Appendix H: Sample Special Notes

SPECIAL NOTE FOR BEARING REPLACEMENT AT ABUTMENTS

I. DESCRIPTION. Perform all work in accordance with the Kentucky Transportation Cabinet, Department of Highway's 2008 Standard Specifications for Road and Bridge Construction and applicable Supplemental Specifications, the Standard Drawings, this Note, and the attached detail drawings. Section references are to the Standard Specifications.

This work consists of the following: (1) Furnish all labor, materials, tools, and equipment; (2) Jack and Support Bridge Span; (3) Remove existing bearings and clean bridge seats; (4) Place new bearing on pedestals (5) Remove jacking and temporary supports (5) Maintain and control traffic; and (6) Any other work specified as part of this contract.

II. MATERIALS.

A. Elastomeric Bearing Pads. See Section 822 and Detail Drawings

B. Structural Steel. See Section 607 and Section 812

C. Expansion Anchors. Provide hot-dip galvanized HILTI Kwik Bolt 3 expansion anchors or approved equal

III. CONSTRUCTION.

A. Remove Existing Bearings. Jack and Support Bridge span as necessary. Remove the existing bearings and dispose of off site. Do not disturb bearing load plates attached to the beams. Blast clean all areas of existing concrete at the abutment cap and pedestals to come in contact with new bearings until free of all laitance and deleterious material.

D. Bearing Replacement. Install new bearing assemblies including masonry plates, load plates and any shear transfer devices in accordance with notes and detailed drawings. Unless otherwise shown in the drawings or notes, new structural steel shall be cleaned and painted in accordance with the Specifications.

IV MEASUREMENT.

A. Bearing Replacement. Measurement will be the actual number of bearings replaced.

V. PAYMENT.

A. Bearing Replacement. Payment at the contract unit price, Each, is full compensation for all labor to install and materials comprising the new bearing assembly, including load plates, shear transfer devices, elastomeric bearing pads, expansion anchors, and all incidental items necessary to complete the work as specified by this note and as shown on the detail drawings.

SPECIAL NOTE FOR BEARING REPLACEMENTS AT PIERS B00287R & B0287L

I. DESCRIPTION. Perform all work in accordance with the Kentucky Transportation Cabinet, Department of Highway's 2008 Standard Specifications for Road and Bridge Construction and applicable Supplemental Specifications, the Standard Drawings, this Note and the rehabilitation plans (Drawing No. 17535, dated December 2007).

This work consists of the following: (1) Furnish all labor, materials, tools, and equipment; (2) Install Jacking Stiffeners; (3) Jack bearing lines in order to remove existing bearing assemblies; (4) Place new concrete on pier caps as specified and as shown on the rehabilitation plans; (5) Replace specified bearings with new bearing assemblies as specified in this note and shown on the rehabilitation plans; (6) Any other work specified as part of this contract.

II. MATERIALS

A. Class "A" Concrete. See Section 601.

B. Steel Reinforcement. Use Grade 60. See Section 602.

C. Grout and Epoxy Bond Coat. See Section 511.

D. Structural Steel. Use ASTM A709, Grade 36.

E. Weld Material. See Section 813.10. All welds shall be E70XX.

F. Bolts. Use ASTM F1554 Grade 55, Galvanized. Grade specified on the rehabilitation plans.

G. Elastomeric Bearing Pads. Bearing Pads shall conform to the size indicated on the rehabilitation plans and shall conform to the AASHTO Standard Specifications for Highway Bridges, Division II, Section 18. Bearings are to be low temperature Grade 3 with a durometer hardness of 50 and shall be subjected to the load testing requirements corresponding to Design Method B.

III. CONSTRUCTION.

A. Jacking Guidelines.

1. Install jacking stiffeners. Clean surfaces of steel to be welded until free of all corrosion, debris and deleterious substances. Attach stiffeners to girder web and flanges as shown in the rehabilitation plans.

2. Lift bearings only enough to allow for bearing removal, no more than 1/4".

3. When the load on the bearings has been relieved by the jacking procedure, remove bearing components without disturbing the girders. Refer to the rehabilitation plans.

B. Place New Concrete and Steel Reinforcement. After the bearings are removed, drill and grout the new steel reinforcement into the existing concrete pier caps according to Section 511. Provide and install steel reinforcement as shown on the bar bill in the rehabilitation plans. Ensure that all exposed steel reinforcement is tied in accordance with Section 602.03.04 prior to pouring the new Class "A" Concrete.

Blast clean all areas of existing concrete until free of laitance and deleterious substances immediately prior to the placement of the Class "A" Concrete. The surface areas of existing concrete to come in contact with the new Class "A" Concrete are to be coated with an epoxy bond coat immediately prior to placing new concrete

in accordance with Section 511. The interfaces of the new and old concrete shall be as nearly vertical and horizontal as possible. Place Class "A" concrete for pier cap risers in accordance with Section 601 and the rehabilitation plans.

C. Bearing Replacement. When the new concrete for the pier cap risers has sufficiently cured, install new bearing assemblies in accordance with the rehabilitation plans.

All new structural steel shall be cleaned and painted with two coats of commercial primer paint red orange in color, except that surfaces to come in contact with concrete are not to be painted.

