

August 20, 2024

ADDENDUM NO. 2

**RE: Item #3, August 21, 2024 Letting - IM 0901(200)1, PCN 07D3, Lawrence County - Polymer
Chip Seal, Joints, Approach Slab Repair**

TO WHOM IT MAY CONCERN:

The following addenda to the plans shall be inserted and made a part of your proposal for the referenced project.

SPECIAL PROVISIONS: Please remove the Index of Special Provisions and replace with attached Index of Special Provisions revised 8/20/24.

Please remove the "Special Provision for High Friction Surface Treatment", dated 8/19/24 and replace with the "Special Provision for High Friction Surface Treatment", dated 8/20/24. *Asphalt Concrete Pavement Preparation and HFST Application was revised.*

SDEBS BID PROPOSAL: *The electronic bid proposal for this contract has been revised to include the changes associated with this addendum. Bidders must log in to the SDEBS to retrieve and incorporate these changes into their bid.*

Bid Items were added:

Bid Item 900E1258 "Abrasive Blasting of AC Pavement"

PLANS: Please destroy sheet 2 and replace with the enclosed sheets, dated 8/20/24.

Sheet 2: Bid Item 900E1258 "Abrasive Blasting of AC Pavement" was added.

Sincerely,

Sam Weisgram
Engineering Supervisor

SW/cj

CC: Todd Seaman, Rapid City Region Engineer
Mike Carlson, Rapid City Area Engineer

REV 8/20/24

INDEX OF SPECIAL PROVISIONS

PROJECT NUMBER(S): IM 0901(200)1

PCN: 07D3

TYPE OF WORK: POLYMER CHIP SEAL, JOINTS, APPROACH SLAB REPAIR

COUNTY: LAWRENCE

The following clauses have been prepared subsequent to the Standard Specifications for Roads and Bridges and refer only to the above described improvement, for which the following Proposal is made.

The Contractor's attention is directed to the need for securing from the Department of Environment & Natural Resources, Foss Building, Pierre, South Dakota, permission to remove water from public sources (lakes, rivers, streams, etc.). The Contractor should make his request as early as possible after receiving his contract, and insofar as possible at least 30 days prior to the date that the water is to be used.

Jonathan England is the official in charge of the Spearfish Career Center for Lawrence County.

THE FOLLOWING ITEMS ARE INCLUDED IN THIS PROPOSAL FORM:

Special Provision for Contract Time, dated 8/19/24.

Special Provision for High Friction Surface Treatment, dated 8/20/24.

Special Provision for Acknowledgment and Certification Regarding Article 3, Section 12 of the South Dakota Constitution, dated 8/24/23.

Special Provision for Buy America, dated 5/1/24.

Special Provision for Liability Insurance, dated 4/21/22.

Special Provision for Responsibility for Damage Claims, dated 4/21/22.

Special Provision for Restriction of Boycott of Israel, dated 1/31/20.

Special Provision for Contractor Administered Preconstruction Meeting, dated 12/18/19.

Fuel Adjustment Affidavit, DOT form 208 dated 7/15.

Standard Title VI Assurance, dated 3/1/16.

Special Provision For Disadvantaged Business Enterprise, dated 2/9/24.

Special Provision For EEO Affirmative Action Requirements on Federal and Federal-Aid Construction Contracts, dated 2/5/24.

Special Provision For Required Contract Provisions Federal-Aid Construction Contracts, Form FHWA 1273 (Rev. October 23, 2023), dated 10/18/23.

Required Contract Provisions Federal-Aid Construction Contracts, Form FHWA 1273 (Rev. 10/23/23).

Special Provision Regarding Minimum Wage on Federal-Aid Projects, dated 10/24/19.

Wage and Hour Division US Department of Labor Washington DC. - US Dept. of Labor Decision Number SD20230032, dated 3/10/23.

Special Provision for Supplemental Specifications to 2015 Standard Specifications for Roads and Bridges, dated 9/7/22.

Special Provision for Price Schedule for Miscellaneous Items, dated 12/6/23.

**STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION**

**SPECIAL PROVISION
FOR
HIGH FRICTION SURFACE TREATMENT**

**PROJECT IM 0901(200)1, PCN 07D3
LAWRENCE COUNTY**

AUGUST 20, 2024

I. DESCRIPTION

This work consists of construction of a High Friction Surface Treatment (HFST) using calcined bauxite aggregate bound with an epoxy resin binder.

II. MATERIALS

A. Epoxy Resin Binder: The epoxy resin binder will consist of a two-part resin binder/compound which holds the calcined bauxite aggregate firmly in position. The epoxy resin binder will conform to the requirements of Table 1. The epoxy resin binder will be certified to meet the requirements of Table 1. The certification will contain test results dated no more than 2 years prior to the anticipated application season from an accredited laboratory for the properties listed in Table 1 meeting the applicable requirements. The Contractor will submit the certification for approval by the Engineer and the Manufacturer's recommended mixing ratio a minimum of 14 days prior to beginning the test section.

Table 1

Physical Requirements for Low Modulus Epoxy		
Property	Requirements	Test Method
Viscosity	1500-3000 Centipoise*	ASTM D2556-11 Spindle and speed selection based on ASTM D2556-11
Gel Time	10 minutes minimum	ASTM C881/M 235
Compressive Modulus 7 days	130,000 psi max	ASTM D695
Compressive Strength 24 hours	3,000 psi min	ASTM C579 Test Method B
Tensile Strength 7days	2,000-5,000 psi	ASTM C881/M 235
Tensile Elongation	40% min	ASTM C881/M 235
Absorption	1.0% max	ASTM C881/M 235
Type D Hardness	60-80	ASTM D2240 Cure specimen for 7 days± 6 hours
Thermal Compatibility	PASS	ASTM C884

*Epoxies with low viscosities may be unsuitable for some heated mechanical applications.

B. Calcined Bauxite Aggregate: The material will be clean, dry, free from foreign matter, and conform to the requirements in Table 2. The Contractor will deliver the calcined bauxite aggregate to the construction site in clearly labeled sealed containers. The calcined bauxite aggregate will be certified to meet the requirements of Table 2. The certification will contain the test results dated no more than 2 years prior to the anticipated application season from an accredited laboratory for the properties listed in Table 2. The Contractor will submit the certification for approval by the Engineer a minimum of 14 days prior to beginning the test section.

Table 2

Calcined Bauxite Aggregate Requirements		
Property	Requirements	Test Method
Gradation	100.0% Passing #4 95.0% - 100.0% Passing #6 0.0% - 5.0% Passing #16 0.0% - 0.2% Passing #30	AASHTO T 27
Moisture Content	0.2% Maximum	AASHTO T 255
Aluminum Oxide	87% Minimum	ASTM C25
Resistance to Degradation	20% Maximum	AASHTO T 96

III. CONSTRUCTION REQUIREMENTS

A. General:

1. **Quality Control (QC) Plan:** The Contractor will submit a QC plan to the Engineer for approval at least 14 days prior to the placement of the HFST. The QC plan will show proposed methods to control the equipment, materials, mixing, and placement operations to ensure conformance with these specifications. The Contractor will discuss the QC plan at the preconstruction meeting and as requested by the Engineer.

At a minimum, the QC plan will contain the following:

- a. Key Personnel and Contact Information.
 - 1) The QC plan will designate a plan administrator, who will have full authority to institute any action necessary for the successful operation of the plan. The plan administrator will be available on the jobsite within one hour after being notified of a concern.
 - 2) A field technician will be present at the job site unless otherwise approved in the QC plan. The technician will be responsible for the required field quality control sampling and testing in conformance with the approved QC plan and contract documents. The Contractor will maintain and make available upon request complete records of sampling, testing, actions taken to correct problems, and quality control inspection results. Any deviation from the approved QC plan, without Engineer approval, will be cause for immediate suspension of operations.
- b. Epoxy resin binder production plants, locations of plant, personnel qualifications, inspection and record keeping methods, equipment calibration records, accreditation certificates, and minimum frequencies of sampling and testing per Table 1.
- c. Calcined Bauxite aggregate production plant locations, personnel qualifications, inspection and record keeping methods, equipment calibration records, accreditation certificates, and minimum frequencies of sampling and testing per Table 2.
- d. Calcined Bauxite aggregate storage and moisture control methods.
- e. Cleaning and maintenance procedures and schedule for mixing and application equipment. The cleaning and maintenance procedures and schedule will contain the equipment manufacturer's recommendations for maximum allowable time the epoxy resin binder may remain in the

application equipment before cleaning of the mixer and application system is required.

