREMENTS), FAR 52.211-12 LIQUIDATED DAMAGES-CONSTRUCTION (SEPT 2000).

1.7 ANTITERRORISM (AT)/OPERATIONS SECURITY (OPSEC) PROVISIONS

1. NOT USED.

2. Access and General Protection/Security Policy and Procedures

All Contractor and all associated sub-contractors employees shall comply with applicable installation, facility and area commander installation/facility access and local security policies and procedures (provided by government representative). The Contractor shall also provide all information required for background checks to meet installation access requirements to be accomplished by installation Provost Marshal Office, Director of Emergency Services or Security Office. Contractor workforce must comply with all personal identity verification requirements as directed by DOD, HQDA and/or local policy. In addition to the changes otherwise authorized by the changes clause of this contract, should the Force Protection Condition (FPCON) at any individual facility or installation change, the Government may require changes in Contractor security matters or processes.

2.1 Submit a complete, updated and signed, list of all Contractor and subcontractor personnel, including their titles and intended working hours, who will be working on site prior to start of work. This listing shall be revised and resubmitted when personnel changes occur. (SUBMITTAL FIO)

2.2 Personnel Risk Assessment

A minimum of seven days prior to engaging in work submit, to the CO or Project POC, a Personnel Risk Assessment (PRA) for each employee requiring authorized unescorted access to the Jobsite. The Contractor employee will only be allowed authorized unescorted physical access after the PRA is shown to and approved by the Government. (Government Security Paperwork)

2.3 Authorized Unescorted Access Requirements

Perform a PRA on all Contractor personnel that require authorized unescorted access to the Jobsite. Costs associated with the execution of the PRA shall be at the expense of the Contractor. The content of the PRA is defined by the requirements as follows:

a. Criminal Check - Obtain a criminal background check, completed within the last seven years of date of task order award under this contract, on all Contractor personnel that require authorized unescorted access to the Jobsite. A minimum of a 7-year criminal background check with the state patrol office shall be performed from all states of residence and employment, for the past seven years. The Project Security Officer through the Contacting Officer will approve, disapprove, or revoke authorized unescorted access to the Jobsite as a result of the seven-year background check. (Government Security Paperwork)

b. Identity Verification - Contractor employees shall provide positive verification of individual identity prior to authorized unescorted access to the Jobsite. Acceptable forms of identity verification are documents issued by a federal Government agency that include: the individual's photograph, name, and date of birth, such as a passport or military identification (ID) card. Additionally, a state issued driver's license or ID card is acceptable for identity verification.

c. The Criminal Check and Identity Verification shall be updated at least every seven years for each employee requiring authorized unescorted access to the Jobsite.

d. Escort Requirements - Contractor personnel not cleared for authorized access to the Jobsite may be escorted by Government or Contractor personnel that have authorized unescorted access to the Jobsite. All costs related to the escorting of non-cleared personnel shall be at the expense of the Contractor. Additional burden shall not be placed upon the Government to provide these escorts. Prior to access, coordination with the Project Security Officer is required, including but not limited to:

- (1) Verification of identity with photo identification
- (2) Name of escorting individual and verification of unescorted status
- (3) Time of entry into the Jobsite
- (4) Time exiting the Jobsite.

3. NOT USED

4. iWATCH and/or CorpsWatch Training

The Contractor and all associated sub-contractors shall brief all employees on the local iWATCH, Corps Watch, or See Something, Say Something program. This locally developed training will be used to inform employees of the types of behavior to watch for and instruct employees to report suspicious activity to the COR. This training shall be completed within 30 calendar days of task order award under this contract and within 30 calendar days of new employees commencing performance with the results reported to the COR NLT 5 calendar days after task order award under this contract (submittal: iWATCH and/or CorpsWatch Training Sign In Sheets). <http://www.myarmyonesource.com/familyprogramsandservices/iwatchprogram/default.aspx>

5. thru 12. Not Used

13. Will be Escorted in Areas Where They May be Exposed to Classified and/or Sensitive Materials and/or Sensitive or Restricted Areas
All contract employees, including subcontractor employees who are not in possession of the appropriate access privileges, will be escorted in areas where they may be exposed to sensitive materials and/or sensitive or restricted areas.

14. Not Used

15. Pre-screen Candidates using E-Verify Program.

The Contractor must pre-screen Candidates using the E-verify Program (<http://www.dhs.gov/E-Verify>) website to meet the established employment eligibility requirements. The Vendor must ensure that the Candidate has two valid forms of Government issued identification prior to ensure the correct information is entered into the E-verify system. An initial list of verified/eligible Candidates must be provided to the COR no later than 3 business days after the task order award under this contract.

16. & 17 Not Used

1.8 CONTRACT DRAWINGS AND SPECIFICATIONS

1.8.1 SETS FURNISHED

The Contractor shall be responsible for making copies of all plans and specifications as needed for the duration of the contract.
]

1.9 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 items below in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

AT Level I Training Sign In Sheets;

Sign In Sheets for all employee training required for AT Level I Training, see OPSEC paragraphs, subparagraph 1

Security Personnel List; G-PO

Security Personnel list as described in Access and General Protection/Security Policy and Procedures see OPSEC paragraphs, subparagraph 2.1.

iWATCH and/or CorpsWatch Training Sign In Sheets;

Sign In Sheets for all employee training required for iWATCH and/or CorpsWatch Training, see OPSEC paragraphs, subparagraph 4

Government Security Paperwork; G, PO

See OPSEC paragraphs, subparagraph 2.2 and 2.3 for more details.

E-Verify; G, PO

See OPSEC paragraphs, subparagraph 15 for more details.

1.10 PAYMENT

1.10.1 PROMPT PAYMENT ACT

Pay requests authorized in GENERAL CONDITIONS (CONTRACT CLAUSES) clause: "Payments Under Fixed-Price Construction Contracts", will be paid pursuant to the clause, "Prompt Payment for Construction Contracts". Submit pay requests on ENG Form 93 and 93a, "Payment Estimate-Contract Performance" and "Continuation". All information and substantiation required by the identified contract clauses must be submitted with the ENG Form 93, and the required certification included on the last page of the ENG Form 93a, signed by an authorized contractor official and dated when signed. The designated billing office is the Office of the Area Engineer.

1.11 DAMAGE TO WORK

The responsibility for damage to any part of the permanent work shall be as set forth in the GENERAL CONDITIONS (CONTRACT CLAUSES) clause: "Permits and Responsibilities." However, if, in the judgment of the Contracting Officer, any part of the permanent work performed by the Contractor is damaged by flood or earthquake, which damage is not due to the failure of the Contractor to take reasonable precautions or to exercise sound engineering and construction practices in the conduct of the work, the Contractor will make the repairs as ordered by the Contracting Officer and full compensation for such repairs will be made at the applicable contract unit or lump sum prices as fixed and established in the contract. If, in the opinion of the Contracting Officer, there are no contract unit or lump sum prices applicable to any part of such work an equitable adjustment pursuant to GENERAL CONDITIONS (CONTRACT CLAUSES) clause: "Changes," of the contract will be made as full compensation for the repairs of that part of the permanent work for which there are no applicable contract unit or lump sum prices. Except as herein provided, damage to all work (including temporary construction), utilities, materials, equipment and plant shall be repaired to the satisfaction of the Contracting Officer at the Contractor's expense, regardless of the cause of such damage.

1.12 AVAILABILITY AND USE OF UTILITY SERVICES

Use of public and private utilities will be as found available. The

Contractor must make his own arrangements for use of public and private utilities.

1.13 QUANTITY SURVEYS

See Section 00 73 00 SUPPLEMENTARY CONDITIONS (SPECIAL CONTRACT REQUIREMENTS) FAR 52.236.16 QUANTITY SURVEYS- Alternate I (APR 1984).

1.14 VARIATIONS IN ESTIMATED QUANTITIES - SUBDIVIDED ITEMS

See Section 00 73 00 SUPPLEMENTARY CONDITIONS (SPECIAL CONTRACT REQUIREMENTS).

1.15 TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER

a. This provision specifies the procedure for the determination of time extensions for unusually severe weather in accordance with the GENERAL CONDITIONS (CONTRACT CLAUSES) clause entitled "Default: (Fixed-Price Construction)." In order for the Contracting Officer to award a time extension under this clause, the following conditions must be satisfied:

(1) The weather experienced at the project site during the contract period must be found to be unusually severe, that is, more severe than the adverse weather anticipated for the project location during any given month.

(2) The unusually severe weather must actually cause a delay to the completion of the project. The delay must be beyond the control and without the fault or negligence of the contractor.

b. The following schedule of monthly anticipated adverse weather delays is based on National Oceanic and Atmospheric Administration (NOAA) or similar data for the project location and will constitute the base line for monthly weather time evaluations. The Contractor's progress schedule must reflect these anticipated adverse weather delays in all weather dependent activities.

MONTHLY ANTICIPATED ADVERSE WEATHER DELAY WORK DAYS BASED ON (5) DAY WORK WEEK

Jan	17
Feb	15
Mar	8
Apr	5
May	5
Jun	6
Jul	4
Aug	4
Sep	5
Oct	4
Nov	5
Dec	16

c. Upon acknowledgment of the Notice to Proceed (NTP) and continuing throughout the contract, the contractor will record on the RMS daily CQC

report, any occurrence of adverse weather and resultant impact to normally scheduled work, within 24 hours of the event. Actual adverse weather delay days must prevent work on critical activities for 50 percent or more of the contractor's scheduled work day. Describe in the RMS daily CQC reports the critical path item that is being affected and provide the critical path activity number(s) from the current schedule. The COR must acknowledge and accept the agreed upon occurrence of each adverse weather delay in RMS for the delays to be considered as adverse weather delays.

At the end of each month, identify the number of actual adverse weather delay days that includes days impacted by actual adverse weather (even if adverse weather occurred in previous month), calculated chronologically from the first to the last day of each month, and recorded as full days. If the number of actual adverse weather delay days exceeds the number of days anticipated in paragraph b. above, the Contracting Officer will convert any qualifying delays to calendar days, giving full consideration for equivalent fair weather work days, and issue a modification in accordance with the GENERAL CONDITIONS (CONTRACT CLAUSES) clause entitled "Default (Fixed Price Construction)". (ER 415-1-15)

1.16 INSURANCE REQUIRED

In accordance with GENERAL CONDITIONS (CONTRACT CLAUSES) clause: "Insurance Work on a Government Installation," procure the following minimum insurance for each Task Order:

Type	Amount
Workmen's Compensation and Employer's Liability Insurance	\$100,000
General Liability Insurance	\$500,000 per occurrence
Automobile Liability Insurance	
Bodily injury	\$200,000 per person and \$500,000 per occurrence
Property damage	\$ 20,000 per occurrence

(Coverages per FAR 28.307-2)

1.17 CONTRACTOR QUALITY CONTROL (CQC)

See Section 01 45 00.00 10 QUALITY CONTROL.

1.18 NONDOMESTIC CONSTRUCTION MATERIALS

The list of excepted nondomestic construction materials or their components referenced in the Buy American Construction Material Contract Clauses includes the list set forth in paragraph 25.104 of the Federal Acquisition Regulation.

1.19 DAILY WORK SCHEDULES AND WEEKLY COORDINATION MEETINGS

In order to closely coordinate work under this contract, prepare a written agenda/meeting minutes and attend a weekly coordination meeting with the Contracting Officer and Using Service at which time the Contractor must submit for coordination and approval, their proposed daily work schedule for the next two week period. Provide a copy of modifications (MODs), Serial Letters, Requests for Information (RFIs) and

any other information that is needed in the minutes of the meeting. Include required temporary utility services, time and duration of interruptions, and protection of adjoining areas with the Contractor's proposed 2-week work schedule. At this meeting, the Contractor must also submit their schedule of proposed dates and times of all preparatory inspections to be performed during the next 2 weeks. All schedules shall be in developed in accordance with paragraph: PROGRESS CHARTS Coordination action by the Contracting Officer relative to these schedules will be accomplished during these weekly meetings. Daily reports must be completed and given to the Contracting Officer or Representative within 24 hours of work. All official correspondence such as serial letters and RFIs, with attachments are to be provided in one hardcopy original with original signatures and one electronic (Adobe pdf format) copy by email. The Government will consider the correspondence to be received when the official hardcopy or electronic copy is received by the designated office.

1.20 PROFIT

a. Use the weighted guidelines method of determining profit on any equitable adjustment change order or modification issued under this contract. The profit factors must be as follows:

Factor	Rate	Weight	Value
Degree of Risk	20	See Item	
Relative difficulty of work	15	b. below	
Size of Job	15		
Period of performance	15		
Contractor's investment	5		
Assistance by Government	5		
Subcontracting	25		
	100		

b. Based on the circumstances of each procurement action, each of the above factors must be weighted from .03 to .12 as indicated below. Obtain the value by multiplying the rate by the weight. The value column when totaled indicates the fair and reasonable profit percentage under the circumstances of the particular procurement.

(1) Degree of Risk. Where the work involves no risk or the degree of risk is very small, the weighting should be .03; as the degree of risk increases, the weighting should be increased up to a maximum of .12. Lump sum items will have, generally, a higher weighted value than the unit price items for which quantities are provided. Other things to consider: the portion of the work to be done by subcontractors, nature of work, where work is to be performed, reasonableness of negotiated costs, amount of labor included in costs, and whether the negotiation is before or after performance of work.

(2) Relative Difficulty of Work. If the work is most difficult and complex, the weighting should be .12 and should be proportionately reduced to .03 on the simplest of jobs. This factor is tied in to some extent with the degree of risk. Some things to consider: the nature of the work, by whom it is to be done, where, and what is the time schedule.

(3) Size of Job. All work not in excess of \$100,000 shall be weighted at .12. Work estimated between \$100,000 and \$5,000,000 shall be proportionately weighted from .12 to .05.

(4) Periods of Performance. Jobs in excess of 24 months are to be weighted at .12. Jobs of lesser duration are to be proportionately weighted to a minimum of .03 for jobs not to exceed 30 days. No weight where additional time not required.

(5) Contractor's Investment. To be weighted from .03 to .12 on the basis of below average, average, and above average. Things to consider: amount of subcontracting, mobilization payment item, Government furnished property, equipment and facilities, and expediting assistance.

(6) Assistance by Government. To be weighted from .12 to .03 on the basis of average to above average. Things to consider: use of Government-owned property, equipment and facilities, and expediting assistance.

(7) Subcontracting. To be weighted inversely proportional to the amount of subcontracting. Where 80 percent or more of the work is to be subcontracted, the weighting is to be .03 and such weighting proportionately increased to .12 where all the work is performed by the Contractor's own forces.

1.21 LABOR CONDITIONS APPLICABLE TO TEMPORARY FACILITIES

It is the position of the Department of Defense that the Davis-Bacon Act, 40 U.S.C. 276a is applicable to temporary facilities such as job headquarters, tool yards, batch plants, borrow pits, sandpits, rock quarries, and similar operations, provided they are dedicated exclusively, or nearly so, to performance of the contract or project, and provided they are adjacent or virtually adjacent to the site of the work and are established after receipt of the proposal or bid. Clause "Payrolls and Basic Records" of the GENERAL CONDITIONS (CONTRACT CLAUSES) is applicable to such operations.

1.22 DRAWING SCALES

All scales shown are based on a standard drawing size of . If any other size drawings are furnished or plotted, the contractor adjust the scales accordingly. The Contractor must also advise their sub-contractors of the above.

PART 2 NOT USED

PART 3 NOT USED

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SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

1.1.1 Submittal Information

The Contractor is responsible for total management of their work including, but not limited to, approval, scheduling, control, certification of all submittals and compliance with all applicable Buy-American and Trade Agreement clauses. The submittal management system provided in these specifications is intended to be a complete system for the Contractor to use to control the quality of materials, equipment and workmanship provided by manufacturers, fabricators, suppliers and subcontractors. Review each submittal for contract compliance.

Compliance with all applicable Buy American and Trade Agreement Clauses is to be included in this review. The Contractor must provide the country of origin on ENG Form 4025 for each item submitted. The Submittal Register (ENG Form 4288) will be utilized to log and monitor all submittal activities.

The Contracting Officer may request submittals, in addition to those specified, when deemed necessary to adequately describe the work covered in the respective sections. Each submittal is to be complete and in sufficient detail to allow ready determination of compliance with contract requirements.

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

1.1.2 Project Type

The Contractor's Quality Control (CQC) System Manager is to check and approve all items before submittal and stamp, sign, and date indicating action taken. Clearly identify proposed deviations from the contract requirements. Include within submittals items such as: Contractor's, manufacturer's, or fabricator's drawings; descriptive literature including (but not limited to) catalog cuts, diagrams, operating charts or curves; test reports; test cylinders; samples; O&M manuals (including parts list); certifications; warranties; and other such required items.

1.1.3 Submission of Submittals

Schedule and provide submittals requiring Government approval, after notice to proceed (NTP). Provide ample lead time to ensure the submittal's processing by the Government and any lead time needed by the manufacturer upon ordering after approval. Dispose of samples not incorporated into the work in accordance with manufacturer's Safety Data Sheets (SDS) and in compliance with existing laws and regulations.

1.2 DEFINITIONS

1.2.1 Submittal Descriptions (SD)

Submittal requirements are specified in the technical sections. Examples and descriptions of submittals identified by the Submittal Description (SD) numbers and titles follow:

SD-01 Preconstruction Submittals

Submittals that are required prior to or at the start of construction (work) or the next major phase of the construction on a multiphase contract.

Preconstruction Submittals include schedules and a tabular list of locations, features, and other pertinent information regarding products, materials, equipment, or components to be used in the work.

The Government reserves the right to handle pre-construction submittals (listed below) as administrative submittals via a Serial Letter, as directed by the Project, Area or Resident Office. When directed by the Project, Area or Resident Office (as directed), submit administrative submittals for acceptance by the Government. Format for the Serial Letter will be as directed by the Project, Area or Resident Office.

Certificates Of Insurance

Surety Bonds

List Of Proposed Subcontractors

List Of Proposed Products

Baseline Network Analysis Schedule (NAS)

Submittal Register

Schedule Of Prices Or Earned Value Report

Accident Prevention Plan

Work Plan

Quality Control (QC) plan

Permits

Environmental Protection Plan

SD-02 Shop Drawings

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

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

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

SD-03 Product Data

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

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

SD-04 Samples

Fabricated or unfabricated physical examples of materials, equipment or workmanship that illustrate functional and aesthetic characteristics of a material or product and establish standards by which the work can be judged.

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

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

SD-05 Design Data

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

SD-06 Test Reports

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

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

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

Investigation reports

Daily logs and checklists

Final acceptance test and operational test procedure

SD-07 Certificates

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

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

Confined space entry permits

Text of posted operating instructions

SD-08 Manufacturer's Instructions

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

SD-09 Manufacturer's Field Reports

Documentation of the testing and verification actions taken by manufacturer's representative at the job site, in the vicinity of the job site, or on a sample taken from the job site, on a portion of the work, during or after installation, to confirm compliance with manufacturer's standards or instructions. The documentation must be signed by an authorized official of a testing laboratory or agency and state the test results; and indicate whether the material, product, or system has passed or failed the test.

Factory test reports.

SD-10 Operation and Maintenance Data

Data provided by the manufacturer, or the system provider, including manufacturer's help and product line documentation, necessary to maintain and install equipment, for operating and maintenance use by facility personnel.

Data required by operating and maintenance personnel for the safe and efficient operation, maintenance and repair of the item.

Data incorporated in an operations and maintenance manual or control system.

SD-11 Closeout Submittals

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

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

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

submittal requirements necessary to properly close out a major phase of construction on a multi-phase contract.

1.2.2 Approving Authority

Office or designated person authorized to approve the submittal.

1.2.3 Work

As used in this section, on-site and off-site construction required by contract documents, including labor necessary to produce submittals, construction, materials, products, equipment, and systems incorporated or to be incorporated in such construction. In exception, excludes work to produce SD-01 submittals.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having any designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with this section. When directed by the Government, the submittal register may be submitted via Section of 01 45 00.15 10 RESIDENTIAL MANAGMENT SYSTEM CONTRACTOR MODE (RMS-CM) in lieu of the copy attached to this section. SpecsIntact is the software system used by Government to generate the Submittal Register that is loaded into RMS-CM.

SD-01 Preconstruction Submittals

Submittal Register; G-AO

1.3.1 Action Codes

1.3.1.1 Contractor Action Codes

DESIGN BID BUILD SUBMITTALS			
Submittal Classifications shown in UFGS Sections	Submittal Classification	Corresponding SpecsIntact Submittal Register Code which is populated in the SI Submittal Register. Software Limitations: (The software shows one character delineation in the SpecsIntact Submittal Register)	RMS - The following Submittal Classifications are populated in RMS when the SpecsIntact Submittal Data File is pulled into RMS)
G	Submittal requires Government Approval	G	GA

DESIGN BID BUILD SUBMITTALS			
BLANK	Submittal is For Information Only (FIO)	BLANK	FIO

1.3.1.2 Government Reviewer Designations

Following the Submittal Classification designation "G", the following reviewer designations may be included:

RO - Resident Office
 AO - Area Office
 DO - District Office
 PO - Project Office

Additional information will be provided at the pre-design and/or pre-construction conference.

1.4 SUBMITTAL CLASSIFICATION

1.4.1 Government Approved (G)

Government approval is required for extensions of design, critical materials, variations, equipment whose compatibility with the entire system must be checked, and other items as designated by the Government.

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

1.4.2 For Information Only

Submittals not requiring Government approval will be for information only. Within the terms of the Contract Clause SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION, they are not considered to be "shop drawings."

1.5 PREPARATION

1.5.1 Transmittal Form

Use the ENG Form 4025 transmittal form for submitting both Government-approved and information-only submittals. Submit in accordance with the instructions on the reverse side of the form. These forms will be furnished to the Contractor. Properly complete this form by filling out all the heading blank spaces and identifying each item submitted. If there are multiple Item numbers listed on a particular ENG Form 4025 submittal, combine all submitted items for review into a single Adobe file with bookmarks (for ease of review). Exercise special care to ensure proper listing of the specification paragraph and sheet number of the contract drawings pertinent to the data submitted for each item.

1.5.2 Submittal Format

1.5.2.1 Format of SD-01 Preconstruction Submittals

When the submittal includes a document that is to be used in the project, or is to become part of the project record, other than as a submittal, do

not apply the Contractor's approval stamp to the document itself, but to a separate sheet accompanying the document.

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

1.5.2.2 Format for SD-02 Shop Drawings

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

- a. Include the nameplate data, size, and capacity on drawings. Also include applicable federal, military, industry, and technical society publication references.
- b. Dimension drawings, except diagrams and schematic drawings. Prepare drawings demonstrating interface with other trades to scale. Use the same unit of measure for shop drawings as indicated on the contract drawings. Identify materials and products for work shown.

Submit an electronic copy of drawings in PDF format.

1.5.2.2.1 Drawing Identification

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

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

1.5.2.3 Format of SD-03 Product Data

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

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

1.5.2.3.1 Product Information

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

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

1.5.2.3.2 Standards

Where equipment or materials are specified to conform to industry or technical-society reference standards of such organizations as the

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

1.5.2.3.3 Data Submission

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

Submit the manufacturer's instructions before installation.

1.5.2.4 Format of SD-04 Samples

1.5.2.4.1 Sample Characteristics

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

- a. Sample of Equipment or Device: Full size.
- b. Sample of Materials Less Than 2 by 3 inches: Built up to 8 1/2 by 11 inches.
- c. Sample of Materials Exceeding 8 1/2 by 11 inches: Cut down to 8 1/2 by 11 inches and adequate to indicate color, texture, and material variations.
- d. Sample of Linear Devices or Materials: 10 inch length or length to be supplied, if less than 10 inches. Examples of linear devices or materials are conduit and handrails.
- e. Sample Volume of Nonsolid Materials: Pint. Examples of nonsolid materials are sand and paint.
- f. Color Selection Samples: 2 by 4 inches. Where samples are specified for selection of color, finish, pattern, or texture, submit the full set of available choices for the material or product specified. Sizes and quantities of samples are to represent their respective standard unit.
- g. Sample Panel: 4 by 4 feet.
- h. Sample Installation: 100 square feet.

1.5.2.4.2 Sample Incorporation

Reusable Samples: Incorporate returned samples into work only if so

specified or indicated. Incorporated samples are to be in undamaged condition at the time of use.

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

1.5.2.4.3 Comparison Sample

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

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

1.5.2.5 Format of SD-05 Design Data

Provide design data and certificates on 8 1/2 by 11 inch page size.

1.5.2.6 Format of SD-06 Test Reports

By prominent notation, indicate each report in the submittal. Indicate the specification number and paragraph number to which each report pertains.

1.5.2.7 Format of SD-07 Certificates

Provide design data and certificates on 8 1/2 by 11 inch page size.

1.5.2.8 Format of SD-08 Manufacturer's Instructions

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

Submit the manufacturer's instructions before installation.

1.5.2.8.1 Standards

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

1.5.2.9 Format of SD-09 Manufacturer's Field Reports

By prominent notation, indicate each report in the submittal. Indicate the specification number and paragraph number to which each report pertains.

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

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

1.5.2.11 Format of SD-11 Closeout Submittals

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

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

1.5.3 Source Drawings for Shop Drawings

1.5.3.1 Source Drawings

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

1.5.3.2 Terms and Conditions

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

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

project. If the Contractor uses, duplicates or modifies these electronic source drawing files for use in producing construction data related to this contract, remove all previous indication of ownership (seals, logos, signatures, initials and dates).

1.5.4 Electronic File Format

Provide submittals in electronic format, with the exception of material samples required for SD-04 Samples items. Compile the submittal file as a single, complete document, to include the Transmittal Form described within. Name the electronic submittal file specifically according to its contents, and coordinate the file naming convention with the Contracting Officer. Electronic files must be of sufficient quality that all information is legible. Use PDF as the electronic format, unless otherwise specified or directed by the Contracting Officer. All documents must make use of optical character recognition (OCR) routines to make text searchable and selectable, so that the text can be copied. Index and bookmark files exceeding 30 pages to allow efficient navigation of the file. When required, the electronic file must include a valid electronic signature.

E-mail electronic submittal documents smaller than 10MB to an e-mail address as directed by the Contracting Officer, unless directed otherwise by COR. Provide electronic documents over 10 MB on an optical disc or through an electronic file sharing system, such as secure ftp site or DoD SAFE located at the following website: <https://safe.apps.mil/>. Use of the Government web application must be initiated by the Government, unless Contractor has a Government CAC card. This Government web application restricts the number of days files are available to download.

1.6 QUANTITY OF SUBMITTALS

Submittals are to be transmitted electronically, unless directed otherwise.

1.6.1 Number of SD-04 Samples

- a. Submit two samples, or two sets of samples showing the range of variation, of each required item. One approved sample or set of samples will be retained by the approving authority and one will be returned to the Contractor.
- b. Submit one sample panel or provide one sample installation where directed. Include components listed in the technical section or as directed.
- c. Submit one sample installation, where directed.
- d. Submit one sample of nonsolid materials.

1.7 INFORMATION ONLY SUBMITTALS

Submittals without an action code must be certified by the QC manager and submitted to the Contracting Officer for information-only. Approval of the Contracting Officer is not required on information only submittals. The Contracting Officer will mark "receipt acknowledged" on submittals for information and will return only the transmittal cover sheet to the Contractor. Normally, submittals for information only will not be returned. However, the Government reserves the right to return unsatisfactory submittals and require the Contractor to resubmit any item

found not to comply with the contract. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and specifications; will not prevent the Contracting Officer from requiring removal and replacement of nonconforming material incorporated in the work; and does not relieve the Contractor of the requirement to furnish samples for testing by the Government laboratory or for check testing by the Government in those instances where the technical specifications so prescribe.

1.8 PROJECT SUBMITTAL REGISTER

A sample Project Submittal Register showing submittals required by the specifications is attached to this section as "Project Submittal Register."

1.8.1 Submittal Management

Prepare and maintain a submittal register, as the work progresses. Do not change data that is output in columns (c), (d), (e), and (f) as delivered by Government; retain data that is output in columns (a), (g), (h), and (i) as approved. As an attachment, provide a 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. Maintain a submittal register for the project in accordance with Section 01 45 00.15 10 RESIDENT MANAGEMENT SYSTEM CONTRACTOR MODE(RMS CM). The Government will provide the initial submittal register in electronic format with the following fields completed, to the extent that will be required by the Government during subsequent usage.

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

Column (d): Lists each submittal description (SD Number. and type, e.g., SD-02 Shop Drawings) required in each specification section.

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

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

1.8.2 Preconstruction Use of Submittal Register

Submit the submittal register as an electronic database, using the submittal management program furnished to Contractor, unless directed otherwise by COR. Include the QC plan and the project schedule. Verify that all submittals required for the project are listed and add missing submittals. Coordinate and complete the following fields on the register database submitted with the QC plan and the project schedule:

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

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

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

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

1.8.3 Contractor Use of Submittal Register

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

Column (b) Transmittal Number: List of consecutive, Contractor-assigned numbers.

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

Column (l) Date submittal transmitted.

Column (q) Date approval was received.

1.8.4 Approving Authority Use of Submittal Register

Update the following fields:

Column (b) Transmittal Number: List of consecutive, Contractor-assigned numbers.

Column (l) Date submittal was received.

Column (m) through (p) Dates of review actions.

Column (q) Date of return to Contractor.

1.8.5 Action Codes

See paragraph Action Codes above.

1.8.6 Delivery of Copies

Submit an updated electronic copy of the submittal register to the Contracting Officer with each invoice request, unless a paper copy is requested by the Contracting Officer. Provide an updated Submittal Register monthly regardless of whether an invoice is submitted.

1.9 VARIATIONS

Variations from contract requirements require Contracting Officer approval pursuant to contract Clause FAR 52.236-21 Specifications and Drawings for Construction, and will be considered where advantageous to the Government.

1.9.1 Considering Variations

Discussion of variations with the Contracting Officer before submission will help ensure that functional and quality requirements are met and

minimize rejections and resubmittals. For variations that include design changes or some material or product substitutions, the Government may require an evaluation and analysis by a licensed professional engineer hired by the contractor. When contemplating a variation that results in lower cost, consider submission of the variation as a Value Engineering Change Proposal (VECP).

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

1.9.2 Proposing Variations

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

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

1.9.3 Warranting that Variations are Compatible

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

1.9.4 Review Schedule Extension

In addition to the normal submittal review period, a period of 14 calendar days will be allowed for the Government to consider submittals with variations.

1.10 SCHEDULING

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

- a. Coordinate scheduling, sequencing, preparing, and processing of submittals with performance of work so that work will not be delayed by submittal processing. The Contractor is responsible for additional time required for Government reviews resulting from required resubmittals. The review period for each resubmittal is the same as for the initial submittal.
- b. Submittals required by the contract documents are listed on the submittal register. If a submittal is listed in the submittal register but does not pertain to the contract work, the Contractor is to include the submittal in the register and annotate it "N/A" with a brief explanation. Approval by the Contracting Officer does not

relieve the Contractor of supplying submittals required by the contract documents but that have been omitted from the register or marked "N/A."

- c. Resubmit the submittal register and annotate it monthly with actual submission and approval dates. When all items on the register have been fully approved, no further resubmittal is required.

Contracting Officer review will be completed within 20 calendar days after the date of submission.

The Government review period for each construction submittal does not begin until the submittal is delivered via RMS CM. Contract compliance for all submittals are the Contractor's responsibility. Government acceptance or receipt acknowledged does not remove this responsibility for contract compliance on any construction submittal.

1.11 GOVERNMENT APPROVING AUTHORITY

When the approving authority is the Contracting Officer, the Government will:

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

Upon completion of review of submittals requiring Government approval, stamp and date submittals. An electronic copy of the submittal will be retained by the Contracting Officer and an electronic copy of the submittal will be returned to the Contractor. The Government may process submittals in the RMS CM System.

1.11.1 Review Notations

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

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

explanation of the reason it is not reviewed. Resubmit submittals returned for lack of review by Contractor or for being incomplete, with appropriate action, coordination, or change.

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

1.12 DISAPPROVED SUBMITTALS

Make corrections required by the Contracting Officer. If the Contractor considers any correction or notation on the returned submittals to constitute a change to the contract drawings or specifications, give notice to the Contracting Officer as required under the FAR clause titled CHANGES. The Contractor is responsible for the dimensions and design of connection details and the construction of work. Failure to point out variations may cause the Government to require rejection and removal of such work at the Contractor's expense.

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

1.13 APPROVED SUBMITTALS

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

Approval or acceptance by the Government for a submittal does not relieve the Contractor of the responsibility for meeting the contract requirements or for any error that may exist, because under the Quality Control (QC) requirements of this contract, the Contractor is responsible for ensuring information contained within each submittal accurately conforms with the requirements of the contract documents.

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

1.14 APPROVED SAMPLES

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

Match the approved samples for materials and equipment incorporated in the work. If requested, approved samples, including those that may be damaged in testing, will be returned to the Contractor, at its expense, upon completion of the contract. Unapproved samples will also be returned to the Contractor at its expense, if so requested.

Failure of any materials to pass the specified tests will be sufficient

cause for refusal to consider, under this contract, any further samples of the same brand or make as that material. The Government reserves the right to disapprove any material or equipment that has previously proved unsatisfactory in service.

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

1.15 WITHHOLDING OF PAYMENT

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

1.16 CERTIFICATION OF SUBMITTAL DATA

Certify the submittal data as follows on Form ENG 4025: "I certify that the above submitted items had been reviewed in detail and are correct and in strict conformance with the contract drawings and specifications except as otherwise stated.

____NAME OF CONTRACTOR _____ SIGNATURE OF CONTRACTOR

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

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GOVERNMENTAL SAFETY REQUIREMENTS

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

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

AMERICAN SOCIETY OF SAFETY PROFESSIONALS (ASSP)

ASSP A10.34	(2021) Protection of the Public on or Adjacent to Construction Sites
ASSP Z359.0	(2018) Definitions and Nomenclature Used for Fall Protection and Fall Arrest
ASSP Z359.1	(2020) The Fall Protection Code
ASSP Z359.2	(2017) Minimum Requirements for a Comprehensive Managed Fall Protection Program
ASSP Z359.3	(2019) Safety Requirements for Lanyards and Positioning Lanyards
ASSP Z359.4	(2013) Safety Requirements for Assisted-Rescue and Self-Rescue Systems, Subsystems and Components
ASSP Z359.6	(2016) Specifications and Design Requirements for Active Fall Protection Systems
ASSP Z359.7	(2019) Qualification and Verification Testing of Fall Protection Products

ASSP Z359.11	(2014) Safety Requirements for Full Body Harnesses
ASSP Z359.12	(2019) Connecting Components for Personal Fall Arrest Systems
ASSP Z359.13	(2013) Personal Energy Absorbers and Energy Absorbing Lanyards
ASSP Z359.14	(2014) Safety Requirements for Self-Retracting Devices for Personal Fall Arrest and Rescue Systems
ASSP Z359.15	(2014) Safety Requirements for Single Anchor Lifelines and Fall Arresters for Personal Fall Arrest Systems
ASSP Z359.16	(2016) Safety Requirements for Climbing Ladder Fall Arrest Systems
ASSP Z359.18	(2017) Safety Requirements for Anchorage Connectors for Active Fall Protection Systems

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 10	(2018; ERTA 1-2 2018) Standard for Portable Fire Extinguishers
NFPA 51B	(2019; TIA 20-1) Standard for Fire Prevention During Welding, Cutting, and Other Hot Work
NFPA 70	(2020; ERTA 20-1 2020; ERTA 20-2 2020; TIA 20-1; TIA 20-2; TIA 20-3; TIA 20-4) National Electrical Code
NFPA 70E	(2021) Standard for Electrical Safety in the Workplace
NFPA 241	(2019) Standard for Safeguarding Construction, Alteration, and Demolition Operations

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2014) Safety and Health Requirements Manual
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U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1910.146	Permit-required Confined Spaces
29 CFR 1915	Confined and Enclosed Spaces and Other Dangerous Atmospheres in Shipyard Employment

29 CFR 1926	Safety and Health Regulations for Construction
29 CFR 1926.16	Rules of Construction
29 CFR 1926.450	Scaffolds
29 CFR 1926.500	Fall Protection
29 CFR 1926.1400	Cranes and Derricks in Construction
CPL 2.100	(1995) Application of the Permit-Required Confined Spaces (PRCS) Standards, 29 CFR 1910.146

1.2 DEFINITIONS

1.2.1 Competent Person (CP)

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

1.2.2 Competent Person, Confined Space

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

1.2.3 Competent Person, Excavation/Trenching

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

1.2.4 Competent Person, Fall Protection

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

to such hazards.

1.2.5 Competent Person, Scaffolding

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

1.2.6 Competent Person (CP) Trainer

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

1.2.7 High Risk Activities

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

1.2.8 High Visibility Accident

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

1.2.9 Load Handling Equipment (LHE)

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

1.2.10 Medical Treatment

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

1.2.11 Near Miss

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

1.2.12 Operating Envelope

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

1.2.13 Qualified Person (QP)

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

1.2.14 Qualified Person, Fall Protection (QP for FP)

A QP for FP is a person meeting the definition requirements of EM 385-1-1 Appendix Q, and ASSP Z359.2 standard, having a recognized degree or professional certificate and with extensive knowledge, training and experience in the fall protection and rescue field who is capable of designing, analyzing, and evaluating and specifying fall protection and rescue systems.

1.2.15 Recordable Injuries or Illnesses

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

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

1.2.16 Government Property and Equipment

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

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

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

1.3 SUBMITTALS

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

SD-01 Preconstruction Submittals

ACCIDENT PREVENTION PLAN; G, AO

Accident Prevention Plan (AAP) - Construction; G, AO

SD-06 Test Reports

Monthly Exposure Reports

Notifications and Reports

Accident Reports; G, AO

LHE Inspection Reports

SD-07 Certificates

Crane Operators/Riggers

Standard Lift Plan; G, AO

Critical Lift Plan; G, AO

Activity Hazard Analysis (AHA)

Confined Space Entry Permit

Hot Work Permit

Certificate of Compliance

License Certificates

1.4 MONTHLY EXPOSURE REPORTS

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

1.5 REGULATORY REQUIREMENTS

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

1.6 SITE QUALIFICATIONS, DUTIES, AND MEETINGS

1.6.1 Personnel Qualifications

1.6.1.1 Site Safety and Health Officer (SSHO)

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

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

1.6.1.1.1 Additional Site Safety and Health Officer (SSHO) Requirements and Duties

The SSHO may also serve as the Quality Control Manager. The SSHO may also serve as the Superintendent.

1.6.1.2 Competent Person Qualifications

Provide Competent Persons in accordance with EM 385-1-1, Appendix Q and herein. Competent Persons for high risk activities include confined

space, cranes and rigging, excavation/trenching, fall protection, and electrical work. The CP for these activities must be designated in writing, and meet the requirements for the specific activity (i.e. competent person, fall protection).

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

1.6.1.2.1 Competent Person for Confined Space Entry

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

1.6.1.2.2 Competent Person for Scaffolding

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

1.6.1.2.3 Competent Person for Fall Protection

Provide a Competent Person for Fall Protection who meets the requirements of EM 385-1-1, Section 21.C.04, 21.B.03, and herein.

1.6.1.3 Qualified Trainer Requirements

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

Instructors are required to:

- a. Prepare class presentations that cover construction-related safety requirements.
- b. Ensure that all attendees attend all sessions by using a class roster signed daily by each attendee. Maintain copies of the roster for at least five years. This is a certification class and must be attended 100 percent. In cases of emergency where an attendee cannot make it to a session, the attendee can make it up in another class session for the same subject.
- c. Update training course materials whenever an update of the EM 385-1-1 becomes available.
- d. Provide a written exam of at least 50 questions. Students are required to answer 80 percent correctly to pass.
- e. Request, review and incorporate student feedback into a continuous course improvement program.

1.6.2 Personnel Duties

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

The SSHO must:

- a. Conduct daily safety and health inspections and maintain a written log which includes area/operation inspected, date of inspection, identified hazards, recommended corrective actions, estimated and actual dates of corrections. Attach safety inspection logs to the Contractors' daily production report.
- b. Conduct mishap investigations and complete required accident reports. Report mishaps and near misses.
- c. Use and maintain OSHA's Form 300 to log work-related injuries and illnesses occurring on the project site for Prime Contractors and subcontractors, and make available to the Contracting Officer upon request. Post and maintain the Form 300A on the site Safety Bulletin Board.
- d. Maintain applicable safety reference material on the job site.
- e. Attend the pre-construction conference, pre-work meetings including preparatory meetings, and periodic in-progress meetings.
- f. Review the APP and AHAs for compliance with EM 385-1-1, and approve, sign, implement and enforce them.
- g. Establish a Safety and Occupational Health (SOH) Deficiency Tracking System that lists and monitors outstanding deficiencies until resolution.
- h. Ensure subcontractor compliance with safety and health requirements.
- i. Maintain a list of hazardous chemicals on site and their material Safety Data Sheets (SDS).
- j. Maintain a weekly list of high hazard activities involving energy, equipment, excavation, entry into confined space, and elevation, and be prepared to discuss details during QC Meetings.
- k. Provide and keep a record of site safety orientation and indoctrination for Contractor employees, subcontractor employees, and site visitors.

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

1.6.3 Meetings

1.6.3.1 Preconstruction Conference

- a. Contractor representatives who have a responsibility or significant

role in accident prevention on the project must attend the preconstruction conference. This includes the project superintendent, Site Safety and Occupational Health Officer, quality control manager, or any other assigned safety and health professionals who participated in the development of the APP (including the Activity Hazard Analyses (AHAs) and special plans, program and procedures associated with it).

- b. Discuss the details of the submitted APP to include incorporated plans, programs, procedures and a listing of anticipated AHAs that will be developed and implemented during the performance of the Contract. This list of proposed AHAs will be reviewed and an agreement will be reached between the Contractor and the Contracting Officer as to which phases will require an analysis. In addition, establish a schedule for the preparation, submittal, and Government review of AHAs to preclude project delays.
- c. Deficiencies in the submitted APP, identified during the Contracting Officer's review, must be corrected, and the APP re-submitted for review prior to the start of construction. Work is not permitted to begin until an APP is established that is acceptable to the Contracting Officer.