D. Order of Repairs. Bearing replacement is to be done before expansion joint replacements, transverse joint elimination, and concrete overlay.

IV. MEASUREMENT.

A. Jack and Support Bearing Line. Measurement will be the number of bearing lines jacked and supported.

B. Class "A" Concrete. See Section 601.

C. Steel Reinforcement. See Section 602.

D. Bearing Replacement. Measurement will be the actual number of bearings replaced.

V. PAYMENT.

A. Jack and Support Bearing Line. Payment at the contract unit price per bearing line (Two at each pier) is full compensation for installing jacking stiffeners, jacking a single line of bearings and all incidental items necessary to complete the work as specified by this note.

B. Class "A" Concrete. See Section 601.

C. Steel Reinforcement. See Section 602.

D. Bearing Replacement. Payment at the contract unit price per bearing is full compensation for all materials comprising the new bearing assembly, all tools, material and labor for removing the existing bearing and installing the new assembly, and all incidental items necessary to complete the work as specified by this note and as shown on the rehabilitation plans.

SPECIAL NOTE FOR BRIDGE CLEANING AND PREVENTIVE MAINTENANCE

1. DESCRIPTION. Perform all work in accordance with the Kentucky Transportation Cabinet, Department of Highway's 2012 Standard Specification for Road and Bridge Construction applicable Supplemental Specifications, Standard Drawings, this Note and Attached Detailed Drawings. Section references are to the Standard Specifications. This work consists of the following: (1) Furnish all labor, materials, tools, and equipment; (2) All items included in Bridge Cleaning and Preventive Maintenance (3) Maintain and control traffic; (4) All other work required for this contract.

2. MATERIALS.

A. Wash Water

Use clean potable water for all pressure washing.

B. Concrete Coatings (Abutment Caps)

Use one of the coatings from the following manufactures:

Manufacture	Prime Coat	Finish Coat
Sherwin Williams	Macropoxy 646	Acrolon 218 HS
PPG	Amberlock 2	Devoe Devflex
Carboline	Carboguard 890	Carbothane 133 HB
Tnemec	Elastogrip 151	EnviroCrete 15

C. Bearing Lubricant

Use one of the lubricants from the following manufactures:

Manufacture	Lubricant
Bostik Inc.,	Never Seez - Mariner's Choice
Mobil Oil	Mobil Centaur Moly NLGI Grades 1 or 2
Certified Labs	Premalube #1 WG

3. CONSTRUCTION.

A. Bridge Cleaning.

Specified bridge abutment components, end of beams and end diaphrams shall have all debris shall be removed. See attached detailed drawings for each bridge addressing components having debris removal. Equipment for removing debris from the bridge components shall be determined by the Contractor, subject to the approval of the Engineer. The Contractor shall prevent any debris from entering any body of water, bridge drainage system, or traffic lanes. All debris removed shall be disposed of in a suitable off-site disposal facility. Remove all vegetation needed to facilitate the bridge cleaning. **All cost to complete Debris Removal, and Remove Vegetation shall as specified shall be included in the Lump Sum price for "Bridge Cleaning".**

B. Stratified and Pact Rust Removal.

Stratified and pack rust shall be removed from all bearing devices. All existing bearing lubrication shall be removed. See attached detailed drawings for each bridge showing location and quantity of the bearing devices. Hand tools including wire brushes, scrapers or impact devices (hand hammers or power chisels) are to be used for removing stratified and pack rust. All surfaces to have stratified and pack rust removed shall be cleaned to an SSPC SP-2 level. All debris collected shall be disposed of in a suitable off-site disposal facility. **All cost to complete Stratified, Pack Rust Removal and removal of existing bearing lubricant shall be considered incidental to the unit price bid for "Lubricate Bearing".**

C. Pressure Washing.

Specified bridge abutment components, beam ends and end diaphragms shall be pressure washed. See attached detailed drawings for each bridge addressing components to be pressure washed. All equipment for pressure washing shall be operated at a minimum pressure of up 4,000 psi with 0 degree spinner tip and/or fan tips as determined by the engineer at the working location with a minimum flow rate of 3.5 gal/minute provided that these pressures do not damage any components of the structure. Pressure and flow rates shall be reduced to a level satisfactory to the Engineer should any damage occur due to power washing procedures. Pressure washing shall be operated at distance of approximately six inches from and perpendicular to the surface. All pressure washing wands shall be equipped with a gauge to accurately determine the amount pressure used. Pressure washing of any bridge element will proceed from top of wash area to bottom of wash area. Wash water will not be released to a bridge element previously washed. Preform all pressure washing at temperatures above 40 degrees Fahrenheit. **All cost to complete Pressure Washing as specified shall be included in the Lump Sum price for Lump Sum price for "Bridge Cleaning".**

D. Concrete Coatings Application.

All abutment components, beam ends and end diaphragms shall have concrete coating applied to as specified after debris removal and power washing. Use compressed air to remove any loose debris from the surfaces that are to be coated after power washing. See concrete coating diagram. All coatings shall be applied within manufacturers recommended dry film thickness range. Comply with KYTC "Standard Specifications for Road and Bridge Construction" Section 614.03.02 and coatings supplier recommended conditions for application. Allow the surfaces to be coated to dry before any coating is applied. The coating must be applied to a clean and dry surface. All coating application shall be executed using brushes, rollers, etc. No spray application will be permitted. The Department requires acceptance testing of samples obtained on a per-lot basis per-shipment. The Division of Materials shall perform acceptance testing. Test samples shall be taken at the Contractor's paint storage site.