- f. Corrective actions that will be taken for unsatisfactory construction practices.
2. **Weather Limitations:** The Contractor will not apply the epoxy resin binder material on wet surfaces (including condensation moisture from construction vehicles in front binder application), when the ambient air and pavement surface temperature is less than 55°F or above 105°F, or when the anticipated weather conditions or pavement surface temperature would prevent the proper application of the surface treatment in accordance with the manufacturer's recommendations.
 3. **Seasonal Limitations:** HFST will only be applied within the seasonal limitation of May 1 to October 15 (inclusive).
 4. **Manufacturer's Representative:** A manufacturer's representative must be present on the jobsite for a minimum of the first two full production days of HFST application.

The manufacturer's representative will provide the Engineer and the Contractor with a copy of the written recommendations, technical data sheet, and product safety data sheet. In addition, the Contractor will make a product safety data sheet available to anyone who will be exposed to the epoxy resin binder materials.

5. **Fully-Automated Continuous Application:** The contractor will apply the epoxy resin binder by a truck or trailer mounted application machine that continually mixes, meters, monitors, and delivers the binder components on demand in varying widths up to 12 feet wide at a minimum uniform thickness of 60 mils. Squeegee application of the epoxy resin will not be permitted except as specified for hand applications in accordance with Section III.A.6. The application equipment must utilize continuous pumping and proportioning devices that blends the binder components within a controlled system per the manufacturer's specifications (+/- 2% by volume). The epoxy resin binder must be continuously applied once blended. The application equipment must have an independent recirculating heating system capable of heating the epoxy resin binder per manufacturer's specifications.

The continuous application equipment will utilize an aggregate distribution system capable of mechanically placing aggregate at an application rate of 13 lbs./SY, within 30 seconds of the epoxy resin binder, and from a maximum height of 12 inches into the wet epoxy resin binder evenly across the full width of the installation. Hand application of the aggregate will only be allowed in accordance with Section III.A.6. No exposed "wet" spots of

the epoxy resin binder will be visible once the aggregate is installed. The Contractor will ensure no seams are visible in the middle of the traffic lanes of the finished work after application of the HFST calcined bauxite aggregate.

The Contractor will not allow the mixed epoxy resin binder to separate, cure, dry, be exposed, or harden which may impair retention and bonding of the calcined bauxite aggregate.

The application equipment must be equipped with a built-in data management unit producing real time data providing the following information to the Engineer:

1. The volume of mixed epoxy resin binder per SY being applied
2. The rate of aggregate being applied in lbs./SY
3. The mixed epoxy resin binder mil thickness on average throughout the application width per SY
4. The ambient air and pavement surface temperature during the application period

- 6. Hand Application:** Hand application may be used for areas less than 300 yd². For hand applications, the Contractor will mix the epoxy resin binder components to the correct proportion within 4% by weight using a low speed high torque drill fitted with a helical stirrer. The Contractor will mechanically spray or squeegee the polymeric resin binder over the application surface area. The Contractor will use spiked shoes for all walking, standing, or any other form of foot contact with the polymeric resin binder prior to the application of the calcined bauxite aggregate. The Contractor will apply the epoxy resin binder in the number of layers (minimum of one) recommended by the manufacturer. The application rates of the polymeric resin binder in the various layers shall be as recommended by the manufacturer in order to achieve an average application thickness of 60 mils on the surface.

The Contractor will sprinkle or vertically drop the calcined bauxite aggregate resulting in a minimum coverage rate of 13 lbs./yd² without splashing or disrupting the leveling of the “wet” epoxy resin binder during placement, whether by mechanical or manual means.