1.6.3.2 Safety Meetings

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

1.7 ACCIDENT PREVENTION PLAN (APP)

1.7.1 ACCIDENT PREVENTION PLAN (AAP)

A qualified person must prepare the written site-specific APP. Prepare the APP in accordance with the format and requirements of EM 385-1-1, Appendix A, and as supplemented herein. Cover all paragraph and subparagraph elements in EM 385-1-1, Appendix A. The APP must be job-specific and address any unusual or unique aspects of the project or activity for which it is written. The APP must interface with the Contractor's overall safety and health program referenced in the APP in the applicable APP element, and made site-specific. Describe the methods to evaluate past safety performance of potential subcontractors in the selection process. Also, describe innovative methods used to ensure and monitor safe work practices of subcontractors. The Government considers the Prime Contractor to be the "controlling authority" for all work site safety and health of the subcontractors. Contractors are responsible for informing their subcontractors of the safety provisions under the terms of the Contract and the penalties for noncompliance, coordinating the work to prevent one craft from interfering with or creating hazardous working conditions for other crafts, and inspecting subcontractor operations to ensure that accident prevention responsibilities are being carried out. The APP must be signed by an officer of the firm (Prime Contractor senior person), the individual preparing the APP, the on-site superintendent, the

designated SSHO, the Contractor Quality Control Manager, and any designated Certified Safety Professional (CSP) or Certified Health Physicist (CIH). The SSHO must provide and maintain the APP and a log of signatures by each subcontractor foreman, attesting that they have read and understand the APP, and make the APP and log available on-site to the Contracting Officer. If English is not the foreman's primary language, the Prime Contractor must provide an interpreter.

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

In lieu of a fully developed APP, the Contracting Officer (KO) and local Safety and Occupational Health Office (SOHO) may allow an Abbreviated APP to be developed and submitted for acceptance. Any allowance for submission of an Abbreviated APP in lieu of a fully developed APP will be communicated within the Scope of Work when a task order is issued. If the Scope of Work of a task order does not specifically provide this allowance, the contractor shall provide a fully developed APP as originally required.

If an Abbreviated APP is requested in lieu of a fully developed APP, the contractor can refer to EM 385-1-1 part 01.A.12.e and Appendix A, paragraph 3.k for more information.

1.7.2 Names and Qualifications

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

- a. Names and qualifications (resumes including education, training, experience and certifications) of site safety and health personnel designated to perform work on this project to include the designated Site Safety and Health Officer and other competent and qualified personnel to be used. Specify the duties of each position.
- b. Qualifications of competent and of qualified persons. As a minimum, designate and submit qualifications of competent persons for each of the following major areas: excavation; scaffolding; fall protection; hazardous energy; confined space; health hazard recognition, evaluation and control of chemical, physical and biological agents; and personal protective equipment and clothing to include selection, use and maintenance.

1.7.3 Plans

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

1.7.3.1 Confined Space Entry Plan

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

1.7.3.2 Standard Lift Plan (SLP)

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

1.7.3.3 Critical Lift Plan - Crane or Load Handling Equipment

Provide a Critical Lift Plan as required by EM 385-1-1, Section 16.H.01, using Form 16-3. In addition, Critical Lift Plans are required for the following:

- a. Lifts over 50 percent of the capacity of barge mounted mobile crane's hoist.
- b. When working around energized power lines where the work will get closer than the minimum clearance distance in EM 385-1-1 Table 16-1.
- c. For lifts with anticipated binding conditions.
- d. When erecting cranes.

1.7.3.3.1 Critical Lift Plan Planning and Schedule

Critical lifts require detailed planning and additional or unusual safety precautions. Develop and submit a critical lift plan to the Contracting Officer 30 calendar days prior to critical lift. Comply with load testing requirements in accordance with EM 385-1-1, Section 16.F.03.

1.7.3.3.2 Lifts of Personnel

In addition to the requirements of EM 385-1-1, Section 16.H.02, for lifts of personnel, demonstrate compliance with the requirements of 29 CFR 1926.1400 and EM 385-1-1, Section 16.T.

1.7.3.4 Multi-Purpose Machines, Material Handling Equipment, and Construction Equipment Lift Plan

Multi-purpose machines, material handling equipment, and construction equipment used to lift loads that are suspended by rigging gear, require proof of authorization from the machine OEM that the machine is capable of making lifts of loads suspended by rigging equipment. Written approval from a qualified registered professional engineer, after a safety analysis is performed, is allowed in lieu of the OEM's approval. Demonstrate that the operator is properly trained and that the equipment is properly configured to make such lifts and is equipped with a load chart.

1.7.3.5 Fall Protection and Prevention (FP&P) Plan

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

1.7.3.6 Rescue and Evacuation Plan

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

1.7.3.7 Excavation Plan

Identify the safety and health aspects of excavation, and provide and prepare the plan in accordance with EM 385-1-1, Section 25.A and Section 31 00 00 EARTHWORK.

1.8 ACTIVITY HAZARD ANALYSIS (AHA)

Before beginning each activity, task or Definable Feature of Work (DFOW) involving a type of work presenting hazards not experienced in previous project operations, or where a new work crew or subcontractor is to perform the work, the Contractor(s) performing that work activity must prepare an AHA. AHAs must be developed by the Prime Contractor, subcontractor, or supplier performing the work, and provided for Prime Contractor review and approval before submitting to the Contracting Officer. AHAs must be signed by the SSHO, Superintendent, QC Manager and the subcontractor Foreman performing the work. Format the AHA in

accordance with EM 385-1-1, Section 1 or as directed by the Contracting Officer. Submit the AHA for review at least 15 working days prior to the start of each activity task, or DFO. The Government reserves the right to require the Contractor to revise and resubmit the AHA if it fails to effectively identify the work sequences, specific anticipated hazards, site conditions, equipment, materials, personnel and the control measures to be implemented.

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

1.8.1 AHA Management

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

1.8.2 AHA Signature Log

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

1.9 DISPLAY OF SAFETY INFORMATION

1.9.1 Safety Bulletin Board

Prior to commencement of work, erect a safety bulletin board at the job site. Where size, duration, or logistics of project do not facilitate a bulletin board, an alternative method, acceptable to the Contracting Officer, that is accessible and includes all mandatory information for employee and visitor review, may be deemed as meeting the requirement for a bulletin board. Include and maintain information on safety bulletin board as required by EM 385-1-1, Section 01.A.07. Additional items required to be posted include:

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

1.9.2 Safety and Occupational Health (SOH) Deficiency Tracking System

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

- a. Date deficiency identified;
- b. Description of deficiency;

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

1.10 SITE SAFETY REFERENCE MATERIALS

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

1.11 EMERGENCY MEDICAL TREATMENT

Contractors must arrange for their own emergency medical treatment in accordance with EM 385-1-1. Government has no responsibility to provide emergency medical treatment.

1.12 NOTIFICATIONS and REPORTS

1.12.1 Mishap Notification

Notify the Contracting Officer as soon as practical, but no more than twenty-four hours, after any mishaps, including recordable accidents, incidents, and near misses, as defined in EM 385-1-1 Appendix Q, any report of injury, illness, or any property damage. For LHE or rigging mishaps, notify the Contracting Officer as soon as practical but not more than four hours after mishap. The Contractor is responsible for obtaining appropriate medical and emergency assistance and for notifying fire, law enforcement, and regulatory agencies. Immediate reporting is required for electrical mishaps, to include Arc Flash; shock; uncontrolled release of hazardous energy (includes electrical and non-electrical); load handling equipment or rigging; fall from height (any level other than same surface); and underwater diving. These mishaps must be investigated in depth to identify all causes and to recommend hazard control measures.

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

1.12.2 Accident Reports

- a. Conduct an accident investigation for recordable injuries and illnesses, property damage, and near misses as defined in EM 385-1-1, to establish the root cause(s) of the accident. Complete the applicable USACE Accident Report ENG Form 3394, and provide the report to the Contracting Officer within 5 calendar days of the accident. The Contracting Officer will provide copies of any required or special forms.
- b. Near Misses: For Army projects, report all "Near Misses" to the GDA, using local mishap reporting procedures, within 24 hrs. The Contracting Officer will provide the Contractor the required forms.

Near miss reports are considered positive and proactive Contractor safety management actions.

- c. Conduct an accident investigation for any load handling equipment accident (including rigging accidents) to establish the root cause(s) of the accident. Complete the LHE Accident Report (Crane and Rigging Accident Report) form and provide the report to the Contracting Officer within 30 calendar days of the accident. Do not proceed with crane operations until cause is determined and corrective actions have been implemented to the satisfaction of the Contracting Officer. The Contracting Officer will provide a blank copy of the accident report form.

1.12.3 LHE Inspection Reports

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

1.13 HOT WORK

1.13.1 Permit and Personnel Requirements

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

When starting work in the facility, require personnel to familiarize themselves with the location of the nearest fire alarm boxes and knowledge of emergency response plan and emergency phone numbers/contacts. REPORT ANY FIRE, NO MATTER HOW SMALL, TO THE RESPONSIBLE FIRE DEPARTMENT OR CONTRACTING OFFICER IMMEDIATELY.

1.13.2 Work Around Flammable Materials

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

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

1.14 CONFINED SPACE ENTRY REQUIREMENTS

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

1.14.1 Entry Procedures

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

1.14.2 Forced Air Ventilation

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

1.14.3 Sewer Wet Wells

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

1.14.4 Rescue Procedures and Coordination with Local Emergency Responders

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

1.15 SEVERE STORM PLAN

In the event of a severe storm warning, the Contractor must comply with the applicable Storm Plan and:

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

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 CONSTRUCTION AND OTHER WORK

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

prevails.

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

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

3.1.1 Worksite Communication

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

3.1.2 Hazardous Material Exclusions

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

3.2 FALL PROTECTION PROGRAM

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

3.2.1 Training

Institute a fall protection training program. As part of the Fall Protection Program, provide training for each employee who might be exposed to fall hazards and using personal fall protection equipment.

Provide training by a competent person for fall protection in accordance with EM 385-1-1, Section 21.C. Document training and practical application of the competent person in accordance with EM 385-1-1, Section 21.C.04 and ASSP Z359.2 in the AHA.

3.2.2 Fall Protection Equipment and Systems

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

Provide personal fall protection equipment, systems, subsystems, and components that comply with EM 385-1-1 Section 21.I, 29 CFR 1926.500 Subpart M, ASSP Z359.0, ASSP Z359.1, ASSP Z359.2, ASSP Z359.3, ASSP Z359.4, ASSP Z359.6, ASSP Z359.7, ASSP Z359.11, ASSP Z359.12, ASSP Z359.13, ASSP Z359.14, ASSP Z359.15, ASSP Z359.16 and ASSP Z359.18.

3.2.2.1 Additional Personal Fall Protection Measures

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

3.2.2.2 Personal Fall Protection Equipment

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

3.2.3 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 from unprotected edge of a roof having a slope less than or equal to 4:12 (vertical to horizontal), protect personnel from falling by the use of conventional fall protection systems (personal fall arrest/restraint systems, guardrails, or safety nets) in accordance with EM 385-1-1, Section 21 and 29 CFR 1926.500. A safety monitoring system is not adequate fall protection and is not authorized.
- (2) For work greater than 6 feet from the unprotected roof edge, addition to the use of conventional fall protection systems the use of a warning line system is also permitted, in accordance with 29 CFR 1926.500 and EM 385-1-1, Section 21.L.

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

3.2.4 Horizontal Lifelines (HLL)

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

3.2.5 Guardrails and Safety Nets

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

3.2.6 Rescue and Evacuation Plan and Procedures

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

3.3 WORK PLATFORMS

3.3.1 Scaffolding

Provide employees with a safe means of access to the work area on the scaffold. Climbing of any scaffold braces or supports not specifically

designed for access is prohibited. Comply with the following requirements:

- a. Scaffold platforms greater than 20 feet in height must be accessed by use of a scaffold stair system.
- b. Ladders commonly provided by scaffold system manufacturers are prohibited for accessing scaffold platforms greater than 20 feet maximum in height.
- c. An adequate gate is required.
- d. Employees performing scaffold erection and dismantling must be qualified.
- e. Scaffold must be capable of supporting at least four times the maximum intended load, and provide appropriate fall protection as delineated in the accepted fall protection and prevention plan.
- f. Stationary scaffolds must be attached to structural building components to safeguard against tipping forward or backward.
- g. Special care must be given to ensure scaffold systems are not overloaded.
- h. Side brackets used to extend scaffold platforms on self-supported scaffold systems for the storage of material are prohibited. The first tie-in must be at the height equal to 4 times the width of the smallest dimension of the scaffold base.
- i. Scaffolding other than suspended types must bear on base plates upon wood mudsills (2 in x 10 in x 8 in minimum) or other adequate firm foundation.
- j. Scaffold or work platform erectors must have fall protection during the erection and dismantling of scaffolding or work platforms that are more than 6 feet.
- k. Delineate fall protection requirements when working above 6 feet or above dangerous operations in the Fall Protection and Prevention (FP&P) Plan and Activity Hazard Analysis (AHA) for the phase of work.

3.3.2 Elevated Aerial Work Platforms (AWPs)

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

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

3.4 EQUIPMENT

3.4.1 Material Handling Equipment (MHE)

- a. Material handling equipment such as forklifts must not be modified with work platform attachments for supporting employees unless specifically delineated in the manufacturer's printed operating instructions. Material handling equipment fitted with personnel work platform attachments are prohibited from traveling or positioning while personnel are working on the platform.
- b. The use of hooks on equipment for lifting of material must be in accordance with manufacturer's printed instructions. Material Handling Equipment Operators must be trained in accordance with OSHA 29 CFR 1910, Subpart N.
- c. Operators of forklifts or power industrial trucks must be licensed in accordance with OSHA.

3.4.2 Load Handling Equipment (LHE)

The following requirements apply. In exception, these requirements do not apply to commercial truck mounted and articulating boom cranes used solely to deliver material and supplies (not prefabricated components, structural steel, or components of a systems-engineered metal building) where the lift consists of moving materials and supplies from a truck or trailer to the ground; to cranes installed on mechanics trucks that are used solely in the repair of shore-based equipment; to crane that enter the activity but are not used for lifting; nor to other machines not used to lift loads suspended by rigging equipment. However, LHE accidents occurring during such operations must be reported.

- a. Equip cranes and derricks as specified in EM 385-1-1, Section 16.
- b. Notify the Contracting Officer 15 working days in advance of any LHE entering the activity, in accordance with EM 385-1-1, Section 16.A.02, so that necessary quality assurance spot checks can be coordinated. Contractor's operator must remain with the crane during the spot check. Rigging gear must be in accordance with OSHA, ASME B30.9 Standards and federal, state, and local safety standards.
- c. Comply with the LHE manufacturer's specifications and limitations for erection and operation of cranes and hoists used in support of the work. Perform erection under the supervision of a designated person (as defined in ASME B30.5). Perform all testing in accordance with the manufacturer's recommended procedures.
- d. As applicable, comply with ASME B30.5 for mobile and locomotive cranes, ASME B30.22 for articulating boom cranes, ASME B30.3 for construction tower cranes, ASME B30.8 for floating cranes and floating derricks, ASME B30.9 for slings, ASME B30.20 for below the hook lifting devices and ASME B30.26 for rigging hardware.
- e. As applicable, when operating in the vicinity of overhead transmission lines, operators and riggers must be alert to this special hazard and follow the requirements of EM 385-1-1 Section 11, and ASME B30.5 or ASME B30.22 as applicable.
- f. Do not use crane suspended personnel work platforms (baskets) unless

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

- g. Inspect, maintain, and recharge portable fire extinguishers as specified in NFPA 10, Standard for Portable Fire Extinguishers.
- h. All employees must keep clear of loads about to be lifted and of suspended loads, except for employees required to handle the load.
- i. Use cribbing when performing lifts on outriggers.
- j. The crane hook/block must be positioned directly over the load. Side loading of the crane is prohibited.
- k. A physical barricade must be positioned to prevent personnel access where accessible areas of the LHE's rotating superstructure poses a risk of striking, pinching or crushing personnel.
- l. Maintain inspection records in accordance by EM 385-1-1, Section 16.D, including shift, monthly, and annual inspections, the signature of the person performing the inspection, and the serial number or other identifier of the LHE that was inspected. Records must be available for review by the Contracting Officer.
- m. Maintain written reports of operational and load testing in accordance with EM 385-1-1, Section 16.F, listing the load test procedures used along with any repairs or alterations performed on the LHE. Reports must be available for review by the Contracting Officer.
- n. Certify that all LHE operators have been trained in proper use of all safety devices (e.g. anti-two block devices).
- o. Take steps to ensure that wind speed does not contribute to loss of control of the load during lifting operations. At wind speeds greater than 20 mph, the operator, rigger and lift supervisor must cease all crane operations, evaluate conditions and determine if the lift may proceed. Base the determination to proceed or not on wind calculations per the manufacturer and a reduction in LHE rated capacity if applicable. Include this maximum wind speed determination as part of the activity hazard analysis plan for that operation.
- q. Follow FAA guidelines when required based on project location.

3.4.3 Machinery and Mechanized Equipment

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

3.4.4 Use of Explosives

Explosives must not be used or brought to the project site.

3.5 EXCAVATIONS

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

3.5.1 Utility Locations

Provide a third party, independent, private utility locating company to positively identify underground utilities in the work area.

3.5.2 Utility Location Verification

Physically verify all underground utility locations, including utility depth, by potholing using water, air with non-conductive ends and can include hand digging using wood or fiberglass handled tools when any adjacent construction work is expected to come within 3 feet of the underground system.

De-energize the circuit for medium voltage cable or direct buried medium voltage cables prior to performing any construction activities within 3 feet of the circuit. If the circuit is reenergized while still exposed, a barrier with danger signs must be provided to limit the approach boundary to 10 feet. De-energize the circuit prior to reentering the 10 feet boundary.

When the excavation will expose and undermine a concrete encased duct bank, submit a concrete encased duct bank electrical support plan for government acceptance prior to undermining the duct bank.

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

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

-- End of Section --

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(SOUTH DAKOTA) NPDES PERMIT REQUIREMENTS
FOR STORM WATER DISCHARGES
FROM CONSTRUCTION SITES

PART 1 GENERAL

"General Permit For Storm Water Discharges Associated With Construction Activities", Permit No. SDR10#### can be found at the following website:
<http://denr.sd.gov/des/sw/StormWaterandConstruction.aspx>

1.1 REFERENCES (Not Applicable)

1.2 SUBMITTALS

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

Notice of Intent.

Authorization Letter.

Storm Water Pollution Prevention Plan.

Notice of Termination.

SD-06 Test Reports

Reports.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL

The Contractor shall be responsible for implementing the terms and requirements of the attached "General Permit For Storm Water Discharges Associated With Construction Activities", Permit No. SDR10####, for storm water discharges from construction sites. The Contractor shall be considered the "permittee". All submissions to the state shall be by certified mail. Copies of the return receipt for each submission shall be included with the submittal to the Contracting Officer's Representative (COR).

3.2 IMPLEMENTATION

3.2.1 Notice of Intent

The Contractor shall complete and submit a Notice of Intent (NOI) in accordance with Permit No. SDR10####. A copy of the submitted NOI shall be furnished to the COR at least 15 days prior to the commencement of construction activities. The Government shall be considered the "Applicant" and shall sign as such on the form after review. The Contractor will complete Attachment C in the Permit No. SDR10####. Attachment C is titled Department of Environment and Natural Resources Contractor Certification Form. Which will be submitted with the NOI.

NOTE: The Contractor is responsible for any Notice of Violations that occur during the NPDES Permit being in effect. The Contractor will be responsible for paying for any violation fines and/or making any corrections necessary.

The State Of South Dakota has authorized stormwater permit fees. Effective July 1, 2018 new construction Notice of Intents (NOIs) must include the first year's fee, shall be paid the the Contractor at time of the NOI filing. (If the fee is not paid, the owner of the project will be billed, but the Contractor will be responsible for the fee.) The fee as follows:

- <5 acres = \$100
- 5 to <40 acres = \$250
- 40 to <80 acres = \$500
- 80+ acres = \$750

NOTE: These fees are per year and must be paid every year of the project by the Contractor.

3.2.2 Authorization Letter

Construction activities regulated under Permit No. SDR10#### shall not begin until an authorization letter from the State granting coverage for the storm water discharges is received by the Contractor. A copy of the authorization letter shall be furnished to the COR at least 2 days prior to the commencement of construction activities.

3.2.3 Posting NOI and Authorization Letter

A copy of the NOI and the authorization letter shall be posted by the Contractor at the construction site in a prominent place for public viewing.

3.2.4 Storm Water Pollution Prevention Plan

The Contractor shall prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) in accordance with Permit No. SDR10####. Any temporary or permanent erosion and sedimentation control measures shown on the drawings shall be incorporated into the Contractor's SWPPP. A copy of the SWPPP shall be submitted to the COR at least 2 days prior to the commencement of construction activities. Copies of all revisions to the SWPPP shall also be submitted.

3.2.5 Inspections and Reporting

The Contractor shall be responsible for all inspections and reporting required under the NPDES Permit No. SDR10####. Copies of all inspection

reports shall be furnished to the COR.

3.2.6 Retention of Records

The Contractor shall retain a copy of the SWPPP, reports, and records of all data used to complete the NOI in accordance with Permit No. SDR10####.

3.2.7 Notice of Termination

The Contractor shall complete and submit a Notice of Termination (NOT) in accordance with Permit No. SDR10####. The Government shall be considered the "Facility Operator". A copy of the submitted NOT shall be furnished to the COR for signature prior to submission to the State..

3.2.8 Renotification

If the current permit expires prior to completion of construction, the Contractor shall submit a new NOI in accordance with Permit No. SDR10####. A copy of all submissions to the State shall be furnished to the COR.

-- End of Section --

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DIVISION 01 - GENERAL REQUIREMENTS

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(NEBRASKA) NPDES PERMIT REQUIREMENTS FOR STORM WATER DISCHARGES FROM
CONSTRUCTION SITES

PART 1 GENERAL

- 1.1 REFERENCES (NOT APPLICABLE)
- 1.2 SUBMITTALS

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

- 3.1 GENERAL
- 3.2 IMPLEMENTATION
 - 3.2.1 Notice of Intent
 - 3.2.2 Storm Water Pollution Prevention Plan
 - 3.2.3 Inspections and Record Keeping
 - 3.2.4 Notice of Termination
 - 3.2.5 Renotification

-- End of Section Table of Contents --

SECTION 01 41 26.02 24

(NEBRASKA) NPDES PERMIT REQUIREMENTS
FOR STORM WATER DISCHARGES
FROM CONSTRUCTION SITES

PART 1 GENERAL

NOTE: NPDES Permit can be found at
<http://deq.ne.gov/Publica.nsf/pages/WAT012>. An on-line application is
also available at this web site.

1.1 REFERENCES (NOT APPLICABLE)

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation;
submittals having no designation are for information only. Submit the
following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittal

Notice of Intent.

Storm Water Pollution Prevention Plan.

Notice of Termination.

SD-06 Test Reports

Records.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 GENERAL

Implement the terms and requirements of the "Authorization To Discharge
Under The State Of Nebraska National Pollutant Discharge Elimination
System (NPDES)", Permit No. NER210000, for storm water discharges from
construction sites. The Contractor will be considered the "permittee".
Use the online permit application process for all submissions to the state.
Provide copies for each submission to the Contracting Officer's
Representative (COR). The project site is not located in designated
critical habitat and there are no known "listed species" located in the
project area.

3.2 IMPLEMENTATION

3.2.1 Notice of Intent

Complete and submit a Notice of Intent (NOI) in accordance with NPDES
Permit No. NER210000. Furnish a copy of the submitted NOI to the COR at

least 10 calendar days prior to the commencement of construction activities.

3.2.2 Storm Water Pollution Prevention Plan

Prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) in accordance with NPDES Permit No. NER210000. Incorporate any temporary or permanent erosion and sedimentation control measures shown on the drawings into the SWPPP. Submit a copy of the SWPPP to the COR at least 10 calendar days prior to the commencement of construction activities. Submit copies of all revisions to the SWPPP.

3.2.3 Inspections and Record Keeping

Maintain responsibility for all inspections, maintenance, and record keeping required under the NPDES Permit No. NER210000. Furnish copies of all inspection and maintenance records to the COR.

3.2.4 Notice of Termination

Complete and submit a Notice of Termination in accordance with NPDES Permit No. NER210000. Furnish a copy of the submitted Notice of Termination to the COR not more than 10 calendar days after submission to the State.

3.2.5 Renotification

If the current permit expires prior to completion of construction, apply for a reissuance of NPDES Permit No. NER210000. Furnish a copy of all submissions to the State to the COR.

-- End of Section --

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SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
2022 IDCC Gavins Point Dam SD

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH	GOVT CLASSIFICATION	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		DATE FWD TO APPR AUTH/	APPROVING AUTHORITY				MAILED TO CONTR/	REMARKS
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION	DATE RCD FRM APPR AUTH	
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		01 12 00	SD-01 Preconstruction Submittals														
			Progress Charts	1.10	G PO												
			Construction Right-of-Way	1.2													
			State and Federal Highways	1.7.6													
			State and Local Public Roads	1.7.7													
			Temporary Traffic Control (TTC)	1.7.3	G AO												
			SD-02 Shop Drawings														
			Care of Water	1.4	G AO												
			SD-11 Closeout Submittals														
			Warranty of Construction	1.11													
		01 30 00.24	SD-01 Preconstruction Submittals														
			AT Level I Training Sign In Sheets														
			Security Personnel List		G PO												
			iWATCH and/or CorpsWatch	1.7													
			Training Sign In Sheets														
			Government Security Paperwork	1.7	G PO												
			Government Security Paperwork	1.7	G PO												
			E-Verify	1.7	G PO												
		01 33 00	SD-01 Preconstruction Submittals														
			Submittal Register	1.8	G AO												
		01 35 26	SD-01 Preconstruction Submittals														
			ACCIDENT PREVENTION PLAN		G AO												
			Accident Prevention Plan (AAP) - Construction		G AO												
			SD-06 Test Reports														

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CONTRACTOR

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION	DATE RCD FRM APPR AUTH	
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		01 35 26	Monthly Exposure Reports	1.4													
			Notifications and Reports	1.12													
			Accident Reports	1.12.2	G AO												
			LHE Inspection Reports	1.12.3													
			SD-07 Certificates														
			Crane Operators/Riggers														
			Standard Lift Plan	1.7.3.2	G AO												
			Critical Lift Plan	1.7.3.3	G AO												
			Activity Hazard Analysis (AHA)	1.8													
			Confined Space Entry Permit	1.9.1													
			Hot Work Permit	1.9.1													
			Certificate of Compliance														
			License Certificates														
		01 41 26.01 24	SD-01 Preconstruction Submittals														
			Notice of Intent	3.2.1													
			Authorization Letter														
			Storm Water Pollution Prevention Plan	3.2.4													
			Notice of Termination	3.2.7													
			SD-06 Test Reports														
			Reports	3.2.5													
		01 41 26.02 24	SD-01 Preconstruction Submittals														
			Notice of Intent	3.2.1													
			Storm Water Pollution Prevention Plan	3.2.2													
			Notice of Termination	3.2.4													

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION	DATE RCD FRM APPR AUTH	
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		01 41 26.02 24	SD-06 Test Reports														
			Records	3.2.3													
		01 45 00.00 10	SD-01 Preconstruction Submittals														
			Contractor Quality Control (CQC) Plan	3.2	G AO												
			SD-06 Test Reports														
			Verification Statement	3.9													
		01 57 20.00 10	SD-01 Preconstruction Submittals														
			Environmental Protection Plan	1.7	G PO												
		01 57 23	SD-07 Certificates														
			Mill Certificate or Affidavit	2.1.3													
		31 00 00	SD-03 Product Data														
			Utilization of Excavated Materials	3.6	G PO												
			Opening of any Excavation or Borrow Pit		G PO												
			Waybills And Delivery Tickets	3.3													
			SD-06 Test Reports														
			Testing	3.12	G PO												
			Borrow Material	3.12.2	G PO												
			SD-07 Certificates														
			Testing	3.12													
		31 05 22	SD-03 Product Data														
			Geotextile	2.1.1	G PO												
			SD-07 Certificates														
			Certificate Of Compliance	2.2.1.1													
		32 01 17.61	SD-03 Product Data														

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(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		32 01 17.61	Installation of Sealant	3.3													
			Sealants	2.1	G PO												
			Backer Materials	2.2	G PO												
		32 11 23	SD-03 Product Data														
			Plant, Equipment, and Tools	1.4	G PO												
			Waybills and Delivery Tickets	1.1.3													
			SD-06 Test Reports														
			Sampling And Testing	2.2.1	G PO												
		32 12 13	SD-03 Product Data														
			Waybills and Delivery Tickets	1.3													
			SD-06 Test Reports														
			Sampling And Testing	3.7	G PO												
			SD-07 Certificates														
			Bituminous Material	3.6													
		32 12 16	SD-03 Product Data														
			Mix Design	2.4	G DO												
			Equipment List	2.1	G PO												
			Material Acceptance	3.12	G PO												
			Waybills And Delivery Tickets	3.12													
			SD-04 Samples														
			Asphalt Cement Binder	2.3													
			SD-06 Test Reports														
			Aggregates	2.2	G PO												
			QC Monitoring	3.11.1.10													
			SD-07 Certificates														
			Asphalt Cement Binder	2.3	G PO												

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(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		32 12 16	Testing Laboratory	3.6													
		32 12 36.13	SD-03 Product Data														
			Waybills and Delivery Tickets	1.4.6													
			Inspection Reports	1.4.6													
			Equipment List	1.3	G PO												
			Qualifications	1.4.5	G PO												
			Chip Seal Design	2.5	G PO												
			SD-04 Samples														
			Bituminous Materials	3.3.2													
			SD-06 Test Reports														
			Aggregates	3.3.1.1	G PO												
			Bituminous Materials	3.3.2	G PO												
		32 15 00	SD-03 Product Data														
			Plant, Equipment, and Tools	1.4	G PO												
			Waybills And Delivery Tickets	1.5													
			SD-06 Test Reports														
			Initial Tests	2.3.1	G PO												
			In-Place Tests	3.9.1	G PO												
		32 16 19	SD-01 Preconstruction Submittals														
			Cold Weather Placing Plan	1.4.1	G PO												
			Hot Weather Placing Plan	1.4.2	G PO												
			Placement Plan	1.3.1	G PO												
			SD-03 Product Data														
			Concrete	2.1	G PO												
			Reinforcement	2.1.4	G PO												
			Concrete Curing Materials	2.2	G PO												

SUBMITTAL REGISTER

CONTRACT NO.

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2022 IDCC Gavins Point Dam SD

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH	GOVT CLASSIFICATION	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
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(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		32 16 19	Joint Filler	2.3	G PO												
			Joint Sealant	2.4	G PO												
			Epoxy Resin	2.1.4.1	G PO												
			Joint Backer Rod	2.5	G PO												
			SD-06 Test Reports														
			Field Quality Control	3.9													
			SD-07 Certificates														
			Batch Tickets	2.1	G PO												
			Qualifications	3.9.1													
		32 17 23	SD-03 Product Data														
			Equipment	2.1	G PO												
			Safety Data Sheets	1.3.1	G PO												
			Reflective media for roads	2.2.2.1	G PO												
			Waterborne Paint	2.2.1	G PO												
			SD-07 Certificates														
			Qualifications	1.3.2	G PO												
			Reflective Media for Roads	2.2.2.1													
			Waterborne Paint	2.2.1													
		32 92 19	SD-03 Product Data														
			Wood Cellulose Fiber Mulch	2.4.3													
			Seed	2.1	G PO												
			Erosion Control Materials	2.6	G PO												
			Fertilizer	2.3	G PO												

INSTRUCTIONS

1. Section I will be initiated by the Contractor in the required number of copies.
2. Each Transmittal shall be numbered consecutively. The Transmittal Number typically includes two parts separated by a dash (-). The first part is the specification section number. The second part is a sequential number for the submittals under that spec section. If the Transmittal is a resubmittal, then add a decimal point to the end of the original Transmittal Number and begin numbering the resubmittal packages sequentially after the decimal.
3. The "Item No." for each entry on this form will be the same "Item No." as indicated on ENG FORM 4288-R.
4. Submittals requiring expeditious handling will be submitted on a separate ENG Form 4025-R.
5. Items transmitted on each transmittal form will be from the same specification section. Do not combine submittal information from different specification sections in a single transmittal.
6. If the data submitted are intentionally in variance with the contract requirements, indicate a variation in column h, and enter a statement in the Remarks block describing the detailed reason for the variation.
7. ENG Form 4025-R is self-transmitting - a letter of transmittal is not required.
8. When submittal items are transmitted, indicate the "Submittal Type" (*SD-01 through SD-11*) in column c of Section I.
 Submittal types are the following:

SD-01 - Preconstruction	SD-02 - Shop Drawings	SD-03 - Product Data	SD-04 - Samples	SD-05 - Design Data	SD-06 - Test Reports
SD-07 - Certificates	SD-08 - Manufacturer's Instructions	SD-09 - Manufacturer's Field Reports	SD-10 - O&M Data	SD-11 - Closeout	
9. For each submittal item, the Contractor will assign Submittal Action Codes in column g of Section I. The U.S. Army Corps of Engineers approving authority will assign Submittal Action Codes in column i of Section I. The Submittal Action Codes are:

A -- Approved as submitted. B -- Approved, except as noted on drawings. Resubmission not required. C -- Approved, except as noted on drawings. Refer to attached comments. Resubmission required. D -- Will be returned by separate correspondence. E -- Disapproved. Refer to attached comments.	F -- Receipt acknowledged. X -- Receipt acknowledged, does not comply with contract requirements, as noted. G -- Other action required (<i>Specify</i>) K -- Government concurs with intermediate design. (<i>For D-B contracts</i>) R -- Design submittal is acceptable for release for construction. (<i>For D-B contracts</i>)
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10. Approval of items does not relieve the contractor from complying with all the requirements of the contract.

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DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01 45 00.00 10

QUALITY CONTROL

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- 1.2 PAYMENT
- 1.3 SUBMITTALS

PART 2 PRODUCTS

PART 3 EXECUTION

- 3.1 GENERAL REQUIREMENTS
- 3.2 CONTRACTOR QUALITY CONTROL (CQC) PLAN
 - 3.2.1 Content of the CQC Plan
 - 3.2.2 Acceptance of Plan
 - 3.2.3 Notification of Changes
- 3.3 COORDINATION MEETING
- 3.4 QUALITY CONTROL ORGANIZATION
 - 3.4.1 Personnel Requirements
 - 3.4.2 CQC System Manager
 - 3.4.3 CQC Personnel
 - 3.4.4 Assignment of CQC System Manager, Project Superintendent, and SSO Responsibilities
 - 3.4.5 Construction Quality Management Course- COVID-19 Restrictions
 - 3.4.6 Construction Quality Management Course - Post-COVID-19 Restrictions
 - 3.4.7 Organizational Changes
- 3.5 SUBMITTALS AND DELIVERABLES
- 3.6 CONTROL
 - 3.6.1 Preparatory Phase
 - 3.6.2 Initial Phase
 - 3.6.3 Follow-up Phase
 - 3.6.4 Additional Preparatory and Initial Phases
- 3.7 TESTS
 - 3.7.1 Testing Procedure
 - 3.7.2 Testing Laboratories
 - 3.7.2.1 Capability Check
 - 3.7.2.2 Capability Recheck
 - 3.7.3 Onsite Laboratory
- 3.8 COMPLETION INSPECTION
 - 3.8.1 Punch-Out Inspection
 - 3.8.2 Pre-Final Inspection
 - 3.8.3 Final Acceptance Inspection
- 3.9 DOCUMENTATION
- 3.10 SAMPLE FORMS
- 3.11 NOTIFICATION OF NONCOMPLIANCE

-- End of Section Table of Contents --

SECTION 01 45 00.00 10

QUALITY CONTROL

PART 1 GENERAL

1.1 REFERENCES

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

ASTM INTERNATIONAL (ASTM)

ASTM D3740 (2019) Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction

ASTM E329 (2020) Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection

1.2 PAYMENT

Separate payment will not be made for providing and maintaining an effective Quality Control program. Include all associated costs in the applicable Pricing Schedule item.

1.3 SUBMITTALS

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

SD-01 Preconstruction Submittals

Contractor Quality Control (CQC) Plan; G, AO

SD-06 Test Reports

Verification Statement

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

Establish and maintain an effective quality control (QC) system that complies with the Contract Clause titled "Inspection of Construction." QC consist of plans, procedures, and organization necessary to produce an end product which complies with the Contract requirements. The QC system covers all construction operations, both onsite and offsite, and be keyed to the proposed construction sequence. The project superintendent will be held responsible for the quality of work and is subject to removal by the Contracting Officer for non-compliance with the quality requirements specified in the Contract. In this context the highest level manager responsible for the overall construction activities at the site, including quality and production is the project superintendent. The project superintendent maintains a physical presence at the site at all times and is responsible for all construction and related activities at the site, except as otherwise acceptable to the Contracting Officer.

3.2 CONTRACTOR QUALITY CONTROL (CQC) PLAN

Submit no later than 15 calendar days after receipt of notice to proceed, the Contractor Quality Control (CQC) Plan proposed to implement the requirements of the Contract Clause titled "Inspection of Construction." The Government will consider an interim plan for the first 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 accepted interim plan will not be permitted to begin until acceptance of a CQC Plan or another interim plan containing the additional work.

3.2.1 Content of the CQC Plan

Include, as a minimum, the following to cover all construction-operations, both onsite and offsite, including work by subcontractors, fabricators, suppliers, and purchasing agents:

- a. A description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff will implement the three phase control system for all aspects of the work specified.
- b. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function.
- c. A copy of the letter to the CQC System Manager signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC System Manager, including authority to stop work which is not in compliance with the Contract. Letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities will be issued by the CQC System Manager. Furnish copies of these letters to the Contracting Officer.
- d. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, offsite fabricators,

suppliers, and purchasing agents. These procedures must be in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.

- e. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test. (Laboratory facilities approved by the Contracting Officer are required to be used.)
- f. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation.
- g. Procedures for tracking construction deficiencies from identification through acceptable corrective action. Establish verification procedures that identified deficiencies have been corrected.
- h. Reporting procedures, including proposed reporting formats.
- i. A list of the definable features of work. A definable feature of work is a task which is separate and distinct from other tasks, has separate control requirements, and is identified by different trades or disciplines, or it is work by the same trade in a different environment. Although each section of the specifications can generally be considered as a definable feature of work, there are frequently more than one definable features under a particular section. This list will be agreed upon during the coordination meeting.

3.2.2 Acceptance of Plan

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

3.2.3 Notification of Changes

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

3.3 COORDINATION MEETING

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

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

3.4 QUALITY CONTROL ORGANIZATION

3.4.1 Personnel Requirements

The requirements for the CQC organization are a Safety and Health Manager, CQC System Manager, and sufficient number of additional qualified personnel to ensure safety and Contract compliance. The Safety and Health Manager reports directly to a senior project (or corporate) official independent from the CQC System Manager. The Safety and Health Manager will also serve as a member of the CQC Staff. Personnel identified in the technical provisions as requiring specialized skills to assure the required work is being performed properly will also be included as part of the CQC organization. The Contractor's CQC staff maintains a presence at the site at all times during progress of the work and have complete authority and responsibility to take any action necessary to ensure Contract compliance. The CQC staff will be subject to acceptance by the Contracting Officer. Provide adequate office space, filing systems and other resources as necessary to maintain an effective and fully functional CQC organization. Promptly complete and furnish all letters, material submittals, shop drawing submittals, schedules and all other project documentation to the CQC organization. The CQC organization is responsible to maintain these documents and records at the site at all times, except as otherwise acceptable to the Contracting Officer.

3.4.2 CQC System Manager

Identify as CQC System Manager an individual within the onsite work organization that is responsible for overall management of CQC and has the authority to act in all CQC matters for the Contractor. The CQC System Manager is required to be a construction person with a minimum of 5 years in related work. This CQC System Manager is on the site at all times during construction and is employed by the prime Contractor. The CQC System Manager is assigned as CQC System Manager, but may have duties as SSHO in addition to quality control and meets the qualifications for each position. Identify in the plan an alternate to serve in the event of the CQC System Manager's absence. The requirements for the alternate are the same as the CQC System Manager.

3.4.3 CQC Personnel

ALTERNATE 2:]Maintain a staff under the direction of the CQC system manager to perform all QC activities. The staff must be of sufficient size to ensure adequate QC coverage of all work phases, work shifts, and work crews involved in the construction. These personnel may perform other duties, but must be fully qualified by experience and technical training to perform their assigned QC responsibilities and must be allowed sufficient time to carry out these responsibilities. Clearly state the duties and responsibilities of each staff member in the QC Plan. Other technical specifications may specify individuals for maintaining quality control for specific areas of work.

3.4.4 Assignment of CQC System Manager, Project Superintendent, and SSHO Responsibilities

The CQC System Manager, Project Superintendent, and Site Safety and Health Officer (SSHO) may be one individual if this individual meets all requirements specified for each position.

3.4.5 Construction Quality Management Course- COVID-19 Restrictions

In addition to the above experience and education requirements, the Contractor Quality Control(CQC) System Manager and Alternate CQC System Manager are required to have completed the Construction Quality Management (CQM) for Contractors course.

Contractor personnel who otherwise fulfill all requirements for designation as a CQC Manager, but have not had the opportunity to obtain a CQM certificate due to COVID-19 restrictions, shall be permitted to serve as Quality Control Managers conditioned upon obtaining a CQM-C certificate within 120 days of USACE lifting current in person learning restrictions.

CQC Managers who were in possession of valid CQM certificate (i.e. not delinquent on the 5 year course renewal requirement) as of 01-Mar-2020 will have a grace period for obtaining the CQM renewal training of 6-months from the lifting of COVID-19 restrictions and USACE being able to provide face to face CQM training.

This course is periodically offered at offices indicated at the following web site:

<http://www.nwo.usace.army.mil/BusinessWithUs/Contracting/QualityManagement.aspx>

The exact date and location for the sessions will be determined approximately 30 calendar days in advance by the trainer (POC). Cost varies by location per student.

The Construction Quality Management Training certificate expires after 5 years. If the CQC System Manager's certificate has expired, retake the course to remain current.

The Government reserves the right to recognize certificates issued as a result of virtual training by a certified instructor as valid.

3.4.6 Construction Quality Management Course - Post-COVID-19 Restrictions

In addition to the above experience and education requirements, the Contractor Quality Control(CQC) System Manager and Alternate CQC System Manager are required to have completed the Construction Quality Management (CQM) for Contractors course. If the CQC System Manager does not have a current certification, obtain the CQM for Contractors course certification within 90 days of award. This course is periodically offered at offices indicated at the following web site:

<http://www.nwo.usace.army.mil/BusinessWithUs/Contracting/QualityManagement.aspx>

The exact date and location for the sessions will be determined approximately 30 days in advance by the trainer (POC). Cost varies by

location per student.

The Construction Quality Management Training certificate expires after 5 years. If the CQC System Manager's certificate has expired, retake the course to remain current.

3.4.7 Organizational Changes

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

3.5 SUBMITTALS AND DELIVERABLES

Submittals, if needed, have to comply with the requirements in Section 01 33 00 SUBMITTAL PROCEDURES. The CQC organization is responsible for certifying that all submittals and deliverables are in compliance with the contract requirements. When Section 01 91 00.15 TOTAL BUILDING COMMISSIONING are included in the contract, the submittals required by those sections have to be coordinated with Section 01 33 00 SUBMITTAL PROCEDURES to ensure adequate time is allowed for each type of submittal required.