Department personnel shall perform sampling. Allow (10) working days for testing and approval of the sampled paint. It is the Contractor's responsibility to maintain an adequate inventory of approved paint. The Department shall assume no responsibility for lost work due to rejection of paint or approved paint subsequently found to be defective during the application process. Preform all concrete coating application at temperatures above 40 degrees Fahrenheit or in accordance with manufactures specifications.

The finish coat shall be gray and will meet the following values.

	L*	a*	b*
Grey	**74.94**	**- 1.54**	**3.92**

All cost to complete Concrete Coating Application as specified shall be included in the Lump Sum price for "Concrete Coatings".

Approximate square footage of concrete to have concrete coatings applied for each bridge follows:

120B00055N ~ 450 Square Feet

The square footage listed this bridge is for informational purposes only.

E. Bearing Lubrication Application.

Bearing devices shall be lubricated as specified after all stratified rust and pack rust is removed and power washing is complete, bearing devices shall have lubricant applied to all surfaces of the bearing including bearing plates and points of movement. See attached detailed drawings for each bridge showing location and quantity of the bearing devices. Allow bearing devices to dry before lubricant is applied. Preform all bearing lubrication application at temperatures above 40 degrees Fahrenheit or in accordance with manufactures specifications. All cost to complete Bearing Lubrication Application as specified shall be included in the unit price Each for "Lubricate Bearing"

F. Sequence of Work.

Complete work in the sequence listed below:

1. Debris Removal
2. Stratified Rust Removal
3. Pressure Washing
4. Concrete Coating Application
5. Bearing Lubrication Application

G. Inspection.

The Cabinet will provide inspection for all items required in this contract. Visual inspection will be required upon completion of each work item for each structure component or at the discretion of the Engineer at any time. All visual inspection shall be performed within arm's length distance.

1. **Debris Removal**: Visual Inspection

2. **Stratified Rust or Pack Rust Removal:** Visual Inspection and Scraper Test any surface cleaned to SSPC SP2 will be inspected by a dull scraper test to ascertain adherence of existing coating and a hammer test for tightness of pact rust.
3. **Power Washing:** Visual Inspection.
4. **Concrete Coating:**
   Prime Coat Application Check for dry film thickness*, and defects in the Paint.
   Finish Coat Application Check for dry film thickness*, paint appearance, color and quality of application.
   *Destructive DFTs shall be used. Contractor shall repair all test locations, cost will be considered incidental to the contract.
5. **Bearing Greasing:** Visual Inspection.

H. Verifying Field Conditions.

The Contractor shall be familiar with all conditions at each bridge site. The Cabinet will not consider any claims due to the Contractor having not familiarized themselves with requirements of this work.

I. Residual Lead.

Residual lead paint may still be on bridge. The Contractor is advised to take all necessary protective measures including worker safety and environmental regulations when performing surface preparation. The Department will not consider any claims based on residual lead paint.

J. Damage to the structure.

The Contractor shall bear all responsibility and expense for any and all damage to the structure during the repair work, even to the removal and replacement of a fallen span, should the fallen span result from the Contractors actions.

4. MEASUREMENT.

Bridge Cleaning: The Cabinet will measure this item by Lump Sum, completed and accepted.

Concrete Coating: The Cabinet will measure this item by Lump Sum, completed and accepted.

Bearing Lubrication: The Cabinet will measure this item by Each, completed and accepted.

5. PAYMENT.

Bridge Cleaning (24981EC): Payment at the contract unit price for "Lump Sum" is full compensation for Debris Removal, Deck Drain Cleaning, Pressure Washing and all incidental items required to complete this with as specified in this note and attached detailed drawings.

Concrete Coating (24982EC): Payment at the contract unit price for "Lump Sum" is full compensation for applying the concreate coatings and all incidental items required to complete this work as specified in this note and attached detailed drawings.

Bearing Lubrication (24983EC): Payment at the contract unit price "Each" is full compensation for applying bearing lubrication and all incidental items required to complete this work as specified in this note and attached detailed drawings.

SPECIAL NOTE FOR BRIDGE JOINT SEAL REPLACEMENT

I. DESCRIPTION. Perform all work in accordance with the Kentucky Transportation Cabinet, Department of Highway's 2012 Standard Specifications for Road and Bridge Construction and applicable Supplemental Specifications, the Standard Drawings, this Note, and the attached detail drawings. Section references are to the Standard Specifications.

This work consists of the following: (1) Furnish all labor, materials, tools, and equipment; (2) Remove existing bridge joint seals; (3) Install new joint seals; (4) Maintain and control traffic; (5) Any other work specified as part of this contract.

All construction will be in accordance with Section 606 unless otherwise specified.