- 7. Test Section:** The Contractor will construct a test section (minimum of 200 yd², maximum of 500 yd²) at a self-determined location to demonstrate equipment has been properly calibrated a minimum of 24 hours prior to beginning the project, unless a shorter time period is approved and the finished surface is satisfactory to the Engineer. If the project site is used for the test section, the Contractor will open the test section to traffic after curing has completed, and no uncovered epoxy resin binder remains exposed. The Contractor will correct deficient areas before opening to traffic as directed by the Engineer at no additional cost. At the completion of the

test section, the Contractor will demonstrate the application equipment cleaning procedures.

B. Portland Cement Concrete Pavement and Bridge Approach Slab Preparation and HFST Application:

- 1. Preparation:** Surfaces must be clean, dry, and free of all dust, oil, debris and any other material that might interfere with the bond between the epoxy resin binder material and existing surfaces. Adequate cleaning of all surfaces will be determined by the Engineer. The Contractor will remove pavement markings and delineation within the area to receive HFST prior to placing epoxy resin binder.

The Contractor will prepare the surface receiving a HFST in accordance with the following.

- a. Abrasive Blasting of PCC Pavement:** The entire surface will be thoroughly shot blasted to approximately an International Concrete Repair Institute (ICRI) concrete surface profile CSP-5 (medium shot blast) to remove all foreign materials which may interfere with the bonding or curing of the HFST. The shot blasting will remove all surface laitance and will expose the coarse aggregate to the satisfaction of the Engineer. Small areas where shot blasting is unable to be performed (curb lines, etc.) will be cleaned by abrasive blast cleaning to the satisfaction of the Engineer.

Upon completion of the shot blasting and abrasive blasting, the entire surface will be blown clean with dry compressed air to remove all dust and debris.

Cleaning by shot blasting, abrasive blasting, and compressed air will be done no more than 24 hours prior to the placement of the HFST. In the event the HFST is not placed within 24 hours of shot blasting and abrasive blast cleaning or in the event of rain or other inclement weather contaminating the surface, the surface will be re-cleaned by abrasive blast cleaning and dry compressed air.

- b. Grinding PCC Pavement:** The entire surface will be ground prior to placement of a HFST.

The Contractor will accomplish grinding with specially prepared circular diamond blades mounted on a horizontal shaft on a self-propelled machine designed for grinding and texturing pavement. The equipment will be operated in such a manner that it will not damage the underlying surface. Grinding equipment that causes ravels, aggregate fractures, or spalls will not be allowed to continue.

The grinding will be performed in the longitudinal direction. The grinding will result in a parallel corduroy texture consisting of grooves between 0.090 and 0.130 inches wide. The distance between the grooves will be between 0.060 and 0.125 inches. The peaks of the ridges will not be greater than 1/16 inch higher than the bottom of the grooves. The grinding will be uniform and will follow the existing profile of the pavement surface. The grinding process will not introduce dips and bumps that did not previously exist on the surface or in any way decrease the existing ride quality.

The Contractor will day light grinding to the outside edge of the pavement. The Contractor will repair and replace joint sealant damaged by corrective grinding as directed by the Engineer and at no additional cost to the Department. The Contractor will not leave ground areas smooth or polished. The Contractor will ensure ground areas have a uniform texture equal in roughness to the surrounding unground concrete.

The Contractor will establish a positive means for the removal of the grinding residue. Solid residue will be removed from the pavement surfaces before being blown by traffic action or wind. The Contractor will conduct this work to control and minimize airborne dust and similar debris that may become a hazard to motor vehicle operation or nuisance to property owners. Residue from wet grooving will not be permitted to flow across lanes being used by public traffic or into gutter or drainage facilities. Residue, whether in solid or slurry form, will be disposed of in a manner that will prevent it from reaching any waterway in a concentrated state.

Only equipment required for the application of the HFST will be allowed on any portion of the surface which has been cleaned and prepared for application of the HFST. If equipment is used on the cleaned and prepared surface, the area will be protected from contamination with plastic.