3.6 CONTROL

CQC 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 are required to be conducted by the CQC System Manager for each definable feature of the construction work as follows:

3.6.1 Preparatory Phase

This phase is performed prior to beginning work on each definable feature of work, after all required plans/documents/materials are approved/accepted, and after copies are at the work site. This phase includes:

- a. A review of each paragraph of applicable specifications, reference codes, and standards. Make available during the preparatory inspection a copy of those sections of referenced codes and standards applicable to that portion of the work to be accomplished in the field. Maintain and make available in the field for use by Government personnel until final acceptance of the work.
- b. Review of the Contract drawings.
- c. Check to assure that all materials and/or equipment have been tested, submitted, and approved.
- d. Review of provisions that have been made to provide required control inspection and testing.
- e. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the Contract.
- f. Examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawings or

submitted data, and are properly stored.

- g. Review of the appropriate activity hazard analysis to assure safety requirements are met.
- h. Discussion of procedures for controlling quality of the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that feature of work.
- i. Check to ensure that the portion of the plan for the work to be performed has been accepted by the Contracting Officer.
- j. Discussion of the initial control phase.
- k. Schedule all preparatory inspections two(2) weeks in advance. Include a meeting conducted by the CQC System Manager and attended by the superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. Document the results of the preparatory phase actions by separate minutes prepared by the CQC System Manager and attach to the daily CQC report. Instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

3.6.2 Initial Phase

This phase is accomplished at the beginning of a definable feature of work. Accomplish the following:

- a. Check work to ensure that it is in full compliance with contract requirements. Review minutes of the preparatory meeting.
- b. Verify adequacy of controls to ensure full contract compliance. Verify required control inspection and testing are in compliance with the contract.
- c. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with required sample panels as appropriate.
- d. Resolve all differences.
- e. Check safety to include compliance with and upgrading of the safety plan and activity hazard analysis. Review the activity analysis with each worker.
- f. The Government needs to be notified at least 48 hours in advance of beginning the initial phase for definable feature of work. Prepare separate minutes of this phase by the CQC System Manager and attach to the daily CQC report. Indicate the exact location of initial phase for definable feature of work for future reference and comparison with follow-up phases.
- g. The initial phase for each definable feature of work is repeated for each new crew to work onsite, or any time acceptable specified quality standards are not being met.

3.6.3 Follow-up Phase

Perform daily checks to assure control activities, including control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. Record the checks in the CQC documentation. Conduct final follow-up checks and correct all deficiencies prior to the start of additional features of work which may be affected by the deficient work. Do not build upon nor conceal non-conforming work.

3.6.4 Additional Preparatory and Initial Phases

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

3.7 TESTS

3.7.1 Testing Procedure

Perform specified or required tests to verify that control measures are adequate to provide a product which conforms to contract requirements. Upon request, furnish to the Government duplicate samples of test specimens for possible testing by the Government. Testing includes operation and/or acceptance tests when specified. Procure the services of a Corps of Engineers approved testing laboratory or establish an approved testing laboratory at the project site. Perform the following activities and record and provide the following data:

- a. Verify that testing procedures comply with contract requirements.
- b. Verify that facilities and testing equipment are available and comply with testing standards.
- c. Check test instrument calibration data against certified standards.
- d. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.
- e. Record results of all tests taken, both passing and failing on the CQC report for the date taken. Specification paragraph reference, location where tests were taken, and the sequential control number identifying the test. If approved by the Contracting Officer, actual test reports are submitted later with a reference to the test number and date taken. Provide an information copy of tests performed by an offsite or commercial test facility directly to the Contracting Officer. Failure to submit timely test reports as stated results in nonpayment for related work performed and disapproval of the test facility for this Contract.

3.7.2 Testing Laboratories

All testing laboratories must be validated by the USACE Material Testing Center (MTC) for the tests to be performed. Information on the USACE MTC with web-links to both a list of validated testing laboratories and for the laboratory inspection request for can be found at:

<https://mtc.erdc.dren.mil/>

Click on "Lab Validation"
Search for a Validation

3.7.2.1 Capability Check

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

3.7.2.2 Capability Recheck

If the selected laboratory fails the capability check, the Contractor will be assessed the actual cost for the recheck 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.

3.7.3 Onsite Laboratory

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

3.8 COMPLETION INSPECTION

3.8.1 Punch-Out Inspection

Conduct an inspection of the work by the CQC System Manager near the end of the work, or any increment of the work established by a time stated in the SUPPLEMENTARY CONDITIONS (SPECIAL CONTRACT REQUIREMENTS), "Commencement, Prosecution, and Completion of Work", or by the specifications. Prepare and include in the CQC documentation a punch list of items which do not conform to the approved drawings and specifications, as required by paragraph DOCUMENTATION. Include within the list of deficiencies the estimated date by which the deficiencies will be corrected. Make a second inspection the CQC System Manager or staff to ascertain that all deficiencies have been corrected. Once this is accomplished, notify the Government that the facility is ready for the Government Pre-Final inspection.

3.8.2 Pre-Final Inspection

The Government will perform the pre-final inspection to verify that the facility is complete and ready to be occupied. A Government Pre-Final Punch List may be developed as a result of this inspection. Ensure that all items on this list have been corrected before notifying the Government, so that a Final inspection with the customer can be scheduled. Correct any items noted on the Pre-Final inspection in a timely manner. These inspections and any deficiency corrections required by this paragraph need to be accomplished within the time slated for completion of the entire work or any particular increment of the work if the project is divided into increments by separate completion dates.

3.8.3 Final Acceptance Inspection

The Contractor's Quality Control Inspection personnel, plus the superintendent or other primary management person, and the Contracting Officer's Representative is required to be in attendance at the final acceptance inspection. Additional Government personnel including, but not limited to, those from Base/Post Civil Facility Engineer user groups, and major commands can also be in attendance. The final acceptance inspection will be formally scheduled by the Contracting Officer based upon results of the Pre-Final inspection. Notify the Contracting Officer at least 14 days prior to the final acceptance inspection and include the Contractor's assurance that all specific items previously identified to the Contractor as being unacceptable, along with all remaining work performed under the Contract, will be complete and acceptable by the date scheduled for the final acceptance inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the Contracting Officer to bill the Contractor for the Government's additional inspection cost in accordance with the Contract clause titled "Inspection of Construction".

3.9 DOCUMENTATION

Maintain current records providing factual evidence that required quality control activities and/or tests have been performed. Include in these records the work of subcontractors and suppliers on an acceptable form that includes, as a minimum, the following information:

- a. The name and area of responsibility of the Contractor/Subcontractor.
- b. Operating plant/equipment with hours worked, idle, or down for repair.
- c. Work performed each day, giving location, description, and by whom. When Network Analysis (NAS) is used, identify each phase of work performed each day by NAS activity number.
- d. Test and/or control activities performed with results and references to specifications/drawings requirements. Identify the control phase (Preparatory, Initial, Follow-up). List of deficiencies noted, along with corrective action.
- e. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawings requirements.
- f. Submittals and deliverables reviewed, with Contract reference, by whom, and action taken.
- g. Offsite surveillance activities, including actions taken.
- h. Job safety evaluations stating what was checked, results, and instructions or corrective actions. Include information identified by the "Responsible Individual(s)" for Safety as outlined in Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS.
- i. Instructions given/received and conflicts in plans and/or specifications.
- k. Verification Statement.

Indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. Cover both conforming and deficient features and include a statement that equipment and materials incorporated in the work and workmanship comply with the Contract. Furnish the original and one copy of these records in report form to the Contracting Officer's Representative on the first day following the date(s) covered by the report, except that reports need not be submitted for days on which no work is performed. The Government may elect to process these records electronically. Coordinate with the Contracting Officer's Representative. As a minimum, prepare and submit one report for every 7 days of no work and on the last day of a no work period. All calendar days need to be accounted for throughout the life of the contract. The first report following a day of no work will be for that day only. Reports need to be signed and dated by the Contractor Quality Control (CQC) System Manager. Include copies of test reports and copies of reports prepared by all subordinate quality control personnel within the CQC System Manager Report.

3.10 SAMPLE FORMS

Generate daily quality control reports using the Government-furnished Construction Contractor Module of RMS specified in Section 01 45 00.15 10 RESIDENT MANAGEMENT SYSTEM CONTRACTOR MODE(RMS CM).

3.11 NOTIFICATION OF NONCOMPLIANCE

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

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RESIDENT MANAGEMENT SYSTEM CONTRACTOR MODE (RMS CM)

PART 1 GENERAL

1.1 REFERENCES

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

U.S. ARMY CORPS OF ENGINEERS (USACE)

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

1.2 MEASUREMENT AND PAYMENT

The work of this section is not measured for payment. The Contractor is responsible for the work of this section, without any direct compensation other than the payment received for contract items.

1.3 CONTRACT ADMINISTRATION

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

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

1.3.1 Correspondence and Electronic Communications

For ease and speed of communications, exchange correspondence and other documents in electronic format to the maximum extent feasible. Some correspondence, including pay requests and payrolls, are also to be provided in paper format with original signatures. Paper documents will govern, in the event of discrepancy with the electronic version.

1.3.2 Other Factors

Other portions of this document have a direct relationship to the

reporting accomplished through RMS. Particular attention is directed to FAR 52.236-15 Schedules for Construction Contracts; FAR 52.232-27 Prompt Payment for Construction Contracts; FAR 52.232-5 Payments Under Fixed-Price Construction Contracts; Section 01 33 00 SUBMITTAL PROCEDURES; Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS; and Section 01 45 00.00 10 QUALITY CONTROL.

1.4 RMS SOFTWARE

RMS is a web based application. Download, install and be able to utilize the latest version of RMS within 7 calendar days of receipt of the Notice to Proceed. RMS software, user manuals, access and installation instructions, program updates and training information are available from the RMS website (<https://rms.usace.army.mil>). The Government and the Contractor will have different access authorities to the same contract database through RMS. The common database will be updated automatically each time a user finalizes an entry or change.

1.5 CONTRACT DATABASE - GOVERNMENT

The Government will enter the basic contract award data in RMS prior to granting the Contractor access. The Government entries into RMS will generally be related to submittal reviews, correspondence status, and Quality Assurance(QA)comments, as well as other miscellaneous administrative information.

1.6 CONTRACT DATABASE - CONTRACTOR

Contractor entries into RMS establish, maintain, and update data throughout the duration of the contract. Contractor entries generally include prime and subcontractor information, daily reports, submittals, RFI's, schedule updates and payment requests. RMS includes the ability to import attachments and export reports in many of the modules, including submittals. The Contractor responsibilities for entries in RMS typically include the following items:

1.6.1 Administration

1.6.1.1 Contractor Information

Enter all current Contractor administrative data and information into RMS within 7 calendar days of receiving access to the contract in RMS. This includes, but is not limited to, Contractor's name, address, telephone numbers, management staff, and other required items.

1.6.1.2 Subcontractor Information

Enter all missing subcontractor administrative data and information into RMS CM within 7 calendar days of receiving access to the contract in RMS or within 7 calendar days of the signing of the subcontractor agreement for agreements signed at a later date. This includes name, trade, address, phone numbers, and other required information for all subcontractors. A subcontractor is listed separately for each trade to be performed.

1.6.1.3 Correspondence

Identify all Contractor correspondence to the Government with a serial number. Prefix correspondence initiated by the Contractor's site office

with "S". Prefix letters initiated by the Contractor's home (main) office with "H". Letters are numbered starting from 0001. (e.g., H-0001 or S-0001). The Government's letters to the Contractor will be prefixed with "C" or "RFP".

1.6.1.4 Equipment

Enter and maintain a current list of equipment planned for use or being used on the jobsite, including the most recent and planned equipment inspection dates.

1.6.1.5 Reports

Track the status of the project utilizing the reports available in RMS. The value of these reports is reflective of the quality of the data input. These reports include the Progress Payment Request worksheet, Quality Control (QC) comments, Submittal Register Status, and Three-Phase Control worksheets.

1.6.1.6 Request For Information (RFI)

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

1.6.2 Finances

1.6.2.1 Pay Activity Data

Develop and enter a list of pay activities in conjunction with the project schedule. The sum of pay activities equals the total contract amount, including modifications. Each pay activity must be assigned to a Contract Line Item Number (CLIN). The sum of the activities assigned to a CLIN equals the amount of each CLIN.

1.6.2.2 Payment Requests

Prepare all progress payment requests using RMS. Update the work completed under the contract at least monthly, measured as percent or as specific quantities. After the update, generate a payment request and prompt payment certification using RMS. Submit the signed prompt payment certification and payment request as well as supporting data either electronically or by hard copy. Unless waived by the Contracting Officer, a signed paper copy of the approved payment certification and request is also required and will govern in the event of discrepancy with the electronic version.

1.6.3 Quality Control (QC)

Enter and track implementation of the 3-phase QC Control System, QC testing, transferred and installed property and warranties in RMS. Prepare daily reports, identify and track deficiencies, document progress of work, and support other Contractor QC requirements in RMS. Maintain all data on a daily basis. Insure that RMS reflects all quality control methods, tests and actions contained within the Contractor Quality Control (CQC) Plan and Government review comments of same within 7 calendar days of Government acceptance of the CQC Plan.

1.6.3.1 Quality Control (QC) Reports

The Contractor's Quality Control (QC) Daily Report in RMS is the official report. The Contractor can use other supplemental formats to record QC data, but information from any supplemental formats are to be consolidated and entered into the RMS QC Daily Report. Any supplemental information may be entered into RMS as an attachment to the report. QC Daily Reports must be finalized and signed in RMS within 24 hours after the date covered by the report. Provide the Government a printed signed copy of the QC Daily Report, unless waived by the Contracting Officer.

1.6.3.2 Deficiency Tracking.

Use the QC Daily Report Module to enter and track deficiencies. Deficiencies identified and entered into RMS by the Contractor or the Government will be sequentially numbered with a QC or QA prefix for tracking purposes. Enter each deficiency into RMS the same day that the deficiency is identified. Monitor, track and resolve all QC and QA entered deficiencies. A deficiency is not considered to be corrected until the Government indicates concurrence in RMS.

1.6.3.3 Three-Phase Control Meetings

Maintain scheduled and actual dates and times of preparatory and initial control meetings in RMS. Worksheets for the three-phase control meetings are generated within RMS.

1.6.3.4 Labor and Equipment Hours

Enter labor and equipment exposure hours on a daily basis. Roll up the labor and equipment exposure data into a monthly exposure report.

1.6.3.5 Accident/Safety Reporting

Both the Contractor and the Government enter safety related comments in RMS as a deficiency. The Contractor must monitor, track and show resolution for safety issues in the QC Daily Report area of the RMS QC Module. In addition, follow all reporting requirements for accidents and incidents as required in EM 385-1-1, Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS and as required by any other applicable Federal, State or local agencies.

1.6.3.6 Definable Features of Work

Enter each feature of work, as defined in the approved CQC Plan, into the RMS QC Module. A feature of work may be associated with a single or multiple pay activities, however a pay activity is only to be linked to a single feature of work.

1.6.3.7 Activity Hazard Analysis

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

1.6.4 Submittal Management

Enter all current submittal register data and information into RMS within 7 calendar days of receiving access to the contract in RMS. The information shown on the submittal register following the specification

Section 01 33 00 SUBMITTAL PROCEDURES will already be entered into the RMS database when access is granted. Group electronic submittal documents into transmittal packages to send to the Government, except very large electronic files, samples, spare parts, mock ups, color boards, or where hard copies are specifically required. Track transmittals and update the submittal register in RMS on a daily basis throughout the duration of the contract. Submit hard copies of all submittals unless waived by the Contracting Officer.

1.6.5 Schedule

Enter and update the contract project schedule in RMS by either manually entering all schedule data or by importing the Standard Data Exchange Format (SDEF) file, based on the requirements in Section 01 32 01.00 10 PROJECT SCHEDULE.

1.6.6 Closeout

Closeout documents, processes and forms are managed and tracked in RMS by both the Contractor and the Government. Ensure that all closeout documents are entered, completed and documented within RMS.

1.7 IMPLEMENTATION

Use of RMS as described in the preceding paragraphs is mandatory. Ensure that sufficient resources are available to maintain contract data within the RMS system. RMS is an integral part of the Contractor's required management of quality control.

1.8 NOTIFICATION OF NONCOMPLIANCE

Take corrective action within 7 calendar days after receipt of notice of RMS non-compliance by the Contracting Officer.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

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SECTION 01 57 20.00 10
ENVIRONMENTAL PROTECTION

PART 1 GENERAL

1.1 REFERENCES

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

U.S. ARMY CORPS OF ENGINEERS (USACE)

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

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

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

33 CFR 328 Definitions of Waters of the United States

40 CFR 261 Identification and Listing of Hazardous Waste

40 CFR 262 Standards Applicable to Generators of Hazardous Waste

40 CFR 279 Standards for the Management of Used Oil

40 CFR 302 Designation, Reportable Quantities, and Notification

40 CFR 355 Emergency Planning and Notification

40 CFR 68 Chemical Accident Prevention Provisions

49 CFR 171 - 178 Hazardous Materials Regulations

1.2 DEFINITIONS

1.2.1 Environmental Pollution and Damage

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

1.2.2 Environmental Protection

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

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

1.2.3 Contractor Generated Hazardous Waste

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

1.2.4 Project Pesticide Coordinator

The Project Pesticide Coordinator (PPC) is an individual that resides at a Civil Works Project office and that is responsible for oversight of pesticide application on Project grounds.

1.2.5 Land Application for Discharge Water

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

1.2.6 Surface Discharge

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

1.2.7 Waters of the United States

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

1.2.8 Wetlands

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

1.3 GENERAL REQUIREMENTS

Minimize environmental pollution and damage that may occur as the result of construction operations. The environmental resources within the

project boundaries and those affected outside the limits of permanent work must be protected during the entire duration of this contract. Comply with all applicable environmental Federal, State, and local laws and regulations. Any delays resulting from failure to comply with environmental laws and regulations will be the Contractor's responsibility.

1.4 SUBCONTRACTORS

Ensure compliance with this section by subcontractors.

1.5 PAYMENT

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

1.6 SUBMITTALS

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

SD-01 Preconstruction Submittals

Environmental Protection Plan; G, PO

1.7 ENVIRONMENTAL PROTECTION PLAN

Prior to commencing construction activities or delivery of materials to the site, submit an Environmental Protection Plan for review and approval by the Contracting Officer. The purpose of the Environmental Protection Plan is to present a comprehensive overview of known or potential environmental issues which the Contractor must address during construction. Issues of concern must be defined within the Environmental Protection Plan as outlined in this section. Address each topic at a level of detail commensurate with the environmental issue and required construction task(s). Topics or issues which are not identified in this section, but are considered necessary, must be identified and discussed after those items formally identified in this section. Prior to submittal of the Environmental Protection Plan, meet with the Contracting Officer for the purpose of discussing the implementation of the initial Environmental Protection Plan; possible subsequent additions and revisions to the plan including any reporting requirements; and methods for administration of the Contractor's Environmental Plans. The Environmental Protection Plan must be current and maintained onsite by the Contractor.

1.7.1 Compliance

No requirement in this Section will relieve the Contractor of any applicable Federal, State, and local environmental protection laws and regulations. During Construction, the Contractor will be responsible for identifying, implementing, and submitting for approval any additional

requirements to be included in the Environmental Protection Plan.

1.7.2 Contents

Include in the environmental protection plan, but not limit it to, the following:

- a. Name(s) of person(s) within the Contractor's organization who is(are) responsible for ensuring adherence to the Environmental Protection Plan.
- b. Name(s) and qualifications of person(s) responsible for manifesting hazardous waste to be removed from the site, if applicable.
- c. Name(s) and qualifications of person(s) responsible for training the Contractor's environmental protection personnel.
- d. Description of the Contractor's environmental protection personnel training program.
- e. An erosion and sediment control plan which identifies the type and location of the erosion and sediment controls to be provided. The plan must include monitoring and reporting requirements to assure that the control measures are in compliance with the erosion and sediment control plan, Federal, State, and local laws and regulations. A Storm Water Pollution Prevention Plan (SWPPP) may be substituted for this plan.
- 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. Include in the Spill Control plan the procedures, instructions, and reports to be used in the event of an unforeseen spill of a substance regulated by 40 CFR 68, 40 CFR 302, 40 CFR 355, and/or regulated under State or Local laws and regulations. The Spill Control Plan supplements the requirements of EM 385-1-1. Include in this plan, as a minimum:
 - 1). The name of the individual who will report any spills or hazardous substance releases and who will follow up with complete documentation. This individual will immediately notify the Contracting Officer, the local Fire Department, and the Gavins Point Dam Control Room in addition to the legally required

Federal, State, and local reporting channels (including the National Response Center 1-800-424-8802) if a reportable quantity is released to the environment. Include in the plan a list of the required reporting channels and telephone numbers.

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

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

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

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

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

k. A non-hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris and schedules for disposal.

1). Identify any subcontractors responsible for the transportation and disposal of solid waste. Submit licenses or permits for solid waste disposal sites that are not a commercial operating facility.

2). Evidence of the disposal facility's acceptance of the solid waste must be attached to this plan during the construction. Attach a copy of each of the Non-hazardous Solid Waste Diversion Reports to the disposal plan. Submit the report for the previous quarter on the first working day after the first quarter that non-hazardous solid waste has been disposed and/or diverted (e.g. the first working day of January, April, July, and October).

3). Indicate in the report the total amount of waste generated and total amount of waste diverted in cubic yards or tons along with the percent that was diverted.

4). A recycling and solid waste minimization plan with a list of measures to reduce consumption of energy and natural resources. Detail in the plan the Contractor's actions to comply with and to participate in Federal, State, Regional, and local government sponsored recycling programs to reduce the volume of solid waste at the source.

l. 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.

m. A contaminant prevention plan that: identifies potentially hazardous substances to be used on the job site; identifies the intended actions to prevent introduction of such materials into the

air, water, or ground; and details provisions for compliance with Federal, State, and local laws and regulations for storage and handling of these materials. In accordance with EM 385-1-1, a copy of the Material Safety Data Sheets (MSDS) and the maximum quantity of each hazardous material to be onsite at any given time must be included in the contaminant prevention plan. Update the plan as new hazardous materials are brought onsite or removed from the site.

n. 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 must 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 must include a sketch showing the location for land application along with a description of the pretreatment methods to be implemented. If surface discharge will be the method of disposal, include a copy of the permit and associated documents as an attachment prior to discharging the waste water. If disposal is to a sanitary sewer, the plan must include documentation that the Waste Water Treatment Plant Operator has approved the flow rate, volume, and type of discharge.

o. 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 and wetlands not previously known to be onsite or in the area are discovered during construction. Include in the plan methods to assure the protection of known or discovered resources, identifying lines of communication between Contractor personnel and the Contracting Officer.

\p. Include and update a pesticide treatment plan, as information becomes available. Include in the plan: sequence of treatment, dates, times, locations, pesticide trade name, EPA registration numbers, authorized uses, chemical composition, formulation, original and applied concentration, application rates of active ingredient (i.e. pounds of active ingredient applied), equipment used for application and calibration of equipment. Federal, State, Regional and Local pest management record keeping and reporting requirements as well as any additional Installation Project Office specific requirements are the Contractor's responsibility in conformance with DA AR 200-5 Pest Management, Chapter 2, Section III "Pest Management Records and Reports".

1.7.3 Appendix

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

1.8 PROTECTION FEATURES

This paragraph supplements the Contract Clause PROTECTION OF EXISTING

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

1.9 PERMITS, NOTICES, REVIEWS, AND/OR APPROVALS

The following is a listing of permits, notices, reviews, and/or approvals which **may be** required for this project. This listing and requirements are not to be considered all-inclusive by the Contractor, but is provided as information that may be used in successfully accomplishing the environmental compliances.

1.9.1 NPDES Permit for South Dakota Construction Activities

Coverage under the State of South Dakota Department of Environment and Natural Resources' (SDENR), Authorization to Discharge Under the Surface Water Discharge System Permit #SDR10#### is required. The Government shall be considered the "Applicant" and shall sign as such on the form after review. The Contractor will complete Attachment C in the Permit No.SDR10####. Attachment C is titled Department of Environment and Natural Resources Contractor Certification Form. Which will be submitted with the NOI.The NOI can be found at the following State of South Dakota website: <https://denr.sd.gov/des/sw/StormWaterandConstruction.aspx>
NOTE: The Contractor is responsible for any Notice of Violations that occur during the NPDES Permit being in effect. The Contractor will be responsible for paying for any violation fines and/or making any corrections necessary. The Contractor shall not begin construction until an authorization letter from the State granting coverage for the storm water discharges is received. The Contractor shall be responsible for posting a copy of the NOI and the authorization letter at the construction site in a prominent place for public viewing. The Contractor shall prepare and implement a Storm Water Pollution Prevention Plan, inspections, and reporting in accordance with the SD#10####. Any temporary or permanent erosion and sedimentation control measures shown on the drawings shall be incorporated into the Contractor's Storm Water Pollution Prevention Plan. The Contractor shall retain copies of the storm water pollution prevention plan and all reports in accordance with the permit. All submissions to the State shall be by certified mail. The Contractor shall include copies of all submittals to the State of South Dakota, plans, and reports in the Appendix to the Environmental Protection Plan.

1.9.2 Air Quality Permit Application Form Concrete Plant

If the contractor decides that a concrete batch plant is required an Air Quality Permit Application Form Concrete Plant will be required to be submitted to the State of South Dakota. There is no fee for this permit

and a copy can be obtained at <https://denr.sd.gov/des/aq/airpermits.aspx>. The permits do need to be obtained before running a batch plant. Time frame for obtaining the permit is between 2 to 4 weeks.

1.10 ENVIRONMENTAL ASSESSMENT OF CONTRACT DEVIATIONS

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

1.11 NOTIFICATION

The Contracting Officer will notify the Contractor in writing of any observed noncompliance with Federal, State or local environmental laws or regulations, permits, and other elements of the Contractor's Environmental Protection plan. After receipt of such notice, the Contractor will inform the Contracting Officer of the proposed corrective action and take such action when approved by the Contracting Officer. The Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time extensions will be granted or equitable adjustments allowed for any such suspensions. This is in addition to any other actions the Contracting Officer may take under the contract, or in accordance with the Federal Acquisition Regulation or Federal Law.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 LAND RESOURCES

Confine all activities to areas defined by the drawings and specifications. Identify any land resources to be preserved within the work area prior to the beginning of any construction. Do not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, and land forms without approval, except in areas indicated on the drawings or specified to be cleared. Ropes, cables, or guys will not be fastened to or attached to any trees for anchorage unless specifically authorized. Provide effective protection for land and vegetation resources at all times, as defined in the following subparagraphs. Remove stone, soil, or other materials displaced into uncleared areas.

3.1.1 Work Area Limits

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

3.1.2 Landscape

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

3.1.3 Erosion and Sediment Controls

Providing erosion and sediment control measures in accordance with Federal, State, and local laws and regulations is the Contractor's responsibility. 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 construction activities. The area of bare soil exposed at any one time by construction operations should be kept to a minimum. 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, slope stabilization, silt fences, construction of terraces, interceptor channels, sediment traps, inlet and outfall protection, diversion channels, and sedimentation basins. Remove any temporary measures after the area has been stabilized.

3.1.4 Contractor Facilities and Work Areas

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

3.2 WATER RESOURCES

Monitor all water areas affected by construction activities to prevent pollution of surface and ground waters. Do not apply toxic or hazardous chemicals to soil or vegetation unless otherwise indicated. For construction activities immediately adjacent to impaired surface waters, the Contractor must be capable of quantifying sediment or pollutant loading to that surface water when required by State or Federally issued Clean Water Act permits.

3.2.1 Wetlands

Do not enter, disturb, destroy, or allow discharge of contaminants into any wetlands.

3.3 AIR RESOURCES

Equipment operation, activities, or processes will be in accordance with all Federal and State air emission and performance laws and standards.

3.3.1 Particulates

Dust particles; aerosols and gaseous by-products from construction activities; and processing and preparation of materials, such as from

asphaltic batch plants; must be controlled at all times, including weekends, holidays and hours when work is not in progress. Maintain excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and other work areas within or outside the project boundaries free from particulates 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. Provide sufficient, competent equipment available to accomplish these tasks. Perform particulate control as the work proceeds and whenever a particulate nuisance or hazard occurs. Comply with all State and local visibility regulations.

3.3.2 Odors

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

3.3.3 Sound Intrusions

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

3.3.4 Burning

Burning is prohibited on the Government premises.

3.4 CHEMICAL MATERIALS MANAGEMENT AND WASTE DISPOSAL

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

3.4.1 Solid Wastes

Place solid wastes (excluding clearing debris) in containers which are emptied on a regular schedule. Handling, storage, and disposal must be conducted to prevent contamination. Employ segregation measures so that no hazardous or toxic waste will become co-mingled with solid waste. Transport solid waste off Government property and dispose of it in compliance with Federal, State, and local requirements for solid waste disposal. A Subtitle D RCRA permitted landfill will be the minimum acceptable offsite solid waste disposal option. Verify that the selected transporters and disposal facilities have the necessary permits and licenses to operate. Comply with Federal, State, and local laws and regulations pertaining to the use of landfill areas.

3.4.2 Chemicals and Chemical Wastes

Dispense chemicals ensuring no spillage to the ground or water. Perform and document periodic inspections of dispensing areas to identify leakage and initiate corrective action. This documentation will be periodically reviewed by the Government. Collect chemical waste in corrosion resistant, compatible containers. Collection drums must be monitored and removed to a staging or storage area when contents are within 6 inches of the top. Wastes will be classified, managed, stored, and disposed of in

accordance with Federal, State, and local laws and regulations.

3.4.3 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. At a minimum, manage and store hazardous waste in compliance with 40 CFR 262 in accordance with the Project Office hazardous waste management plan. Take sufficient measures to prevent spillage of hazardous and toxic materials during dispensing. Segregate hazardous waste from other materials and wastes, protect it from the weather by placing it in a safe covered location, and take precautionary measures such as berming or other appropriate measures against accidental spillage. Storage, describing, packaging, labeling, marking, and placarding of hazardous waste and hazardous material in accordance with 49 CFR 171 - 178, State, and local laws and regulations is the Contractor's responsibility. Transport Contractor generated hazardous waste off Government property within 60 days in accordance with the Environmental Protection Agency and the Department of Transportation laws and regulations. Dispose of hazardous waste in compliance with Federal, State and local laws and regulations. Spills of hazardous or toxic materials must be immediately reported to the Contracting Officer. Cleanup and cleanup costs due to spills are the Contractor's responsibility. The disposition of Contractor generated hazardous waste and excess hazardous materials are the Contractor's responsibility. The Gavins Point project Environmental Compliance Coordinator must sign off on all hazardous waste manifests. Gavins Point Dam has a small hazardous waste generator EPA ID that will be provided when requested by the Contractor.

3.4.4 Fuel and Lubricants

Storage, fueling and lubrication of equipment and motor vehicles must 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. If the Contractor stores fuel at the site, the Contractor shall assume all responsibility for direct or consequential damage which may result from any on-site storage of fuel. The Contractor agrees to be responsible for the following which is not limited to but including any damage from storm events, high water, ice flow, public interference/vandalism. 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.

3.4.5 Waste Water

Disposal of waste water will be as specified below.

- a. Waste water from construction activities, such as onsite material processing, concrete curing, foundation and concrete clean-up, water used in concrete trucks, forms, etc. will not be allowed to enter water ways or to be discharged prior to being treated to remove pollutants. Dispose of the construction related waste water off-Government property in accordance with all Federal, State, Regional and Local laws and regulations.
- b. For discharge of ground water, the Contractor shall obtain a State

or Federal permit specific for pumping and discharging ground water prior to surface discharging. In South Dakota the contractor may also need to obtain a Temporary Water Right Permit from the SDDENR Water Rights Program for any dewatering. The SDDENR Water Rights Program can be contacted at (605)773-3352 to determine if a permit is required.

3.5 RECYCLING AND WASTE MINIMIZATION

Participate in State and local government sponsored recycling programs. The Contractor is further encouraged to minimize solid waste generation throughout the duration of the project.

3.6 NON-HAZARDOUS SOLID WASTE DIVERSION REPORT

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

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

3.7 HISTORICAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

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 will 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, immediately notify the Contracting Officer so that the appropriate authorities may be notified and a determination made as to their significance and what, if any, special disposition of the finds should be made. Cease all activities that may result in impact to or the destruction of these resources. Secure the area and prevent employees or other persons from trespassing on, removing, or otherwise disturbing such resources.

3.8 BIOLOGICAL RESOURCES

Minimize interference with, disturbance to, and damage to fish, wildlife, and plants including their habitat. The protection of threatened and endangered animal and plant species, including their habitat, is the Contractor's responsibility in accordance with Federal, State, Regional, and local laws and regulations.

3.8.1 Endangered/Threatened Species

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. The following are known endangered/threatened species that could possibly be in the project area.

3.8.1.1 Interior Least Terns and/or Piping Plovers

No Construction shall occur within a quarter of a mile of the areas identified as nesting habitat for the Interior Least Terns and/or Piping Plovers between the dates of April 15 and August 15 of any year.

3.8.1.2 Bald Eagles

The Contractor shall be responsible for identifying and avoiding disturbance to bald eagles which may be roosting in the project area. Bald Eagles. The Government recommends avoiding roosting bald eagles by eliminating activity within 75 meters of the roosting bald eagle. However, this is a general recommendation, and may change dependant upon location, available cover, and concealment. It is the Contractor's responsibility to accurately determine appropriate distances to avoid disturbing the Bald Eagle. The Contractor shall ensure that his employees are able to identify bald eagles and shall avoid disturbing bald eagles.

3.8.2 Migratory Bird Treaty Act

Clearing and grubbing shall be scheduled so as to avoid disturbance to any active nests of migratory birds covered by the above Act. Normally, that allows clearing only from 15 September to 31 January. However, if the CO determines that trees in the work area are free of nests, the contractor may clear such trees outside that time window. Adherence to these guidelines will help avoid any unnecessary take of migratory birds and the penalties specified in the Act and associated regulations.

3.9 INTEGRATED PEST MANAGEMENT

In order to minimize impacts to existing fauna and flora, the Contractor shall coordinate with the CO at the earliest possible time prior to pesticide application. The Contractor shall discuss integrated pest management strategies prior to the application of any pesticide associated with these specifications.

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 CO. 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

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

3.11 MAINTENANCE OF POLLUTION FACILITIES

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

3.12 TRAINING OF CONTRACTOR PERSONNEL

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

3.13 POST CONSTRUCTION CLEANUP

The Contractor will clean up all areas used for construction in accordance with Contract Clause: "Cleaning Up". Unless otherwise instructed in writing by the Contracting Officer, obliterate all signs of temporary construction facilities such as haul roads, work area, structures, foundations of temporary structures, stockpiles of excess or waste materials, and other vestiges of construction prior to final acceptance of the work. The disturbed area must be graded, filled and the entire area

seeded unless otherwise indicated.

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SECTION 01 57 23

TEMPORARY STORM WATER POLLUTION CONTROL

PART 1 GENERAL

1.1 REFERENCES

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

ASTM INTERNATIONAL (ASTM)

ASTM D448 (2012; R 2017) Standard Classification for Sizes of Aggregate for Road and Bridge Construction

ASTM D4873/D4873M (2017) Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO M 288 (2017) Standard Specification for Geosynthetic Specification for Highway Applications

1.2 GENERAL

The Contractor shall install and maintain stabilization and structural best management practices which will minimize erosion and sediment pollution from the construction site to the extent attainable. The Contractor shall be responsible for selection of appropriate best management practices as specified herein.

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 as required for each delivery order in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-07 Certificates

Mill Certificate or Affidavit

1.4 EROSION AND SEDIMENT CONTROLS

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

1.4.1 Stabilization Practices

The stabilization practices to be implemented may include temporary seeding, mulching, sod stabilization, vegetative buffer strips, erosion control blankets, protection of trees, preservation of mature vegetation, etc. On his daily CQC Report, the Contractor shall record the dates when the major grading activities occur; when construction activities temporarily or permanently cease on a portion of the site; and when stabilization practices are initiated.

1.4.1.1 Permanent Seeding

Disturbed areas of the site where construction activities permanently ceases shall be stabilized with permanent seeding no more than 14 days after the construction activity ceases. The Contractor is responsible for implementing winter stabilization methods during frozen ground conditions if the site was not stabilized prior to the ground freezing. Permanent seeding shall then be initiated as soon as practicable.

1.4.1.2 Temporary Seeding and Mulching

The Contractor must begin soil stabilization measures by the following work day whenever earth-disturbing activities have permanently or temporarily ceased on any portion of the site. Earth-disturbing activities have temporarily ceased when you cease clearing, grading, and excavation within any area for a period of at least 14 days, but will resume such activities in the future.

1.4.1.3 Erosion Control Blankets

Erosion control blanket may be installed on steep slopes and in drainage swales and ditches to protect finished grades from erosion.

1.4.2 Temporary Structural Practices

Temporary structural practices shall be implemented to divert flows from exposed soils, temporarily store flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site to the degree attainable. Temporary structural practices shall be implemented in a timely manner during the construction process to minimize erosion and sediment runoff. Temporary structural practices shall include but not be limited to the following devices.

1.4.2.1 Silt Fences

The Contractor shall provide silt fences as a temporary structural practice to minimize erosion and sediment runoff. Silt fences shall be properly installed to effectively retain sediment immediately after completing each phase of work where erosion would occur in the form of sheet and rill erosion (e.g. clearing and grubbing, excavation, embankment, and grading). Silt fence barriers shall be installed along the down slope boundary of all disturbed areas prior to beginning land-disturbing activities in those areas. Silt fence barriers may be installed across ditches or swales but not where the drainage area is greater than 1 acre. Removal of silt fence barriers shall be approved by the Contracting Officer.

1.4.2.2 Storm Drain Inlet Protection

Storm drain inlet protection shall be installed at each new and existing inlet which receives storm runoff from disturbed areas of 1 acre or less. The protection at each inlet shall be removed once the disturbed area has been finally stabilized.

1.4.2.3 Culvert Inlet Protection

Culvert inlet protection shall be installed at all culverts with a drainage area of 1 acre or less.

1.4.2.4 Rock Check Dams

Rock check dams may be used to reduce erosion of temporary or permanent ditches or swales. Type 1 rock check dams shall be used when the upstream drainage area is less than 2 acres. Type 2 rock check dams shall be used when the upstream area is 2 to 10 acres.

1.4.2.5 Stone Construction Entrance

A stone construction entrance shall be constructed wherever traffic will be leaving the construction site and move directly onto a paved road. Stone construction entrances shall be removed after the site has been finally stabilized.

1.4.2.6 Sediment Trap

Sediment traps may be constructed below disturbed areas where the total contributing drainage area is less than 3 acres. Sediment traps, when used, should be constructed prior to disturbance of upslope areas. Sediment traps must have an initial storage volume of 134 cubic yards per acre of drainage area, half of which shall be in the form of a permanent pool or wet storage to provide a stable settling medium. The remaining half shall be in the form of a drawdown or dry storage which will provide extended settling time during less frequent, larger storm events.

1.4.2.7 Diversion Dikes

Diversion dikes may be constructed to divert runoff from upslope drainage areas away from unprotected disturbed areas and slopes to a stabilized outlet or to divert sediment-laden runoff from a disturbed area to a sediment-trapping facility such as a sediment trap or sediment basin. Diversion dikes shall have a maximum channel slope of 2 percent and shall be adequately compacted to prevent failure. The minimum height measured from the top of the dike to the bottom of the channel shall be 18 inches. The minimum base width shall be 6 feet and the minimum top width shall be 2 feet. The Contractor shall ensure that the diversion dikes are not damaged by construction operations or traffic.

PART 2 PRODUCTS

2.1 COMPONENTS FOR SILT FENCES

2.1.1 Geotextile

The geotextile shall comply with the requirements of AASHTO M 288 for temporary silt fence.

2.1.2 Silt Fence Stakes and Posts

The Contractor may use either wooden stakes or steel posts for fence construction. Wooden stakes utilized for silt fence construction, shall have a minimum cross section of 2 inches by 2 inches when oak is used and 4 inches by 4 inches when pine is used, and shall have a minimum length of 3 feet. Steel posts (standard "U" or "T" section) utilized for silt fence construction, shall have a minimum weight of 1.33 pounds per linear foot and a minimum length of 5 feet.

2.1.3 Mill Certificate or Affidavit

A mill certificate or affidavit shall be provided attesting that the geotextile and factory seams meet chemical, physical, and manufacturing requirements specified above. The mill certificate or affidavit shall specify the actual Minimum Average Roll Values and shall identify the fabric supplied by roll identification numbers. The Contractor shall submit a mill certificate or affidavit signed by a legally authorized official from the company manufacturing the geotextile.

2.1.4 Identification Storage and Handling

Geotextile shall be identified, stored and handled in accordance with ASTM D4873/D4873M.

2.1.5 Support Mesh

Support mesh shall be 14-1/2 gage or heavier steel wire with a mesh spacing of 6 by 6 inch or a prefabricated polymeric mesh of equivalent strength.

2.2 Erosion Control Blankets

Installation staple patterns shall be clearly marked on the erosion control blanket with environmentally safe paint.

2.2.1 Netless Erosion Control Blanket

Erosion control blankets shall be a machine-produced mat with a biodegradable agricultural straw matrix (approximately 0.50 lb/sq yd). The blanket shall have a 12-month typical functional longevity and be designed for use on geotechnically stable slopes with gradients up to 1V:4H and channels with shear stresses up to 0.50 pounds per square foot.

2.2.2 Single-Net Erosion Control Blanket

Erosion control blankets shall be a machine-produced mat with a biodegradable agricultural straw matrix (approximately 0.50 lb/sq yd) and photodegradable netting on the top side. The blanket shall be sewn together with degradable thread. The blanket shall have a 12-month typical functional longevity and be designed for use on geotechnically stable slopes with gradients up to 1V:3H and channels with shear stresses up to 1.50 pounds per square foot.

2.2.3 Double-Net Erosion Control Blanket

Erosion control blankets shall be a machine-produced mat with a biodegradable agricultural straw matrix (approximately 0.50 lb/sq yd) and photodegradable netting on each side. The blanket shall be sewn together

with degradable thread. The blanket shall have a 12-month typical functional longevity and be designed for use on geotechnically stable slopes with gradients up to 1V:2H and channels with shear stresses up to 1.75 pounds per square foot.

2.3 Permanent Turf Reinforcement Mat

Turf reinforcement matting shall conform to FHWA FP-03, Section 713, Type 5.A.