II. MATERIALS.

A. (2") Joint Seal. It shall have a cellular, or micro-cell, polyurethane foam impregnated with a hydrophobic acrylic emulsion, or a hydrophobic polymer. The polyurethane foam external facing shall be factory coated and cured with highway-grade, fuel resistant silicone or a highway-grade elastomeric coating at a width greater than the maximum joint expansion.

B. **Preformed Neoprene Strip Seal.** See attached detail drawings and Section 807.

III. CONSTRUCTION.

A. Remove Existing Materials. Remove existing Expansion Dam as shown on the attached sketches. Remove debris and/or expansion joint filler as directed by the Engineer. Clean and leave all existing steel reinforcement encountered in place. Damaged steel reinforcement will be repaired/replaced as directed by the Engineer at no additional cost to the Department.

Dispose of all removed material entirely away from the job site. This work is incidental to the contract unit price for "Joint Seal Replacement".

B. (2") Joint Seal. Seal shall be installed in accordance with manufacturer's recommendations concerning approved adhesives, welds between sticks and appurtenances, and adhesion to concrete deck or armored edges. Joint seal is to be installed ½" recessed from the surface.

C. Preformed Neoprene Strip Seal. Place the preformed joint seal in one continuous, unbroken length. Place neoprene strip seal as recommended by the manufacturer and in accordance with Section 609.03.04

D. Shop Plans. Shop plans will <u>not</u> be required. The Contractor is responsible for obtaining field measurements and supplying properly sized materials to complete the work.

IV. MEASUREMENT.

A. Joint Seal Replacement – 2". The Department will measure the quantity in linear feet from gutterline to gutterline along the centerline of the joint.

V. PAYMENT. See Section 606 and the following:

A. Joint Seal Replacement – 2". Payment at the contract unit price per linear foot is full compensation for removing specified existing materials, furnishing and installing neoprene strip seal or pre-compressed horizontal expansion joint system and all incidental items necessary to complete the work within the specified pay limits as specified by this note and as shown on the attached detail drawings.

SPECIAL NOTE FOR BRIDGE RESTORATION AND WATERPROOFING WITH CONCRETE OVERLAYS

I. DESCRIPTION. Perform all work in accordance with the Kentucky Transportation Cabinet, Department of Highway's 2012 Standard Specifications for Road and Bridge Construction and applicable Supplemental Specifications, the Standard Drawings, this Note, and the attached detail drawings. Section references are to the Standard Specifications.

This work consists of the following: (1) Furnish all labor, materials, tools, and equipment; (2) Machine prep the existing slab; (3) Complete full-depth and partial depth repairs as directed by the Engineer; (4) Repair/replace damaged and corroded reinforcing bars; (5) Place new concrete overlay and epoxy-sand slurry in accordance with Section 606; (6) Complete asphalt/concrete approach pavement; (7) Maintain and control traffic; and (8) Any other work specified as part of this contract.

All construction will be in accordance with Section 606 unless otherwise specified.

II. MATERIALS.

A. Latex Concrete. See Section 606.03.17.

B. Class "M" Concrete. Use either "M1" or "M2". See Section 601.

C. Bituminous Asphalt. Use CL3 ASPH SURF 0.38D PG76-22; CL4 ASPH SURF 0.38D PG76-22.

D. Epoxy-Sand Slurry. See Section 606.03.10.

III. CONSTRUCTION.

A. Machine prep of existing slab. Remove concrete from existing slab to a depth of at least ¼" below the existing surface, and remove all patches completely, in accordance with the requirements of Section 606.03.03.

B. Partial Depth Slab Repair and Latex Overlay. Remove areas determined to be unsound by the Engineer via hydrodemolition or via hand held jackhammers weighing less than 45lbs in accordance with Section 606.02.10 D. Repair/Replace all damaged or severely corroded reinforcing bars prior to partial depth repair operation. The Department will not measure material removal and will consider this work incidental to the bid item "PARTIAL DEPTH PATCHING". Mix and place Latex Modified Concrete Overlay in accordance with Sections 606.03.08 and 606.03.17.

C. Asphalt/Concrete Approach Pavement. Mill each existing asphalt approach for a distance of 100' from the bridge end. For the rigid approach (south), repair any damaged rigid approach with Class M concrete. Remove the bituminous material uniformly by making an edge key, so as to provide a smooth transition to the finished bridge when a new bituminous overlay of compacted depth of approximately 1½" is added to the approaches. The grinding depth may vary depending of the condition of the existing approach and final elevation of bridge end. Dispose of all removed material away from the site.

D. Surface Texturing. Texture the concrete surface of the overlay in accordance with Section 609.03.10.

IV. MEASUREMENT. See Section 606 and the following:

A. Latex Modified Concrete for Overlay. The Department will measure the quantity in cubic yards using the theoretical volume as follows for each bridge:

056B00388N	**(403'x 96'x 1.50")**	**=**	**163.0 cuyd**
056B00391N	**(413'x 150'x 1.50")**	**=**	**287.0 cuyd**

B. Latex Modified Concrete for Partial Depth Patching and variable thickness of Overlay. The Department will measure the quantity in cubic yards by deducting the theoretical volume of bridge deck overlay (LMC) from the total volume (as indicated by the batch quantity tickets) of Concrete required to obtain the finished grade shown on the Plans or established by the Engineer.