Surfaces may need to be washed with a mild detergent, rinsed, and dried using a hot compressed air lance.

2. **HFST Application:** The Contractor will apply the HFST on Portland cement concrete pavements and bridge approach slabs in accordance with the following.
 - a. **Epoxy Resin Binder Application Requirements:** The Contractor will apply the two-part modified epoxy resin binder onto the surface to be treated within the temperature range specified and in accordance with Section III.A of this special provision.

- b. Calcined Bauxite Aggregate Application Requirements:** The Contractor will apply the calcined bauxite aggregate in accordance with Section III.A of this special provision.
- c. Curing and Clean Up:** The Contractor will allow the HFST to cure in accordance with the epoxy resin binder manufacturer's recommendations (3 hours maximum at an ambient air temperature of at least 75°F). The Contractor will clean up the HFST by removing the excess calcined bauxite aggregate on the treated area and adjacent areas with raveled calcined bauxite aggregate. The Contractor will perform the clean-up prior to opening the section to traffic. The Contractor may reuse excess HFST calcined bauxite aggregate. In order to reuse the reclaimed excess HFST calcined bauxite aggregate, the Contractor must reclaim the excess HFST calcined bauxite aggregate with a mechanical sweeper. The recovered calcined bauxite aggregate must be clean, uncontaminated, and dry. The Contractor will perform street sweeping before placing pavement markings. Temporary or permanent pavement markings must be in place prior to opening lanes to traffic. At least 3 days but not more than 5 days following opening the application area to through traffic, the Contractor will perform additional clean-up of the application area to remove all aggregate shed from the application site by traffic. The Contractor will perform this clean up by sweeping the surface with equipment meeting the requirements of Section 4.5 of the specifications.

C. Asphalt Concrete Pavement Preparation and HFST Application:

- 1. Preparation:** Surfaces must be clean, dry, and free of all dust, oil, debris and any other material that might interfere with the bond between the epoxy resin binder material and existing surfaces. Adequate cleaning of all surfaces will be determined by the Engineer. The Contractor will remove pavement markings and delineation within the area to receive HFST prior to placing epoxy resin binder.

The Contractor will prepare the surface receiving a HFST in accordance with the following.

a. Abrasive Blasting of Asphalt Concrete:

The entire asphalt concrete surface will be thoroughly shot blasted to approximately an International Concrete Repair Institute (ICRI) concrete surface profile CSP-5 (medium shot blast) to remove all foreign materials and to remove any surface oil coating the aggregate which may interfere with the bonding or curing of the HFST. The shot blasting will remove all surface laitance and will expose the coarse aggregate to

the satisfaction of the Engineer. Small areas where shot blasting is unable to be performed (curb lines, etc.) will be cleaned by abrasive blast cleaning to the satisfaction of the Engineer.

Upon completion of the shot blasting and abrasive blasting, the entire surface will be blown clean with dry compressed air to remove all dust and debris.

Cleaning by shot blasting, abrasive blasting, and compressed air will be done no more than 24 hours prior to the placement of the HFST. In the event the HFST is not placed within 24 hours of shot blasting and abrasive blast cleaning or in the event of rain or other inclement weather contaminating the surface, the surface will be re-cleaned by abrasive blast cleaning and dry compressed air.

Only equipment required for the application of the HFST will be allowed on any portion of the surface which has been cleaned and prepared for application of the HFST. If equipment is used on the cleaned and prepared surface, the area will be protected from contamination with plastic.

Surfaces may need to be washed with a mild detergent, rinsed, and dried using a hot compressed air lance.