2.4 COMPONENTS FOR SEDIMENT TRAP

Coarse aggregate shall conform to ASTM D448, Size 3, 357, or 5. Minor variations from the gradations specified will be permitted. Stone for riprap shall consist of field stone or rough unhewn quarry stone of approximately rectangular shape. The stone shall be hard and angular and of such quality that it will not disintegrate on exposure to water or weathering. The specific gravity of individual stones shall be at least 2.5. Riprap stones shall weigh between 50 and 150 pounds each, except that approximately 10 percent may weigh 50 pounds or less. At least 60 percent shall weigh more than 100 pounds. Geotextile shall conform to paragraph GEOTEXTILES.

2.5 COMPONENTS FOR INLET PROTECTION

Aggregates for gravel filter should be sized to get the greatest amount of filtering action possible (by using smaller-sized stone), while not creating significant ponding problems.

2.6 STONE CONSTRUCTION ENTRANCE

Aggregate for construction entrance shall conform to ASTM D448, Size 1. Minor variations from the gradation specified will be permitted. Geotextile shall conform to paragraph GEOTEXTILES.

2.7 ROCK CHECK DAMS

Coarse aggregate shall conform to ASTM D448 size number 1 or approved equal. Riprap shall consist of field stone or rough unhewn quarry stone of approximately rectangular shape. Riprap shall be hard and angular. The specific gravity of individual stones shall be at least 2.5. Concrete rubble may be used provided it has a density of at least 150 pcf. Individual stones shall have a weight of 50 to 150 lbs except that a maximum of 10 percent of stone may weigh less than 50 lbs. At least 60 percent of stones shall weigh more than 100 lbs.

2.8 GEOTEXTILES

Geotextile for other than silt fence shall comply with the requirements of AASHTO M 288 for a separation geotextile.

PART 3 EXECUTION

3.1 INSTALLATION OF SILT FENCES

Silt fences shall extend a minimum of 16 inches above the ground surface and shall not exceed 34 inches above the ground surface. Filter fabric shall be from a continuous roll cut to the length of the barrier to avoid the use of joints. When joints are unavoidable, filter fabric shall be

spliced together at a support post, with a minimum 6 inch overlap, and securely sealed. A trench shall be excavated approximately 6 inches wide and 8 inches deep on the upslope side of the location of the silt fence. The 6-inch by 8-inch trench shall be backfilled and the soil compacted over the filter fabric. Silt fences shall be removed upon approval by the Contracting Officer

3.2 EROSION CONTROL BLANKETS

Installation of erosion control blankets shall conform to the manufacturer's recommendations.

3.3 TURF REINFORCEMENT MAT

Installation of turf reinforcement matting shall conform to the manufacturer's recommendations.

3.4 Sediment Trap

The area under the embankment shall be cleared, grubbed, and stripped of any vegetation and root mat. Fill material for the embankment shall be placed in accordance with Section 31 00 00 EARTHWORK. A geotextile shall be placed between the riprap and subgrade.

3.5 Stone Construction Entrance

The area of the entrance shall be cleared of all vegetation, roots, and other objectionable material. The aggregate layer shall have a minimum total thickness of 6 inches. A geotextile shall be placed beneath aggregate for the full width and length of the entrance. A minimum of 3 inches of the aggregate shall be placed in a cut section to provide stability and secure the geotextile. If conditions on the site are such that the majority of the mud is not removed by the vehicles traveling over the stone, then the tires of the vehicles shall be washed before entering the road. Wash water must be carried away from the entrance to an approved settling area to remove sediment. A wash rack may also be installed for washing of vehicles.

3.6 MAINTENANCE

The Contractor shall maintain the temporary and permanent vegetation, erosion and sediment control measures, and other protective measures in good and effective operating condition by performing routine inspections to determine condition and effectiveness, by restoration of destroyed vegetative cover, and by repair of erosion and sediment control measures and other protective measures. The following procedures shall be followed to maintain the protective measures.

3.6.1 Silt Fences

Silt fences shall be inspected in accordance with paragraph INSPECTIONS. Any required repairs shall be made promptly. Close attention shall be paid to the repair of damaged silt fence resulting from end runs and undercutting. Should the fabric on a silt fence decompose or become ineffective, and the barrier is still necessary, the fabric shall be replaced promptly. Sediment deposits shall be removed when deposits reach one-third of the height of the barrier. When a silt fence is no longer required, it shall be removed. The immediate area occupied by the fence and any sediment deposits shall be shaped to an acceptable grade. The

areas disturbed by this shaping shall be seeded.

3.6.2 Storm Drain Inlet Protection

Inlet protection structures shall be inspected after each rainfall and repairs made as needed. Sediment shall be removed and the trap restored to its original dimensions when the sediment has accumulated to one half the design depth.

3.6.3 Rock Check Dams

Check dams should be checked for sediment after each runoff-producing storm event. Sediment should be removed when it reaches one half the original height of the measure.

3.6.4 Stone Construction Entrance

Stone construction entrances shall be maintained in a condition which will prevent tracking or flow of mud onto paved roads. This may require periodic top dressing with additional stone or the washing and reworking of existing stone as conditions demand and repair and/or cleanout of any structures used to trap sediment. The use of water trucks to remove materials dropped, washed, or tracked onto roadways will not be permitted under any circumstances.

3.6.5 Sediment Traps

Sediment shall be removed and the trap restored to its original dimensions when the sediment has accumulated to one half the design volume of the wet storage. Filter stone shall be regularly checked to ensure that filtration performance is maintained. Stone choked with sediment shall be removed and cleaned or replaced. The structure should be inspected regularly to ensure that it is structurally sound and has not been damaged by erosion or construction equipment. The height of the stone outlet should be inspected to ensure that its center is at least 1 foot below the top of the embankment.

3.6.6 Diversion Dikes

Diversion dikes shall be inspected in accordance with paragraph INSPECTIONS. Close attention shall be paid to the repair of damaged diversion dikes and necessary repairs shall be accomplished promptly. When diversion dikes are no longer required, they shall be shaped to an acceptable grade. The areas disturbed by this shaping shall be seeded.

3.7 INSPECTIONS

3.7.1 General

The Contractor must conduct a site inspection once every 7 calendar days and within 24 hours of precipitation that exceeds 0.25 inches or snowmelt that generates runoff. Site inspection includes, but is not limited to, disturbed areas, material storage and stockpile areas not fully stabilized, erosion and sediment control and stabilization best management practices, and vehicle access areas. Where sites have been finally stabilized, inspection frequency may be reduced to once per month. If earth-disturbing activities are suspended due to frozen conditions and all disturbed areas of the site have been temporarily or permanently stabilized, inspection frequency may be reduced to once per month.

3.7.2 Inspections Details

Disturbed areas and areas used for material storage that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. Erosion and sediment control measures shall be observed to ensure that they are operating correctly. Discharge locations or points shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters. Locations where vehicles exit the site shall be inspected for evidence of offsite sediment tracking.

3.7.3 Inspection Reports

For each inspection conducted, the Contractor shall prepare a report summarizing the scope of the inspection, name(s) of personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of the storm water pollution prevention measures, maintenance performed, and actions taken. The report shall be furnished to the Contracting Officer within 24 hours of the inspection as a part of the Contractor's daily CQC REPORT.

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SECTION 31 00 00

EARTHWORK

PART 1 GENERAL

1.1 CRITERIA FOR BIDDING

Base bids on the following criteria:

- a. Pipes or other artificial obstructions, except those indicated, will not be encountered.
- b. Hard materials and rock will not be encountered in excavations.
- c. Dewatering will not be required.

1.2 REFERENCES

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

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
(AASHTO)

AASHTO T 99 (2019) Standard Method of Test for
Moisture-Density Relations of Soils Using
a 2.5-kg (5.5-lb) Rammer and a 305-mm
(12-in.) Drop

ASTM INTERNATIONAL (ASTM)

ASTM C136/C136M (2019) Standard Test Method for Sieve
Analysis of Fine and Coarse Aggregates

ASTM D698 (2012; E 2014; E 2015) Laboratory
Compaction Characteristics of Soil Using
Standard Effort (12,400 ft-lbf/cu. ft.
(600 kN-m/cu. m.))

ASTM D1140 (2017) Standard Test Methods for
Determining the Amount of Material Finer
than 75- μ m (No. 200) Sieve in Soils by
Washing

ASTM D2487 (2017; E 2020) Standard Practice for
Classification of Soils for Engineering
Purposes (Unified Soil Classification
System)

ASTM D4318 (2017; E 2018) Standard Test Methods for
Liquid Limit, Plastic Limit, and
Plasticity Index of Soils

ASTM D6938 (2017a) Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION (SDDOT)

SDDOT 210 (2015) Standard Specifications for Roads and Bridges, Roadway Shaping

SDDOT 830 (2015) Standard Specification for Roads and Bridges, Riprap

1.3 DEFINITIONS

1.3.1 Satisfactory Materials

Satisfactory materials comprise any materials classified by ASTM D2487 as CL, ML, CL-ML, CH, MH. Other materials may be deemed satisfactory by the Contracting Officer.

1.3.2 Unsatisfactory Materials

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

1.3.3 Cohesionless and Cohesive Materials

Cohesionless materials include materials classified in ASTM D2487 as GW, GP, SW, and SP. Cohesive materials include materials classified as GC, SC, ML, CL, MH, and CH. Materials classified as GM and SM will be identified as cohesionless only when the fines are nonplastic. Perform testing, required for classifying materials, in accordance with ASTM D4318, ASTM C136/C136M and ASTM D1140.

1.3.4 Degree of Compaction

Degree of compaction required, except as noted in the second sentence, is expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D698 abbreviated as a percent of laboratory maximum density. Since ASTM D698 applies only to soils that have 30 percent or less by weight of their particles retained on the 3/4 inch sieve, express the degree of compaction for material having more than 30 percent by weight of their particles retained on the 3/4 inch sieve as a percentage of the maximum density in accordance with AASHTO T 99 Method D and corrected with Annex A of AASHTO T 99.

1.3.5 Topsoil

Material suitable for topsoil obtained from either offsite areas, excavations, or areas indicated on the task order's drawings is defined as: Natural, friable soil representative of productive, well-drained soils in the area, free of subsoil, stumps, rocks larger than one inch diameter, brush, weeds, toxic substances, and other material detrimental to plant growth.

1.4 SYSTEM DESCRIPTION

1.4.1 Salvaging, Stockpiling, and Placing Topsoil

1.4.1.1 Salvage

Topsoil shall be selected from the regular grading areas or from other designated areas. Areas from which topsoil is to be excavated shall be cleared of objectionable vegetation and all litter such as brush, rock, and foreign material. Topsoil shall be excavated in sufficient volume to cover the designated areas to the required depths specified for each task order.

Salvaged topsoil may be stockpiled in convenient locations within the right-of-way as approved by the Contracting Officer. The separation of cut and fill piles is not required. Topsoil piles shall be located where the topsoil will not run off into any waterway due to a rain event.

When operations of the Contractor do not permit stockpiling of topsoil within the right-of-way, it shall be the Contractor's obligation to arrange for stockpile sites at the Contractor's own expense. The stockpiles shall be shaped and smoothed to permit accurate measurements. Stockpile areas shall be left in a neat condition.

1.4.1.2 Preparation of Topsoiled Areas

Areas designated to be covered with salvaged topsoil shall be undercut or underfilled so that finished lines and grades, after the placement of topsoil, conform to the template lines and grades of the cross sections shown on the project drawings provided for each task order. The areas receiving topsoil shall be shaped and smoothed prior to placing topsoil.

1.4.1.3 Placing

Topsoil shall be spread evenly and uniformly over the designated areas to the specified depth shown in the project drawings provided for each task order, and as directed by the Contracting Officer. If topsoil is not available in sufficient quantities to cover the designated areas to the plan specified depth, the Contractor shall spread the available topsoil as required by the Contracting Officer.

1.4.2 Classification of Surface Preparation

Consideration will be given to the level of surface preparation work required to be completed by the Contractor. The levels of surface preparation, described below, involve the reshaping and reworking of an existing surface prior to placement of surfacing materials. It shall be the Contractor's responsibility to maintain the prepared surface until surfacing has been placed. The listed levels of surface preparation shall be performed in accordance with SDDOT 210, except as modified below.

1.4.2.1 Existing Surface Preparation

The upper 4 inches of existing base material shall be scarified, reworked, shaped, and recompact in accordance with Section 32 15 00 AGGREGATE BASE AND SURFACE COURSE.

1.4.2.2 Ordinary Roadway Shaping

The existing granular material shall be removed and the upper 6 inches of the subgrade shall be reworked and recompact as specified in this section. After the subgrade is reworked and recompact, the granular material shall be brought back onto the roadway and recompact in accordance with Section 32 15 00 AGGREGATE BASE AND SURFACE COURSE.

1.4.2.3 Heavy Roadway Shaping

The existing granular material shall be removed and the upper 12 inches of the subgrade shall be reworked and recompact in a minimum of two lifts as specified in this section. The Government may order the Contractor to rework and recompact the subgrade to a depth greater than 12 inches. If more than 12 inches of the subgrade is reworked and recompact, the maximum lift thickness during recompact shall not exceed 6 inches. After the subgrade is reworked and recompact, the granular material shall be brought back onto the roadway and recompact in accordance with Section 32 15 00 AGGREGATE BASE AND SURFACE COURSE.

1.5 SUBMITTALS

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

SD-03 Product Data

Utilization of Excavated Materials; G-PO

Submit a plan indicating the usage of excavated materials. Include procedure and location for disposal of unused satisfactory material. Submit proposed source of borrow material, if applicable.

Opening of any Excavation or Borrow Pit; G-PO

Provide notification to the Contracting Officer sufficiently in advance of the opening of any excavation, or borrow pit if applicable, to permit elevations and measurements of the undisturbed ground surface to be taken.

Waybills And Delivery Tickets

Copies of certified waybills and delivery tickets shall be submitted, before final payment is allowed, for all materials actually approved, used, and delivered for specified work.

SD-06 Test Reports

Testing; G-PO

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

Borrow Material; G-PO

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

SD-07 Certificates

Testing

Submit qualifications of the Corps validated commercial testing laboratory or the Contractor's validated testing facilities.

PART 2 PRODUCTS

2.1 REQUIREMENTS FOR SOILS

Satisfactory materials comprise any materials classified by ASTM D2487 as CL, ML, CL-ML, CH, MH. Other materials may be deemed satisfactory by the Contracting Officer.

2.2 MATERIAL FOR RIP-RAP

Provide bedding material, filter fabric, and rock conforming to these requirements and as directed by the Contracting Officer for construction indicated.

2.2.1 Geotextile Filter Fabric

When specified by the Contracting Officer, provide geotextile filter fabric that conforms to the requirements as specified in Section 31 05 22 GEOTEXTILES USED FOR FILTERS AND ROAD CONSTRUCTION.

2.2.2 Bedding Material

When specified by the Contracting Officer, provide bedding material consisting of sand, gravel, or crushed rock, that is well graded. Compose material of tough, durable particles. Gradations and material properties for bedding material shall be as specified by the Contracting Officer for each task order.

2.2.3 Rock

Rock for riprap shall be durable quarried Sioux Quartzite stone the meets the requirements for "Class C Riprap" as specified in Section 32 11 23 MATERIAL STOCKPILING AND CONCRETE AND ASPHALT CRUSHING/MIXING and in SDDOT 830. Provide rock fragments sufficiently hard and durable to ensure permanence in the structure and the environment in which it is to be used. Use rock fragments free from cracks, seams, and other defects that would cause rapid or excessive deterioration from natural causes. The riprap shall contain no more than 5 percent of undesirable material by weight. Undesirable material can be defined as individual pieces of stone which do not meet the quality requirements when tested as specified, and which can be visually differentiated from the satisfactory pieces. Undesirable material shall also include dirt, sand, clay, and rock fines.

The riprap shall be of pieces approximately rectangular in cross section, free from thin, slabby pieces and shall have a maximum dimension more than four (4) times the least dimension. The stone shall have a minimum weight of 155 pounds per cubic foot and shall have a gradation within the limits

designated in TABLE 1 in Section 32 11 23 MATERIAL STOCKPILING AND CONCRETE AND ASPHALT CRUSHING/MIXING. Rock for riprap shall be well graded from the smallest to the largest size specified.

PART 3 EXECUTION

3.1 PREPARATION

Prior to beginning any excavation work, the Contractor shall verify the location of any utilities located within the work limits. The Contractor shall protect all utilities, pavements, and structures located within the work limits during construction operations.

The Contractor shall perform clearing and grubbing operations within the work limits, if necessary, to remove any vegetation, debris, and other items that would interfere with construction operations and the quality of excavated materials.

When specified by Contracting Officer, strip suitable topsoil from the work limits as directed, and stockpile separately from other excavated material. Material unsuitable for use as topsoil shall be wasted and remove offsite. Refer to paragraph SALVAGING, STOCKPILING, AND PLACING TOPSOIL in this section for more detailed directions.

3.2 GENERAL EXCAVATION

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

3.2.1 Ditches, Gutters, and Channel Changes

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

3.2.2 Drainage

Provide for the collection and disposal of surface and subsurface water encountered during construction. Completely drain construction site during periods of construction to keep soil materials sufficiently dry. Construct storm drainage features (ponds/basins) at the earliest stages of site development, and throughout construction grade the construction area to provide positive surface water runoff away from the construction activity or provide temporary ditches, swales, and other drainage features and equipment as required to maintain dry soils. When unsuitable working platforms for equipment operation and unsuitable soil support for subsequent construction features develop, remove unsuitable material and provide new soil material as specified herein. It is the responsibility of the Contractor to assess the soil and ground water conditions presented by the plans and specifications and to employ necessary measures to permit construction to proceed.

3.3 OPENING AND DRAINAGE OF BORROW PITS

Notify the Contracting Officer sufficiently in advance of the opening of any borrow pits to permit elevations and measurements of the undisturbed ground surface to be taken. Except as otherwise permitted, excavate borrow pits, if applicable, and other excavation areas to provide adequate drainage. If the Contractor is directed to furnish borrow from outside Government-controlled land, the Contractor shall submit waybills and delivery tickets during progress of work to track quantities of borrow material. Transport overburden and other spoil material to designated spoil areas or otherwise dispose of as directed. Ensure that excavation of any area, operation of borrow pits, or dumping of spoil material results in minimum detrimental effects on natural environmental conditions.

3.4 GRADING AREAS

Place and grade stockpiles of satisfactory and unsatisfactory as specified. Keep stockpiles in a neat and well drained condition, giving due consideration to drainage at all times. Clear, grub, and seal by rubber-tired equipment, the ground surface at stockpile locations; separately stockpile excavated satisfactory and unsatisfactory materials. Protect stockpiles of satisfactory materials from contamination which may destroy the quality and fitness of the stockpiled material. If the Contractor fails to protect the stockpiles, and any material becomes unsatisfactory, remove and replace such material with satisfactory material from approved sources.

3.5 GROUND SURFACE PREPARATION

3.5.1 General Requirements

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

3.5.2 Frozen Material

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

3.6 UTILIZATION OF EXCAVATED MATERIALS

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

3.7 BACKFILLING AND COMPACTION

Place backfill in successive horizontal layers of loose material not more than 8 inches in depth. Compact to at least 95 percent laboratory maximum density for cohesive materials and cohesionless materials. Backfill material must be within the range of -3 to +3 percent of optimum moisture content at the time of compaction or as specified by the Contracting Officer.

Prepare ground surface on which backfill is to be placed and provide compaction requirements for backfill materials in conformance with the applicable portions of paragraphs GROUND SURFACE PREPARATION. Finish compaction by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment.

3.8 SPECIAL CONSTRUCTION REQUIREMENTS

3.8.1 Rip-Rap Construction

Construct rip-rap as shown on each task order's project drawings in the areas indicated, and as specified by the Contracting Officer. Trim and dress indicated areas to conform to cross sections, lines and grades shown within a tolerance of 0.1 foot.

3.8.1.1 Geotextile Filter Fabric Placement

When directed by the Contracting Officer, install geotextile filter fabric as specified in Section 31 05 22 GEOTEXTILES USED FOR FILTERS AND ROAD CONSTRUCTION.

3.8.1.2 Bedding Placement

When directed by the Contracting Officer, spread bedding material uniformly on prepared subgrade to the thickness indicated on each task order's project drawings. If geotextile filter fabric is installed on subgrade, place bedding material in a manner to ensure intimate contact of the geotextile with the prepared subgrade and bedding material. Placement shall also be performed in a manner that will not damage the fabric including, tear, puncture, or abrasion. On sloped surfaces, place bedding material from the bottom of the slope upward. Compaction of bedding is not required. Finish bedding to present even surface free from mounds and windrows.

3.8.1.3 Stone Placement

Place rock for rip-rap on prepared bedding material and/or filter fabric to produce a well graded mass with the minimum practicable percentage of voids in conformance with lines and grades indicated on each task order's project drawings. Distribute larger rock fragments, with dimensions extending the full depth of the rip-rap throughout the entire mass and eliminate "pockets" of small rock fragments. Rearrange individual pieces by mechanical equipment or by hand as necessary to obtain the distribution of fragment sizes specified above. During placement, the height of drop of riprap material shall not be greater than 12 inches or as directed by the authorized Government representative. Geotextile that is damaged beneath bedding material shall be uncovered, as necessary, and replaced at no cost to the Government.

3.9 SUBGRADE PREPARATION

3.9.1 Proof Rolling

Proof rolling will be required at the discretion of the Contracting Officer. When required, finish proof rolling on an exposed subgrade free of surface water (wet conditions resulting from rainfall) which would promote degradation of an otherwise acceptable subgrade. After stripping, proof roll the existing subgrade of the road with six passes of a 15 ton, pneumatic-tired roller or as approved by the Contracting Officer. Operate the roller in a systematic manner to ensure the number of passes over all areas, and at speeds between 2-1/2 to 3-1/2 mph. When proof rolling, provide one-half of the passes made with the roller in a direction perpendicular to the other passes. Notify the Contracting Officer a minimum of 3 days prior to proof rolling. Perform proof rolling in the presence of the Contracting Officer. Undercut rutting or pumping of material as directed by the Contracting Officer and replace with fill and backfill material.

3.9.2 Construction

Shape subgrade to line, grade, and cross section, and compact as specified. Include plowing, disking, and any moistening or aerating required to obtain specified compaction for this operation. Remove soft or otherwise unsatisfactory material and replace with satisfactory excavated material or other approved material as directed. Excavate rock, if encountered in the cut section, to a depth of 6 inches below finished grade for the subgrade or as specified. Bring up low areas resulting from removal of unsatisfactory material or excavation of rock to required grade with satisfactory materials, and shape the entire subgrade to line, grade,

and cross section and compact as specified. After rolling, the surface of the subgrade for roadways shall not show deviations greater than 1/2 inch when tested with a 12-foot straightedge applied both parallel and at right angles to the centerline of the area. Do not vary the elevation of the finish subgrade more than 0.05 foot from the established grade and cross section.

3.9.3 Compaction

Finish compaction by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment. Compact subgrade for pavements and shoulders to at least 95 percent of laboratory maximum density for the depth below the surface of the pavement and shoulder as shown and specified.

3.10 SHOULDER CONSTRUCTION

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

3.11 FINISHING

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

3.11.1 Subgrade and Embankments

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

3.12 TESTING

Perform testing by a Corps validated commercial testing laboratory or the Contractor's validated testing facility. Submit qualifications of the Corps validated commercial testing laboratory or the Contractor's validated testing facilities. The testing laboratory shall be certified to perform the required testing by the Materials Testing Center (MTC) at the USACE Engineering Research and Development Center (ERDC). If the Contractor elects to establish testing facilities, do not permit work requiring testing until the Contractor's facilities have been inspected, Corps validated, and approved by the Contracting Officer. Perform testing on materials as specified below and as directed by the Contracting Officer.

3.12.1 In-Place Densities

Field in-place density shall be determined in accordance with ASTM D6938. Tests performed in accordance with ASTM D6938 shall be used to determine the moisture content of the soil. The calibration curves furnished with the moisture gauges shall also be checked along with density calibration checks as described in ASTM D6938. When test results indicate, as determined by the Contracting Officer, that compaction work does not meet specified requirements, rework, replace, and retest at the expense of the Contractor. Field density tests shall be performed as shown below:

- a. One test per 250 linear feet, or fraction thereof, for roadway construction.
- b. One test per 2,500 square feet, or fraction thereof, for non-roadway construction.

3.12.2 Optimum Moisture and Laboratory Maximum Density

Perform tests for each type of material or source of material, including borrow material, in accordance with ASTM D698 to determine the optimum moisture and laboratory maximum density values. One representative test shall be performed per 500 cubic yards of fill and backfill, or when any change in material occurs which may affect the optimum moisture content or laboratory maximum density.

3.12.3 Tolerance Tests for Subgrades

Perform continuous checks on the degree of finish specified in paragraph SUBGRADE PREPARATION or by other approved methods during construction of the subgrades.

3.13 DISPOSITION OF SURPLUS MATERIAL

Satisfactory surplus material not required for filling, backfilling, or topsoiling may be removed to an approved stockpile location if specified by the Contracting Officer. If not specified, all other surplus material not required or suitable for placement, and brush refuse, stumps, roots, and timber shall be removed from Government property as directed by the Contracting Officer at no additional cost to the Government.

-- End of Section --

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DIVISION 31 - EARTHWORK

SECTION 31 05 22

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SECTION 31 05 22

GEOTEXTILES USED FOR FILTERS AND ROAD CONSTRUCTION

PART 1 GENERAL

1.1 REFERENCES

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

ASTM INTERNATIONAL (ASTM)

ASTM D123	(2015b; R 2017) Standard Terminology Relating to Textiles
ASTM D4355/D4355M	(2014) Deterioration of Geotextiles from Exposure to Light, Moisture and Heat in a Xenon-Arc Type Apparatus
ASTM D4491/D4491M	(2017) Standard Test Methods for Water Permeability of Geotextiles by Permittivity
ASTM D4533/D4533M	(2015) Standard Test Method for Trapezoid Tearing Strength of Geotextiles
ASTM D4632/D4632M	(2015a) Grab Breaking Load and Elongation of Geotextiles
ASTM D4751	(2020) Standard Test Method for Determining Apparent Opening Size of a Geotextile
ASTM D4873/D4873M	(2017) Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples
ASTM D4884/D4884M	(2014a) Strength of Sewn or Thermally Bonded Seams of Geotextiles
ASTM D6241	(2014) Standard Test Method for the Static Puncture Strength of Geotextiles and Geotextile-Related Products Using a 50-mm Probe

SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION (SDDOT)

SDDOT AP LIST	South Dakota Department of Transportation Approved Products List
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1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When

used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following as required for each task order in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Geotextile; G-PO

Provide product data for Government approval. Contractor shall also submit documentation that the geotextile material is listed on the SDDOT AP LIST.

SD-07 Certificates

Certificate Of Compliance

Provide manufacturer's written certification that states the geotextile material meets contract specifications.

1.3 DELIVERY, STORAGE, AND HANDLING

Rolls of geotextile shall be packaged in an opaque, waterproof, protective plastic wrapping when delivered on-site. The plastic wrapping shall not be removed until placement. Adequate storage facilities shall be provided for the material by the Contractor. Do not store the material in direct sunlight. The material shall be protected from mud, debris, and other contaminants. Geotextile or plastic wrapping damaged during storage or handling shall be repaired or replaced as directed by the Contracting Officer. All geotextile shall be labeled, shipped, stored, and handled in accordance with ASTM D4873/D4873M. No hooks, tongs, or other sharp instruments shall be used for handling geotextile. Rolls of geotextile shall not be dragged along the ground, lifted by one end, or dropped to the ground.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 General

Provide geotextile, as directed by the Contracting Officer, that is either a woven or a non-woven pervious sheet of plastic yarn as defined by ASTM D123. Woven geotextile shall be used for roadway construction and non-woven geotextile shall be used for riprap construction. Woven and non-woven geotextiles shall match or exceed the minimum average roll values listed in TABLE 1, and shall be listed as approved products on the SDDOT AP LIST. Strength values indicated in the table are for the weaker principal direction. The SDDOT AP LIST can be found at the following website:

<https://apps.sd.gov/HC60ApprovedProducts/main.aspx>

<p>TABLE 1 MINIMUM PHYSICAL REQUIREMENTS FOR GEOTEXTILE</p>

PROPERTY	UNITS	ACCEPTABLE VALUES (WOVEN)	ACCEPTABLE VALUES (NON-WOVEN)	TEST METHOD
GRAB STRENGTH	lb	315	200	ASTM D4632/D4632M
PUNCTURE	lb	620	430	ASTM D6241
TRAPEZOID TEAR	lb	110	80	ASTM D4533/D4533M
APPARENT OPENING SIZE	U.S. SIEVE	40	40	ASTM D4751
PERMITTIVITY	sec -1	0.05	1.4	ASTM D4491/D4491M
ULTRAVIOLET DEGRADATION	Percent	70 at 500 Hrs	70 at 500 Hrs	ASTM D4355/D4355M

2.1.2 Geotextile Fiber

Fibers used in the manufacturing of the geotextile shall consist of a long-chain synthetic polymer composed of at least 85 percent by weight of polyolefins, polyesters, or polyamides. Add stabilizers and/or inhibitors to the base polymer, if necessary to make the filaments resistant to deterioration caused by ultraviolet light and heat exposure. Reclaimed or recycled fibers or polymer shall not be added to the formulation. Geotextile shall be formed into a network such that the filaments or yarns retain dimensional stability relative to each other, including the edges. Finish the edges of the geotextile to prevent the outer fiber from pulling away from the geotextile.

2.1.3 Seams

Seams in the geotextile shall be overlapped a minimum of 18 inches or as shown in each task order's project drawings, sewn with thread of a material meeting the chemical requirements given above for geotextile yarn, or bonded by cementing or by heat. Attach the sheets of geotextile at the factory or another approved location, if necessary, to form sections not less than 12 feet wide. Test seams in accordance with method ASTM D4884/D4884M. The strength of the seam shall be not less than 90 percent of the required grab tensile strength of the unaged geotextile in any principal direction.

2.1.4 Securing Pins

When necessary, secure the geotextile to the foundation soil by temporary pinning to prevent movement prior to placement of overlying materials. The use of pins shall be restricted as much as possible since pinholes in geotextile provide a path for water to erode away material. Other appropriate means to prevent movement such as staples, sand bags, and stone could also be used if approved by the authorized Government representative. Insert securing pins through both strips of overlapped geotextile along the line passing through midpoints of the overlap. Remove securing pins as overlying materials are placed to prevent tearing of geotextile or enlarging holes. Maximum spacing between securing pins depends on the steepness of the embankment slope. The maximum pin spacing shall be equal to or less than the values listed in TABLE 2. When windy

conditions prevail at the construction site, increase the number of pins upon the demand of the Contracting Officer. During rip-rap construction, anchor terminal ends of the geotextile with key trench or apron at crest, toe of the slope and upstream and downstream limits of installation.

TABLE 2 MAXIMUM SPACING FOR SECURING PINS	
EMBANKMENT	SPACING, feet
STEEPER THAN 1V ON 3H	2
1V ON 3H TO 1V ON 4H	3
FLATTER THAN 1V ON 4H	5

2.2 INSPECTIONS, VERIFICATIONS, AND TESTING

2.2.1 Manufacturing and Sampling

Geotextiles and factory seams shall meet the requirements specified in TABLE 1, MINIMUM PHYSICAL REQUIREMENTS FOR GEOTEXTILE.

2.2.1.1 Manufacturer Certification

The Contractor shall submit copies of the written certificate of compliance signed by a legally authorized official of the manufacturer. The certificate shall state that the geotextile shipped to the site meets the chemical requirements and exceeds the minimum average roll value listed in TABLE 1.

PART 3 EXECUTION

3.1 SURFACE PREPARATION

Prepare surface, on which the geotextile will be placed, to a relatively smooth surface condition in accordance with the applicable portion of this specification and Section 31 00 00 EARTHWORK. The surface shall be free from obstruction, debris, depressions, erosion feature, or vegetation. Remove any irregularities so as to ensure continuous, intimate contact of the geotextile with all the surface. Any loose material, soft or low density pockets of material, shall be removed; erosion features such as rills, gullies etc. shall be graded out of the surface before geotextile placement.

3.2 INSTALLATION OF THE GEOTEXTILE

3.2.1 General

Place the geotextile in the manner and at the locations indicated by the Contracting Officer. At the time of installation, reject the geotextile if it has defects, rips, holes, flaws, deterioration or damage incurred during manufacture, transportation or storage.

3.2.2 Placement for Rip-Rap Construction

The geotextile shall be oriented and placed as shown on the project

drawings provided for each task order. The geotextile shall be laid in intimate contact with the subgrade soil; smooth and free of tension, stress, folds, wrinkles, or creases. If the Contractor elects to overlap seams versus sewing them, the sections shall be placed to provide a minimum overlap for each joint as specified in the task order's project drawings. If no minimum overlap is specified, the Contractor shall provide a minimum of 18 inches of overlap for each joint. Temporary pinning of the geotextile to help hold it in place until the bedding or riprap is placed will be allowed. Remove the temporary pins as the bedding or riprap is placed to relieve high tensile stress which may occur during placement of material on the geotextile. Perform trimming in such a manner that the geotextile is not damaged in any way.

3.2.3 Placement for Road Construction

The geotextile shall be placed in intimate contact with the subgrade soil. The geotextile shall be laid smooth and free of tension, stress, folds, wrinkles, or creases. If the Contractor elects to overlap seams versus sewing them, the sections shall be placed to provide a minimum of 18 inches of overlap for each joint. Temporary pinning of the geotextile to help hold it in place until the base course material is placed will be allowed. Remove the temporary pins as the base course material is placed to relieve high tensile stress which may occur during placement of material on the geotextile. Perform trimming in such a manner that the geotextile shall not be damaged in any way.

3.3 PROTECTION

Protect the geotextile at all times during construction from contamination by surface runoff; remove any geotextile so contaminated and replaced with uncontaminated geotextile. Replace any geotextile damaged during its installation or during placement of overlying materials (base course, bedding material, rip-rap) at no cost to the Government. Schedule the work so that placement of overlying materials is accomplished the same day as placement of the geotextile. Failure to comply shall require replacement of geotextile. Protect the geotextile from damage prior to and during the placement of overlying material. Before placement of any overlying material, the Contractor shall demonstrate that the placement technique will not cause damage to the geotextile. In no case shall any type of equipment be allowed on the unprotected geotextile.

3.4 OVERLAPPING AND SEAMING

3.4.1 Overlapping

The overlap of geotextile rolls shall be a minimum of 18 inches or as specified in the project drawings provided for each task order. Appropriate measures will be taken to ensure required overlap exists after placement of overlying materials.

3.4.2 Sewn Seams

When the Contractor elects to sew seams, high strength thread should be used so that seam test conforms to ASTM D4884/D4884M. The thread shall meet the chemical, ultraviolet, and physical requirements of the geotextile, and the color shall be different from that of the geotextile. The seam strength shall be equal to the strength required for the geotextile in the direction across the seam. Overlapping J-type seams are preferable over prayer-type seams as the overlapping geotextile reduces

the chance of openings to occur at the seam. Use double sewing, specially for field seams, to provide a safety factor against undetected missed stitches.

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SECTION 32 01 16.71

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SECTION 32 01 16.71

COLD MILLING/PAVEMENT DEMOLITION

PART 1 GENERAL

1.1 UNIT PRICES

1.1.1 Measurement

The quantity of milled pavement will be the number of square yards as specified in each task order. The final quantity that will be paid for will be the number of square yards that are completed and accepted as determined by the Contracting Officer. .

1.1.2 Payment

Payment will be to the nearest square yard. No payment will be made for milling outside the specified area of work. Cold milling shall include the cost of materials, equipment, stockpiling, and other incidental costs associated with this work item.

1.2 QUALITY ASSURANCE

1.2.1 Grade

Mill pavement such that the finished surface conforms to the lines, grades, and cross sections indicated. The maximum allowable deviation of the finished milled pavement surfaces from the established plan grade line and elevation will be 0 inch. Finished surfaces at a juncture with other pavements shall coincide with the finished surfaces of the abutting pavements. The deviations from the plan grade line and elevation will not be permitted in areas of pavements where closer conformance with planned grade and elevation is required for the proper functioning of appurtenant structures involved.

1.2.2 Surface Smoothness

The maximum allowable deviation of the finished surfaces from the testing edge in the transverse or longitudinal direction will be 1/4 inch.

1.2.3 Traffic Control

Provide all necessary traffic controls during milling operations. Refer to Section 01 12 00 CONSTRUCTION GENERAL for traffic control plan requirements.

1.3 EQUIPMENT, TOOLS, AND MACHINES

Maintain in a satisfactory working condition equipment, tools, and machines used in the performance of the work.

1.3.1 Cold-Milling Machine

Provide a cold-milling machine which is self-propelled, capable of milling

the pavement to a specified depth and smoothness and of establishing grade control; with means of controlling transverse slope and dust produced during the pavement milling operation. Machine will have capability of adding water in front of equipment to minimize dust during milling operation. The machine will have the ability to remove the millings or cuttings from the pavement and load them into a truck. The milling machine will not damage any part of the pavement structure that is not to be removed.

1.3.2 Cleaning Equipment

Provide cleaning equipment suitable for removing and cleaning loose material from the pavement surface.

1.3.3 Straightedge

Furnish and maintain at the site, in good condition, one 10 foot straightedge or other suitable device for each milling machine, for testing the finished surface. Make straightedge available for Government use. Use straightedges constructed of aluminum or other lightweight metal, with blades of box or box-girder cross section with flat bottom reinforced to insure rigidity and accuracy. Use straightedges with handles to facilitate movement on the pavement.

1.4 ENVIRONMENTAL REQUIREMENTS

Do not perform milling when there is accumulation of snow or ice on the pavement surface.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 PAVEMENT DEMOLITION/REMOVAL

Pavement demolition and removal, for both asphalt pavements and concrete pavements, shall be as specified for each task order. Limits of pavement demolition, as shown in the project drawings provided for each task order, shall be saw cut to full-depth prior to demolition activities to prevent any damage to adjacent pavements and areas that are to be protected. Saw cuts shall be made using a pre-approved concrete saw so as to leave a straight true edge. The Contractor shall be responsible for hauling and disposing all demolished materials outside the limits of Government-controlled land at the Contractor's own expense.

3.2 MILLING OPERATION

A minimum of seven days notice is required, prior to start work, for the Contracting Officer to coordinate the milling operation with other activities at the site. Make sufficient passes so that the designated area is milled to the grades and cross sections indicated. Mill the pavement in depth increments that will not damage the pavement below the designated finished grade. If scabbing occurs, the surface will not meet smoothness requirements. Take steps to modify the process as needed to prevent scabbing from occurring. Repair or replace, as directed, items damaged during milling such as manholes, valve boxes, utility lines, pavement that is torn, cracked, gouged, broken, or undercut. Remove the

milled material from the pavement and load into trucks. Milling operations cannot begin more than 7 calendar days before placement of new asphalt or concrete unless full-depth removal and subbase preparation is required per the task order.

3.3 GRADE AND SURFACE-SMOOTHNESS TESTING

3.3.1 Grade-Conformance Tests

Test the finished milled surface of the pavement for conformance with the plan-grade requirements and for acceptance by the Contracting Officer by running lines of levels at intervals of 25 feet longitudinally and 25 feet transversely to determine the elevation of the completed pavement. Correct variations from the designated grade line and elevation in excess of the plan-grade requirements as directed. Skin patching for correcting low areas will not be permitted. Remove and replace the deficient low area. Remove sufficient material to allow at least 1 inch of asphalt concrete to be placed.

3.3.2 Surface-Smoothness Tests

After completion of the final milling, the finished milled surface will be tested by the Government with a straightedge. Other approved devices may be used, provided that when satisfactorily and properly operated, such devices reveal all surface irregularities exceeding the tolerances specified. Correct surface irregularities that depart from the testing edge by more than 1/4 inch. Skin patching for correcting low areas will not be permitted. Remove and replace the deficient low area. Remove sufficient material to allow at least 1 inch of asphalt concrete to be placed.

3.4 REMOVAL OF MILLED MATERIAL

Stockpile material that is removed as specified and in such a manner to prevent segregation or contamination. If stockpiling is not specified, the material that is removed will become the property of the Contractor and will be removed from the site at the Contractor's own expense.

3.5 TEMPORARY MARKINGS

After completion of milling operations on all public roads, temporary markings shall be placed for traffic control as referenced in Section 32 17 23 PAVEMENT MARKINGS.

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SECTION 32 01 17.61

SEALING CRACKS IN ASPHALT PAVEMENTS

PART 1 GENERAL

1.1 REFERENCES

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

ASTM INTERNATIONAL (ASTM)

ASTM C509	(2006; R 2015) Elastomeric Cellular Preformed Gasket and Sealing Material
ASTM D789	(2015) Determination of Relative Viscosity and Moisture Content of Polyamide (PA)
ASTM D6690	(2015) Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements

SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION (SDDOT)

SDDOT 350	(2015) Standard Specifications for Roads and Bridges, Asphalt Concrete Crack Sealing
SDDOT AP LIST	South Dakota Department of Transportation Approved Products List

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. Submit the following as required for each task order in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Installation of Sealant

Sealants; G-PO

Backer Materials; G-PO

1.3 QUALITY ASSURANCE

Final acceptance will be based on the performance of materials that have been satisfactorily installed.

1.3.1 Traffic Control

Provide all necessary traffic control devices during crack sealing operations. Only one (1) travel lane may be closed at any time on the roadway, unless a traffic control plan to work the full width of the roadway is submitted by the Contractor and approved by the Contracting Officer. Refer to Section 01 12 00 CONSTRUCTION GENERAL for traffic control plan requirements.

1.4 DELIVERY, STORAGE, AND HANDLING

Inspect materials delivered to the job site for defects; unload, and store them with a minimum of handling to avoid damage. Provide storage facilities at the job site to protect materials from weather and maintain them at the temperatures recommended by the manufacturer.

1.5 EQUIPMENT, TOOLS, AND MACHINES

Equipment, tools, and machines used in performance of the work are subject to approval by the Contracting Officer or authorized Government representative, before work is started. Maintain in a satisfactory working condition at all times.

1.5.1 Routing Equipment

Provide routing equipment which is a self-powered machine operating a power driven tool or bit specifically designed for routing bituminous pavements. Use a bit rotating about a vertical axis at sufficient speed to cut a smooth vertical-walled reservoir in the pavement surface and maintain accurate cutting without damaging the sides or top edges of the reservoir. Provide a router capable of following the trace of the crack without deviation. The use of rotary impact routing devices may be permitted if vertical-sided carbide tipped bits are used.

1.5.2 Concrete Saw

Provide a self-propelled power saw with small diameter (6 inches or less) water-cooled diamond or abrasive saw blades for cutting cracks to the depths and widths specified and for removing filler that is embedded in the cracks or adhered to the crack faces. Use a saw blade with a diameter small enough to allow the saw to closely follow the trace of the crack.