C. Machine Prep of Slab. The Department will measure the machine preparation of the existing bridge deck in square yards, which shall include all labor, equipment, and material needed to complete this work.

D. Steel Reinforcement. The Department will measure any reinforcing steel necessary for the partial or full depth patch in pounds, which shall include all labor, equipment, and material needed to complete this work.

E. Asphalt/Concrete Approach Pavement. The Department will measure the quantity in square yards, which shall include all labor, equipment, and material needed to complete this work.

V. PAYMENT. See Section 606 and the following:

A. Latex Modified Concrete for Overlay. The Department will make payment for the Latex Modified Concrete under bid item #08534 "CONCRETE OVERLAY – LATEX" for the quantity in cubic yards complete in place.

B. Latex Modified Concrete for Partial Depth Patching and variable thickness of Overlay. The Department will make payment for the Partial Depth Patching under bid item #24094EC "PARTIAL DEPTH PATCHING". Payment will be for the quantity per cubic yard complete in place.

C. Machine Prep of Slab. The Department will make payment for the machine preparation of the existing bridge deck under bid item #08551 "MACHINE PREP OF SLAB"**.** Payment will be for the square yard complete.

D. Steel Reinforcement. The Department will make payment for steel reinforcement, if necessary, under bid item #08150 "STEEL REINFORCEMENT". Payment will be at the unit price per pound.

E. Asphalt/Concrete Approach Pavement. The Department will make payment for the completed and accepted quantity of this work under the bid item #03304 "BRIDGE OVERLAY APPROACH PAVEMENT".

SPECIAL NOTE FOR CONCRETE COATING

Bundle 19.03.09
Grant County 06-10002.10 041B00013N
Grant County 06-10002.00 041B00014N
Grant County 06-10010.00 041B00011N

I. DESCRIPTION

Perform all work in accordance with the Kentucky Transportation Cabinet, Department of Highways 2012 Standard Specifications for Road and Bridge Construction and applicable Supplemental Specifications, the Standard Drawings, this Note, and the Contract Documents. Section references are to the Standard Specifications.

This work consists of the following:

1. Furnish all labor, materials, tools, equipment, and incidental items necessary to complete the work.
2. Provide safe access to the bridge, in accordance with Section 107.01.01, for the Engineer to sound possible repair areas and for workers to complete the construction.
3. Repair cracks as applicable in accordance with the Special Note for Epoxy Injection Crack Repair.
4. Repair delaminated or spalled areas as applicable in accordance with the Special Note for Concrete Patching.
5. Apply Ordinary Surface Finish
6. Prepare the surfaces to receive coating.
7. Apply concrete coating.
8. Any other work as specified as part of this contract.

II. MATERIALS

One of the following coating systems shall be used:

Manufacturer	***Prime Coat***	***Finish Coat***
Sherwin Williams	Macropoxy 646	Acrolon 218 HS
PPG	Amerlock 2	Devoe Devflex HP
Carboline	Carboguard 890	Carbothane 133 HB
Tnemec	Elastogrip 151	Envirocrete 156

The finish product shall be opaque and satin or semi-gloss. The contractor must apply sufficient coats as required to achieve this goal. The finish coat shall be gray and will meet the following values:

	L*	a*	b*
Gray	74.94	-1.54	3.92

Furnish to the Engineer copies of the manufacturer's technical data sheets, installation guidelines, material safety data sheets, and other pertinent data at least two (2) days prior to beginning the work.

III. CONSTRUCTION

A. Perform Concrete Repairs. Repair concrete surface in accordance with the Special Note for Epoxy Injection Crack Repair and/or the Special Note for Concrete Patching Repair if included in the contract documents.

B. Apply Ordinary Surface Finish. Areas receiving epoxy injection, concrete patching, and other surface imperfections, including areas of minor cracking, should receive Ordinary Surface Finish in accordance with Section 601.03.18 of the Standard Specifications. Use mortar of the same cement and fine aggregate as the concrete patching, or as directed by the Engineer. Payment will be incidental to Concrete Sealing.

C. Areas to Receive Concrete Coating:

1. Every exposed surface above a point 6" below ground or fill line of abutments, wing walls, end bent and pier caps, pedestals, back walls, columns, and exposed footings.
2. All exposed surfaces of concrete barrier walls, parapets, curbs, and plinths. Do not apply to the riding surface of the concrete deck.
3. The underneath surfaces of slab overhangs outside of exterior girders and to the exterior side and bottom of exterior concrete girders, beams, and box beams.

D. Prepare Concrete Surfaces for Repair. All areas specified shall be pressure washed. Equip the pressure washers with calibrated gages and pressure regulators to ascertain and regulate water pressure. All equipment for pressure washing shall be operated at a minimum pressure of up 3,500 to 4,500 psi with 0 degree spinner tip and/or fan tips as determined by the engineer at the working location with a minimum flow rate of 3.5 gal/minute provided that these pressures do not damage any components of the structure. Pressure and flow rates shall be reduced to a level satisfactory to the Engineer should any damage occur due to power washing procedures. The washing wand must be approximately perpendicular to the washed surface and within a maximum of 12 inches of the surface. Wand extensions greater than 36 inches will be subject to Division of Construction approval. Pressure washing of any bridge element will proceed from top of wash area to bottom of wash area. Preform all pressure washing at temperatures above 40 degrees Fahrenheit.