2. **Asphalt Concrete Pavements HFST Application:** HFST installation will not be permitted within the first 30 days following any new asphalt concrete paving. The Contractor will apply the HFST on asphalt pavements in accordance with the following.
 - a. **Epoxy Resin Binder Application Requirements:** The Contractor will apply the two-part modified epoxy resin binder onto the surface to be treated within the temperature range specified and in accordance with Section III.A of this special provision.
 - b. **Calcined Bauxite Aggregate Application Requirements:** The Contractor will apply the calcined bauxite aggregate in accordance with Section III.A of this special provision.
 - c. **Curing and Clean Up:** The Contractor will allow the HFST to cure in accordance with the epoxy resin binder manufacturer's recommendations (3 hours maximum at an ambient air temperature of at least 75°F). The Contractor will clean up the HFST by removing the excess calcined bauxite aggregate on the treated area and adjacent areas with raveled calcined bauxite aggregate. The Contractor will perform the clean-up prior to opening the section to traffic. The Contractor may reuse excess HFST calcined bauxite aggregate. In order to reuse the reclaimed excess HFST calcined bauxite aggregate,

the Contractor must reclaim the excess HFST calcined bauxite aggregate with a mechanical sweeper. The recovered calcined bauxite aggregate must be clean, uncontaminated, and dry. The Contractor will perform street sweeping before placing pavement markings. Temporary or permanent pavement markings must be in place prior to opening lanes to traffic. At least 3 days but not more than 5 days following opening the application area to through traffic, the Contractor will perform additional clean-up of the application area to remove all aggregate shed from the application site by traffic. The Contractor will perform this clean up by sweeping the surface with equipment meeting the requirements of Section 4.5 of the specifications.

B. Field Acceptance Testing: The Contractor will ensure the coverage rate of the retained calcined bauxite aggregate is a minimum of 13 lbs./yd². The Contractor will remove and reapply HFST where any patches of exposed epoxy resin binder exist, at no additional cost. The Contractor will perform testing in accordance with Table 3 between 60 and 90 days after installation.

Table 3

Field Acceptance Testing Requirements			
Property	Requirements	Frequency	Test Method
FN40R (Corrected field FN by adding the correction in Table 4)	65 Minimum	Every 0.1 mile in each lane. Location determined by SDDOT	ASTM E274 using a ribbed tire

Table 4

HFST Speed Correction Factors for ASTM E274 Testing					
Test Speed (mph)	FN Correction	Test Speed (mph)	FN Correction	Test Speed (mph)	FN Correction
20	-9.3	30	-4.8	40	0.0
21	-8.9	31	-4.4	41	0.5
22	-8.4	32	-3.9	42	1.0
23	-8.0	33	-3.4	43	1.5
24	-7.6	34	-2.9	44	2.0
25	-7.1	35	-2.5	45	2.5
26	-6.7	36	-2.0	46	3.1
27	-6.2	37	-1.5	47	3.6
28	-5.8	38	-1.0	48	4.1
29	-5.3	39	-0.5	49	4.6

The maximum aggregate moisture at the time of application will not exceed 0.5%. The Department will sample the aggregate and perform the aggregate

moisture testing in accordance with SD 108 at a minimum frequency of 1 per day.

II. METHOD OF MEASUREMENT

- A. Abrasive Blasting of PCC Pavement:** Measurement will not be made for abrasive blasting of PCC pavement. The plan quantity will be the basis of payment.
- B. Grinding PCC Pavement:** Measurement will not be made for grinding PCC pavement. The plan quantity will be the basis of payment.
- C. Abrasive Blasting of AC Pavement:** Measurement will not be made for abrasive blasting of AC Pavement. The plan quantity will be the basis of payment.
- D. High Friction Surface Treatment:** Measurement will not be made for high friction surface treatment. The plan quantity will be the basis of payment unless additional application areas are ordered by the Engineer. No deductions will be made for the areas occupied by manholes, inlets, drainage structures, pavement markings, or by any public utility appurtenances within the area.

III. BASIS OF PAYMENT

- A. Abrasive Blasting of PCC Pavement:** Abrasive blasting of PCC pavement will be paid for at the contract unit price per square yard. Payment will be full compensation for all labor, equipment, materials, and all incidental work required to shot blast and abrasive blast clean the PCC pavement surface of all foreign materials and to remove and dispose of all residue.
- B. Grinding PCC Pavement:** Grinding PCC pavement will be paid for at the contract unit price per square yard. Payment will be full compensation for all labor, equipment, materials, and all incidental work required to grind the surface and to contain, remove, and dispose of the grinding residue and water.
- C. Abrasive Blasting of AC Pavement:** Abrasive blasting of AC pavement will be paid for at the contract unit price per square yard. Payment will be full compensation for all labor, equipment, materials, and all incidental work required to shot blast and abrasive blast clean the AC pavement surface of all foreign materials and to remove and dispose of all residue.
- D. High Friction Surface Treatment:** High friction surface treatment will be paid for at the contract unit price per square yard. Payment will be full compensation for all labor, equipment, materials, and all incidental work required to furnish and install the high friction surface treatment including all testing and to remove

and dispose of excess calcined bauxite aggregate and all preparation work required by this specification not included in the contract items provided.