1.5.3 Compressed Air Cleaning Equipment

Provide an air compressor and all hoses and fittings necessary for cleaning reservoirs, cracks, and roadway surfaces. The air compressor shall be capable of producing a minimum of 125 CFM (cubic feet per minute) output and be equipped with a maximum 3/4 inch nozzle. The air compressor shall be equipped with traps capable of removing all free water and oil from the compressed air.

1.5.4 Hand Tools

Hand tools may be used, when approved, for removing defective sealant from cracks and repairing or cleaning the crack faces.

1.5.5 Crack Sealing Equipment

Provide unit applicators, used for heating and installing the hot-poured

crack sealant materials, that are mobile and equipped with a double-boiler, agitator-type kettle with an oil medium in the outer space for heat transfer; a direct-connected pressure-type extruding device with a nozzle shaped for inserting in the crack to be filled; positive temperature devices for controlling the temperature of the transfer oil and sealant; and a recording type thermometer for indicating the temperature of the sealant. Allow the sealant to circulate through the delivery hose and return to the inner kettle when not in use, due to the applicator unit design.

1.6 ENVIRONMENTAL REQUIREMENTS

Crack sealing operations shall be performed in accordance with the seasonal and temperature limitations shown in SDDOT 350. Application of sealant materials will only be allowed when the pavement surface temperature is at least 35 degrees F and rising. Application of sealant materials will only be allowed when the ambient air temperature is between 40 degrees F and 85 degrees F. Application of sealant materials will only be allowed when the relative humidity is less than 75%. Do not apply sealant if moisture is observed in the crack.

PART 2 PRODUCTS

2.1 SEALANTS

Provide sealants conforming to ASTM D6690, Type II, listed as acceptable products on the SDDOT AP LIST and as directed by the Contracting Officer. Submit product data on the proposed sealant for Government approval. The SDDOT AP LIST can be found at the following website:

<https://apps.sd.gov/HC60ApprovedProducts/main.aspx>

2.2 BACKER MATERIALS

Provide backer rod material that is a compressible, nonshrinking, nonstaining, nonabsorptive material and nonreactive with the crack sealant. Use backer rod with a melting point temperature of at least 5 degrees F greater than the maximum pouring temperature of the sealant being used, when tested in accordance with ASTM D789. Use material that has a water absorption of not more than 5 percent by weight when tested in accordance with ASTM C509. Use backer rod material that is 25 percent (plus or minus 5 percent) larger in diameter than the nominal width of the crack. Submit product data on the proposed backer material for Government approval.

PART 3 EXECUTION

3.1 PREPARATION OF CRACKS

Immediately before the installation of the crack sealant, thoroughly dry and clean the cracks to remove oxidized pavement, loose aggregate and foreign debris. Prepare cracks as follows:

3.1.1 Cracks

3.1.1.1 Hairline Cracks

Cracks that are less than 1/4 inch wide do not need to be sealed.

3.1.1.2 Small Cracks

Route cracks that are 1/4 to 3/4 inch wide to a nominal width 1/8 inch greater than the existing nominal width and to a depth not less than 3/4 inch, and clean and dry using compressed air.

3.1.1.3 Medium Cracks

Cracks that are 3/4 to 1 1/2 inches wide shall be cleaned and dried using compressed air.

3.1.1.4 Large Cracks

Repair cracks that are greater than 1 1/2 inches wide using pothole repair techniques instead of sealing.

3.1.2 Existing Sealant Removal

Cut loose the in-place sealant from both crack faces and to a depth shown on the drawings using a concrete saw or hand tools as specified in paragraph EQUIPMENT, TOOLS, AND MACHINES. Remove sealant to a depth sufficient to accommodate any backer rod material that is required to maintain the depth of new sealant to be installed. Prior to further cleaning operations, remove all old loose sealant remaining in the crack opening by blowing with compressed air.

3.1.3 Routing

Perform routing of the cracks using a rotary router with a bit that is at least 1/8 inch wider than the nominal width of the crack to remove all residual old sealant (resealing), oxidized pavement and any loose aggregate in the crack wall. Routing will not be allowed when the roadway is wet.

3.1.4 Sawing

Perform sawing of the cracks using a power-driving concrete saw as specified in paragraph EQUIPMENT, TOOLS, AND MACHINES. Stiffen the blade as necessary with suitable dummy (or used) blades or washers. Immediately following the sawing operation, clean the crack opening using compressed air to remove all saw cuttings and debris.

3.1.5 Cleaning

Cleaning shall be accomplished with an air compressor as specified in paragraph EQUIPMENT, TOOLS, AND MACHINES. All reservoirs, cracks, and adjoining roadway surfaces shall be thoroughly cleaned of dust, dirt, and loose materials so that they are clean and dry at the time the backer material or sealant is applied.

3.1.6 Backer Rod Material

Use backer rod material in all cracks that have a depth greater than 3/4 inch, or otherwise would require excessive sealant. Insert the backer rod material into the lower portion of the crack as shown on the drawings. Place the backer rod so that the top of the backer rod is at least 3/4 inch below the top of the pavement. Ensure that the backer rod material is placed at the specified depth and is not stretched or twisted during installation.

3.1.7 Rate of Progress of Crack Preparation

Limit the stages of crack preparation, which include routing, air pressure cleaning, and placing of the backer rod material, to only that linear footage that can be sealed during the same day.

3.2 PREPARATION OF SEALANT

Do not heat hot-poured sealants in excess of the safe heating temperature recommended by the manufacturer, as shown on the sealant containers. Withdraw and waste sealant that has been overheated or subjected to application temperatures for over 4 hours or that has remained in the applicator at the end of the day's operation.

3.3 INSTALLATION OF SEALANT

Submit manufacturer's instructions 30 days prior to the use of the material on the project. Installation of the material will not be allowed until the instructions are received.

3.3.1 Time of Application

Seal cracks immediately following final cleaning and drying of the crack walls and following the placement of the backer rod material (when required). Place sealant only when cracks are dry. Reclean cracks that cannot be sealed under the conditions specified, or when rain interrupts sealing operations, and allow to dry or dry by mechanical means prior to installing the sealant.

3.3.2 Sealing the Crack

Immediately preceding, but not more than 50 feet ahead of the crack sealing operations, perform a final cleaning and drying with compressed air. When applying the sealant, the reservoir shall be overfilled and squeegeed to provide a film of sealant on the roadway surface 1 to 3 inches on both sides of the reservoir. The squeegee shall be a "U" shaped device capable of producing a full, uniform, and neat appearing reservoir and adjoining surface area. Install the sealant in a manner which prevents the formation of voids and entrapped air. Several passes with the applicator wand may be necessary to obtain the specified sealant depth from the pavement surface. Do not use gravity methods or pouring pots to install the sealant material. Do not permit traffic over newly sealed pavement until authorized by the Contracting Officer. Check cracks frequently to ensure that the newly installed sealant is cured to a tack-free condition within 3 hours. Immediately notify the Contracting Officer of the location of any sealant that has not cured to a tack-free condition within 3 hours. When approved by the Government, a blotting material, such as toilet tissue, shall be placed over the sealant material if traffic must cross a sealed area before a tack-free condition has been achieved. The proposed blotting material shall be approved for use, by the Government before crack sealing operations begin.

3.4 CLEANUP

Upon completion of the project, remove unused materials from the site and leave the pavement in a clean condition.

3.5 QUALITY CONTROL PROVISIONS

3.5.1 Crack Cleaning

Provide quality control provisions during the crack cleaning process to correct improper equipment and cleaning techniques that damage the bituminous pavement in any manner. Cleaned cracks must be approved by the Contracting Officer or authorized Government representative prior to installation of the crack sealant.

3.5.2 Crack Seal Application Equipment

Inspect the application equipment to ensure conformance to temperature requirements and proper installation. Evidences of bubbling, improper installing, and failing to cure or set will cause to suspend operations until causes of the deficiencies are determined and corrected.

3.5.3 Crack Sealant

Inspect the crack sealant for proper cure and set rating, tack free surface, bonding to the bituminous pavement, cohesive separation within the sealant, reversion to liquid, and entrapped air and voids. Remove sealants exhibiting any of these deficiencies, at any time prior to the final acceptance of the project, and replace as specified herein at no additional cost to the Government.

-- End of Section --

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SECTION 32 11 23

MATERIAL STOCKPILING AND CONCRETE AND ASPHALT CRUSHING/MIXING

PART 1 GENERAL

1.1 UNIT PRICES

1.1.1 Measurement

1.1.1.1 Weight

The tonnage of material will be the number of tons of aggregate crushed/mixed and/or delivered and stockpiled and accepted in the completed course placed in authorized stockpiles, as determined by the Contracting Officer. Deductions will be made for any material wasted, unused, rejected, or used for convenience of the Contractor, and for water exceeding specified amount at time of weighing.

1.1.2 Payment

1.1.2.1 Payment for Quantities

Quantities of material, determined as specified above, will be paid for at the respective contract unit prices, which will constitute full compensation for the completion of the task order. Full cost of transportation, mobilization, demobilization, and stockpiling shall be included in the bid items for procurement of material(s). Full cost of stockpiling shall be included in the bid item for crushing concrete and crushing/mixing asphalt. Tonnage for procured materials will be as determined by certified waybills, but payment will be limited to the amount as listed on the task order award document. Tonnage for crushed materials will be based on the Contractor's furnished waybills produced by either a certified truck scale or a calibrated loader equipped scale or by any other Government approved method. A loader equipped scale must be calibrated within +/- 1 percent by use of a certified weight at the beginning of every shift or as designated by the Contracting Officer.

1.1.3 Waybills and Delivery Tickets

Submit copies of waybills and delivery tickets during progress of the work. Before the final payment is allowed, file certified waybills and certified delivery tickets for all stockpiled materials.

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.

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
(AASHTO)

AASHTO T 99

(2019) Standard Method of Test for
Moisture-Density Relations of Soils Using

a 2.5-kg (5.5-lb) Rammer and a 305-mm
(12-in.) Drop

ASTM INTERNATIONAL (ASTM)

ASTM C33/C33M	(2018) Standard Specification for Concrete Aggregates
ASTM C88	(2018) Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C117	(2017) Standard Test Method for Materials Finer than 75-um (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C131/C131M	(2020) Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C136/C136M	(2019) Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM D75/D75M	(2019) Standard Practice for Sampling Aggregates
ASTM D698	(2012; E 2014; E 2015) Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/cu. ft. (600 kN-m/cu. m.))
ASTM D2487	(2017; E 2020) Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D4318	(2017; E 2018) Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM E11	(2020) Standard Specification for Woven Wire Test Sieve Cloth and Test Sieves

SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION (SDDOT)

SDDOT 830	(2015) Standard Specification for Roads and Bridges, Riprap
SDDOT 882	(2015) Standard Specifications for Roads and Bridges, Aggregates for Granular Bases and Surfacing

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2014) Safety and Health Requirements Manual
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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, as required for each task order, in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Plant, Equipment, and Tools; G-PO

Waybills and Delivery Tickets

Copies of certified waybills and delivery tickets shall be submitted during performance of work. Before the final payment is allowed, the Contractor shall file certified waybills and delivery tickets for all aggregate materials actually approved, used, and delivered for specified work.

SD-06 Test Reports

Sampling And Testing; G-PO

1.4 EQUIPMENT, TOOLS, AND MACHINES

All plant, equipment, and tools used in the performance of the work will be subject to approval by the Contracting Officer before the work is started. Maintain all plant, equipment, and tools in satisfactory working condition at all times. Submit a list of proposed equipment, including descriptive data. Use equipment that minimizes segregation, produces material that meets required gradations and other physical properties, and accurately measures quantities of material, as set forth herein. Crushing equipment shall be capable of producing square aggregates of various sizes. Loaders shall be equipped with certified scales or other approved means capable of being calibrated in the field. Scale equipment shall be capable of printing out waybills.

All equipment must be maintained in good working condition and comply to the safety standards provided in EM 385-1-1.

1.5 QUALITY ASSURANCE

Sampling and testing are the responsibility of the Contractor. Perform sampling and testing using a commercial testing laboratory approved in accordance with Section 01 45 00.00 10 QUALITY CONTROL. Work requiring testing will not be permitted until the testing laboratory has been inspected and approved. Test the materials to establish compliance with the specified requirements and perform testing at the specified frequency. The Contracting Officer may specify the time and location of the tests. Furnish certified copies of test results to the Contracting Officer for approval within 24 hours of completion of the tests and not less than 15 days before material is required for work. Submit waybills and delivery tickets for tracking material quantities for payment.

1.5.1 Sampling

Take samples for laboratory testing in conformance with ASTM D75/D75M.

When deemed necessary, the sampling will be observed by the Contracting Officer.

1.5.2 Tests

Perform the following tests in conformance with the applicable standards listed and as directed by the Contracting Officer. All tests shall be performed by a certified material testing technician.

1.5.2.1 Sieve Analysis

Perform sieve analysis in conformance with ASTM C117 and ASTM C136/C136M using sieves conforming to ASTM E11.

1.5.2.2 Liquid Limit and Plasticity Index

Determine liquid limit and plasticity index in accordance with ASTM D4318.

1.5.2.3 Moisture-Density Determinations

Determine the laboratory maximum dry density and optimum moisture content in accordance with ASTM D698. Since ASTM D698 applies only to soils that have 30 percent or less by weight of their particles retained on the 3/4 inch sieve, the laboratory maximum dry density and optimum moisture content for material having more than 30 percent by weight of their particles retained on the 3/4 inch sieve will be determined in accordance with AASHTO T 99 Method D and corrected with Annex A of AASHTO T 99.

1.5.2.4 Wear Test

Perform wear tests on course material in conformance with ASTM C131/C131M.

PART 2 PRODUCTS

2.1 PROCURE MATERIALS

Materials shall be free of silt and clay as defined by ASTM D2487, organic matter, and other objectionable materials or coatings. The portion retained on the No. 4 sieve is known as coarse aggregate; that portion passing the No. 4 sieve is known as fine aggregate. When aggregate is supplied from more than one source, provide aggregate from each source that meets the specified requirements. Provide materials as specified in the following paragraphs.

2.1.1 Riprap

Riprap shall be durable quarried Sioux Quartzite stone that meets the requirements for "Class C Riprap" in accordance with SDDOT 830. The riprap material shall be hard and durable, free from cracks, seams, and other defects that will cause rapid or excessive deterioration or degradation. The material delivered to the Government stockpile site shall be of such quality that tests performed on representative samples shall have results within the limits specified. The riprap shall contain no more than 5 percent of undesirable material by weight. Undesirable material can be defined as individual pieces of stone which do not meet the quality requirements when tested as specified, and which can be visually differentiated from the satisfactory pieces. Undesirable material shall also include dirt, sand, clay, and rock fines.

The riprap shall be of pieces approximately rectangular in cross section, free from thin, slabby pieces and shall have a maximum dimension more than four (4) times the least dimension. The stone shall have a minimum weight of 155 pounds per cubic foot and shall have a gradation within the limits designated in TABLE 1. Riprap material shall be well graded from the smallest to the largest size specified.

TABLE 1. GRADATION OF RIPRAP		
Rock Size (ft)	Rock Weight (lbs)	Percent of Riprap Smaller Than
2.25	1000	100
1.80	500	50
0.95	75	15

2.1.2 Spalls

Spalls shall be composed of hard and durable fragments of quarried Sioux Quartzite stone or granite reasonably well graded that meets the gradation shown in TABLE 2. Apply the specified gradation requirements to the completed materials. The aggregates shall be continuously well graded within the limits shown. Sieves shall conform to ASTM E11.

TABLE 2. GRADATION OF SPALLS	
Percentage by Weight Passing Square-Mesh Sieve	
Sieve Designation	Percent Passing
5 inch	100
3 inch	60-85
1 inch	15-40
3/4 inch	-
No. 4	0-10
No. 16	-
No. 200	-

2.1.3 Filter Rock

Filter rock shall consist of Aggregate material that conforms to the requirements for course aggregate specified in ASTM C33/C33M, Sieve Size No. 7. The aggregates shall be continuously well-graded within the limits shown in TABLE 3.

TABLE 3. GRADATION OF FILTER ROCK	
Percentage by Weight Passing Square-Mesh Sieve	
Sieve Designation	Percent Passing
3/4 inch	100
1/2 inch	40-100
3/8 inch	20-70
No. 4	0-15
No. 8	0-5

2.1.4 Manufactured Sand

Manufactured sand shall consist of aggregate material that conforms to the requirements for fine aggregate specified in ASTM C33/C33M. The aggregates shall be continuously well-graded within the limits shown in TABLE 4.

TABLE 4. GRADATION OF MANUFACTURED SAND	
Percentage by Weight Passing Square-Mesh Sieve	
Sieve Designation	Percent Passing
3/8 inch	100
No. 4	95-100
No. 8	80-100
No. 16	50-85
No. 40	25-60
No. 50	10-40
No. 100	0-10

2.1.5 Other Material

Material shall be one of the four (4) aggregate courses listed in TABLE 1 - "GRADATION FOR AGGREGATE COURSES" located in Section 32 15 00 AGGREGATE BASE AND SURFACE COURSE. Materials for these aggregate courses shall meet the requirements as specified in SDDOT 882 and Section 32 15 00 AGGREGATE BASE AND SURFACE COURSE.

2.1.6 Topsoil

Topsoil shall be natural, friable soil representative of productive, well-drained soils in the area and shall be suitable for vegetative growth. Topsoil shall be a loam, sandy loam, clay loam, silt loam, sandy clay loam, or loamy sand. Other soils may be used if recommended by an agronomist or soil scientist and approved by the Contracting Officer. Topsoil shall not be a mixture of contrasting textured subsoils and shall be free from clay lumps, stones, coarse gravel, or similar objects larger than 1 inch in diameter. Brush, stumps, roots, wood, weeds, trash, toxic substances, or any other material which may be harmful to plant growth will not be allowed. Organic material will be decomposed.

2.2 TESTS, INSPECTIONS, AND VERIFICATIONS

2.2.1 Sampling And Testing

Perform sampling and testing on materials as shown in TABLE 5 and as directed by the Contracting Officer. Required testing that is specified in TABLE 5 shall be performed in conformance with the listed applicable standards and specifications shown in the paragraphs below. Perform these tests to demonstrate that the material meets all specified requirements when furnished. Complete the specified testing for each source of material if materials from more than one source are proposed. All sampling and testing shall be performed by a certified material testing technician from a commercial testing laboratory approved in accordance with Section 01 45 00.00 10 QUALITY CONTROL.

Submit certified test results for approval 15 days prior to delivery of the material and also during delivery of material, as specified in TABLE 5. Certified test results shall include the name of the owner of the quarry, the legal description of the quarry, and the geological section of the quarry which shows the various rock units identified by geological name of formation and member identifying the ledge from which the samples were obtained.

TABLE 5: REQUIRED TESTING FOR MATERIALS			
Material	Material Test	Testing Limits	Testing Frequency
Riprap	Sieve Analysis	Limits as shown in TABLE 1.	Initial Tests - (1) test on first delivered load During Work - Perform visual inspection on remaining loads to verify gradation
Spalls	Sieve Analysis	Limits as shown in TABLE 2.	Initial Tests - (1) test before delivery of material During Work - (1) test for every 500 tons of material delivered

TABLE 5: REQUIRED TESTING FOR MATERIALS			
Material	Material Test	Testing Limits	Testing Frequency
Filter Rock	Sieve Analysis	Limits as shown in TABLE 3.	Initial Tests - (1) test before delivery of material During Delivery - (1) test for every 100 tons of material delivered
Manufactured Sand	Sieve Analysis	Limits as shown in TABLE 4.	Before Delivery - (1) test before delivery of material During Delivery - (1) test for every 100 tons of material delivered
Other Material (As specified in Paragraph 2.1.5)	Sieve Analysis	Limits as shown in TABLE 1 of Section 32 15 00.	Initial Tests - (1) test before delivery of material During Work - (1) test for every 500 tons of material delivered
	Liquid Limit (LL) Plasticity Index (PI)	Max LL of 25 PI of 0-6 (Gravel Surfacing - PI of 4-12)	Initial Tests - (1) test before delivery of material During Work - (1) test for every 500 tons of material delivered
	Moisture and Density Relationship	-	Initial Tests - (1) test before delivery of material
	Wear	Percentage of loss shall not exceed 40.0%.	Initial Tests - (1) test before delivery of material During Work - (1) test for every 500 tons of material delivered
	Soundness	Percentage of loss shall not exceed 12.0%.	Initial Tests - (1) test before delivery of material During Work - (1) test for every 500 tons of material delivered
Topsoil	-	-	-

TABLE 5: REQUIRED TESTING FOR MATERIALS			
Material	Material Test	Testing Limits	Testing Frequency

2.2.1.1 Sieve Analysis

Perform sieve analysis in conformance with ASTM C117 and ASTM C136/C136M using sieves conforming to ASTM E11. Provide gradation results 15 days before delivery of material. Perform sieve analysis testing on specified materials as shown in TABLE 5 and at the discretion of the Contracting Officer. Delivered material that fails testing will require the Contractor to stop delivery, remove failed material from the project site as determined by additional testing at no cost to the Government, and correct any additional material delivered to the project site.

2.2.1.2 Liquid Limit and Plasticity Index

Perform liquid limit and plasticity index testing in accordance with ASTM D4318. Provide test results 15 days before delivery of material. Perform liquid limit and plasticity index testing on specified materials as shown in TABLE 5 and at the discretion of the Contracting Officer. Delivered material that fails testing will require the Contractor to stop delivery, remove failed material from the project site as determined by additional testing at no cost to the Government, and correct any additional material delivered to the project site.

2.2.1.3 Moisture-Density Determinations

Determine the laboratory maximum dry density and optimum moisture content in accordance with ASTM D698. Since ASTM D698 applies only to soils that have 30 percent or less by weight of their particles retained on the 3/4 inch sieve, the laboratory maximum dry density and optimum moisture content for material having more than 30 percent by weight of their particles retained on the 3/4 inch sieve will be determined in accordance with AASHTO T 99 Method D and corrected with Annex A of AASHTO T 99. Determine laboratory maximum dry density and optimum moisture content on specified materials as shown in TABLE 5 and at the discretion of the Contracting Officer.

2.2.1.4 Wear Test

Perform wear testing on aggregate course material in conformance with ASTM C131/C131M. Provide test results 15 days before the delivery of material. Perform wear testing on specified materials as shown in TABLE 5 and at the discretion of the Contracting Officer. Delivered material that fails testing will require the Contractor to stop delivery, remove failed material from the project site as determined by additional testing at no cost to the Government, and correct any additional material delivered to the project site.

2.2.1.5 Soundness Test

Perform soundness testing on aggregate course material in conformance with ASTM C88, using five (5) cycles in sodium sulfate solution. Provide test results 15 days before the delivery of material. Perform soundness testing on specified materials as shown in TABLE 5 and at the discretion of the Contracting Officer. Delivered material that fails testing will require the Contractor to stop delivery, remove failed material from the project site as determined by additional testing at no cost to the Government, and correct any additional material delivered to the project site.

2.2.2 Approval of Material

Select the source of the material to be used for producing material and submit certified test results for approval within 24 hours of completion of the tests and not less than 15 days before material is required for work. Approval of sources not already approved by the Government will be based on an inspection by the Contracting Officer. Tentative approval of material will be based on initial test results for the material sources. Final approval of material will be based on results from material testing performed during delivery of material.

PART 3 EXECUTION

3.1 PREPARATION

Clear and level storage sites prior to stockpiling of material. Any existing vegetation must be removed prior to crushing operations either by approved chemical application or mechanical grubbing of the reclaimed stockpile. The vegetation and reclaimed material that is not suitable for crushing, due to organic matter, shall be placed in an adjacent stockpile that will be later removed offsite, as directed by the Contracting Officer.

3.2 STOCKPILING MATERIAL

Stockpile all materials in the manner and at the locations designated. Stockpile materials on the cleared and leveled areas designated by the Contracting Officer to prevent segregation. Stockpile materials obtained from different sources separately.

3.3 DISPOSAL OF UNSATISFACTORY MATERIALS

Dispose of any unsuitable materials, including trash, debris, and rebar, encountered and removed during asphalt and/or concrete crushing and mixing operations outside the limits of Government-controlled land and as directed by the Contracting Officer.

3.4 SITE RESTORATION

The Contractor shall be responsible for restoring all areas disturbed during operations to their original condition once work is complete. Replacement of topsoil, seeding, and mulching shall be as approved by the Government and at the expense of the Contractor.

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BITUMINOUS TACK COATS

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
(AASHTO)

AASHTO M 208 (2018) Standard Specification for Cationic
Emulsified Asphalt

AASHTO R 66 (2016) Standard Practice for Sampling
Asphalt Materials

ASTM INTERNATIONAL (ASTM)

ASTM D140/D140M (2016) Standard Practice for Sampling
Asphalt Materials

ASTM D2995 (1999; R 2009) Determining Application
Rate of Bituminous Distributors

1.2 SUBMITTALS

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

SD-03 Product Data

Waybills and Delivery Tickets

Submit certified waybills and delivery tickets during work performance for tracking material quantities for payment.

SD-06 Test Reports

Sampling And Testing; G-PO

Provide copies of certified test reports for all bituminous materials that indicate compliance with specified requirements, not less than 30 days before the material is required in the work.

If directed by the Contractor Officer, furnish a 1 gallon sample of all bituminous materials used for work.

SD-07 Certificates

Bituminous Material

Submit bills of lading for every load of bituminous material delivered to the work site, that indicate the type, grade, and quality of material and include the manufacturer's certification that the material meets specification.

1.3 QUALITY ASSURANCE

Certificates of compliance for asphalt materials delivered will be obtained and checked to ensure that specification requirements are met. Quantities of applied material will be determined. Submit certified waybills and delivery tickets during performance of work for tracking material quantities for payment. To track tack coat quantities, the Contractor shall "zero" the digital readout on the bituminous distributor before beginning application work and then record the number of gallons of bituminous material applied over a known area once application work is complete.

1.4 DELIVERY, STORAGE, AND HANDLING

Inspect the materials delivered to the site for contamination and damage. Unload and store the materials with a minimum of handling.

1.5 EQUIPMENT, TOOLS AND MACHINES

1.5.1 General Requirements

Equipment, tools, and machines used in the work are subject to approval. Maintain in a satisfactory working condition at all times. Provide equipment which is adequate and has the capability of producing the results specified. Discontinue the use of equipment which fails to produce satisfactory work and replace with satisfactory equipment. Calibrate equipment such as asphalt distributors, scales, batching equipment, and similar equipment within 12 months of their use. If the calibration expires during project, recalibrate the equipment before work can continue.

1.5.2 Bituminous Distributor

Provide a self propelled distributor with pneumatic tires of such size and number to prevent rutting, shoving or otherwise damaging the surface being sprayed. Calibrate the distributor in accordance with ASTM D2995. Design and equip the distributor to spray the bituminous material in a uniform coverage at the specified temperature, at readily determined and controlled total liquid rates from 0.05 to 2.0 gallons per square yard, with a pressure range of 25 to 75 psi and with an allowable variation from the specified rate of not more than plus or minus 5 percent, and at variable widths. Include with the distributor equipment a separate power unit for the bitumen pump, full-circulation spray bars, tachometer, pressure gauges, volume-measuring devices, adequate heaters for heating of materials to the proper application temperature, a thermometer for reading the temperature of tank contents, and a hand hose attachment suitable for applying bituminous material manually to areas inaccessible to the distributor. The distributor will be capable of circulating and agitating the bituminous material during the heating process. Provide distributor

with a horizontally and vertically adjustable spray nozzle bar. Make normal width of bar application at least 12 feet, with provisions for lesser or larger width when necessary. Equip distributor with a meter having a dial registering feet of travel/min and a meter that registers the application rate in gallons/square yard. Make both dials visible to the distributor driver. Provide a thermometer and well, not in contact with any heating tubes, for accurately indicating temperature of asphalt emulsion.

1.5.3 Heating Equipment for Storage Tanks

Use steam, electric, or hot oil heaters for heating the bituminous material. Provide steam heaters consisting of steam coils and equipment for producing steam, so designed that the steam cannot come in contact with the bituminous material. Fix an armored thermometer to the tank with a temperature range from 40 to 400 degrees F so that the temperature of the bituminous material may be determined at all times.

1.5.4 Power Brooms and Power Blowers

Use power brooms and power blowers suitable for cleaning the surfaces to which the bituminous coat is to be applied.

1.6 ENVIRONMENTAL REQUIREMENTS

Apply bituminous coat only when the surface to receive the bituminous coat is dry. Apply bituminous coat only when the atmospheric and pavement surface temperature in the shade is 60 degrees F or above and when the temperature has not been below 35 degrees F for the 12 hours prior to application, unless otherwise directed. Do not apply bituminous material when wind conditions will adversely affect the spraying operation.

PART 2 PRODUCTS

2.1 TACK COAT

2.1.1 Emulsified Asphalt

Provide emulsified asphalt conforming to AASHTO M 208, Grade CSS-1h. No dilution is allowed for tack coat applications.

PART 3 EXECUTION

3.1 PREPARATION OF SURFACE

Immediately before applying the bituminous coat, remove all loose material, dirt, clay, or other objectionable material from the surface to be treated by means of a power broom or blower supplemented with hand brooms. Apply treatment only when the surface is dry and clean. Protect appurtenances immediately adjacent to the surface to be treated from the splatter of asphalt.

3.2 APPLICATION RATE

The exact quantities within the range specified, which may be varied to suit field conditions, will be determined by the Contracting Officer.

3.2.1 Tack Coat

Apply bituminous material for the tack coat in quantities of not less than 0.05 gallons nor more than 0.15 gallons per square yard onto the pavement surface, or as directed by the Contracting Officer. Do not dilute asphalt emulsion when used as a tack coat.

3.3 APPLICATION TEMPERATURE

3.3.1 Viscosity Relationship

Apply asphalt at a temperature that will provide a viscosity between 10 and 60 seconds, Saybolt Furol, or between 20 and 120 centistokes, kinematic. Furnish the temperature viscosity relation to the Contracting Officer.

3.3.2 Temperature Ranges

The viscosity requirements determine the application temperature to be used. The following is the acceptable range of application temperatures at the time of placement:

Asphalt Emulsion	
CSS-1h	120-180 degrees F

3.4 APPLICATION

3.4.1 General

Following preparation and subsequent inspection of the surface, apply the bituminous tack coat with the bituminous distributor at the specified rate with uniform distribution over the surface to be treated. Properly treat all areas and spots, not capable of being sprayed with the distributor, with the hand spray. Until the succeeding layer of pavement is placed, maintain the surface by protecting the surface against damage and by repairing deficient areas at no additional cost to the Government. If required, spread clean dry sand to effectively blot up any excess bituminous material. No smoking, fires, or flames other than those from the heaters that are a part of the equipment are permitted within 25 feet of heating, distributing, and transferring operations of bituminous materials. Prevent all traffic, except for paving equipment used in constructing the surfacing, from using the underlying material, whether primed or not, until the surfacing is completed. The bituminous coat requirements are described herein.

3.4.2 Tack Coat

Apply tack coat at the locations shown on the drawings. A tack coat should be applied to every bound surface (asphalt or concrete pavement) that is being overlaid with asphalt mixture and at transverse and longitudinal joints. Vertical contact faces of previously constructed pavement, curb and gutter, manholes, and other structures shall also be sprayed with a thin coat of bituminous tack coat. Apply the tack coat when the surface to be treated is clean and dry. Immediately following the preparation of the surface for treatment, apply the bituminous material by means of the bituminous distributor, within the limits of temperature specified herein and at a rate as specified above in paragraph

APPLICATION RATE. Apply the bituminous material so that uniform distribution is obtained over the entire surface to be treated. Treat lightly coated areas and spots missed by the distributor by spraying with a hand wand or using other approved method. Following the application of bituminous material, allow the surface to cure without being disturbed for period of time necessary to permit setting of the tack coat. Apply the bituminous tack coat only as far in advance of the placing of the overlying layer as required for that day's operation. Maintain and protect the treated surface from damage until the succeeding course of pavement is placed.

3.5 CURING PERIOD

Following application of the bituminous material and prior to application of the succeeding layer of asphalt mixture, allow the bituminous coat to cure and water or volatiles to evaporate (bituminous coat turns from brown to black) prior to overlaying. Maintain the tacked surface in good condition until the succeeding layer of pavement is placed, by protecting the surface against damage and by repairing and recoating deficient areas.

3.6 FIELD QUALITY CONTROL

Obtain bills of lading that indicate the type, grade, and quality of material and includes the manufacturer's certificates of compliance for all loads of bituminous material delivered to the project. The certification shall also show the shipment number, refinery, consignee, destination, contract number, and date of shipment.

3.7 SAMPLING AND TESTING

Furnish certified copies of the manufacturer's test reports indicating temperature viscosity relationship for cutback asphalt or asphalt cement, compliance with applicable specified requirements, not less than 30 days before the material is required in the work. When specified by the Contracting Officer, obtain a 1 gallon sample from each source of bituminous material under the supervision of the Contracting Officer. The sample will be retained by the Government.

3.7.1 Sampling

When specified by the Contracting Officer, sample bituminous material in accordance with ASTM D140/D140M or AASHTO R 66. Sources from which bituminous materials are to be obtained shall be selected and notification furnished to the Contracting Officer within 15 days after the award of the contract.

3.7.2 Sampling and Testing During Construction

Perform quality control sampling and testing as required in paragraph FIELD QUALITY CONTROL.

3.8 TRAFFIC CONTROLS

Keep traffic off surfaces freshly treated with bituminous material. Provide sufficient warning signs and barricades so that traffic will not travel over freshly treated surfaces. Any vehicle or personal property damaged or affected by construction activities is the responsibility of the Contractor.

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HOT-MIX ASPHALT (HMA) FOR ROADS

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
(AASHTO)

AASHTO M 156	(2013; R 2017) Standard Specification for Requirements for Mixing Plants for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures
AASHTO M 320	(2017) Standard Specification for Performance-Graded Asphalt Binder
AASHTO T 304	(2011; R 2015) Standard Method of Test for Uncompacted Void Content of Fine Aggregate

ASPHALT INSTITUTE (AI)

AI MS-2	(2015) Asphalt Mix Design Methods
AI SP-2	(2001; 3rd Ed) Superpave Mix Design

ASTM INTERNATIONAL (ASTM)

ASTM C88	(2018) Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C117	(2017) Standard Test Method for Materials Finer than 75-um (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C123	(2014) Standard Test Method for Lightweight Particles in Aggregate
ASTM C131/C131M	(2020) Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C136/C136M	(2019) Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM C142/C142M	(2017) Standard Test Method for Clay Lumps and Friable Particles in Aggregates

ASTM C566	(2013) Standard Test Method for Total Evaporable Moisture Content of Aggregate by Drying
ASTM D140/D140M	(2016) Standard Practice for Sampling Asphalt Materials
ASTM D1461	(2017) Standard Test Method for Moisture or Volatile Distillates in Asphalt Mixtures
ASTM D2172/D2172M	(2017; E 2018) Standard Test Methods for Quantitative Extraction of Asphalt Binder from Asphalt Mixtures
ASTM D2419	(2014) Sand Equivalent Value of Soils and Fine Aggregate
ASTM D2489/D2489M	(2016) Standard Test Method for Estimating Degree of Particle Coating of Asphalt Mixtures
ASTM D2950/D2950M	(2014) Density of Bituminous Concrete in Place by Nuclear Methods
ASTM D3665	(2012; R 2017) Standard Practice for Random Sampling of Construction Materials
ASTM D3666	(2016) Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials
ASTM D4125/D4125M	(2010) Asphalt Content of Bituminous Mixtures by the Nuclear Method
ASTM D4318	(2017; E 2018) Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D4791	(2019) Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate
ASTM D5444	(2015) Mechanical Size Analysis of Extracted Aggregate
ASTM D6307	(2019) Standard Test Method for Asphalt Content of Asphalt Mixture by Ignition Method
ASTM D6925	(2014) Standard Test Method for Preparation and Determination of the Relative Density of Hot Mix Asphalt (HMA) Specimens by Means of the Superpave Gyrotory Compactor

U.S. ARMY CORPS OF ENGINEERS (USACE)

COE CRD-C 171	(1995) Standard Test Method for
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Determining Percentage of Crushed
Particles in Aggregate

SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION (SDDOT)

SDDOT 320	(2015) Standard Specifications for Roads and Bridges, Asphalt Concrete, General
SDDOT 321	(2015) Standard Specifications for Roads and Bridges, Asphalt Concrete - Class D, E, and G
SDDOT 324	(2015) Standard Specifications for Roads and Bridges, Asphalt Concrete Composite
SDDOT 880	(2015) Standard Specifications for Roads and Bridges, Aggregates For Asphalt Concrete

1.2 SUBMITTALS

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

SD-03 Product Data

Mix Design; G-DO

Submit the job mix formula and supporting mix design data for approval at least 14 days prior to the start of the placement of pavement. Minimum requirements for the job mix formula area as listed in paragraph 2.4.1.

Equipment List; G-PO

Submit a list of all equipment that will be used for performing construction work for Government approval.

Material Acceptance; G-PO

Forward test results and payment calculations daily to the Contracting Officer. Acceptance of the plant produced mix and in-place requirements will be on a lot to lot basis.

Waybills And Delivery Tickets

Submit certified waybills and delivery tickets for the tracking of material quantities for payment. Only accepted batches of hot-mix asphalt that are acceptably placed will be paid for by the Government.

SD-04 Samples

Asphalt Cement Binder

Submit bills of lading to the Contracting Officer for every load of binder that is delivered to the mix plant. Include the product description, amount, and certification that the product meets specified requirements.

If the Contractor Officer deems it necessary, furnish a 1 gallon sample for verification testing, which shall be at no cost to the Contractor.

SD-06 Test Reports

Aggregates; G-PO

Submit initial test results for aggregate materials to the Contracting Officer at least 14 days prior to start of construction. Perform sieve analysis and material testing as shown in paragraph 2.2 for all aggregate used in the production of asphalt concrete composite.

QC Monitoring

Submit test results to the Contracting Officer on a daily basis, as necessary, for all QC tests that are performed. Required QC testing will be as shown in paragraph 3.11.2 and as specified by the Contracting Officer.

SD-07 Certificates

Asphalt Cement Binder; G-PO

Submit test data and certificates of compliance, from the supplier, that indicates grade certification for every load of binder that is delivered to the mix plant. Submit copies of certified test data, amount, type and description of any modifiers blended into the asphalt cement binder.

Testing Laboratory

Submit the qualifications and certification for the testing laboratory that will be performing mix design and required testing. Submit the Plant Scale Calibration Certification.

1.3 ENVIRONMENTAL REQUIREMENTS

Do not place the hot-mix asphalt upon a wet surface or when the surface temperature of the underlying course is less than specified in Table 1. The temperature requirements may be waived by the Contracting Officer, if requested; however, meet all other requirements, including compaction.

Table 1. Surface Temperature Limitations of Underlying Course	
Mat Thickness, inches	Degrees F
3 or greater	40
Less than 3	45

PART 2 PRODUCTS

2.1 SYSTEM DESCRIPTION

Perform the work consisting of pavement courses composed of mineral aggregate and asphalt material heated and mixed in a central mixing plant and placed on a prepared course. HMA designed and constructed in accordance with this section shall conform to the lines, grades, thicknesses, and typical cross sections indicated on the project drawings provided for each task order. Construct each course to the depth, section, or elevation required by the drawings and roll, finish, and approve it before the placement of the next course.

All plant, equipment, and tools used in the performance of the work shall be subject to approval before the work is started and shall be maintained in satisfactory working condition at all times. The equipment shall be adequate and shall have the capability of producing pavements meeting the requirements as set forth herein. Submit an equipment list showing all equipment that will be used to perform work. Include descriptive data on asphalt pavers (including grade controls), rollers, scales, and other equipment necessary to perform work.

All asphalt construction must follow requirements listed in SDDOT Spec Book section 320 "ASPHALT CONCRETE, GENERAL".

2.1.1 Asphalt Mixing Plant

Plants used for the preparation of hot-mix asphalt shall conform to the requirements of AASHTO M 156 with the following changes:

2.1.1.1 Truck Scales

Weigh the asphalt mixture on approved, certified scales at the Contractor's expense. Inspect and seal scales at least annually by an approved calibration laboratory.

2.1.1.2 Inspection of Plant

Provide the Contracting Officer with access at all times, to all areas of the plant for checking adequacy of equipment; inspecting operation of the plant; verifying weights, proportions, and material properties; checking the temperatures maintained in the preparation of the mixtures and for taking samples. Provide assistance as requested, for the Government to procure any desired samples.

2.1.1.3 Storage bins

Use of storage bins for temporary storage of hot-mix asphalt will be permitted as follows:

- a. The asphalt mixture may be stored in non-insulated storage bins for a period of time not exceeding 3 hours.
- b. The asphalt mixture may be stored in insulated storage bins for a period of time not exceeding 8 hours. The mix drawn from bins shall meet the same requirements as mix loaded directly into trucks.

2.1.2 Hauling Equipment

Provide trucks for hauling hot-mix asphalt having tight, clean, and smooth metal beds. To prevent the mixture from adhering to them, the truck beds shall be lightly coated with a minimum amount of paraffin oil, lime solution, or other approved material. Petroleum based products shall not be used as a release agent. Each truck shall have a suitable cover to protect the mixture from adverse weather. When necessary to ensure that the mixture will be delivered to the site at the specified temperature, truck beds shall be insulated or heated and covers (tarps) shall be securely fastened.

2.1.3 Asphalt Pavers

Provide asphalt pavers which are self-propelled, with an activated screed, heated as necessary, and capable of spreading and finishing courses of hot-mix asphalt which will meet the specified thickness, smoothness, and grade. The paver shall have sufficient power to propel itself and the hauling equipment without adversely affecting the finished surface.

2.1.3.1 Receiving Hopper

Provide paver with a receiving hopper of sufficient capacity to permit a uniform spreading operation and equipped with a distribution system to place the mixture uniformly in front of the screed without segregation. The screed shall effectively produce a finished surface of the required evenness and texture without tearing, shoving, or gouging the mixture. Contractor to use pick up machine in order to not allow hopper wings to be raised.

2.1.3.2 Automatic Grade Controls

Equip the paver with a control system capable of automatically maintaining the specified screed elevation. The control system shall be automatically actuated from either a reference line and/or through a system of mechanical sensors or sensor-directed mechanisms or devices which will maintain the paver screed at a predetermined transverse slope and at the proper elevation to obtain the required surface. The transverse slope controller shall be capable of maintaining the screed at the desired slope within plus or minus 0.1 percent. A transverse slope controller shall not be used to control grade. Provide controls capable of working in conjunction with any of the following attachments:

- a. Ski-type device of not less than 30 feet in length.
- b. Taut stringline set to grade.
- c. Short ski or shoe for joint matching.
- d. Laser control.

2.1.4 Rollers

Rollers shall be in good condition and shall be operated at slow speeds to avoid displacement of the asphalt mixture. The number, type, and weight of rollers shall be sufficient to compact the mixture to the required density while it is still in a workable condition. Do not use equipment which causes excessive crushing of the aggregate. Only self-propelled rollers will be allowed for performing compaction operations.