E. Apply Concrete Coating. All areas specified shall have concrete coating applied to as specified after debris removal and power washing. New concrete shall be allowed to properly cure in accordance with the manufacturer's recommendations prior to application. Use compressed air to remove any loose debris from the surfaces that are to be coated after power washing. All coatings shall be applied within manufacturers recommended dry film thickness range. Comply with KYTC "Standard Specifications

for Road and Bridge Construction" Section 614.03.02 and coatings supplier recommended conditions for application. Allow the surfaces to be coated to dry a minimum of 24 hours before any coating is applied. The coating must be applied with 72 hours of pressure washing. The coating must be applied to a clean and dry surface. All coating application shall be executed using brushes, rollers, etc. No spray application will be permitted.

The Department requires acceptance testing of samples obtained on a per-lot basis per-shipment. The Division of Materials shall perform acceptance testing. Test samples shall be taken at the Contractor's paint storage site. Department personnel shall perform sampling. Allow (10) working days for testing and approval of the sampled paint. It is the Contractor's responsibility to maintain an adequate inventory of approved paint. The Department shall assume no responsibility for lost work due to rejection of paint or approved paint subsequently found to be defective during the application process. Preform all concrete coating application at temperatures above 40 degrees Fahrenheit or in accordance with manufactures specifications.

IV. MEASUREMENT

The Department will measure the quantity in square feet. The Department will not measure preparation of the site for the Engineer's access or removal and reapplication of coatings that do not satisfy the Engineer's approval for payment and will consider them incidental to "Concrete Coating".

V. PAYMENT.

The Department will make payment for the completed and accepted quantities of concrete coating under the following:

Code	***Pay Item***	***Pay Unit***
24982EC	Concrete Coating	Lump Sum

The plans may show an estimate quantity in square feet. The Department will consider payment as full compensation for all work required as described in this note.

SPECIAL NOTE FOR CONCRETE PATCHING REPAIR

Bundle 19.03.09
Grant County 06-10002.10 041B00013N
Grant County 06-10002.00 041B00014N
Grant County 06-10010.00 041B00011N

These Notes or designated portions thereof, apply where so indicated on the plans, proposals or bidding instruction.

I. DESCRIPTION. Perform all work in accordance with the Department's 2012 Standard Specifications, and applicable Supplemental Specifications, the attached sketches, and these Notes. Section references are to the Standard Specifications.
This work consists of: (1) Furnish all labor, materials, tools, and equipment; (2) Remove existing spalled/delaminated concrete; (3) Prepare the existing surface for concrete patching; (4) Place hook fasteners and welded wire fabric over surfaces to be repaired (where applicable); (5) Apply concrete patching as specified by this note and as shown on the attached detail drawings; (6) Finish and cure the new Concrete Patches; (7) Maintain & control traffic; and, (8) Any other work specified as part of this contract.

II. MATERIALS.

A. Class "M" Concrete. Use either "M1" or "M2". See Section 601.

B. Steel Reinforcement. Use Grade 60. See Section 602

C. Welded Steel Wire Fabric (WWF). Conform to Section 811

D. Hook Fasteners. Use commercial grade galvanized hook fasteners. Minimum 3/16" diameter.

III. CONSTRUCTION.

A. Concrete Removal and Preparation. The Contractor, as directed by the Engineer shall locate and remove all loose, spalled, deteriorated and delaminated concrete. Sounding shall be used to locate delaminated areas. Care shall be exercised not to damage areas of sound concrete or reinforcing steel during concrete removal operations. Concrete removal shall be in accordance with a sequence approved by the Engineer.

Concrete removal shall be accomplished by chipping with hand picks, chisels or light duty pneumatic or electric chipping hammers (not to exceed 15 lbs.). Remove all deteriorated loose concrete to a minimum depth of 4". When reinforcing steel is exposed, concrete removal shall continue until there is a minimum ¾ inch clearance around the exposed reinforcing bar. Care shall be taken to not damage bond to adjacent non-exposed reinforcing steel during concrete removal processes. Unless specifically *directed by the Engineer*, depth of removal shall not exceed 6 inches.

The perimeter of all areas where concrete is removed shall be tapered at an approximately 45° angle, except that the outer edges of all chipped areas shall be

saw cut to minimum depth of 1 inch to prevent featheredging unless otherwise approved by the Engineer.
After all deteriorated concrete has been removed; the repair surface to receive concrete patching shall be prepared by abrasive blast cleaning. Abrasive blast cleaning shall remove all fractured surface concrete and all traces of any unsound material or contaminants such as oil, grease, dirt, slurry, or any materials which could interfere with the bond of freshly placed concrete.

The Contractor shall dispose all removed material off State Right Of Way in an approved site.

B. **Steel Reinforcement.** All corroded reinforcing steel exposed during concrete removal shall have corrosion products removed by abrasive grit blasting or wire brush whichever is more appropriate. Furnish for replacement, as directed by the Engineer, additional linear feet of steel reinforcing bars ½" diameter by 20-foot lengths. Place these bars in areas deemed by the Engineer to require additional reinforcement. Field cutting and bending is permitted. Deliver unused bars to the nearest County Maintenance Barn. Payment will be made in accordance with Section 602.