* * * * *

ESTIMATE OF QUANTITIES

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0901(200)1	2	177

Structure No. 41-015-042

Revised 8/20/24 GDS

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
110E0730	Remove Beam Guardrail	150.0	Ft
110E1010	Remove Asphalt Concrete Pavement	3,869.0	SqYd
110E6410	Remove Type 1 MGS for Reset	1,150.0	Ft
110E6617	Remove MGS Tangent End Terminal for Reset	4	Each
120E0010	Unclassified Excavation	860	CuYd
260E1010	Base Course	1,065.0	Ton
260E2010	Gravel Cushion	280.0	Ton
320E1200	Asphalt Concrete Composite	428.0	Ton
380E0070	9" Nonreinforced PCC Pavement	2,666.6	SqYd
380E6110	Insert Steel Bar in PCC Pavement	1,200	Each
630E1500	Type 1 Guardrail Transition	4	Each
630E5010	Reset Type 1 MGS	1,150.0	Ft
630E5206	Reset MGS Tangent End Terminal	4	Each
633E1220	High Build Waterborne Pavement Marking Paint, 4" White	420	Ft
633E1222	High Build Waterborne Pavement Marking Paint, 4" Yellow	420	Ft
633E1230	High Build Waterborne Pavement Marking Paint, 6" White	2,002	Ft
633E1232	High Build Waterborne Pavement Marking Paint, 6" Yellow	1,078	Ft
634E0010	Flagging	2,000.0	Hour
634E0110	Traffic Control Signs	1,819.1	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0275	Type 3 Barricade	20	Each
634E0310	Temporary Flexible Vertical Markers (Tabs)	4,032	Ft
634E0420	Type C Advance Warning Arrow Board	4	Each
634E0525	Linear Delineation System Panel, Barrier Mounted	23	Each
634E0700	Traffic Control Movable Concrete Barrier	46	Each
634E0750	Temporary Concrete Barrier End Protection	2	Each
634E0755	Remove and Reset Temporary Concrete Barrier End Protection	2	Each
634E0760	Temporary Concrete Barrier End Protection Module Set or Repair Kit	1	Each
634E1002	Detour and Restriction Signing	632.9	SqFt
900E1250	High Friction Surface Treatment	933.0	SqYd
900E1258	Abrasive Blasting of AC Pavement	933.0	SqYd

Structure No. 41-015-041

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
410E2600	Membrane Sealant Expansion Joint	83.8	Ft
460E0070	Class A45 Concrete, Bridge Repair	8.1	CuYd
460E0300	Breakout Structural Concrete	8.1	CuYd
464E0100	Controlled Density Fill	2.7	CuYd
480E0200	Epoxy Coated Reinforcing Steel	347	Lb
480E0505	No. 5 Rebar Splice	8	Each
480E5000	Galvanic Anode	104	Each
491E0005	Two Coat Bridge Deck Polymer Chip Seal	524.4	SqYd
491E0110	Abrasive Blasting of Bridge Deck	524.4	SqYd
491E0120	Bridge Deck Grinding	524.4	SqYd
491E0130	Concrete Removal, Class A	33.2	SqYd
491E0140	Concrete Removal, Class B	33.2	SqYd
491E0172	Concrete Patching Material, Bridge Deck	436.0	CuFt