2.2 AGGREGATES

Provide aggregates consisting of crushed stone, natural sand, and mineral filler, as required that meets the material properties for Class E, Type 2 mineral aggregate as shown in Table 1 of SDDOT 880. The portion of material retained on the No. 4 sieve is coarse aggregate. The portion of material passing the No. 4 sieve and retained on the No. 200 sieve is fine aggregate. The portion passing the No. 200 sieve is defined as mineral filler.

Performing initial testing on proposed aggregate material prior to commencing construction, to demonstrate that the material meets all specified requirements when furnished. The Contractor shall perform additional testing if the source of the material changes and/or as directed by the Contracting Officer. Submit all aggregate test results to the Contracting Officer at least 14 days prior to start of construction.

2.2.1 Coarse Aggregate

Provide coarse aggregate consisting of sound, tough, durable particles, free from films of material that would prevent thorough coating and bonding with the asphalt material and free from organic matter and other deleterious substances. All individual coarse aggregate sources shall meet the following requirements:

- a. The percentage of loss shall not be greater than 40 percent after 500 revolutions when tested in accordance with ASTM C131/C131M.
- b. The percentage of loss shall not be greater than 15 percent after five cycles when tested in accordance with ASTM C88 using sodium sulfate.
- c. At least 70 percent by weight of coarse aggregate shall have at least two or more fractured faces when tested in accordance with COE CRD-C 171. Fractured faces shall be produced by crushing.
- d. The particle shape shall be essentially cubical and the aggregate shall not contain more than 20 percent percent, by weight, of flat and elongated particles (3:1 ratio of maximum to minimum) when tested in accordance with ASTM D4791.
- e. Clay lumps and friable particles shall not exceed 0.3 percent, by weight, when tested in accordance with ASTM C142/C142M.
- f. Lightweight particles shall not exceed 3 percent, by weight, when tested in accordance with ASTM C123.

2.2.2 Fine Aggregate

Fine aggregate shall consist of clean, sound, tough, durable particles free from coatings of clay, silt, or any objectionable material and containing no clay balls.

- a. All individual fine aggregate sources shall have a sand equivalent value not less than 45 when tested in accordance with ASTM D2419.
- b. Testing for fine aggregate angularity shall be in accordance with AASHTO T 304 Method A. The fine aggregate portion of the blended aggregate shall have an uncompacted void content not less than 45.0

percent.

- c. The quantity of natural sand (noncrushed material) added to the aggregate blend shall not exceed 25 percent by weight of total aggregate.
- d. Clay lumps and friable particles shall not exceed 0.3 percent, by weight, when tested in accordance with ASTM C142/C142M
- e. The percentage of loss shall not be greater than 15 percent after five cycles when tested in accordance with ASTM C88 using sodium sulfate.
- f. Lightweight particles shall not exceed 3 percent, by weight, when tested in accordance with ASTM C123.
- g. Aggregate shall not have a liquid limit exceeding 25 and shall be non-plastic when tested in accordance with ASTM D4318.

2.2.3 Mineral Filler

Mineral filler shall be nonplastic material meeting the requirements of SDDOT 880.

2.2.4 Aggregate Gradation

The combined aggregate gradation shall conform to the gradation listed for Class E, Type 2 mineral aggregate as shown in Table 1 of SDDOT 880. Aggregate shall be tested in accordance with ASTM C136/C136M and ASTM C117 for gradation, and shall not vary from the low limit on one sieve to the high limit on the adjacent sieve or vice versa, but shall be graded uniformly from coarse to fine limits.

2.3 ASPHALT CEMENT BINDER

Asphalt cement binder shall conform to AASHTO M 320 Performance Grade (PG) 64-28 or one of the asphalt binders listed in SDDOT 324, unless otherwise specified. An equivalent binder may be proposed for approval if the specified binders are unavailable. Test data indicating grade certification shall be provided by the supplier at the time of delivery of each load to the mix plant. Submit copies of these certifications to the Contracting Officer. The supplier is defined as the last source of any modification to the binder. The Contracting Officer may sample and test the binder at the mix plant at any time before or during mix production. Obtain samples for this verification testing, if deemed necessary by the Contracting Officer, in accordance with ASTM D140/D140M and in the presence of the Contracting Officer. Furnish a 1 gallon sample to the Contracting Officer for the verification testing, which shall be at no cost to the Contractor. Submit copies of certified test data, amount, type and description of any modifiers blended into the asphalt cement binder.

2.4 MIX DESIGN

The hot-mix asphalt used for asphalt concrete composite shall conform to the requirements for SDDOT Class E hot-mix asphalt, using Class E, Type 2 mineral aggregate, as specified in SDDOT 324 and SDDOT 321. The Contractor shall develop the mix design. The job mix formula and supporting mix design data shall be submitted to the Contracting Officer at least 14 days prior to the start of the placement of pavement. Do not

produce hot-mix asphalt for payment until the JMF has been approved by the Contracting Officer. The asphalt mix shall be composed of a mixture of well-graded aggregate, mineral filler if required, and asphalt material. The aggregate fractions shall be sized, handled in separate size groups, and combined in such proportions that the resulting mixture meets the grading requirements of the job mix formula (JMF).

The hot-mix asphalt shall be design using the Superpave method of mix design contained in AI SP-2 and ASTM D6925, and the procedures and requirements shown in SDDOT 321, SDDOT 324, and SDDOT 880. The mix design specifications for SDDOT Class E hot-mix asphalt shall be as shown in SDDOT 321. The Contractor shall not use any recycled asphalt pavement (RAP) in the asphalt mixture.

2.4.1 JMF Requirements

Submit in writing the job mix formula for approval at least 14 days prior to the start of the placement of any pavement. The job mix formula shall include at a minimum:

- a. Percent passing each sieve size.
- b. Percent of asphalt cement.
- c. Percent of each aggregate and mineral filler to be used.
- d. Asphalt viscosity grade, penetration grade, or performance grade.
- e. Number of gyrations of Superpave gyratory compactor.
- f. Laboratory mixing temperature.
- g. Lab compaction temperature.
- h. Temperature-viscosity relationship of the asphalt cement.
- i. Plot of the combined gradation on the 0.45 power gradation chart, stating the nominal maximum size.
- j. Graphical plots of air voids, voids in the mineral aggregate, and unit weight versus asphalt content as shown in AI MS-2.
- k. Specific gravity and absorption of each aggregate.
- l. Percent natural sand.
- m. Percent particles with 2 or more fractured faces (in coarse aggregate).
- n. Fine aggregate angularity.
- o. Percent flat or elongated particles (in coarse aggregate).
- p. List of all modifiers and amount.

2.4.2 Adjustments to Field JMF

Keep the Laboratory JMF for each mixture in effect until a new formula is approved in writing by the Contracting Officer. Should a change in sources of any materials be made, perform a new laboratory jmf design and

a new JMF shall be approved before the new material is used. The Contractor will be allowed to adjust the Laboratory JMF within the limits specified in Section 320.2 of SDDOT 320 to optimize mix volumetric properties with the approval of the Contracting Officer. Adjustments to the Laboratory JMF shall be applied to the field (plant) established JMF and limited to those values as shown in SDDOT 320. Adjustments shall be targeted to produce or nearly produce 4 percent voids total mix (VTM).

If adjustments are needed that exceed these limits, develop a new mix design. Tolerances given in SDDOT 320 may permit the aggregate grading to be outside the limits shown in SDDOT 880 for Class E, Type 2 aggregate; while not desirable, this is acceptable, except for the No. 200 sieve, which shall remain within the aggregate grading as shown in SDDOT 880.

PART 3 EXECUTION

3.1 PREPARATION OF ASPHALT BINDER MATERIAL

Heat the asphalt cement material avoiding local overheating and providing a continuous supply of the asphalt material to the mixer at a uniform temperature. The temperature of unmodified asphalts shall be no more than 325 degrees F when added to the aggregates. Performance-Graded (PG) asphalts shall be within the temperature range of 265 to 320 degrees F when added to the aggregate.

3.2 PREPARATION OF MINERAL AGGREGATE

Heat and dry the aggregate for the mixture prior to mixing. No damage shall occur to the aggregates due to the maximum temperature and rate of heating used. The temperature of the aggregate and mineral filler shall not exceed 350 degrees F when the asphalt cement is added. The temperature shall not be lower than is required to obtain complete coating and uniform distribution on the aggregate particles and to provide a mixture of satisfactory workability.

3.3 PREPARATION OF HOT-MIX ASPHALT MIXTURE

The aggregates and the asphalt cement shall be weighed or metered and introduced into the mixer in the amount specified by the JMF. Mix the combined materials until the aggregate obtains a uniform coating of asphalt binder and is thoroughly distributed throughout the mixture. Wet mixing time shall be the shortest time that will produce a satisfactory mixture, but no less than 25 seconds for batch plants. Establish the wet mixing time for all plants based on the procedure for determining the percentage of coated particles described in ASTM D2489/D2489M, for each individual plant and for each type of aggregate used. The wet mixing time will be set to at least achieve 95 percent of coated particles. The moisture content of all hot-mix asphalt upon discharge from the plant shall not exceed 0.5 percent by total weight of mixture as measured by ASTM D1461.

3.4 PREPARATION OF THE UNDERLYING SURFACE

Immediately before placing the hot mix asphalt, clean the underlying course of dust and debris. Apply a tack coat in accordance with Section 32 12 13 BITUMINOUS TACK COATS and as directed by the Contracting Officer.

3.5 PREPARATION OF POTHOLES

Clean areas with power and/or hand brooms as conditions permit and with compressed air. Use an air compressor that produces a minimum of 125 CFM output and is equipped with a maximum 3/4 inch nozzle. Air compressors shall be equipped with traps capable of removing all free water and oil from the compressed air.

3.6 TESTING LABORATORY

Submit certification of compliance and Plant Scale Calibration Certification. Use a laboratory to develop the JMF that meets the requirements of ASTM D3666. The Government will inspect the laboratory equipment and test procedures prior to the start of hot mix operations for conformance to ASTM D3666. Testing laboratories shall be certified by the Materials Testing Center (MTC) at the USACE Engineering Research and Development Center (ERDC) as referenced in Section 01 45 00.00 10 QUALITY CONTROL. The laboratory shall maintain the Corps certification for the duration of the project. A statement signed by the manager of the laboratory stating that it meets these requirements or clearly listing all deficiencies shall be submitted to the Contracting Officer prior to the start of construction. The statement shall contain as a minimum:

- a. Qualifications of personnel; laboratory manager, supervising technician, and testing technicians.
- b. A listing of equipment to be used in developing the job mix.
- c. A copy of the laboratory's quality control system.
- d. Evidence of participation in the AASHTO Materials Reference Laboratory (AMRL) program.

3.7 TRANSPORTING AND PLACING

3.7.1 Transporting

Transport the hot-mix asphalt from the mixing plant to the site in clean, tight vehicles. Schedule deliveries so that placing and compacting of mixture is uniform with minimum stopping and starting of the paver. Provide adequate artificial lighting for night placements. Hauling over freshly placed material will not be permitted until the material has been compacted as specified, and allowed to cool to 140 degrees F. To deliver mix to the paver, use a material transfer vehicle operated to produce continuous forward motion of the paver. When transferring material, the paver shall move forward to meet the material transfer vehicle. Do not allow the material transfer vehicle to back into the paver. Backing into the paver may cause the paver to be "bumped" which will create deficiencies in the paved surface.

3.7.2 Placing

Place and compact the mix at a temperature suitable for obtaining density, surface smoothness, and other specified requirements. Upon arrival, place the mixture to the full width by an asphalt paver; it shall be struck off in a uniform layer of such depth that, when the work is completed, it will have the required thickness and conform to the grade and contour indicated. Regulate the speed of the paver to eliminate pulling and tearing of the asphalt mat. Unless otherwise permitted, placement of the

mixture shall begin along the centerline of a crowned section or on the high side of areas with a one-way slope. Place the mixture in consecutive adjacent strips having a minimum width of 10 feet or as specified. The longitudinal joint in one course shall offset the longitudinal joint in the course immediately below by at least 1 foot; however, the joint in the surface course shall be at the centerline of the pavement. Transverse joints in one course shall be offset by at least 10 feet from transverse joints in the previous course. Transverse joints in adjacent lanes shall be offset a minimum of 10 feet. On isolated areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the mixture may be spread and luted by hand tools.

3.8 COMPACTION OF MIXTURE

After placing, the mixture shall be thoroughly and uniformly compacted by rolling. Compact the surface as soon as possible without causing displacement, cracking or shoving. The sequence of rolling operations and the type of rollers used shall be at the discretion of the Contractor. The speed of the roller shall, at all times, be sufficiently slow to avoid displacement of the hot mixture and be effective in compaction. Any displacement occurring as a result of reversing the direction of the roller, or from any other cause, shall be corrected at once. Furnish sufficient rollers to handle the output of the plant. Continue rolling until the surface is of uniform texture, true to grade and cross section, and the required field density is obtained. To prevent adhesion of the mixture to the roller, keep the wheels properly moistened but excessive water will not be permitted. In areas not accessible to the roller, the mixture shall be thoroughly compacted with hand tampers. Any mixture that becomes loose and broken, mixed with dirt, contains check-cracking, or is in any way defective shall be removed full depth, replaced with fresh hot mixture and immediately compacted to conform to the surrounding area. This work shall be done at the Contractor's expense. Skin patching will not be allowed.

3.9 JOINTS

The formation of joints shall be performed ensuring a continuous bond between the courses and to obtain the required density. All joints shall have the same texture as other sections of the course and meet the requirements for smoothness and grade.

3.9.1 Transverse Joints

Do not pass the roller over the unprotected end of the freshly laid mixture, except when necessary to form a transverse joint. When necessary to form a transverse joint, it shall be made by means of placing a bulkhead or by tapering the course. The tapered edge shall be cut back to its full depth and width on a straight line to expose a vertical face prior to placing material at the joint. Remove the cutback material from the project. In both methods, all contact surfaces shall be given a light tack coat of asphalt material before placing any fresh mixture against the joint.

3.9.2 Longitudinal Joints

Longitudinal joints which are irregular, damaged, uncompacted, cold (less than 175 degrees F at the time of placing adjacent lanes), or otherwise defective, shall be cut back a maximum of 3 inches from the top of the course with a cutting wheel to expose a clean, sound vertical surface for

the full depth of the course. All cutback material shall be removed from the project. All contact surfaces shall be given a light tack coat of asphalt material prior to placing any fresh mixture against the joint. The Contractor will be allowed to use an alternate method if it can be demonstrated that density, smoothness, and texture can be met.

3.10 POTHOLE REPAIR

3.10.1 Deep Patch

Mark a rectangular area extending 1 foot past the extents of the area to be repaired. Saw cut asphalt pavement so that all edges are square. Remove material to a minimum depth of 4 inches or until firm support is reached and recompact the area as necessary. Apply bituminous tack coat to vertical edge faces and any granular base material that is part of the pavement structure in accordance with Section 32 12 13 BITUMINOUS TACK COATS. Once the tack coat has cured, place hot-mix asphalt in layers not exceeding 4 inches in thickness, and compact with an approved vibratory plate or roller. The repair will be completed by placing the surface layer and compacting flush with the surrounding pavement surfaces.

3.11 QUALITY CONTROL

3.11.1 Quality Control Testing

Perform all quality control tests applicable to these specifications, as set forth in the Quality Control Program, and as specified by the Contracting Officer. The testing program shall include, but shall not be limited to, tests for the control of asphalt content, aggregate gradation, temperatures, aggregate moisture, moisture in the asphalt mixture, laboratory air voids, in-place density, grade and smoothness. Develop a Quality Control Testing Plan as part of the Quality Control Program. Testing of materials shall be performed by an approved commercial testing laboratory.

3.11.1.1 Asphalt Content

A minimum of two tests to determine asphalt content will be performed per lot (a lot is defined in paragraph MATERIAL ACCEPTANCE).

One test will be performed by one of the following methods: the extraction method in accordance with ASTM D2172/D2172M, Method A or B, the ignition method in accordance with ASTM D6307, or the nuclear method in accordance with ASTM D4125/D4125M. Calibrate the ignition oven or the nuclear gauge for the specific mix being used. For the extraction method, determine the weight of ash, as described in ASTM D2172/D2172M, as part of the first extraction test performed at the beginning of plant production; and as part of every tenth extraction test performed thereafter, for the duration of plant production. The last weight of ash value obtained shall be used in the calculation of the asphalt content for the mixture.

The second test for asphalt content will be performed by "sticking" the storage tank at the plant both before and after batching in order to calculate the amount of asphalt cement used. The asphalt content of the total batch will then be calculated.

3.11.1.2 Gradation

Determine aggregate gradations a minimum of once per lot from mechanical

analysis of recovered aggregate in accordance with ASTM D5444. When asphalt content is determined by the ignition oven or nuclear method, aggregate gradation shall be determined from hot bin samples on batch plants, or from the cold feed on drum mix plants. For batch plants, test aggregates in accordance with ASTM C136/C136M using actual batch weights to determine the combined aggregate gradation of the mixture. Gradation tests shall be performed on aggregate composite taken via a belt sample.

3.11.1.3 Temperatures

Check temperatures at least three times per lot, at necessary locations, to determine the temperature at the dryer, the asphalt cement in the storage tank, and the asphalt mixture at the plant. Check temperatures at least twice per lot, for the asphalt mixture that is delivered to the job site. Check the temperature of the asphalt mixture that is directly behind the paver at least twice per lot, to ensure that temperature is ideal for compaction operations.

3.11.1.4 Aggregate Moisture

Determine the moisture content of aggregate used for production a minimum of once per lot in accordance with ASTM C566.

3.11.1.5 Moisture Content of Mixture

Determine the moisture content of the mixture at least once per lot in accordance with ASTM D1461 or an approved alternate procedure. The moisture content of all hot-mix asphalt upon discharge from the plant shall not exceed 0.5 percent by total weight of mixture.

3.11.1.6 Laboratory Air Voids

Take mixture samples at least once per lot and compacted into specimens. When the Superpave gyratory compactor is used, mixes will be compacted to 50 gyrations in accordance with ASTM D6925. Hot-mix provided under the DOT Superpave option shall be compacted in accordance with the DOT requirements shown in SDDOT 321. After compaction, determine the laboratory air voids of each specimen.

3.11.1.7 In-Place Density

Conduct any necessary testing to ensure the specified density of 92 percent is achieved. A nuclear gauge may be used to monitor pavement density in accordance with ASTM D2950/D2950M. Perform a minimum of two tests per lot, or as specified by the Contracting Officer.

3.11.1.8 Grade and Smoothness

Conduct the necessary checks to ensure the grade and smoothness requirements are met in accordance with paragraphs MATERIAL ACCEPTANCE.

3.11.1.9 Additional Testing

Any additional testing, which the Contractor deems necessary to control the process, may be performed at the Contractor's option.

3.11.1.10 QC Monitoring

Submit all QC test results to the Contracting Officer on a daily basis as

the tests are performed. The Contracting Officer reserves the right to monitor any of the Contractor's quality control testing and to direct additional sampling and testing for any area which appears to deviate from the specification requirements. Any additional testing will be at the expense of the Contractor and no additional cost to the Government.

3.11.2 Sampling

When directed by the Contracting Officer, sample and test any material which appears inconsistent with similar material being produced, unless such material is voluntarily removed and replaced or deficiencies corrected by the Contractor. All sampling shall be in accordance with standard procedures specified.

3.12 MATERIAL ACCEPTANCE

Testing for acceptability of work will be performed by an independent commercial testing laboratory hired by the Contractor. Forward test results and payment calculations daily to the Contracting Officer. Acceptance of the plant produced mix and in-place requirements will be on a lot to lot basis. A standard lot for all requirements will be equal to 8 hours of production, unless otherwise specified by the Contracting Officer. Lots will not be divided into sublots, unless deemed necessary by the Contracting Officer. Where appropriate, adjustment in payment for individual lots of hot-mix asphalt will be made based on in-place density, laboratory air voids, grade and smoothness in accordance with the following paragraphs. Grade and surface smoothness determinations will be made on the lot as a whole. Exceptions or adjustments to this will be made in situations where the mix within one lot is placed as part of both the intermediate and surface courses, thus grade and smoothness measurements for the entire lot cannot be made. Submit certified waybills and delivery tickets for tracking material quantities for payment. Only accepted loads of hot-mix asphalt that have been acceptably placed will be paid for.

3.12.1 Sampling and Testing

One random mixture sample for determining laboratory air voids, theoretical maximum density, and for any additional testing the Contracting Officer desires, will be taken from a loaded truck delivering mixture to each lot, or other appropriate location for each lot. All samples will be selected randomly, using commonly recognized methods of assuring randomness conforming to ASTM D3665 and employing tables of random numbers or computer programs. Laboratory air voids will be determined from one laboratory compacted specimens of each lot sample in accordance with ASTM D6925, or as specified by the Contracting Officer. The specimens will be compacted within 2 hours of the time the mixture was loaded into trucks at the asphalt plant. Samples will not be reheated prior to compaction and insulated containers will be used as necessary to maintain the temperature.

3.12.2 Additional Sampling and Testing

The Contracting Officer reserves the right to direct additional samples and tests for any area which appears to deviate from the specification requirements. Any additional testing will be at the expense of the Contractor and no additional cost to the Government. Testing in these areas will be in addition to the lot testing, and the requirements for these areas will be the same as those for a lot.

3.12.3 Grade

The final wearing surface of pavement shall conform to the elevations and cross sections shown and shall vary not more than 0.05 foot from the plan grade established and approved at site of work. Finished surfaces at juncture with other pavements shall coincide with finished surfaces of abutting pavements. Deviation from the plan elevation will not be permitted in areas of pavements where closer conformance with planned elevation is required for the proper functioning of drainage and other appurtenant structures involved. The grade will be determined by running lines of levels at intervals of 25 feet, or less, longitudinally and transversely, to determine the elevation of the completed pavement surface. Within 5 working days, after the completion of a particular lot incorporating the final wearing surface, test the final wearing surface of the pavement for conformance with the specified plan grade. Diamond grinding may be used to remove high spots to meet grade requirements. Areas that have been ground shall not be left smooth or polished, but shall have a uniform texture similar in roughness to the surrounding unground asphalt concrete. Skin patching for correcting low areas or planing or milling for correcting high areas will not be permitted.

3.12.4 Surface Smoothness

Use the following method to test and evaluate surface smoothness of the pavement. Perform all testing in the presence of the Contracting Officer. Keep detailed notes of the results of the testing and furnish a copy to the Government immediately after each day's testing. Where drawings show required deviations from a plane surface (crowns, drainage inlets, etc.), the surface shall be finished to meet the approval of the Contracting Officer.

3.12.4.1 Smoothness Requirements

3.12.4.1.1 Straightedge Testing

The finished surfaces of the pavements shall have no abrupt change of 1/4 inch or more, and all pavements shall be within the tolerances of 1/4 inch in both the longitudinal and transverse directions, when tested with an approved 10 feet straightedge.

3.12.4.2 Testing Method

After the final rolling, but not later than 24 hours after placement, test the surface of the pavement in each entire lot in such a manner as to reveal all surface irregularities exceeding the tolerances specified above. If any pavement areas are ground, these areas shall be retested immediately after grinding. Test each lot of the pavement in both a longitudinal and a transverse direction on parallel lines. Set the transverse lines 15 feet or less apart, as directed. The longitudinal lines shall be at the centerline of each paving lane for lanes less than 20 feet wide and at the third points for lanes 20 feet or wider. Also test other areas having obvious deviations. Longitudinal testing lines shall be continuous across all joints.

3.12.4.2.1 Straightedge Testing

Hold the straightedge in contact with the surface and move it ahead one-half the length of the straightedge for each successive measurement.

Determine the amount of surface irregularity by placing the freestanding (unleveled) straightedge on the pavement surface and allowing it to rest upon the two highest spots covered by its length, and measuring the maximum gap between the straightedge and the pavement surface in the area between these two high points.

-- End of Section --

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ASPHALTIC SEAL AND FOG COATS

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
(AASHTO)

AASHTO M 208 (2018) Standard Specification for Cationic Emulsified Asphalt

AASHTO M 316 (2018) Standard Specification for Polymer-Modified Emulsified Asphalt

ASTM INTERNATIONAL (ASTM)

ASTM C29/C29M (2017a) Standard Test Method for Bulk Density ("Unit Weight") and Voids in Aggregate

ASTM C88 (2018) Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate

ASTM C131/C131M (2020) Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine

ASTM C136/C136M (2019) Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates

ASTM C142/C142M (2017) Standard Test Method for Clay Lumps and Friable Particles in Aggregates

ASTM D75/D75M (2019) Standard Practice for Sampling Aggregates

ASTM D140/D140M (2016) Standard Practice for Sampling Asphalt Materials

ASTM D2995 (1999; R 2009) Determining Application Rate of Bituminous Distributors

ASTM D3625/D3625M (2012) Standard Practice for Effect of Water on Bituminous-Coated Aggregate Using Boiling Water

ASTM D4318	(2017; E 2018) Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D4791	(2019) Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate
ASTM D5821	(2013; R 2017) Standard Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate

U.S. FEDERAL HIGHWAY ADMINISTRATION (FHWA)

MUTCD	(2009; R 2012) Manual on Uniform Traffic Control Devices
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SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION (SDDOT)

SDDOT 330	(2015) Standard Specifications for Roads and Bridges, Prime, Tack, Fog Seal, and Flush Seal
SDDOT 879	(2015) Standard Specifications for Roads and Bridges, Blotting Sand
SDDOT 881	(2015) Standard Specification for Roads and Bridges, Aggregates for Asphalt Surface Treatments
SDDOT 890	(2015) Standard Specification for Roads and Bridges, Asphalt Material

MINNESOTA DEPARTMENT OF TRANSPORTATION

MNDOT	(2006) Minnesota Seal Coat Handbook
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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. Submit the following as required for each task order in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Waybills and Delivery Tickets

Submit certified waybills and delivery tickets during work performance for tracking material quantities for payment.

Inspection Reports

Provide reports and all quality assurance records daily when applications are made. Include the results of calibration tests performed on the asphalt distributor and aggregate spreader and the results from the test section application with the recommendations made by the Contractor based on these results.

Equipment List; G-PO

Submit a list of equipment that will be used to perform work for Government approval. Include descriptive data on proposed equipment and calibration procedures recommended by the equipment's manufacturer, if applicable.

Qualifications; G-PO

Provide copies of the Contractor's and/or subcontractor's qualifications.

Chip Seal Design; G-PO

Submit a copy of the compatibility test results and the chip seal design for approval prior to start of work. Design the chip seal in accordance with the requirements specified in paragraph CHIP SEAL DESIGN.

SD-04 Samples

Bituminous Materials

Submit bills of lading for every load of bituminous material delivered to the work site, that indicate the type, grade, and quality of material and include the manufacturer's certification that the material meets specification.

If directed by the Contractor Officer, furnish a 1 gallon sample of all bituminous materials used for work.

SD-06 Test Reports

Aggregates; G-PO

Provide to the Contracting Officer copies of the test results, within 24 hours of the completion of the test and not less than 30 days before materials are required for work. Certified copies of the aggregate test results shall include the test specified in paragraph FIELD QUALITY CONTROL - SEAL COAT.

Bituminous Materials; G-PO

Provide copies of certified test reports for the bituminous materials that indicate compliance with specified requirements, not less than 30 days before the material is required in the work.

1.3 EQUIPMENT, TOOLS, AND MACHINES

Equipment, machines, and tools used in the work are subject to approval. Maintain in a satisfactory working condition at all times. Provide equipment which is adequate and has the capability of producing the results specified. Discontinue the use of equipment which fails to produce satisfactory work and replace with satisfactory equipment. Provide calibrated equipment, such as asphalt distributors, scales, spreaders, and similar equipment. Submit an equipment list that shows the proposed equipment to be used to perform work. Include descriptive data for proposed equipment (bituminous distributors, aggregate spreaders,

rollers, etc.) and information on calibration procedures recommended by the equipment's manufacturer, if applicable.

1.3.1 Bituminous Distributors

Provide self-propelled distributors that have pneumatic tires of sufficient size and number to prevent rutting, shoving, or otherwise damaging any part of the pavement structure. Use distributors that distribute the bituminous material in a uniform double or triple lap at the specified temperature, at readily determined and controlled rates from 0.05 to 2.0 gallons/square yard, with a pressure range of 25 to 75 psi with an allowable variation from the specified rate of not more than plus or minus 5 percent, and at variable widths. Include in the distributor equipment a separate power unit for the bitumen pump, full-circulation spray bars, tachometer, pressure gauges, volume-measuring devices, adequate heaters for heating of materials to the proper application temperature, a thermometer for reading the temperature of tank contents, and a hand-held hose attachment suitable for applying bituminous material manually to areas inaccessible to the distributor. Equip the distributor to circulate and agitate the bituminous material during the heating process. Provide distributor with a horizontally and vertically adjustable spray nozzle bar. Make normal width of bar application at least 12 feet, with provisions for lesser or larger width when necessary. Equip distributor with a meter having a dial registering feet of travel/min and a meter that registers the application rate in gallons/square yard. Make both dials visible to the distributor driver. Provide a thermometer and well, not in contact with any heating tubes, for accurately indicating temperature of asphalt emulsion.

1.3.2 Aggregate Spreader

Use aggregate-spreading equipment that is adjustable and capable of uniformly spreading aggregate at the specified rate in a single-pass operation over the surface to be sealed.

1.3.3 Pneumatic-Tired Roller

Provide a adequate number of self-propelled pneumatic-tired rollers of sufficient size to seat the cover aggregate into the bituminous material without fracturing the aggregate particles. Use rollers that have a total compacting width of not less than 5 feet and a tire pressure of at least 50 psi. Use rollers that furnish a minimum rolling weight (mass) of 250 pounds per inch of roller width.

1.3.4 Power Brooms and Power Blowers

Provide power brooms and power blowers suitable for cleaning surfaces to which the seal coat is to be applied.

1.3.5 Storage Tanks

Provide tanks capable of heating the bituminous material, under effective and positive control at all times, to the required temperature. Accomplish heating by steam coils, hot oil, or electricity. Affix to the tank an armored thermometer with a range from 100 to 300 degrees F so that the temperature of the bituminous material may be read at all times.

1.3.6 Vacuum Sweepers

Provide self-propelled, vacuum pickup sweeper capable of removing loose aggregate, sand, water, and debris from pavement surface.

1.4 QUALITY ASSURANCE

Perform sampling and testing using an approved commercial testing laboratory at no expense to the Government. No work requiring testing will be permitted until the facilities have been inspected and approved. If deemed necessary by the Contracting Officer, laboratory inspection shall be accomplished at the Contractor's expense by the Contracting Officer. Perform tests in sufficient numbers, and at the location and times directed, to ensure that the materials meet specified requirements. Submit copies of test results within 24 hours after completion of each test.

1.4.1 Samples

Take aggregate samples for laboratory tests in accordance with ASTM D75/D75M. Take samples of bituminous material in accordance with ASTM D140/D140M.

1.4.2 Aggregates Source

Select sources from which aggregates are to be obtained and notify the Contracting Officer within 15 days after the award of the task order. Perform tests on the initial source samples for the evaluation of aggregates and repeat tests when there is a change of source. Tests for determining the suitability of aggregate are shown in paragraph FIELD QUALITY CONTROL - SEAL COAT.

1.4.3 Bituminous Material Source

Select sources from which bituminous materials are to be obtained and notify the Contracting Officer within 15 days after the award of the task order. From each source of supply, submit a one gallon sample of bituminous material, if directed by the Contracting Officer. Submit certificates of compliance and certified test data for all delivered bituminous materials to ensure that they meet specification requirements.

1.4.4 Equipment Calibration

Furnish all equipment, materials and labor necessary to calibrate the bituminous distributor and the aggregate spreader. Perform all calibrations with the approved job materials and prior to applying the specified coatings to the prepared surface. Perform calibration of the bituminous distributor in accordance with ASTM D2995. Perform work to calibrate the tank and measuring devices of the distributor. Inspect all equipment prior to start of work and at least once a day during construction.

1.4.5 Qualifications

Submit copies of the Contractor's qualifications, certifying that personnel are qualified to handle materials and operate equipment. Provide documentation showing that personnel have made at least three (3) applications similar to this project in past two (2) years, and include letters from contracting authorities attesting to work performance,

schedule adherence, and quality of workmanship. Provide names and work phone numbers for these points of contact.

1.4.6 Inspection Reports

Provide written inspection reports citing the following; climatic temperature during application of seal coat and/or fog seal, emulsion temperature and rate of application, aggregate rate of application, if applicable, adequacy of surface cleaning and preparation, protection of site facilities, and any significant observations. Provides these reports to the Contracting Officer for each day of application. Include the results of calibration tests performed on the asphalt distributor and aggregate spreader and the results from the test section application and recommendations made by the Contractor based on these results.

Submit certified waybills and delivery tickets during performance of the work for tracking cover aggregate quantities for payment. Payment of emulsified asphalt for flush seal and fog seal will not include payment for any water that is used for diluting the emulsion. To track emulsified asphalt quantities, the Contractor shall "zero" the digital readout on the bituminous distributor before beginning application work and then record the number of gallons of bituminous material applied over a known area once application work is complete.

1.5 DELIVERY, STORAGE, AND HANDLING

Deliver asphalt materials to the site in a homogenous and undamaged condition. Inspect the materials for contamination and damage. Unload and store the materials with a minimum of handling. Protect stored aggregate from contamination and segregation. Replace defective or damaged materials.

1.6 ENVIRONMENTAL REQUIREMENTS

Apply the coating when the existing surface is dry, and when the weather is not foggy, rainy, or when the wind velocity will prevent the uniform application of the bitumen or aggregates. Apply the bituminous seal coat only when both the atmospheric temperature and the pavement surface temperature is above 60 degrees F in the shade and rising, unless otherwise directed. When specified, apply fog seal when both the atmospheric temperature and the pavement surface temperature is above 60 degrees F in the shade and rising, unless otherwise directed.

PART 2 PRODUCTS

2.1 BITUMINOUS MATERIAL FOR SEAL COAT

Use emulsified asphalt material conforming to AASHTO M 316, grade CRS-2P for chip seal coats and AASHTO M 208, grade CSS-1h for flush seal coats as specified in SDDOT 890. The emulsified asphalt used for flush seal coat applications shall be diluted with water in accordance with the requirements specified in SDDOT 330. The rate of dilution for emulsified asphalt for flush seal shall be at a ratio of 1 part emulsion to 1 part added water (1:1 ratio minimum) by volume, unless otherwise specified. Do not dilute emulsified asphalt that is used for chip seal coats.

2.2 AGGREGATE FOR SEAL COAT

Use aggregate consisting of crushed stone. Use aggregate with a moisture

content between 1% and 3%. Drying may be required, as directed. Use aggregate conforming to the gradations shown in TABLE I. Aggregate used in chip seal applications shall consist of crushed Sioux Quartzite stone conforming to the requirements of Type 2B aggregate as specified in SDDOT 881. Aggregate used in flush seal applications shall consist of blotting sand used for flush and fog seal in accordance with SDDOT 879.

TABLE I. AGGREGATE GRADATIONS (Percent by Weight Passing Square-Mesh Sieves)		
Sieve Size	Gradation No. 1 (Chip Seal Aggregate)	Gradation No. 2 (Flush Seal Aggregate)
3/8 inch	100	100
No. 4	0-60	-
No. 8	0-18	0-95
No. 40	0-4	0-70
No. 200	0-1.3	0-12.0

2.2.1 Chip Seal Aggregate

Use aggregate consisting of clean, sound, durable particles meeting the "Chip Seal Aggregate" gradation requirements specified in TABLE 1 and the following requirements.

2.2.1.1 Film Retention

Use aggregate that exhibits not less than 95 percent retention of bituminous film in accordance with ASTM D3625/D3625M.

2.2.1.2 Particle Shapes

Use aggregate that has no more than 30 percent by weight of flat and elongated particles on any sieve when determined in accordance with ASTM D4791. A flat particle is one having a ratio of width to thickness greater than 3; an elongated particle is one having a ratio of length to width greater than 3.

2.2.1.3 Weight Loss

Use aggregate with a percent weight loss not exceeding 40 after 500 revolutions, as determined in accordance with ASTM C131/C131M.

2.2.1.4 Friable Particles

Use aggregate with no more than 0.1 percent of the total weight of aggregate sample consisting of friable particles when tested in accordance with ASTM C142/C142M.

2.2.1.5 Soundness

Use aggregate with a weight loss of not greater than 12 percent when subjected to five cycles of sodium sulfate when tested in accordance with

ASTM C88.

2.2.1.6 Crushed Aggregate

Crushed aggregate retained on the No. 4 sieve and each coarser sieve must contain at least 100 percent by weight of crushed pieces having two or more fractured faces with the area of each face equal to at least 75 percent of the smaller midsectional area of the aggregate particle. When two fractures are contiguous, the angle between the planes of fractures must be at least 30 degrees to count as two fractured faces. Testing for crushed particles shall be performed in accordance with ASTM D5821.

2.2.2 Flush Seal Aggregate

Use aggregate consisting of clean, sound, durable particles meeting the "Flush Seal Aggregate" gradation requirements specified in TABLE 1 and that has a plasticity index of 0-6. Test plasticity index in accordance with ASTM D4318.

2.2.3 Testing Requirements

Submit certified copies of the aggregate test results, not less than 30 days before the material is required in the work. The Contractor shall perform material testing on cover aggregates to determine their suitability. Required material tests include, but are not limited to:

- a. Gradation in accordance with ASTM C136/C136M.
- b. Abrasion resistance in accordance with ASTM C131/C131M.
- c. Clay lumps and friable particles in accordance with ASTM C142/C142M.
- d. Unit weight and voids in accordance with ASTM C29/C29M.
- e. Plasticity index in accordance with ASTM D4318.
- f. Soundness in accordance with ASTM C88.
- g. Crushed particles in accordance with ASTM D5821.
- h. Flat and elongated particles in accordance with ASTM D4791.

Perform one of each of the listed tests prior to start of work. Only gradation and plasticity index testing will be required for flush seal aggregate. If the source of aggregate is changed, conduct additional tests prior to using another source. When deficiencies are found, retest the material already placed to determine the extent of the unacceptable material. Replace all in-place unacceptable material or re-apply seal coat material that conforms to specification as directed by the Contracting Officer at no additional expense to the Government.

2.3 EMULSIFIED ASPHALT FOR FOG SEAL

Use emulsified asphalt for fog seal conforming to AASHTO M 208, grade CSS-1h for cationic materials. The emulsified asphalt for fog seal shall be diluted with water in accordance with the requirements specified in SDDOT 330. The rate of dilution for fog seal shall be at a ratio of 3 parts emulsion to 1 part added water (3:1 ratio maximum) by volume, unless otherwise specified. Fog seal shall be applied to newly chip-sealed

pavement surfaces and/or as specified by the Contracting Officer.

2.4 WATER

Provide fresh, clean, and potable water.

2.5 CHIP SEAL DESIGN

For chip seal coat applications, the Contractor shall design the seal coat to determine starting application rates for emulsified asphalt and cover aggregate. The Contractor shall submit an aggregate sample to the asphalt supplier a minimum of 14 days prior to starting the project to allow time to evaluate the compatibility and design of the chip seal surface treatment. Perform stripping tests on aggregate from each source to determine compatibility, in accordance with ASTM D3625/D3625M.

The chip seal shall be designed in accordance with the Modified McLeod Design Procedure as shown in MNDOT. The design shall be prepared by qualified personnel experienced in asphalt surface treatment design. The design will be based on traffic volume(s) and pavement conditions provided by the Government and materials meeting the specified requirements contain in this section. The chip seal design will include the following:

1. Cover aggregate gradation.
2. Bulk specific gravity of the cover aggregate.
3. Loose unit weight of the cover aggregate.
4. Emulsified asphalt type.
5. Emulsified asphalt rate of application.
6. Cover aggregate rate of application.

Submit a copy of the test results and the chip seal design to the Contracting Officer for approval prior to start of work. The application rates determined in the chip seal design will be used as the initial starting rate of application for emulsified asphalt and cover aggregate for the completion of a test section as shown in paragraph TRIAL APPLICATION - SEAL COAT. Final application rates will be determine after the completion of the test section. A seal coat design is not required for flush seal coat or fog seal applications.

PART 3 EXECUTION

3.1 PREPARATION OF SURFACE

Repair damaged surfaces and fill cracks before starting work. Treat cracks in pavement surfaces, not due to structural deficiencies, as outlined in Section 32 01 17.61 SEALING CRACKS IN ASPHALT PAVEMENTS.

Provide a clean surface for the seal coat. Flushing with water will be permitted. Immediately before starting work, remove all loose material, dirt, clay, or other objectionable material from the surface to be treated with power brooms and blowers. This will be followed by vacuum sweepers, when required. Paint firmly bonded to the surface may remain. Do not mix material removed from the surface with the cover aggregate. After cleaning operations and prior to application of the seal coat, the

Contracting Officer or authorized Government representative will inspect the area to be treated to determine fitness of the area to receive the seal coat.

3.2 SEAL COAT APPLICATION

3.2.1 Rate

Base bids on applying seal coat materials within the ranges shown in TABLE II. The actual application rates within the range specified, which may be varied to suit field conditions, will be determined by the Contractor and approved by the Contracting Officer prior to use by the construction of a test section. The bituminous quantities may have to be increased when the pavement has rough surface texture and may have to be decreased when the pavement surface is very tight. Unauthorized increases in application rates of seal coat materials will not be eligible for payment.

When the Contracting Officer specifies that emulsified asphalt shall be diluted with water, the Contractor shall ensure that the bituminous distributor's rate of application is adjusted as necessary to obtain the specified application rate for the emulsified asphalt.

TABLE II. APPLICATION OF MATERIAL (Quantities Per Square Yard)		
Application Types	Emulsified Asphalt, gallons	Aggregate, pounds
CHIP SEAL COAT	0.35-0.40 (Grade CRS-2P, undiluted)	19-22
FLUSH SEAL COAT	0.05 (Grade CSS-1h, diluted at a 1:1 ratio)	8
FOG SEAL COAT	0.075 (Grade CSS-1h, diluted at a 3:1 ratio)	-

3.2.2 Temperature

Asphalt application temperature shall remain between 120 and 180 degrees F during application.

3.2.3 Application of Bituminous Material

Following the preparation and inspection of the pavement surface, apply the emulsified asphalt material at the rates determined by the test section. Uniformly apply the bituminous material in a single pass of the distributor and with either a double or triple lap spray over the surface to be sealed. Ensure that the distributor's spray bar and nozzles are sized and oriented properly to produce an ideal application of material as specified. Spread building paper on the surface for a sufficient distance back from the ends of each application so that flow through the spray bar may be started and stopped on the paper and so that all sprays will be operating at the proper pressure on the surface to be sealed. Immediately after the bituminous material application, remove the building paper. Apply bituminous material to all areas missed with the distributor. No smoking, fires, or flames, other than the heaters that are a part of the

equipment, will be permitted within 25 feet of heating, distributing, and transferring operations of bituminous material other than bituminous emulsions.