Reinforcing steel displaying deep pitting or loss of more than 20 percent of cross-sectional area shall be removed and replaced. Such bars shall be placed in accordance with the recommendations of ACI 506R, Sections 5.4 and 5.5. In particular, bars shall not be bundled in lapped splices, but shall be placed such that the minimum spacing around each bar is three times the maximum aggregate size to allow for proper encapsulation with concrete patching.

Intersecting reinforcing bars shall be tightly secured to each other using tie wire and adequately supported to minimize movement during concrete placement.
Welded wire fabric (WWF) shall be provided when shown on the attached sketches and at each repair area larger than 1 square foot if the depth of the repair exceeds 3 inches from the original dimension of the repaired member. Sheets of adjoining WWF shall be lapped by at least one and one-half spaces at all intersections, in both directions, and be securely fastened. WWF fabric shall be supported no closer than ½ inch to the prepared concrete surface and shall have a minimum concrete cover of 1.5 inches.

WWF shall be fastened to preset anchors on a grid not more than 12 inches square. Large knots of tie wire which could result in sand pockets and voids during patching shall be avoided.

C. **Hook Fasteners.** Hook fasteners shall be positioned at the spacing as stated above or as directed by the Engineer. Any given area shall have a minimum of four anchors. The WWF shall not move or deform excessively during concrete patching. Maximum hook fastener spacing shall not exceed 2 feet on a grid pattern over the entire repair area.

Hook fasteners shall be of commercial grade galvanized steel with a minimum diameter of 3/16". They may be mechanically set or grouted, as approved by the Engineer.

The Department will randomly select hook fasteners to be tested to verify pullout force is sufficient. If any anchors fail to meet the minimum acceptable pullout value, corrective measures shall be taken by the Contractor and further testing will be conducted.

D. **Class M Concrete.** Place and finish the new concrete for the patching area as shown on the attached detail drawings, or as directed by the Engineer. The Engineer shall approve the Contractor's method of placing and consolidating the concrete prior to the beginning of this operation.

E. **Curing.** On completion of finishing operation, patching concrete shall immediately be prevented from drying out and cracking by fogging, wetting, and/or any appropriate method approved by the Engineer. See Section 501.03.15.

Each Contractor submitting a bid for this work shall make a thorough inspection of the site prior to submitting his bid and shall thoroughly familiarize himself with existing conditions so that the work can be expeditiously performed after a contract is awarded. Submission of a bid will be considered evidence of this inspection having been made. Any claims resulting from site conditions will not be honored by the Department. Quantities given are approximate. The quantity for "Concrete Patching Repair" shall be bid with the contingency that quantities may be increased, decreased, or eliminated by the Engineer. Dispose of all removed material entirely away from the job site as approved by the Engineer. This work is incidental to the contract unit price for "Concrete Patching Repair".

IV. MEASUREMENT

A. **Concrete Patching Repair.** The Department will measure the quantity per square feet of each area restored. Double payment will not be made on both faces of corner repairs.

B. **Steel Reinforcement.** See Section 602.

C. **Welded Wire Fabric & Hook Fasteners.** Welded Wire Fabric and Hook Fasteners will not be measured for payment, but shall be considered incidental to "Concrete Patching Repair".

V. PAYMENT

A. **Concrete Patching Repair.** Payment at the contract unit price per square feet is full compensation for the following: (1) Furnish all labor, materials, tools, equipment; (2) preparation of specified areas including removing and disposing of specified existing materials; (3) place, finish, and cure new concrete patches; and (4) all incidentals necessary to complete the work as specified by this note and as shown on the attached detail drawings.

B. **Steel Reinforcement.** See Section 602.

The Department will consider payment as full compensation for all work required by these notes and detail drawings.

SPECIAL NOTE FOR CONTRACT COMPLETION DATE AND LIQUIDATED DAMAGES ON BRIDGE REPAIR CONTRACTS

I. COMPLETION DATE. The Contractor has the option of selecting the starting date for this Contract. Once selected, notify the Department in writing of the date selected at least two weeks prior to beginning work. All work is to be completed by November 8, 2019. An allotted number of Calendar days are assigned to each structure in this contract as shown below.

STRUCTURE	ALLOTTED TIME	COMPLETION DATE
056B00342N	30 Calendar Days	November 8, 2019
056B00388N	30 Calendar Days	November 8, 2019
056B00391N I-65 NB	Two weekends (57 hours ea.)	November 8, 2019
056B00391N I-65 SB	Two weekends (57 hours ea.)	November 8, 2019
056B00391N I-65 Ramp	Two weekends (57 hours ea.)	November 8, 2019
056B00394N	Two weekends (57 hours ea.)	November 8, 2019
056B00396N	Two weekends (57 hours ea.)	November 8, 2019

Contrary to Section 108.07.02, the Engineer will begin charging calendar days for a structure on the day the Contractor starts work or sets up traffic control on that particular structure.

Due to events at the Kentucky Exposition Center, no work will be allowed November 9-22, 2019 for bridges 056B00391N and 056B00396N.