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
410E2600	Membrane Sealant Expansion Joint	83.8	Ft
460E0070	Class A45 Concrete, Bridge Repair	7.0	CuYd
460E0300	Breakout Structural Concrete	7.0	CuYd
464E0100	Controlled Density Fill	1.5	CuYd
480E0200	Epoxy Coated Reinforcing Steel	347	Lb
480E0505	No. 5 Rebar Splice	8	Each
480E5000	Galvanic Anode	93	Each
491E0005	Two Coat Bridge Deck Polymer Chip Seal	524.4	SqYd
491E0110	Abrasive Blasting of Bridge Deck	524.4	SqYd
491E0120	Bridge Deck Grinding	524.4	SqYd
491E0130	Concrete Removal, Class A	30.1	SqYd
491E0140	Concrete Removal, Class B	30.1	SqYd
491E0172	Concrete Patching Material, Bridge Deck	395.2	CuFt

Structure No. 41-020-041

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
410E2600	Membrane Sealant Expansion Joint	83.8	Ft
460E0070	Class A45 Concrete, Bridge Repair	7.7	CuYd
460E0300	Breakout Structural Concrete	7.7	CuYd
464E0100	Controlled Density Fill	4.2	CuYd
480E0200	Epoxy Coated Reinforcing Steel	347	Lb
480E0505	No. 5 Rebar Splice	8	Each
480E5000	Galvanic Anode	115	Each
491E0005	Two Coat Bridge Deck Polymer Chip Seal	582.2	SqYd
491E0110	Abrasive Blasting of Bridge Deck	582.2	SqYd
491E0120	Bridge Deck Grinding	582.2	SqYd
491E0130	Concrete Removal, Class A	22.0	SqYd
491E0140	Concrete Removal, Class B	22.0	SqYd
491E0172	Concrete Patching Material, Bridge Deck	288.8	CuFt

Structure No. 41-020-042

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
410E2600	Membrane Sealant Expansion Joint	83.8	Ft
460E0070	Class A45 Concrete, Bridge Repair	9.7	CuYd
460E0300	Breakout Structural Concrete	9.7	CuYd
464E0100	Controlled Density Fill	2.7	CuYd
480E0200	Epoxy Coated Reinforcing Steel	347	Lb
480E0505	No. 5 Rebar Splice	8	Each
480E5000	Galvanic Anode	124	Each
491E0005	Two Coat Bridge Deck Polymer Chip Seal	582.2	SqYd
491E0110	Abrasive Blasting of Bridge Deck	582.2	SqYd
491E0120	Bridge Deck Grinding	582.2	SqYd
491E0130	Concrete Removal, Class A	31.2	SqYd
491E0140	Concrete Removal, Class B	31.2	SqYd
491E0172	Concrete Patching Material, Bridge Deck	409.8	CuFt

Structure No. 41-061-056

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
460E0070	Class A45 Concrete, Bridge Repair	0.7	CuYd
460E0300	Breakout Structural Concrete	0.7	CuYd
464E0100	Controlled Density Fill	1.4	CuYd
480E5000	Galvanic Anode	12	Each
491E0005	Two Coat Bridge Deck Polymer Chip Seal	759.4	SqYd
491E0110	Abrasive Blasting of Bridge Deck	759.4	SqYd
491E0120	Bridge Deck Grinding	759.4	SqYd
491E0130	Concrete Removal, Class A	4.8	SqYd
491E0140	Concrete Removal, Class B	4.8	SqYd
491E0172	Concrete Patching Material, Bridge Deck	34.0	CuFt

Structure No. 41-061-057

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
460E0070	Class A45 Concrete, Bridge Repair	0.6	CuYd
460E0300	Breakout Structural Concrete	0.6	CuYd
464E0100	Controlled Density Fill	1.2	CuYd
480E5000	Galvanic Anode	10	Each
491E0005	Two Coat Bridge Deck Polymer Chip Seal	759.4	SqYd
491E0110	Abrasive Blasting of Bridge Deck	759.4	SqYd
491E0120	Bridge Deck Grinding	759.4	SqYd
491E0130	Concrete Removal, Class A	33.7	SqYd
491E0140	Concrete Removal, Class B	33.7	SqYd
491E0172	Concrete Patching Material, Bridge Deck	239.9	CuFt