3.2.3.1 Excess Sealcoat Material

Approved mineral aggregate shall be provided by the Contractor and shall be spread in sufficient quantity to effectively blot up any excess sealcoat material remaining on the treated pavement surface after 24 hours.

3.2.3.2 Ponding and Puddling of Sealcoat Material

If low spots and depressions greater than 1/2 inch in depth in the pavement surface cause ponding or puddling of the applied materials, the pavement surface shall be broomed with a broom drag. Brooming shall continue until the pavement surface is free of any pools of excess material.

3.2.3.3 Excess Runoff of Sealcoat

Pavement surfaces which have excessive runoff of sealcoat due to excessive amount of material being applied or excessive surface grade shall be treated in two or more applications at no additional cost to the Government. Each additional application shall be performed after the prior application of material has penetrated into the pavement.

3.2.3.4 Insufficient Sealcoat Material

When it is determined by the Contracting Officer that the actual application rate of the sealcoat is more than 20 percent below the approved application rate, subsequent applications of sealcoat shall be made to bring the actual application rate up to the approved rate; additional sealcoat material shall penetrate into the pavement surface within 24 hours after application.

3.2.4 Aggregate Application Rate

Spread the aggregate in the quantities shown in TABLE II. The exact quantities within the range specified in TABLE II may be varied to suit field conditions. Actual application rates will be determined by the Contractor, by construction of a test section, and shall be approved by the Contracting Officer prior to use. The aggregate weights shown in TABLE II are those of aggregate having a specific gravity of 2.65. If the specific gravity of the aggregate to be used is less than 2.55 or greater than 2.75, make adjustments in the number of pounds of aggregate required per square yard to insure a constant volume of aggregate per square yard of treatment.

3.2.5 Application of Aggregate

Spread the specified quantity of cover aggregate uniformly over the bituminous material. Provide sufficient aggregate on trucks at the work site to cover the distributor load of bituminous material before the bituminous material is applied. No bituminous material may be down more than 3 minutes before it is covered with aggregate. Uniformly spread aggregate with aggregate-spreading equipment. Lightly recover areas having insufficient cover with additional aggregate by hand during the operations whenever necessary.

3.2.6 Rolling and Brooming

Rolling will be required for all chip seal coat applications, but not for flush seal coat applications. Begin rolling operations immediately following the application of cover aggregate. Perform rolling using pneumatic-tired rollers. Operate the rollers at a speed that will not displace the aggregate. Continue rolling until the aggregate is uniformly distributed and keyed into the bituminous material. Sweep off the surface and remove all surplus aggregate not less than 24 hours nor more than 3 days after rolling is completed. Use only vacuum sweepers for removing loose aggregate and do not broom loose aggregate onto roadside shoulders and ditches. Immediately prior to opening to traffic, roll the entire treated area with a self-propelled pneumatic-tired roller. Immediately prior to subsequent construction operations (fog seal, pavement markings), vacuum sweep the entire treated area to remove loose material. Dispose all removed loose aggregate offsite at no additional cost to the Government.

3.3 FIELD QUALITY CONTROL - SEAL COAT

3.3.1 Tests

Perform field tests in sufficient numbers to assure that the specifications are being met. Submit copies of the test results, within 24 hours of the completion of the test. Sampling and testing is the responsibility of the Contractor. Perform test using an approved commercial laboratory.

3.3.1.1 Aggregates

Submit certified copies of the aggregate test results, not less than 30 days before the material is required in the work. The Contractor shall perform material testing on cover aggregates to determine their suitability. Required material tests include, but are not limited to:

- a. Gradation in accordance with ASTM C136/C136M.
- b. Abrasion resistance in accordance with ASTM C131/C131M.
- c. Clay lumps and friable particles in accordance with ASTM C142/C142M.
- d. Unit weight and voids in accordance with ASTM C29/C29M.
- e. Plasticity index in accordance with ASTM D4318.
- f. Soundness in accordance with ASTM C88.
- g. Crushed particles in accordance with ASTM D5821.
- h. Flat and elongated particles in accordance with ASTM D4791.

Perform one of each of the listed tests prior to start of work. Only gradation and plasticity index testing will be required for flush seal aggregate. If the source of aggregate is changed, conduct additional tests prior to using another source. When deficiencies are found, retest the material already placed to determine the extent of the unacceptable material. Replace all in-place unacceptable material or re-apply seal coat material that conforms to specification as directed by the

Contracting Officer at no additional expense to the Government.

3.3.2 Bituminous Materials

Submit certified copies of the bituminous materials test reports indicating compliance with applicable specified requirements, not less than 30 days before the material is required in the work. When specified by the Contracting Officer, obtain a 1 gallon sample from each source of bituminous material under the supervision of the Contracting Officer. The sample will be retained by the Government.

The Contractor shall submit a bill of lading for every load of bituminous material delivered to the worksite, that indicates the type, grade, and quality of material and includes the manufacturer's certification that the material meets specification. The certification shall also show the shipment number, refinery, consignee, destination, contract number, and date of shipment.

3.3.3 Water Compatibility Test

In some localities, an incompatibility may exist between the asphalt emulsion and the water to be used for dilution due to their characteristics. Clear, potable water should be used. Dilution of emulsified asphalt, when specified, shall be in accordance with the requirements of SDDOT 330, and shall be performed only by the asphalt supplier. Field dilution will not be allowed.

No less than thirty days prior to commencing work, one half pint of the proposed asphalt emulsion and one half pint of the proposed water shall be combined, agitated, and allowed to sit for a period of 24 hours to test their compatibility. If they prove to be incompatible, indicated by separation of the emulsion, clotting, particles settling or other adverse properties from mixing with water, an approved chemical treatment shall be provided for all water used for dilution or a different and compatible source of water shall be selected. Report results to the Contracting Officer.

3.4 TRIAL APPLICATION - SEAL COAT

Prior to applying the seal coat, place a test section, at a location determined by the Contracting Officer, that is at least 100 feet long and as wide as the distributor spray bar using the approved job materials and roll them in accordance with the specified requirements. Perform tests to determine the application rates of the bitumen and aggregate. Test sections shall be placed in the presence of the Contracting Officer. The application rates used for the test section shall be those determined by the chip seal design, or as specified by the Contracting Officer. The Contractor shall recommend to the Contracting Officer application rates of materials used in production seal coating based on the test section results. The Contracting Officer shall approve the application rates prior to production seal coating.

If the tests indicate that the seal coat test section does not conform to the specification requirements, make necessary adjustments to the application equipment and to the spreading and rolling procedures, and construct additional test sections for conformance to the specifications. Where test sections do not conform to specification requirements, remove seal coat at no expense to the Government; no separate payment will be made for seal coat materials and labor, either in placement or removal of

any test section. Perform quality control sampling and testing during construction as required in paragraph FIELD QUALITY CONTROL above.

3.5 FOG SEAL APPLICATION

Fog seal application shall begin after the completion of the chip seal coat and prior to the placement of permanent pavement markings. Unless otherwise directed, fog seal application will begin no earlier than 24 hours following the application of the chip seal but no later than 3 calendar days after the application of chip seal coat.

3.5.1 Sample Application

Determine the required application rate from a sample installation. Perform a trial application, on an area of the prepared pavement, selected by the Contracting Officer, that is at least 100 feet long and as wide as the distributor spray bar. Dilute emulsified asphalt and apply at an application rate as specified by the Contracting Officer. The trial application rate may be modified if approved by the Contracting Officer. Additional trial applications may be made if warranted by pavement surface conditions and the size of the area to be treated. Use the rate which has been satisfactorily applied without leaving an excess of asphalt residue on the surface and has been approved, for the fog seal.

3.5.2 Application

Prior to fog sealing, the Contractor shall broom the surface of the treated areas a second time. If fog seal is applied immediately after the final brooming required for chip seal coats, a second brooming will not be required. All brooming for fog seal applications shall be accomplished by vacuum sweeping.

Following preparation of the surface, apply the water diluted asphalt emulsion at the rate determined from the trial application. The application temperature of emulsified asphalt shall be maintained between 120 and 180 degrees F. Inspect application of fog seal for uniformity. To obtain uniform application of the fog seal at the junction of previous and subsequent applications, spread building paper on the surface of the applied material for a sufficient distance back from the ends of each application so that flow from the spray bar may be started and stopped on the paper, and so that all sprayers will operate at full force. Immediately after application, remove and properly dispose of the building paper. Treat spots unavoidably missed with the hand spray equipment. Base bids on application of diluted emulsion at the rate specified in TABLE II. If the actual amount required is more or less than the rate shown in TABLE II, an adjustment in the contract price will be made as provided by the contract.

The Contractor will plan operations and maintain traffic control to allow adequate cure time for the fog seal to prevent pickup on vehicles. Any areas where vehicles are allowed to drive and pickup occurs will be considered unacceptable and the quantities will be deducted. The application of permanent pavement markings will be performed in accordance with Section 32 17 23 PAVEMENT MARKINGS and as directed by the Contracting Officer.

3.6 SITE PROTECTION

During applications, protect adjacent buildings, structures, vehicles,

manhole covers, inlet grates, signs, lights, Portland cement concrete, and trees to prevent being spattered or marred. Account for possible wind drift when providing protection for surrounding features. Any asphalt splatter and/or excess loose cover aggregate, not removed during vacuum sweeping, shall be clean and disposed of offsite at no additional cost to the Government.

3.7 TRAFFIC CONTROL

Protect freshly placed coatings from damage by traffic. Provide sufficient warning signs and barricades to prevent traffic over freshly treated surfaces. Protect treated areas from traffic for at least 2 hours after final application of coatings, or for such time as necessary to prevent picking up. Provide warning signs and barricades for proper traffic control, in accordance with MUTCD.

-- End of Section --

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SECTION 32 15 00

AGGREGATE BASE AND SURFACE COURSE

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
(AASHTO)

AASHTO T 99 (2019) Standard Method of Test for
Moisture-Density Relations of Soils Using
a 2.5-kg (5.5-lb) Rammer and a 305-mm
(12-in.) Drop

ASTM INTERNATIONAL (ASTM)

ASTM C88 (2018) Standard Test Method for Soundness
of Aggregates by Use of Sodium Sulfate or
Magnesium Sulfate

ASTM C117 (2017) Standard Test Method for Materials
Finer than 75-um (No. 200) Sieve in
Mineral Aggregates by Washing

ASTM C131/C131M (2020) Standard Test Method for Resistance
to Degradation of Small-Size Coarse
Aggregate by Abrasion and Impact in the
Los Angeles Machine

ASTM C136/C136M (2019) Standard Test Method for Sieve
Analysis of Fine and Coarse Aggregates

ASTM D75/D75M (2019) Standard Practice for Sampling
Aggregates

ASTM D698 (2012; E 2014; E 2015) Laboratory
Compaction Characteristics of Soil Using
Standard Effort (12,400 ft-lbf/cu. ft.
(600 kN-m/cu. m.))

ASTM D4318 (2017; E 2018) Standard Test Methods for
Liquid Limit, Plastic Limit, and
Plasticity Index of Soils

ASTM D6938 (2017a) Standard Test Method for In-Place
Density and Water Content of Soil and
Soil-Aggregate by Nuclear Methods (Shallow
Depth)

ASTM E11 (2020) Standard Specification for Woven Wire Test Sieve Cloth and Test Sieves

SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION (SDDOT)

SDDOT 882 (2015) Standard Specifications for Roads and Bridges, Aggregates for Granular Bases and Surfacing

1.2 DEGREE OF COMPACTION

Degree of compaction required, except as noted in the second sentence, is expressed as a percentage of the maximum laboratory dry density obtained by the test procedure presented in ASTM D698 abbreviated as a percent of laboratory maximum dry density. Since ASTM D698 applies only to soils that have 30 percent or less by weight of their particles retained on the 3/4 inch sieve, the degree of compaction for material having more than 30 percent by weight of their particles retained on the 3/4 inch sieve will be expressed as a percentage of the laboratory maximum dry density in accordance with AASHTO T 99 Method D and corrected with Annex A of AASHTO T 99.

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, for each task order, in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Plant, Equipment, and Tools; G-PO

Waybills And Delivery Tickets

SD-06 Test Reports

Initial Tests; G-PO

In-Place Tests; G-PO

1.4 EQUIPMENT, TOOLS, AND MACHINES

All plant, equipment, and tools used in the performance of the work will be subject to approval by the Contracting Officer before the work is started. Maintain all plant, equipment, and tools in satisfactory working condition at all times. Submit a list of proposed equipment, including descriptive data. Provide adequate equipment having the capability of minimizing segregation, producing the required compaction, meeting grade controls, thickness control, and smoothness requirements as set forth herein.

1.5 QUALITY ASSURANCE

Sampling and testing are the responsibility of the Contractor. Perform sampling and testing using a commercial testing laboratory approved in accordance with Section 01 45 00.00 10 QUALITY CONTROL. Work requiring

testing will not be permitted until the testing laboratory has been inspected and approved. Test the materials to establish compliance with the specified requirements and perform testing at the specified frequency. The Contracting Officer may specify the time and location of the tests. Furnish certified copies of test results to the Contracting Officer for approval within 24 hours of completion of the tests and not less than 15 days before material is required for work. Submit waybills and delivery tickets for tracking material quantities for payment.

1.5.1 Sampling

Take samples for laboratory testing in conformance with ASTM D75/D75M. When deemed necessary, the sampling will be observed by the Contracting Officer.

1.5.2 Testing

1.5.2.1 Sieve Analysis

Perform sieve analysis in conformance with ASTM C117 and ASTM C136/C136M using sieves conforming to ASTM E11. The Contractor shall perform an initial field gradation test upon delivery to the project site. Additional field gradation tests shall be required if the source of the material changes and/or as directed by the Contracting Officer.

1.5.2.2 Liquid Limit and Plasticity Index

Determine liquid limit and plasticity index in accordance with ASTM D4318. Perform liquid limit and plasticity index testing at the same frequency as gradation testing.

1.5.2.3 Moisture-Density Determinations

Determine the laboratory maximum dry density and optimum moisture content in accordance with paragraph DEGREE OF COMPACTION.

1.5.2.4 Field Density Tests

Measure field density in accordance with ASTM D6938. Tests performed in accordance with ASTM D6938 result in a wet unit weight of soil and ASTM D6938 will be used to determine the moisture content of the soil. Also check the calibration curves furnished with the moisture gauges along with density calibration checks as described in ASTM D6938. Make the calibration checks of both the density and moisture gauges using the prepared containers of material method, as described in paragraph Calibration of ASTM D6938, on each different type of material being tested at the beginning of a job and at intervals as directed. Submit calibration curves and related test results prior to using the device or equipment being calibrated.

1.5.2.5 Wear Test

Perform wear tests on aggregate course material in conformance with ASTM C131/C131M. Perform wear testing at the same frequency as gradation testing.

1.6 ENVIRONMENTAL REQUIREMENTS

Perform construction when the atmospheric temperature is above 35 degrees F

and when subgrades are not frozen and do not contain frost. It is the responsibility of the Contractor to protect, by approved method or methods, all areas of surfacing that have not been accepted by the Contracting Officer. The Contractor shall bring surfaces damaged by freeze, rainfall, or other weather conditions to a satisfactory condition.

PART 2 PRODUCTS

2.1 AGGREGATES

Provide aggregates consisting of clean, sound, durable particles of natural gravel, crushed gravel, crushed stone, sand, slag, soil, or other approved materials processed and blended or naturally combined. Provide aggregates free from lumps and balls of clay, organic matter, objectionable coatings, and other foreign materials. The Contractor is responsible for obtaining materials that meet the specification and can be used to meet the grade and smoothness requirements specified herein after all compaction and proof rolling operations have been completed.

2.1.1 Coarse Aggregates

The material retained on the No. 4 sieve is known as coarse aggregate. Use only coarse aggregates that are reasonably uniform in density and quality. Use only coarse aggregate having a percentage of wear not exceeding 40 percent after 500 revolutions as determined by ASTM C131/C131M. The amount of flat and/or elongated particles must not exceed 20 percent. A flat particle is one having a ratio of width to thickness greater than three; an elongated particle is one having a ratio of length to width greater than three. When the coarse aggregate is supplied from more than one source, aggregate from each source must meet the requirements set forth herein.

2.1.2 Fine Aggregates

The material passing the No. 4 sieve is known as fine aggregate. Fine aggregate consists of screenings, sand, soil, or other finely divided mineral matter that is processed or naturally combined with the coarse aggregate.

2.1.3 Gradation Requirements

Gradation requirements specified in TABLE I and in SDDOT 882 apply to the completed aggregate material. It is the responsibility of the Contractor to obtain materials that will meet the gradation requirements after mixing, placing, compacting, and other operations. TABLE I shows permissible gradations for granular material used in aggregate base courses and aggregate surface roads in accordance with SDDOT 882. Use sieves conforming to ASTM E11. For "Aggregate Base Course" material, the fraction passing the No. 200 sieve shall not be greater than 2/3 of the fraction passing the No. 40 sieve. In no case shall the upper limit specified for the No. 200 sieve be exceeded.

TABLE I. GRADATION FOR AGGREGATE COURSES Percentage by Weight Passing Square-Mesh Sieve				
Sieve Designation	Subbase	Gravel Cushion	Aggregate Base Course	Gravel Surfacing
2 inch	100	-	-	-
1 inch	70-100	-	100	-
3/4 inch	-	100	80-100	100
1/2 inch	-	-	68-91	-
No. 4	30-70	50-75	46-70	50-78
No. 8	22-62	38-64	34-58	37-67
No. 40	10-35	15-35	13-35	13-35
No. 200	0.0-15.0	3.0-12.0	3.0-12.0	4.0-15.0

2.2 LIQUID LIMIT AND PLASTICITY INDEX

The portion of the completed aggregate material passing the No. 40 sieve must have a maximum liquid limit of 25 and a plasticity index of 0 to 6. A plasticity index of 4 to 12 will be accepted only for "Gravel Surfacing."

2.3 TESTS, INSPECTIONS, AND VERIFICATIONS

2.3.1 Initial Tests

Perform one of each of the following tests, on the proposed material prior to commencing construction, to demonstrate that the proposed material meets all specified requirements when furnished. The Contractor shall perform additional testing if the source of the material changes and/or as directed by the Contracting Officer. All tests shall be performed by a commercial testing laboratory approved in accordance with Section 01 45 00.00 10 QUALITY CONTROL.

- a. Sieve Analysis shall be performed in conformance with ASTM C117 and ASTM C136/C136M using sieves conforming to ASTM E11.
- b. Liquid limit and plasticity index testing shall be performed in accordance with ASTM D4318.
- c. Moisture-density relationship (laboratory maximum dry density and optimum moisture content) shall be determined in accordance with paragraph DEGREE OF COMPACTION.
- d. Wear testing on aggregate course material shall be performed in conformance with ASTM C131/C131M. The percentage of loss must not exceed 40 percent.
- e. Soundness testing on aggregate course material shall be performed in conformance with ASTM C88. The percentage of loss must not exceed a 12 percent weighted average when tested at five cycles using sodium sulfate solution.

2.3.2 Approval of Material

Select the source of the material to be used for producing aggregate and submit certified test results for approval within 24 hours of completion of the tests and not less than 15 days before material is required for work. Approval of sources not already approved by the Government will be based on an inspection by the Contracting Officer. Tentative approval of materials will be based on initial test results for the aggregate sources. Final approval will be based on tests for gradation.

PART 3 EXECUTION

3.1 OPERATION OF AGGREGATE SOURCES

Perform clearing, stripping, and excavating. Operate the aggregate sources to produce the quantity and quality of materials meeting these specification requirements in the specified time limit. Upon completion of the work, leave aggregate sources on Government property in a satisfactory condition so that they readily drain. Finalize aggregate sources on private lands in agreement with local laws or authorities.

3.2 STOCKPILING MATERIAL

Prior to stockpiling the material, clear and level the storage sites. Stockpile all materials, including approved material available from excavation and grading, in the manner and at the locations designated. Stockpile aggregates in such a manner that will prevent segregation. Stockpile materials obtained from different sources separately.

3.3 PREPARATION OF UNDERLYING COURSES/SUBGRADE

Prior to the placement of aggregate materials, the underlying course/subgrade shall be cleaned of all trash, debris, and other foreign substances. Do not construct base course(s) or surface course on underlying course or subgrade that is frozen. Correct ruts or soft yielding spots, areas having inadequate compaction and deviations of the surface from the requirements set forth herein by loosening and removing soft or unsatisfactory material and by adding approved material, reshaping to line and grade and recompact to density requirements specified in this section for base course, and in Section 31 00 00 EARTHWORK for subgrade. If specified by the Contracting Officer, install geotextile fabric on subgrade in accordance with Section 31 05 22 GEOTEXTILES USED FOR FILTERS AND ROAD CONSTRUCTION before the placement of base course material. Do not allow traffic or other operations to disturb the completed underlying course and/or subgrade and maintain in a satisfactory condition until the base and/or surface course is placed.

3.4 MIXING AND PLACING MATERIALS

Mix and place the materials to obtain uniformity of the material and a uniform optimum water content for compaction. Make adjustments in mixing, placing procedures, or in equipment to obtain the true grades, to minimize segregation and degradation, to obtain the desired water content, and to ensure a satisfactory aggregate course.

3.5 LAYER THICKNESS

Place the aggregate material on the underlying course/subgrade in layers of uniform thickness. Compact the completed layer of aggregate course to

the thickness indicated. No individual layer may be thicker than 6 inches nor be thinner than 3 inches in compacted thickness. Compact the layer of aggregate course to a total thickness that is within -0 inch/+1/2 inch of the thickness indicated on the project drawings provided for each task order. Where the measured thickness is deficient from the specified total thickness, correct such areas by scarifying, adding new material of proper gradation, reblading, and recompact as directed and at no additional cost to the Government. Where the measured thickness is more than 1/2 inch thicker than indicated, the course will be considered as conforming to the specified thickness requirements plus 1/2 inch. The average job thickness will be the average of all thickness measurements taken for the job and must be within 1/4 inch of the thickness indicated. When the average job thickness fails to meet this criterion, make corrections by scarifying, adding or removing material of proper gradation, reblading, and recompact as directed and at no additional cost to the Government. Measure the total thickness of the aggregate course at intervals of one measurement for each 500 square yards of aggregate course. Measure total thickness using 3 inch diameter test holes penetrating the aggregate base course or surface course, or by other methods approved by the authorized Government representative.

3.6 COMPACTION

Degree of compaction is a percentage of the maximum density obtained by the test procedure presented in ASTM D698 abbreviated herein as percent laboratory maximum density. Compact each layer of the aggregate course with approved compaction equipment, as required in the following paragraph COMPACTION EQUIPMENT. Maintain the water content during the compaction procedure at optimum or at the percentage specified by the Contracting Officer. Compact the mixture with mechanical tampers in locations not accessible to rollers. Continue compaction until each layer through the full depth is compacted to at least 100 percent of laboratory maximum density or as specified by the Contracting Officer. Remove any materials that are found to be unsatisfactory and replace them with satisfactory material or rework them to produce a satisfactory material.

3.6.1 Compaction Equipment

Compaction equipment shall consist of pneumatic-tired rollers and other equipment as approved by the Contracting Officer. Begin rolling at the outside edge of the aggregate course and proceed to the center, overlapping on successive trips at least one-half the width of the roller. Slightly vary the length of alternate trips of the roller. Adjust speed of the roller as needed so that displacement of the aggregate does not occur.

3.7 EDGES OF AGGREGATE COURSE(S)

Place approved material along the edges of the aggregate base and/or surface course in such quantity as to compact to the thickness of the course being constructed. Simultaneously roll and compact the shoulder width with the rolling and compacting of each layer of the base course and/or the surface course when the course is being constructed in two or more layers.

3.8 SMOOTHNESS TEST

Construct each layer so that the surface shows no deviations in excess of 3/8 inch when tested with a 10 foot straightedge applied both parallel

with and at right angles to the centerline of the area to be paved. Measurements shall be taken in successive positions parallel to the centerline of the area to be paved. Measurements shall also be taken perpendicular to the centerline at 50 foot intervals. Correct deviations exceeding this amount by removing material, replacing with new material, or reworking existing material and compacting, as directed to meet these specifications.

3.9 FIELD QUALITY CONTROL

3.9.1 In-Place Tests

Perform each of the following tests on samples taken from the placed and compacted aggregate course(s). Take samples and perform tests at the rates indicated for the placed material and as specified by the Contracting Officer.

- a. Perform field density tests in accordance with ASTM D6938. Tests performed in accordance with ASTM D6938 shall be used to determine the moisture content of the soil. The calibration curves furnished with the moisture gauges shall also be checked along with density calibration checks as described in ASTM D6938. When test results indicate, as determined by the Contracting Officer, that compaction work does not meet specified requirements, rework, replace, and retest at the expense of the Contractor. Field density tests shall be performed at the following frequencies:

- One test per every 250 linear feet, or fraction thereof, of aggregate placed for roadway construction.
- One test per every 2,500 square feet, or fraction thereof, of aggregate placed for non-roadway construction.

- b. Measure the thickness of the aggregate course at intervals providing at least one measurement for each 500 square yards of aggregate course or as specified by the Contracting Officer. Measure the thickness using test holes, at least 3 inch in diameter through the aggregate course or by other methods approved by the authorized Government representative.

3.10 TRAFFIC

Do not allow traffic on completed base course. If approved by the Contracting Officer, completed portions of base course may be opened to limited traffic, provided there is no marring or distorting of the surface by the traffic. Do not allow heavy equipment on the completed base course except when necessary for construction. When it is necessary for heavy equipment to travel on the completed base course, protect the area against marring and damage.

3.11 MAINTENANCE

Maintain the aggregate course in a condition that will meet all specification requirements until the full paving section is completed and accepted. Provide adequate drainage during the entire period of construction to prevent water from collecting or standing on the working area. Immediately repair any defects and repeat repairs as often as necessary to keep the area intact.

3.12 DISPOSAL OF UNSATISFACTORY MATERIALS

Dispose of any unsuitable materials that have been removed outside the limits of Government-controlled land. No additional payments will be made for materials that have to be replaced.

-- End of Section --

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CONCRETE PAVEMENTS, SIDEWALKS, AND CURBS AND GUTTERS

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
(AASHTO)

AASHTO M 182 (2005; R 2017) Standard Specification for
Burlap Cloth Made from Jute or Kenaf and
Cotton Mats

AMERICAN CONCRETE INSTITUTE (ACI)

ACI 305R (2010) Guide to Hot Weather Concreting

ACI 306R (2016) Guide to Cold Weather Concreting

ACI SP-2 (2007; Abstract: 10th Edition) ACI Manual
of Concrete Inspection

ASTM INTERNATIONAL (ASTM)

ASTM A615/A615M (2020) Standard Specification for Deformed
and Plain Carbon-Steel Bars for Concrete
Reinforcement

ASTM A775/A775M (2017) Standard Specification for
Epoxy-Coated Steel Reinforcing Bars

ASTM A934/A934M (2016) Standard Specification for
Epoxy-Coated Prefabricated Steel
Reinforcing Bars

ASTM A1064/A1064M (2017) Standard Specification for
Carbon-Steel Wire and Welded Wire
Reinforcement, Plain and Deformed, for
Concrete

ASTM A1078/A1078M (2019) Standard Specification for
Epoxy-Coated Steel Dowels in Concrete
Pavement

ASTM C31/C31M (2019a) Standard Practice for Making and
Curing Concrete Test Specimens in the Field

ASTM C39/C39M (2020) Standard Test Method for
Compressive Strength of Cylindrical

Concrete Specimens

ASTM C143/C143M	(2020) Standard Test Method for Slump of Hydraulic-Cement Concrete
ASTM C171	(2016) Standard Specification for Sheet Materials for Curing Concrete
ASTM C172/C172M	(2017) Standard Practice for Sampling Freshly Mixed Concrete
ASTM C173/C173M	(2016) Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method
ASTM C231/C231M	(2017a) Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C309	(2011) Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C881/C881M	(2020) Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete
ASTM C1064/C1064M	(2017) Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete
ASTM C1077	(2017) Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation
ASTM D1751	(2004; E 2013; R 2013) Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
ASTM D1752	(2018) Standard Specification for Preformed Sponge Rubber, Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction
ASTM D5249	(2010; R 2016) Standard Specification for Backer Material for Use with Cold-and Hot-Applied Joint Sealants in Portland-Cement Concrete and Asphalt Joints
ASTM D5893/D5893M	(2016) Standard Specification for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements

SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION (SDDOT)

SDDOT 380	(2015) Standard Specifications for Roads and Bridges, Portland Cement Concrete Pavement
SDDOT 460	(2015) Standard Specifications for Roads and Bridges, Structural Concrete
SDDOT 650	(2015) Standard Specifications for Roads and Bridges, Concrete Curb and Gutter
SDDOT 650.01	(2019) Standard Plates, Type B Concrete Curb and Gutter
SDDOT 650.90	(2019) Standard Plates, Joints in Concrete Curb and Gutters
SDDOT 651	(2015) Standard Specifications for Roads and Bridges, Concrete Sidewalk
SDDOT 800	(2015) Standard Specifications for Roads and Bridges, Fine Aggregate for use in Portland Cement Concrete
SDDOT 820	(2015) Standard Specifications for Roads and Bridges, Coarse Aggregate for use in Portland Cement Concrete

1.2 SUBMITTALS

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

SD-01 Preconstruction Submittals

Cold Weather Placing Plan; G-PO

Hot Weather Placing Plan; G-PO

Placement Plan; G-PO

SD-03 Product Data

Concrete; G-PO

Submit the proposed concrete mix design for Government approval. The submittal shall include:

(1) Aggregate source data (pit location) and laboratory reports verifying material properties and gradations, that is dated within one year of task order award date

(2) Mill and manufacturer's certifications for portland cement and flyash (if used) that is dated within one year of task order award date

(3) Concrete mixture proportions

(4) Datasheets for admixtures and other chemicals

- (5) Concrete material test properties and performance information (compression test results)
- (6) Sample batch ticket information

Reinforcement; G-PO

Concrete Curing Materials; G-PO

Joint Filler; G-PO

Joint Sealant; G-PO

Epoxy Resin; G-PO

Joint Backer Rod; G-PO

SD-06 Test Reports

Field Quality Control

Copies of all test reports shall be provided within 24 hours of completion of the test.

SD-07 Certificates

Batch Tickets; G-PO

Certified batch/delivery tickets shall be provided for every delivery of concrete to the project site.

Qualifications

Provide qualifications of the proposed testing laboratory and technicians for approval by the Contracting Officer prior to performing testing on concrete.

1.3 EQUIPMENT, TOOLS, AND MACHINES

1.3.1 General Requirements

Plant, equipment, machines, and tools used in the work will be subject to approval and must be maintained in a satisfactory working condition at all times. Use equipment capable of producing the required product, meeting grade controls, thickness control and smoothness requirements as specified. Discontinue using equipment that produces unsatisfactory results. Allow the Contracting Officer access at all times to the plant and equipment to ensure proper operation and compliance with specifications. When specified by the Contracting Officer, submit a detailed placement plan for review and approval which outlines the methods and equipment for transporting, handling, depositing, and consolidating the concrete prior to the first concrete placement.

1.3.2 Slip Form Equipment

Slip form paver or curb forming machines, will be approved based on trial use on the job and must be self-propelled, automatically controlled, crawler mounted, and capable of spreading, consolidating, and shaping the plastic concrete to the desired cross section in one pass.

1.3.3 Concrete Boom Pump Truck

Concrete boom pump truck shall be a 56 meter truck or larger, with a minimum horizontal reach of 155 feet. Attention should be given to minimize the disturbance to the surrounding areas. Priming grout will not be allowed to be placed within the forms and will need to be transported away as waste. Deposit concrete as close as possible to its final position in the forms and regulate it so that it may be effectively consolidated in a single layer with a minimum of lateral movement. Perform concrete placement at such a rate that the formation of cold joints will be prevented. Consolidate concrete by means of internal vibration.

1.3.4 Concrete Buggy

Concrete buggies shall be tracked with an outside track-to-track dimension no wider than 40 inches. The buggy's bucket shall be constructed of material that will not absorb any moisture while transporting the concrete.

1.4 ENVIRONMENTAL REQUIREMENTS

1.4.1 Placing During Cold Weather

Concrete placement during cold weather shall be performed in accordance with ACI 306R, except as otherwise specified herein. The ambient temperature of the space adjacent to the concrete placement and surfaces to receive concrete shall be above 40 degrees F. Obtain approval prior to placing concrete when concrete is likely to be subjected to freezing temperatures within 24 hours. When ambient temperatures are below 40 degrees F, the placing temperature of concrete shall be between 60 degrees F and 75 degrees F. Heating of the mixing water or aggregates will be required to regulate the concrete placing temperatures. Materials entering the mixer shall be free from ice, snow, or frozen lumps. Salt, chemicals, or other materials shall not be mixed with the concrete to prevent freezing. Cover concrete and provide sufficient heat to maintain 50 degrees F minimum adjacent to both the formwork and the structure while curing. Protect from freezing as soon as practicable after placement, consolidation, and finishing without marring or damaging the finished surface. The temperature of the concrete shall be maintained between 50 degrees F and 75 degrees F for at least 72 hours following placement. Submit a detailed cold weather placing plan for review and approval which outlines the Contractor's means and methods of adhering to these requirements.

1.4.2 Placing During Warm Weather

Concrete placement during warm weather shall be performed in accordance with ACI 305R, except as otherwise specified herein. When the ambient temperature during placement is expected to exceed 90 degrees F, properly place and finish the concrete in accordance with the procedures specified herein. Provide concrete that does not exceed the temperature shown in the table below when measured in accordance with ASTM C1064/C1064M at the time of delivery. Cooling of the mixing water or aggregates or placing during the cooler part of the day may be required to obtain an adequate placing temperature. Cool steel forms and reinforcement as needed to maintain steel temperatures below 120 degrees F. Cool or protect transporting and placing equipment if necessary to maintain proper concrete placing temperature. Keep the finished surfaces of the newly placed concrete damp by applying a fog spray (mist) with approved spraying

equipment until the pavement is covered by the curing medium. Submit a detailed hot weather placing plan for review and approval which outlines the Contractor's means and methods of adhering to these requirements.

Maximum Allowable Concrete Placing Temperature	
Relative Humidity, Percent, During Time of Concrete Placement	Maximum Allowable Concrete Temperature in Degrees F
Greater than 60	90
40-60	85
Less than 40	80

PART 2 PRODUCTS

2.1 CONCRETE

Provide concrete conforming to the applicable requirements of SDDOT 380, SDDOT 650, and SDDOT 651 except as otherwise specified. The requirements provided herein shall take precedence over any contradictions found between any of the SDDOT standards referenced in this specification section. Concrete must have a minimum compressive strength of 4000 psi at 28 days. The water-cementitious material ratio for the concrete mixture shall never exceed 0.45. Submit copies of certified batch tickets for all concrete batches used in the construction.

Portland cement concrete that is used for concrete pavements shall conform to the requirements specified in SDDOT 380, except as modified herein. At the Contractor's option, the SDDOT Rigid Pavement Mix that is specified in SDDOT 380 may be substituted with the SDDOT Structural Class A40 Mix that is specified in SDDOT 460. This option may be done only if the Class A40 mix is designed with the following requirements:

- a. Concrete mix includes a minimum of 600 lbs. of cementitious material (Portland Type II cement and Class F flyash) per cubic yard.
- b. Concrete mix contains Class F flyash at a 20%-25% content by weight of total cementitious materials per cubic yard.
- c. Concrete mix contains a minimum coarse aggregate content of 55% by weight of total aggregates. Coarse aggregate shall also meet gradation requirements for the "Size 15" gradation as specified in Section 820 of the SDDOT.

Portland cement concrete that is used for concrete sidewalks, curbs, and gutters shall conform to the requirements specified in SDDOT 650 and SDDOT 651, excepted as modified herein. When SDDOT Class M6 Mix is specified for concrete sidewalk and/or curb and gutter, the SDDOT Structural Class A40 Mix may be substituted by the Contractor when approved by the Contracting Officer.

2.1.1 Aggregates

Aggregates used in Portland cement concrete mixtures shall conform to the

requirements of SDDOT 800 for fine aggregate, and SDDOT 820 for coarse aggregate. Coarse aggregate used for the SDDOT Rigid Pavement Mix and the SDDOT Structural Class A40 Mix shall conform to the "Size 15" gradation as specified in SDDOT 820. Coarse aggregate used for the SDDOT Class M6 Mix shall conform to the "Size 1" gradation as specified in SDDOT 820. Fine aggregate used for all concrete mixes shall conform to the gradation requirements specified in SDDOT 800. The Contractor shall include in their concrete mix design submittal data on aggregate sources and laboratory reports verifying the material properties and gradations for coarse and fine aggregate. The submitted laboratory reports shall be dated within one year of the task order award date.

2.1.2 Air Content

Use concrete mixtures that have an air content by volume of concrete of 5 to 7.5 percent, based on measurements made immediately after discharge from the mixer.

2.1.3 Slump

Use concrete with a slump of 1 to 4.5 inches as determined in accordance with ASTM C143/C143M.

2.1.4 Reinforcement

Reinforcement steel shall be plain-coated or epoxy-coated, as specified in the project drawings provided for each task order. Use reinforcement bars conforming to ASTM A615/A615M, Grade 60. When specified, reinforcement steel shall be epoxy-coated in conformance to the requirements of ASTM A775/A775M. Prefabricated reinforcement steel shall be epoxy-coated in conformance to ASTM A934/A934M and dowel bars shall be epoxy-coated in conformance to ASTM A1078/A1078M.3

When specified, use wire mesh reinforcement conforming to ASTM A1064/A1064M as shown in the project drawings provided for each task order.

2.1.4.1 Epoxy Resin

Epoxy resin materials for embedding dowels and tie bars shall be two-component materials intended for horizontal applications that conform to the requirements of ASTM C881/C881M, Type IV, Grade 3. Class shall be appropriate for each application temperature to be encountered. The minimum gel time shall be 5 minutes.

2.2 CONCRETE CURING MATERIALS

2.2.1 Impervious Sheet Materials

Use impervious sheet materials conforming to ASTM C171, type optional, except that polyethylene film, if used, must be white opaque.

2.2.2 Burlap

Use burlap conforming to AASHTO M 182.

2.2.3 White Pigmented Membrane-Forming Curing Compound

Use white pigmented membrane-forming curing compound conforming to ASTM C309, Type 2.

2.3 JOINT FILLER

2.3.1 Contraction Joint Filler for Curb and Gutter

Use hard-pressed fiberboard contraction joint filler for curb and gutter.

2.3.2 Expansion Joint Filler, Premolded

Unless otherwise indicated, use 1/2 inch thick premolded expansion joint filler conforming to ASTM D1751 or ASTM D1752.

2.4 JOINT SEALANT

Use cold-applied silicone joint sealant conforming to ASTM D5893/D5893M. Low modulus silicone sealant shall be used for resealing joints in concrete pavements, sidewalks, and curbs and gutters and on applications with steep grades that make self-leveling sealants undesirable. Usage of self-leveling sealants will be only allowed if approved by the Government. Joint sealant shall be gray in color to match concrete. Submit product data for the proposed joint sealant.

2.5 JOINT BACKER ROD

Backer material used for resealing joints in concrete pavements, sidewalks, and curbs and gutters shall be a non-moisture absorbing, closed cell, resilient material meeting the requirements of ASTM D5249. The backer rod shall be approximately 25% larger in diameter than the width of the joint to be sealed and shall be compatible with the joint sealant. No bond or reaction shall occur between the backer rod and the joint sealant. Submit product data for the joint backer rod for Government approval.

2.6 FORM WORK

Design and construct form work to ensure that the finished concrete will conform accurately to the indicated dimensions, lines, and elevations, and within the tolerances specified. Use wood or steel forms that are straight and of sufficient strength to resist springing during depositing and consolidating concrete.

2.6.1 Wood Forms

Use forms that are surfaced plank, 2 inches nominal thickness, straight and free from warp, twist, loose knots, splits or other defects. Use forms with a nominal length of 10 feet. Radius bends may be formed with 3/4 inch boards, laminated to the required thickness.

2.6.2 Steel Forms

Use channel-formed sections with a flat top surface and welded braces at each end and at not less than two intermediate points. Use forms with interlocking and self-aligning ends. Provide flexible forms for radius forming, corner forms, form spreaders, and fillers as needed. Use forms with a nominal length of 10 feet and that have a minimum of 3 welded stake pockets per form. Use stake pins consisting of solid steel rods with chamfered heads and pointed tips designed for use with steel forms.

2.6.3 Pavement and Sidewalk Forms

Use forms that are of a height equal to the full depth of the finished concrete surface.

2.6.4 Curb and Gutter Forms

Use curb and gutter outside forms that have a height equal to the full depth of the curb or gutter.

2.6.5 Biodegradable Form Release Agent

Use form release agent that is colorless and biodegradable and that is composed of at least 87 percent biobased material. Provide product that does not bond with, stain, or adversely affect concrete surfaces and does not impair subsequent treatments of concrete surfaces. Provide form release agent that does not contain diesel fuel, petroleum-based lubricating oils, waxes, or kerosene.

PART 3 EXECUTION

3.1 SUBGRADE PREPARATION

Construct subgrade to the specified grade and cross section prior to concrete placement. Subgrade shall be placed and compacted as specified in the project drawings provided for each task order.

3.1.1 Pavement and Sidewalk Subgrade

Test the subgrade for grade and cross section with a template extending the full width of the pavement or sidewalk and supported between side forms. Other proposed methods for testing the grade and cross section for pavement and sidewalk subgrade shall be approved by the authorized Government representative.

3.1.2 Curb and Gutter Subgrade

Test the subgrade for grade and cross section by means of a template extending the full width of the curb and gutter. Use subgrade materials equal in bearing quality to the subgrade under the adjacent pavement.

3.1.3 Maintenance of Subgrade

Maintain subgrade in a smooth, compacted condition in conformity with the required section and established grade until the concrete is placed. The subgrade must be in a moist condition when concrete is placed. Prepare and protect subgrade so that it is free from frost, snow, standing water, debris, and foreign matter when the concrete is deposited.

3.2 FORM SETTING

Set forms to the indicated alignment, grade and dimensions. Hold forms rigidly in place by a minimum of 3 stakes per form placed at intervals not to exceed 4 feet. Use additional stakes and braces at corners, deep sections, and radius bends, as required. Use clamps, spreaders, and braces where required to ensure rigidity in the forms. Remove forms in a manner that will not injure the concrete. Do not use bars or heavy tools against the concrete when removing the forms. Promptly and satisfactorily repair concrete found to be defective after form removal. Clean forms and

coat with form oil or biodegradable form release agent each time before concrete is placed. Wood forms may, instead, be thoroughly wetted with water before concrete is placed, except that with probable freezing temperatures, oiling is mandatory.

3.2.1 Pavements and Sidewalks

Set forms for pavements and sidewalks with the upper edge true to line and grade with an allowable tolerance of 1/8 inch in any 10 foot long section. After forms are set, grade and alignment must be checked with a 10 foot straightedge. Forms shall have a transverse slope as indicated in the project drawings provided for each task order. Do not remove side forms less than 12 hours after finishing has been completed.

3.2.2 Curbs and Gutters

Remove forms used along the front of the curb not less than 2 hours after the concrete has been placed. Do not remove forms used along the back of curb until the face and top of the curb have been finished, as specified for concrete finishing. Do not remove gutter forms while the concrete is sufficiently plastic to slump in any direction. Any defects in the concrete after form removal (honeycombs, cracking, etc.) shall be repaired as directed by the Contracting Officer.

3.3 PAVEMENT AND SIDEWALK CONCRETE PLACEMENT AND FINISHING

3.3.1 Formed Concrete Pavement and Sidewalks

Place concrete in the forms in one layer. When consolidated and finished, the concrete must be of the thickness indicated. Use a strike-off guided by side forms after concrete has been placed in the forms to bring the surface to proper section to be compacted. Consolidate concrete with an approved vibrator. Finish the surface to grade with a metallic strike off.

3.3.2 Concrete Finishing

After straightedging, when most of the water sheen has disappeared, and just before the concrete hardens, finish the surface with a wood or magnesium float or darby to a smooth and uniformly fine granular or sandy texture free of waves, irregularities, or tool marks. Produce a scored surface by brooming with a fiber-bristle brush in a direction transverse to that of the traffic, followed by edging.

3.3.3 Edge and Joint Finishing

Finish all slab edges, including those at formed joints, with an edger having a radius of 1/8 inch. Edge transverse joints before brooming. Eliminate the flat surface left by the surface face of the edger with a steel float before brooming. Clean and solidly fill corners and edges which have crumbled and areas which lack sufficient mortar for proper finishing with a properly proportioned mortar mixture and then finish.

3.3.4 Surface and Thickness Tolerances

Finished surfaces must not vary more than 5/16 inch from the testing edge of a 10-foot straightedge. Permissible deficiency in section thickness will be up to 1/4 inch.

3.3.5 Joint Sealant

Joints shall be cleaned out with compressed air and as directed per the manufacturer's recommendations prior to placement of joint sealant.

3.4 CURB AND GUTTER CONCRETE PLACEMENT AND FINISHING

3.4.1 Formed Curb and Gutter

Place concrete to the required section in a single lift. Consolidate concrete using approved mechanical vibrators. Curve shaped gutters must be finished with a standard curb "mule".

3.4.2 Curb and Gutter Finishing

Approved slipformed curb and gutter machines may be used in lieu of hand placement.

3.4.3 Concrete Finishing

Float and finish exposed surfaces with a smooth wood float until true to grade and section and uniform in texture. Brush floated surfaces with a fine-hair brush using longitudinal strokes. Round the edges of the gutter and top of the curb with an edging tool to a radius of 1/2 inch. Immediately after removing the front curb form, rub the face of the curb with a wood or concrete rubbing block and water until blemishes, form marks, and tool marks have been removed. Brush the front curb surface, while still wet, in the same manner as the gutter and curb top. Finish the top surface of gutter and entrance to grade with a wood float.

3.4.4 Joint Finishing

Finish curb edges at formed joints as indicated.

3.4.5 Surface and Thickness Tolerances

Finished surfaces must not vary more than 1/4 inch from the testing edge of a 10-foot straightedge. Permissible deficiency in section thickness will be up to 1/4 inch.

3.5 PAVEMENT AND SIDEWALK JOINTS

Construct pavement and sidewalk joints to divide the surface into rectangular areas. Space transverse contraction joints at a distance equal to the pavement or sidewalk width or 5 feet on centers, whichever is less, and continuous across the slab. Construct longitudinal contraction joints along the centerline of all pavements or sidewalks 10 feet or more in width. Construct transverse expansion joints at pavement or sidewalk returns and opposite expansion joints in adjoining curbs. Where the pavement or sidewalk is not in contact with the curb, install transverse expansion joints as indicated. Form expansion joints around structures and features which project through or into the pavement or sidewalk, using joint filler of the type, thickness, and width indicated.

3.5.1 Pavement and Sidewalk Contraction Joints

Form contraction joints in the fresh concrete by cutting a groove in the top portion of the slab to a depth of at least one-fourth of the pavement or sidewalk slab thickness. Unless otherwise approved or indicated,

either use a jointer to cut the groove or saw a groove in the hardened concrete with a power-driven saw. Construct sawed joints by sawing a groove in the concrete with a 1/8 inch blade. Provide an ample supply of saw blades on the jobsite before concrete placement is started. Provide at least one standby sawing unit in good working order at the jobsite at all times during the sawing operations. Commence sawing of the joints as soon as the concrete has hardened sufficiently to permit cutting the concrete without chipping, spalling, or tearing. Use a chalk line or other suitable guide to mark the alignment of the joint.

3.5.2 Pavement and Sidewalk Expansion Joints

Form expansion joints using 1/2 inch joint filler strips. Joint filler in expansion joints surrounding structures and features within the pavement or sidewalk may consist of preformed filler material conforming to ASTM D1752 or building paper. Hold joint filler in place with steel pins or other devices to prevent warping of the filler during floating and finishing. Immediately after finishing operations are completed, round joint edges using an edging tool having a radius of 1/8 inch. Remove any concrete over the joint filler. At the end of the curing period, clean the top of expansion joints and fill with cold-applied joint sealant. Use joint sealant that is gray in color to match the concrete. Thoroughly clean the joint opening before the sealing material is placed. Do not spill sealing material on exposed surfaces of the concrete. Apply joint sealing material in accordance with the manufacturer's instructions and only when the concrete at the joint is surface dry. Immediately remove any excess material on exposed surfaces of the concrete and clean the concrete surfaces.

3.5.3 Reinforcement Steel Placement

Accurately and securely fasten reinforcement steel in place with suitable supports and ties before the concrete is placed as indicated on the project drawings provided for each task order. All reinforcement steel shall be protect to keep it free of loose rust and scale, dirt, oil, or any other deleterious coating that could reduce bond with the concrete. Damage to any epoxy coatings on reinforcement shall be repaired prior to concrete placement with a method approved by the Contracting Officer or authorized government representative. The Contractor shall avoid walking on any reinforcement steel once concrete placement begins.

3.5.3.1 Welded Wire Reinforcement Placement

Welded wire reinforcement shall be placed as shown in each task order's project drawings and embedded/supported at mid-depth of the concrete. Reinforcement shall not be continuous through expansion joints, construction joints, or contraction joints. Any required splicing of WWR shall be accomplished by overlapping one full mesh square above another full mesh square. Wire ties shall be 16 gauge or heavier black annealed steel wire and shall be bent down and away from any concrete surface.

It is essential that WWR be placed on supports to maintain its required position during concrete placement. Supports for WWR shall be precast concrete blocks, plastic coated steel fabricated with bearing plates, or specifically designed wire-fabric supports that are made of plastic. Precast concrete blocks shall have wire ties and shall not be any smaller than a 4-inch square when supporting reinforcement on the ground. Precast concrete blocks shall have a compressive strength equal to that of the specified concrete. Supports shall not be spaced more than 2 feet in each

direction. Contractor shall not walk on WWR once concrete placement begins.

3.5.3.2 Placing Dowels and Tie Bars

Dowels and tie bars shall be sized and installed as indicated on the project drawings provided for each task order. Dowels and tie bars shall be installed with alignment not greater than 1/8 inch per ft. Except as otherwise specified below, location of dowels and tie bars shall be within a horizontal tolerance of plus or minus 5/8 inch and a vertical tolerance of plus or minus 3/16 inch. Dowels and tie bars in joints shall be omitted when the center of the dowel or tie bar is located within a horizontal distance from an intersecting joint equal to or less than one-fourth of the slab thickness.

Installation of dowels and tie bars in new concrete shall be by the bonded-in-place method. Dowels and tie bars shall be supported by means of devices fastened to the forms. Installation by removing and replacing in preformed holes will not be permitted.

Installation of dowels and tie bars in hardened concrete shall be by bonding into drilled holes. Holes approximately 1/8 inch greater in diameter than the dowels or tie bars shall be drilled into the hardened concrete. Drilled holes shall be thoroughly cleaned with compressed air prior to installing any dowels or tie bars. Dowels and tie bars shall be bonded in the drilled holes using epoxy resin that is injected at the back of the hole before installation and extruded to the collar during insertion of the dowels and tie bars so as to completely fill the void around the dowels and tie bars. Application by buttering dowels and tie bars shall not be permitted. Dowels and tie bars shall be held in alignment at the collar of the hole, after insertion and before the grout hardens, by means of suitable metal or plastic collars fitted around the bars. The vertical alignment of the bars shall be checked by placing a straightedge on the surface of the pavement over the top of the bars and measuring the vertical distance between the straightedge and the beginning and ending point of the exposed part of the dowels and tie bars.

3.6 CURB AND GUTTER JOINTS

Construct curb and gutter joints at right angles to the line of curb and gutter at the locations and of the dimensions shown in each task order's project drawings or as directed by the Government. When PCC pavement is adjacent to the curb and gutter, the joints shall match the contraction joints of the pavement. Joints shall be constructed in accordance to SDDOT 650, SDDOT 650.01, and SDDOT 650.90, unless otherwise indicated.

3.7 CURING AND PROTECTION

3.7.1 General Requirements

Protect concrete against loss of moisture and rapid temperature changes for at least 7 days from the beginning of the curing operation. Protect unhardened concrete from rain and flowing water. All equipment needed for adequate curing and protection of the concrete must be on hand and ready for use before actual concrete placement begins. Protect concrete as necessary to prevent cracking of the pavement due to temperature changes during the curing period.

3.7.1.1 Membrane Curing Method

Apply a uniform coating of white-pigmented membrane-curing compound to the entire exposed surface of the concrete as soon after finishing as the free water has disappeared from the finished surface. Coat formed surfaces immediately after the forms are removed and in no case longer than 1 hour after the removal of forms. Do not allow concrete surface to dry before application of the membrane. If drying has occurred, moisten the surface of the concrete with a fine spray of water and apply the curing compound as soon as the free water disappears. Apply curing compound in two coats by hand-operated pressure sprayers at a coverage of approximately 200 square feet/gallon for the total of both coats. Apply the second coat in a direction approximately at right angles to the direction of application of the first coat. The compound must form a uniform, continuous, coherent film that will not check, crack, or peel and must be free from pinholes or other imperfections. If pinholes, abrasion, or other discontinuities exist, apply an additional coat to the affected areas within 30 minutes. Respray concrete surfaces that are subjected to heavy rainfall within 3 hours after the curing compound has been applied by the method and at the coverage specified above. Respray areas where the curing compound is damaged by subsequent construction operations within the curing period. Take precautions necessary to ensure that the concrete is properly cured at sawed joints, and that no curing compound enters the joints. Tightly seal the top of the joint opening and the joint groove at exposed edges before the concrete in the region of the joint is resprayed with curing compound. The method used for sealing the joint groove shall prevent loss of moisture from the joint during the entire specified curing period. Provide approved standby facilities for curing concrete pavement at a location accessible to the jobsite for use in the event of mechanical failure of the spraying equipment or other conditions that might prevent correct application of the membrane-curing compound at the proper time. Adequately protect concrete surfaces to which membrane-curing compounds have been applied during the entire curing period from pedestrian and vehicular traffic, except as required for joint-sawing operations and surface tests, and from other possible damage to the continuity of the membrane.

3.7.2 Backfilling

After curing, remove debris and backfill, grade, and compact the area adjoining the concrete to conform to the surrounding area in accordance with lines and grades indicated.

3.7.3 Protection

Protect completed concrete from damage until accepted. Repair damaged concrete and clean concrete discolored during construction. Remove and reconstruct concrete that is damaged for the entire length between regularly scheduled joints at no cost to the Government. Refinishing the damaged portion will not be acceptable. Dispose of removed material as directed.

3.8 REMOVING AND REPLACING JOINT SEALANT

When directed by the Contracting Officer, the Contractor shall remove and replace the sealant in the joints of concrete pavements, sidewalks, and curbs and gutters.

3.8.1 Joint Preparation

Joints to be resealed shall be thoroughly clean and dry. All materials such as old sealant, oil, asphalt, curing compound, paint, rust, and other foreign materials shall be completely removed. Cleaning shall be accomplished by sand blasting and other tools as necessary. Joints to be sealed with silicone sealant shall be sand blasted utilizing a mechanical device that holds the sand blaster at the appropriate angle and distance from the joint to ensure proper cleaning. The device shall have a mechanism attached that will correctly guide the device in the joint.

Just prior to sealing, each joint shall be blown out using a jet of compressed air, at a working pressure of not less than 90 psi, to remove all traces of dust. Air compressors used for cleaning joints shall be equipped with traps capable of removing all free water and oil from the compressed air. The use of leaf blowers will not be permitted for use during cleaning operations.

3.8.2 Application of Sealant

Silicone sealant shall be applied with a mechanical device equipped with a nozzle or spout shaped to fit into the joint. The joint sealant shall be applied under pressure from the inside of the joint to remove entrapped air and ensure good joint contact. Backer rod shall be installed to the proper depth to produce the width and depth of the sealant specified. The sealant surface shall be tooled to produce a slightly concave surface below the pavement surface. Tooling shall be accomplished before a skin forms on the sealant surface. The use of water, soap, or oil as a tooling aid will not be permitted.

Joint sealer application will not be permitted when the air or pavement temperature near the joint is less than 40 degrees F or is 40 degrees F and falling. The sealant shall be applied without spilling on the exposed surface. Sealant that is spilled on the concrete surface shall be removed immediately and the surface shall be cleaned. Failure of the joint material in either adhesion or cohesion will be cause for rejection. Repair and replacement of failed joint sealant shall be at the expense of the Contractor.

3.9 FIELD QUALITY CONTROL

Submit copies of all test reports within 24 hours of completion of the test.

3.9.1 General Requirements

Perform the inspection and tests described and meet the specified requirements for inspection details and frequency of testing. Based upon the results of these inspections and tests, take the action and submit reports as required below, and additional tests to ensure that the requirements of these specifications are met.

Submit data on the qualifications of the proposed testing laboratory and technicians for approval by the Contracting Officer prior to performing testing on concrete. Work requiring testing will not be permitted until the proposed testing laboratory and technicians have been approved.

a. Work involving the sampling and testing of concrete under this contract must be performed by an ACI Concrete Field Testing

Technician, Grade 1 qualified in accordance with ACI SP-2 or equivalent. Equivalent certification programs must include requirements for written and performance examinations as stipulated in ACI SP-2.

b. Testing laboratories that perform testing services on concrete materials under this contract must meet the requirements of ASTM C1077. Testing laboratories shall also be certified by the Materials Testing Center (MTC) at the USACE Engineering Research and Development Center (ERDC) as referenced in Section 01 45 00.00 10 QUALITY CONTROL.

3.9.2 Preparations for Placing

Inspect foundation or construction joints, forms, and embedded items in sufficient time prior to each concrete placement to certify that it is ready to receive concrete. Do not begin placement until the availability of an adequate number of acceptable vibrators and consolidation equipment, which are in working order and have competent operators, has been verified. Discontinue placing if any lift is inadequately consolidated.

3.9.3 Concrete Testing

3.9.3.1 Strength Testing

Take concrete samples in accordance with ASTM C172/C172M not less than once a day nor less than once for every 100 cubic yards of concrete placed, or as the Contracting Officer deems necessary. Sampling for the testing of the concrete will take place at the point of placement. Mold six (6) concrete cylinders in accordance with ASTM C31/C31M for strength testing by an approved laboratory. Perform compressive strength testing in accordance to ASTM C39/C39M. Each strength test result must be the average of 2 test cylinders from the same concrete sample tested at 7 days and 28 days, with the remaining 2 cylinders being held in reserve, unless otherwise specified or approved. Concrete specified on the basis of compressive strength will be considered satisfactory if the averages of all sets of three consecutive strength test results equal or exceed the specified strength, and no individual strength test result falls below the specified strength by more than 500 psi.

3.9.3.2 Air Content

Determine air content in accordance with ASTM C173/C173M or ASTM C231/C231M. Use ASTM C231/C231M with concretes and mortars made with relatively dense natural aggregates, and use ASTM C173/C173M with concretes and mortars made with lightweight or extremely porous aggregates. Perform air content testing on the first two (2) delivered loads and then for every 50 cubic yards of concrete placed thereafter, for each work day. Make additional tests when excessive variation in concrete workability is reported by the placing foreman or the Government inspector. Notify the placing foreman if results are out of tolerance. The placing foreman must take appropriate action to have the air content corrected at the plant. Additional tests for air content will be performed on each truckload of material until such time as the air content is within the tolerance specified.

3.9.3.3 Slump Test

Testing of concrete slump shall be in accordance with ASTM C143/C143M. Perform slump testing on the first two (2) delivered loads and then for every 50 cubic yards of concrete placed thereafter, for each work day.

Perform additional tests when excessive variation in the workability of the concrete is noted or when excessive crumbling or slumping is noted along the edges of slip-formed concrete.

3.9.3.4 Concrete Temperature

Determine temperature of concrete at time of placement in accordance with ASTM C1064/C1064M. Check concrete temperatures each time an air content or slump test is performed, and also when strength test specimens are fabricated.

3.9.4 Thickness Evaluation

Determine the anticipated thickness of the concrete prior to placement by passing a template through the formed section or by measuring the depth of opening of the extrusion template of the curb forming machine. If a slip form paver is used for sidewalk placement, construct the subgrade true to grade prior to concrete placement. The thickness will be determined by measuring each edge of the completed slab.

3.9.5 Surface Evaluation

Provide finished surfaces for each category of the completed work that are uniform in color and free of blemishes and form or tool marks.

3.10 SURFACE DEFICIENCIES AND CORRECTIONS

3.10.1 Thickness Deficiency

When measurements indicate that the completed concrete section is deficient in thickness by more than 1/4 inch the deficient section will be removed, between regularly scheduled joints, and replaced at no cost to the Government.

3.10.2 High Areas

In areas not meeting surface smoothness and plan grade requirements, reduce high areas either by rubbing the freshly finished concrete with carborundum brick and water when the concrete is less than 36 hours old or by grinding the hardened concrete with an approved surface grinding machine after the concrete is 36 hours old or more. The area corrected by grinding the surface of the hardened concrete must not exceed 5 percent of the area of any integral slab, and the depth of grinding must not exceed 1/4 inch. Remove and replace pavement areas requiring grade or surface smoothness corrections in excess of the limits specified.

3.10.3 Appearance

Exposed surfaces of the finished work will be inspected by the Contracting Officer and deficiencies in appearance will be identified. Remove and replace areas which exhibit excessive cracking, discoloration, form marks, or tool marks or which are otherwise inconsistent with the overall appearances of the work.

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PAVEMENT MARKINGS

PART 1 GENERAL

1.1 REFERENCES

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

ASTM INTERNATIONAL (ASTM)

ASTM D4280	(2012) Extended Life Type, Nonplowable, Raised, Retroreflective Pavement Markers
ASTM D4383	(2012) Standard Specification for Plowable, Raised Retroreflective Pavement Markers
ASTM D6628	(2003; R 2015) Standard Specification for Color of Pavement Marking Materials

U.S. FEDERAL HIGHWAY ADMINISTRATION (FHWA)

MUTCD	(2009; R 2012) Manual on Uniform Traffic Control Devices
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U.S. GENERAL SERVICES ADMINISTRATION (GSA)

FS TT-B-1325	(Rev D; Notice 1; Notice 2 2017) Beads (Glass Spheres) Retro-Reflective (Metric)
FS TT-P-1952	(2015; Rev F; Notice 1) Paint, Traffic and Airfield Markings, Waterborne

1.2 SUBMITTALS

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

SD-03 Product Data

Equipment; G-PO

Provide a list of proposed equipment that will be used for surface preparation/paint removal and application of new pavement markings. Include descriptive data and proposed Contractor actions as specified in this section.

Safety Data Sheets; G-PO

Provide safety data sheets for paints and reflective media.

Reflective media for roads; G-PO

Provide product data and manufacturer's instructions for Government approval.

Waterborne Paint; G-PO

Provide product data and manufacturer's instructions for Government approval.

SD-07 Certificates

Qualifications; G-PO

Provide documentation on personnel qualifications, as specified.

Reflective Media for Roads

Provide certificate of compliance stating that product meets contract specifications.

Waterborne Paint

Provide certificate of compliance stating that product meets contract specifications.

1.3 QUALITY ASSURANCE

1.3.1 Regulatory Requirements

Submit Safety Data Sheets for each product.

1.3.2 Qualifications

Submit documentation certifying that pertinent personnel are qualified for equipment operation and handling of applicable chemicals.

1.4 DELIVERY AND STORAGE

Deliver paint materials and reflective media in original sealed containers that plainly show the designated name, specification number, batch number, color, date of manufacture, manufacturer's directions, and name of manufacturer.

Provide storage facilities at the job site only in areas approved by the Contracting Officer or authorized government representative for maintaining materials at temperatures recommended by the manufacturer. Make available paint and reflective media stored at the project site for inspection and product verification.

1.5 PROJECT/SITE CONDITIONS

1.5.1 Environmental Requirements

1.5.1.1 Weather Limitations for Application

Apply pavement markings to clean, dry surfaces, and unless otherwise approved, only when the air and pavement surface temperature is at least 45 degrees F and 5 degrees F above the dew point, and the air and pavement temperatures are within the limits recommended by the pavement marking manufacturer. Allow pavement surfaces to dry after water has been used for cleaning or rainfall has occurred prior to striping or marking. Test the pavement surface for moisture before beginning work each day and after cleaning. Do not commence marking until the pavement is sufficiently dry and the pavement condition has been approved by the Contracting Officer. Employ the "plastic wrap method" to test the pavement for moisture as specified in paragraph TESTING FOR MOISTURE.

1.5.1.2 Weather Limitations for Removal of Pavement Markings on Roads and Automotive Parking Areas

Pavement surface must be free of snow, ice, or slush; with a surface temperature of at least 40 degrees F and rising at the beginning of operations, except those involving sand blasting or grinding. Cease operation during thunderstorms, or during rainfall, except for waterblasting and removal of previously applied chemicals. Cease waterblasting where surface water accumulation alters the effectiveness of material removal.

1.5.2 Traffic Controls

Place warning signs conforming to MUTCD near the beginning of the worksite and well ahead of the worksite for alerting approaching traffic from both directions. Place small markers along newly painted lines to control traffic and prevent damage to newly painted surfaces. Mark painting equipment with large warning signs indicating slow-moving painting equipment in operation. Do not use foil-backed material for temporary pavement marking because of its potential to conduct electricity during accidents involving downed power lines.

When traffic must be rerouted or controlled to accomplish the work, provide necessary warning signs, flag persons, and related equipment for the safe passage of vehicles. Refer to Section 01 12 00 CONSTRUCTION GENERAL for traffic control plan requirements.

PART 2 PRODUCTS

2.1 EQUIPMENT

2.1.1 Surface Preparation and Paint Removal

2.1.1.1 Surface Preparation Equipment for Roads and Automotive Parking Areas

Submit an equipment list showing the proposed surface preparation equipment by serial number, type, model, and manufacturer. Include descriptive data indicating area of coverage per pass, pressure adjustment range, tank and flow capacities, and safety precautions required for the equipment operation. Mobile equipment shall be mounted on rubber tires

and must allow for removal of markings without damaging the pavement surface or joint sealant. Maintain machines, tools, and equipment used in the performance of the work in satisfactory operating condition.

2.1.1.1.1 Sandblasting Equipment

Use mobile sandblasting equipment capable of producing a pressurized stream of sand and air that effectively removes paint from the surface without filling voids with debris in asphalt or tar pavements or removing joint sealants in Portland cement concrete pavements. Include with the equipment and air compressor, hoses, and nozzles of adequate size and capacity for removing paint. The compressor shall be capable of furnishing not less than 150 cfm (cubic feet per minute) of air at a pressure of not less than 90 psi at each nozzle used. Equip the compressor with traps and coalescing filters that maintain the compressed air free of oil and water.

2.1.1.1.2 Waterblasting Equipment

Use mobile waterblasting equipment capable of producing a pressurized stream of water that effectively removes paint from the pavement surface without significantly damaging the pavement. The water pressure shall be specified at 2600 psi at 140 degrees F in order to adequately clean the surfaces to be marked. Provide equipment, tools, and machinery which are safe and in good working order at all times.

2.1.1.1.3 Grinding or Scarifying Equipment

Use equipment capable of removing surface contaminants, paint build-up, or extraneous markings from the pavement surface without leaving any residue. Clean the surface by hydro blast to remove surface contaminants and ash after a weed torch is used to remove paint.

2.1.1.1.4 Chemical Removal Equipment

Use chemical equipment capable of applying and removing chemicals and paint from the pavement surface, leaving only non-toxic biodegradable residue without scarring or other damage to the pavement or joints and joint seals.

2.1.1.1.5 Blackout Pavement Markings

When approved by the Contracting Officer, the Contractor may black out any existing pavement markings in order for new pavement markings to be painted. Paint used for blacking out existing pavement markings shall meet specifications for waterborne paint. Paint used for blacking out shall be compatible with pavement surfaces and the new pavement marking paint and reflective media.

2.1.2 Application Equipment

Submit an equipment list showing the proposed application equipment appropriate for the material(s) to be used. Include manufacturer's descriptive data and certification for the planned use that indicates area of coverage per pass, pressure adjustment range, tank and flow capacities, and all safety precautions required for operating and maintaining the equipment. Provide and maintain machines, tools, and equipment used in the performance of the work in satisfactory operating condition, or remove them from the work site. Provide mobile and maneuverable application

equipment to the extent that straight lines can be followed and normal curves can be made in a true arc.

2.1.2.1 Paint Application Equipment

2.1.2.1.1 Hand-Operated, Push-Type Machines

Provide hand-operated push-type applicator machine of a type commonly used for application of water based paint to pavement surfaces for small marking projects, such as legends and cross-walks, automotive parking areas, or surface painted signs. Provide applicator machine equipped with the necessary tanks and spraying nozzles capable of applying paint uniformly at coverage specified. Hand operated spray guns may be used in areas where push-type machines cannot be used.

2.1.2.1.2 Self-Propelled or Mobile-Drawn Spraying Machines

Provide self-propelled or mobile-drawn spraying machine with suitable arrangements of atomizing nozzles and controls to obtain the specified results. Provide machine having a speed during application capable of applying the stripe widths indicated at the paint coverage rate specified herein and of even uniform thickness with clear-cut edges.

Provide paint applicator with paint reservoirs or tanks of sufficient capacity and suitable gages to apply paint in accordance with requirements specified. Equip tanks with suitable air-driven mechanical agitators. Equip spray mechanism with quick-action valves conveniently located, and include necessary pressure regulators and gages in full view and reach of the operator. Install paint strainers in paint supply lines to ensure freedom from residue and foreign matter that may cause malfunction of the spray guns. The paint applicator shall be readily adaptable for attachment of an air-actuated dispenser for the reflective media approved for use.

2.1.2.1.2.1 Road Marking

Provide equipment used for marking roads capable of placing three lines, 4 to 8 inches wide, at a single pass as solid lines, intermittent lines, or a combination of solid and intermittent lines using a maximum of two different colors of paint as specified.

2.1.2.1.2.2 Hand Application

Provide spray guns for hand application of paint in areas where the mobile paint applicator cannot be used.

2.1.2.2 Reflective Media Dispenser

The dispenser for applying the reflective media shall be attached to the paint dispenser and shall operate automatically and simultaneously with the applicator through the same control mechanism. The dispenser must be capable of adjustment and designed to provide uniform flow of reflective media over the full length and width of the stripe at the rate of coverage specified in paragraph APPLICATION, at all operating speeds of the applicator to which it is attached.

2.2 MATERIALS

Use waterborne paint for roads. Use non-reflectorized waterborne paint for

automotive parking areas. The maximum allowable VOC content of pavement markings is 150 grams per liter. Color of markings are indicated on the drawings and must conform to ASTM D6628 for roads and automotive parking areas. The paint shall be used as furnished by the manufacturer without the use of thinner or diluent. The paint shall be homogenous and easily stirred to a smooth consistency in its original container before being transferred to the tank of the application equipment. Provide materials conforming to the requirements specified herein.

2.2.1 Waterborne Paint

FS TT-P-1952F, Type I and II.

2.2.2 Reflective Media

2.2.2.1 Reflective Media for Roads

FS TT-B-1325, Type I, Gradation A.

PART 3 EXECUTION

3.1 EXAMINATION

3.1.1 Testing for Moisture

Test the pavement surface for moisture before beginning pavement marking after each period of rainfall, fog, high humidity, or cleaning, or when the ambient temperature has fallen below the dew point. Do not commence marking until the pavement is sufficiently dry and the pavement condition has been approved by the Contracting Officer or authorized representative.

Employ the "plastic wrap method" to test the pavement for moisture as follows: Cover the pavement with a 12 inch by 12 inch section of clear plastic wrap and seal the edges with tape. After 15 minutes, examine the plastic wrap for any visible moisture accumulation inside the plastic. Do not begin marking operations until the test can be performed with no visible moisture accumulation inside the plastic wrap. Re-test surfaces when work has been stopped due to rain.

3.2 SURFACE PREPARATION

Allow new pavement surfaces to cure for a period of not less than 30 days before application of marking materials. Thoroughly clean surfaces to be marked before application of the paint. Remove dust, dirt, and other granular surface deposits by sweeping, blowing with compressed air, rinsing with water, or a combination of these methods as required. Remove rubber deposits, existing paint markings, and other coatings adhering to the pavement by scrapers, wire brushes, sandblasting, or approved chemical removal method.

Scrub affected areas, where oil or grease is present on old pavements to be marked, with several applications of trisodium phosphate solution or other approved detergent or degreaser and rinse thoroughly after each application. After cleaning oil-soaked areas, seal with shellac or primer recommended by the manufacturer to prevent bleeding through the new paint. Do not commence painting in any area until pavement surfaces are dry and clean.

3.3 APPLICATION

Apply pavement markings to dry pavements only.

3.3.1 Paint

Apply paint with approved equipment at rate of coverage specified herein. Provide guidelines and templates as necessary to control paint application. Take special precautions using stencils or templates in marking numbers, letters, and symbols (handicap symbols). Manually paint numbers, letters, and symbols. Sharply outline all edges of markings. The maximum drying time requirements of the paint specifications will be strictly enforced, to prevent undue softening of bitumen, and pickup, displacement, or discoloration by tires of traffic. If there is a deficiency in drying of the markings, painting operations must cease until the cause of the slow drying is determined and corrected.

3.3.1.1 Waterborne Paint

Apply paint evenly to the pavement area to be coated at a minimum wet thickness of 15 mils, equivalent to a dry thickness of 7 to 8 mils. This application rate shall be used for painting reflective pavement markings and non-reflective pavement markings.

3.3.2 Reflective Media

Application of reflective media shall immediately follow the application of paint and shall only be performed for reflective pavement markings. Apply FS TT-B-1325 Type I (Gradation A) beads uniformly to wet paint at a rate of 7 plus or minus 0.5 pounds of glass spheres per gallon of paint.

Accomplish drop-on application of the glass spheres to ensure even distribution at the specified rate of coverage. Should there be malfunction of either paint applicator or reflective media dispenser, discontinue operations until deficiency is corrected.

3.3.3 Cleanup and Waste Disposal

Keep the worksite clean and free of debris and waste from the removal and application operations. Dispose of debris offsite.

3.4 FIELD QUALITY CONTROL

3.4.1 Material Inspection

Examine material at the job site to determine that it is the material referenced in the submitted product data and certificate of compliance. Any materials that do not meet specification shall not be used and be removed from the worksite. Provide test results substantiating conformance to the specified requirements with each certificate of compliance.

3.4.2 Surface Preparation and Application Procedures

Surface preparation and application procedures will be examined by the Contracting Officer or authorized government representative to determine conformance with the specified requirements. Each separate operation shall be approved prior to initiation of subsequent operations.

3.4.3 Dimensional Tolerances

Apply all markings in the standard dimensions and lengths shown in the drawings provided for each task order. Any markings found not to be in accordance with the task order's project drawings and specifications shall be removed or blacked out and shall be repainted at the expense of the Contractor.

3.4.4 Bond Failure Verification

Inspect newly applied markings for signs of bond failure based on visual inspection.

-- End of Section --

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SECTION 32 92 19

SEEDING

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.

SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION (SDDOT)

SDDOT AP LIST

South Dakota Department of Transportation
Approved Products List

U.S. DEPARTMENT OF AGRICULTURE (USDA)

AMS Seed Act

(1940; R 1988; R 1998) Federal Seed Act

1.2 DEFINITIONS

1.2.1 Stand of Turf

95 percent ground cover of the established species.

1.3 RELATED REQUIREMENTS

Section 31 00 00 EARTHWORK applies to this section for pesticide use and plant establishment requirements, with additions and modifications herein.

1.4 SUBMITTALS

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

SD-03 Product Data

Wood Cellulose Fiber Mulch

Seed; G-PO

Provide product data for seed mixture that includes percentage of pure live seed, minimum percentage of germination and hard seed, maximum percentage of weedseed content, and the date that seed is tested. Also include the state certification for the seed in this submittal.

Erosion Control Materials; G-PO

Provide product data and manufacturer's instructions for

Government approval.

Fertilizer; G-PO

Provide product data for fertilizer that includes physical characteristics and recommendations.

1.5 DELIVERY, STORAGE, AND HANDLING

1.5.1 Delivery

1.5.1.1 Seed Protection

Protect from drying out and from contamination during delivery, on-site storage, and handling.

1.5.1.2 Fertilizer Delivery

Deliver to the site in original, unopened containers bearing manufacturer's chemical analysis, name, trade name, trademark, and indication of conformance to state and federal laws. Instead of containers, fertilizer may be furnished in bulk with certificate indicating the above information.

1.5.2 Storage

1.5.2.1 Seed and Fertilizer Storage

Store in cool, dry locations away from contaminants.

1.5.2.2 Topsoil

Prior to stockpiling topsoil, treat growing vegetation with application of appropriate specified non-selective herbicide. Clear and grub existing vegetation three to four weeks prior to stockpiling topsoil.

1.5.2.3 Handling

Do not drop or dump materials from vehicles.

1.6 TIME RESTRICTIONS AND PLANTING CONDITIONS

1.6.1 Restrictions

Do not plant when the ground is frozen, snow covered, muddy, or when air temperature exceeds 90 degrees Fahrenheit.

1.7 TIME LIMITATIONS

1.7.1 Seed

Apply seed within twenty four hours after seed bed preparation.

PART 2 PRODUCTS

2.1 SEED

2.1.1 Classification

Provide State-certified seed of the latest season's crop delivered in original sealed packages, bearing producer's guaranteed analysis for percentages of mixtures, purity, germination, weedseed content, and inert material. Label in conformance with AMS Seed Act and applicable state seed laws. Wet, moldy, or otherwise damaged seed will be rejected. Field mixes will be acceptable when field mix is performed on site in the presence of the Contracting Officer, or authorized Government representative.

2.1.2 Seed Mixture by Weight

<u>Common Name (Botanical Name)</u>	<u>Rate of Application</u>
Smooth Brome (Bromus Inermis)	10 lbs. per 1000 SF
K32 Mix	12 lbs. per 1000 SF

Proportion seed mixtures by weight as shown in the table above. Any temporary seeding must later be replaced by plantings for a permanent stand of grass. The same requirements for turf establishment apply for temporary seeding. If broadcasting the seed for application, increase the rate of application by 50%.

2.2 TOPSOIL

2.2.1 On-Site Topsoil

Surface soil stripped and stockpiled on site and modified as necessary to meet the specified requirements. When available, topsoil must be existing surface soil stripped and stockpiled on-site in accordance with Section 31 00 00 EARTHWORK.

2.2.2 Off-Site Topsoil

Conform to requirements as specified. Additional topsoil will be provided by the Government. If directed by the Contracting Officer, additional topsoil shall be furnished by the Contractor.

2.3 FERTILIZER

If specified, provide fertilizer for seeding operations as directed by the Contracting Officer. Fertilizer shall be a starter mix that is compatible with the specified seed mix and will promote the establishment of the new turf. Submit product data for approval that shows the fertilizer's physical characteristics (content of available nitrogen, phosphorus, and potassium) and product recommendations.

2.4 MULCH

Mulch must be free from noxious weeds, mold, and other deleterious

materials.

2.4.1 Straw

Stalks from oats, wheat, rye, barley, or rice. Furnish in air-dry condition and of proper consistency for placing with commercial mulch blowing equipment. Straw must contain no fertile seed.

2.4.2 Hay

Air-dry condition and of proper consistency for placing with commercial mulch blowing equipment. Hay must be sterile, containing no fertile seed.

2.4.3 Wood Cellulose Fiber Mulch

Use recovered materials of either paper-based (100 percent post-consumer content) or wood-based (100 percent total recovered content) hydraulic mulch. Processed to contain no growth or germination-inhibiting factors and dyed an appropriate color to facilitate visual metering of materials application. Composition on air-dry weight basis: 9 to 15 percent moisture, pH range from 5.5 to 8.2. Use with hydraulic application of grass seed and fertilizer.

2.5 WATER

Source of water must be approved by Contracting Officer and of suitable quality for irrigation, containing no elements toxic to plant life.

2.6 EROSION CONTROL MATERIALS

Provide erosion control materials for all areas shown in each task order's project drawings or as directed by the Contracting Officer. Erosion control material must conform to the following:

2.6.1 Erosion Control Blanket

100 percent agricultural straw stitched with a degradable nettings, designed to degrade within 12 months. Products shall be listed as approved products on the SDDOT AP LIST. The SDDOT AP LIST can be found at the following website:

<https://apps.sd.gov/HC60ApprovedProducts/main.aspx>

2.6.2 Erosion Control Fabric

Fabric must be knitted construction of polypropylene yarn with uniform mesh openings 3/4 to 1 inch square with strips of biodegradable paper. Filler paper strips must have a minimum life of 6 months.

2.6.3 Erosion Control Net

Net must be heavy, twisted jute mesh, weighing approximately 1.22 pounds per linear yard and 4 feet wide with mesh openings of approximately one inch square.

2.6.4 Erosion Control Material Anchors

Erosion control anchors must be as recommended by the manufacturer.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 EXTENT OF WORK

Provide soil preparation prior to planting (including soil conditioners as required), fertilizing, seeding, and surface topdressing of all newly graded finished earth surfaces, unless indicated otherwise, and at all areas inside or outside the limits of construction that are disturbed by the Contractor's operations.

3.1.1.1 Topsoil

Areas to receive topsoil shall be undercut/underfilled, shaped, and smoothed so finished lines conforms with template lines on cross sections after placement of topsoil. Provide 4 inches of existing soil to meet indicated finish grade. If existing topsoil is unavailable, topsoil shall be provided by the Government, or furnished by the Contractor if directed by the Contracting Officer. Do not spread topsoil when frozen or excessively wet or dry. After areas have been brought to indicated finish grade and if directed to do so by the Contracting Officer, incorporate fertilizer into soil a minimum depth of 4 inches by disking, harrowing, tilling or other approved method. Remove debris and stones larger than 3/4 inch in any dimension remaining on the surface after finish grading. Correct irregularities in finish surfaces to eliminate depressions. Protect finished topsoil areas from damage by vehicular or pedestrian traffic.

3.2 SEEDING

3.2.1 Seed Application Seasons and Conditions

Immediately before seeding, restore soil to proper grade. Do not seed when ground is muddy, frozen, snow covered, or in an unsatisfactory condition for seeding. If special conditions exist that may warrant a variance, submit a written request to the Contracting Officer stating the special conditions and proposed variance. Apply seed within twenty four hours after seedbed preparation. Perform seeding operations with approved equipment only.

3.2.2 Seed Application Method

Seeding method shall be either broadcasted and drop seeding, drill seeding, or hydroseeding.

3.2.2.1 Broadcast and Drop Seeding

Seed must be uniformly broadcast at the rate of 30 pounds per 1000 square feet. Use broadcast or drop seeders. Sow one-half the seed in one direction, and sow remainder at right angles to the first sowing. Cover seed uniformly to a maximum depth of 1/4 inch in clay soils and 1/2 inch in sandy soils by means of spike-tooth harrow, cultipacker, raking or other approved devices.

3.2.2.2 Drill Seeding

Seed must be drilled at the rate of 20 pounds per 1000 square feet. Use grass seed drills. Drill seed uniformly to average depth of 1/2 inch.

3.2.2.3 Hydroseeding

First, mix water and fiber. Wood cellulose fiber, paper fiber, or recycled paper must be applied as part of the hydroseeding operation. Fiber must be added at 1,000 pounds, dry weight, per acre. Then add and mix seed and fertilizer to produce a homogeneous slurry. Seed must be mixed to ensure broadcasting at the rate recommended by the manufacturer. When hydraulically sprayed on the ground, material must form a blotter like cover impregnated uniformly with grass seed. Spread with one application with no second application of mulch.

3.2.3 Mulching

3.2.3.1 Hay or Straw Mulch

Hay or straw mulch must be spread uniformly at the rate of 2 tons per acre. Mulch must be spread by hand, blower-type mulch spreader, or other approved method. Mulching must be started on the windward side of relatively flat areas or on the upper part of steep slopes, and continued uniformly until the area is covered. The mulch must not be bunched or clumped. Sunlight must not be completely excluded from penetrating to the ground surface. All areas installed with seed must be mulched on the same day as the seeding. Mulch must be anchored immediately following spreading.

3.2.3.2 Mechanical Anchor

Mechanical anchor must be a V-type-wheel land packer; a scalloped-disk land packer designed to force mulch into the soil surface; or other suitable equipment.

3.2.4 Rolling

Immediately after seeding, firm entire area except for slopes in excess of 3 to 1 with a roller not exceeding 90 pounds for each foot of roller width.

3.2.5 Erosion Control Material

Install in accordance with manufacturer's instructions, where indicated on the project drawings provided for each task order, and as directed by the Contracting Officer.

3.2.6 Watering

Start watering areas seeded as required by temperature and wind conditions. Apply water at a rate sufficient to insure thorough wetting of soil to a depth of 2 inches without run off. During the germination process, seed is to be kept actively growing and not allowed to dry out.

3.3 PROTECTION OF TURF AREAS

Immediately after turfing, protect area against traffic and other use.

3.4 RESTORATION

Restore to original condition existing turf areas which have been damaged during construction of turf installation operations at the Contractor's

expense. Keep clean, at all times, at least one paved pedestrian access route. Clean other paving when work in adjacent areas is complete.

-- End of Section --

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