II. LIQUIDATED DAMAGES. Liquidated damages will be assessed the Contractor in accordance with the Transportation Cabinet, Department of Highway's 2012 Standard Specifications for Road and Bridge Construction, Section 108.09, when either the allotted number of calendar days or the November 8, 2019 date is exceeded. In addition to the liquidated damages specified in Section 108.9, liquidated damages in the amount of $500 per 15 minutes will be assessed when bridge remains closed to traffic during prohibited hours as specified in the Traffic Control Plan.

Contrary to the Standard Specifications, liquidated damages will be assessed the Contractor during the months of December, January, February and March when the contract time has expired on any individual bridge or bridges. Contract time will be charged during these months.

All construction must be completed in accordance with the weather limitations specified in Section 606 and/or Section 601 as applicable. No extension of Contract time will be granted due to inclement weather or temperature limitations that occur due to starting work on the Contract or a structure late in the construction season.

SPECIAL NOTE FOR DISTRIBUTED GALVANIC ANODES

Bundle 19.03.09
Grant County06-10002.10041B00013N
Grant County06-10002.00041B00014N
Grant County06-10010.00041B00011N

I. DESCRIPTION

Perform all work in accordance with the Kentucky Transportation Cabinet, Department of Highways 2012 Standard Specifications for Road and Bridge Construction and applicable Supplemental Specifications, the Standard Drawings, this Special Note, and the Contract Documents. Section references are to the Standard Specifications.

The work under this section shall consist of supply, installation, and quality control services for an alkali-activated zinc embedded galvanic corrosion protection system. The work includes preparation of submittal documents, verification and correction of electrical continuity, and making low-voltage electrical connections between the anodes and the existing reinforcing as shown on the drawings.

II. REFERENCES

A. ACI 222R Protection of Metals in Concrete Against Corrosion
B. ASTM B6 Standard Specification for Zinc
C. ASTM B69 Standard Specification for Rolled Zinc
D. ASTM B418 Standard Specification for Cast and Wrought Galvanic Zinc Anodes

III. MATERIALS

A. The basis of design galvanic anode system is the Galvanode DAS distributed anode system supplied by Vector Corrosion Technologies, or approved equal.
B. The embedded galvanic anode system shall have sufficient mass of sacrificial metal to produce galvanic current for twenty (20) years as calculated using Faradays Law. The system shall be designed to deliver a galvanic current density of at least 0.75 mA/SF of reinforcing steel surface area. Anode life is calculated using an efficiency factor and utilization factor of 0.9.
C. Galvanic anode units shall be alkali-activated high-purity zinc encased in a mortar shell with pH greater than 14 with an internal alkali-resistant reinforcing mesh and wicking material that completely surrounds the zinc core. The anode units shall have nominal cross-section dimension of 1.25-inch diameter and nominal 6.5-feet length, or as indicated on the drawings.
D. Two steel electrical connection wires shall be provided at each end of the anodes.
E. The anode units shall contain at least 0.6 lb. of high-purity zinc per lineal foot of anode and shall contain no constituents that are corrosive to reinforcing steel as per ACI 222R such as chlorides, sulfates, bromides, or other halides.
F. The zinc anode shall contain a steel core and shall be manufactured in compliance with ASTM B 418 Type II (Z13000) and ASTM B69 Rolled Special High Grade Zinc

(Z13004) using zinc in compliance with ASTM B6 Special High Grade (Z13001) with iron content less than 15 ppm.

IV. CONSTRUCTION

A. Submittals

The Contractor shall submit installation shop drawings and product data for the galvanic anode system. Shop drawings shall identify:

a. The quantity and length of anodes located on each individual element, provide details and notes for connection of anodes to the existing reinforcing. Any changes to locations of anodes made during installation shall be identified and included on an as-built drawing.
b. The high-purity zinc anode contains an alkali-activated mortar with a pH of 14 or greater.
c. The anode unit does not contain any corrosive constituents detrimental to reinforcing steel, e.g. chloride, sulfate, bromide, etc.
d. Proven track record of the anode technology showing satisfactory field performance with a minimum of three projects of similar size and application.
e. Independent third-party evaluation of the anode technology, e.g. Hitec, Concrete Innovations Appraisal Service, BRE, etc.

B. Personnel

a. Contractor shall enlist and pay for the services of a cathodic protection technician (CPT) working under the direction of a cathodic protection specialist (CPS) certified by NACE International with documented experience in design and installation Quality Control of cathodic protection systems for reinforced concrete. The CPT shall be provided by the anode Manufacturer. CPT shall have a minimum of five years of documented experience installing cathodic protection systems for reinforced concrete.
b. The contractor shall coordinate its work schedule with the designated CPT to allow for installation training during project startup and initial anode installation.
c. The CPT shall be responsible for training the contractor's employees and State personnel in the following areas:
    i. Anode storage and handling safety precautions;
    ii. Verification of reinforcing steel electrical continuity and electrical continuity corrections;
    iii. Anode installation process;
d. The CPT shall prepare and submit to the Contractor a letter report certifying that the installation training has been completed containing the date(s) when training occurred, the names of personnel trained, and that the individuals demonstrated competency in the various aspects of the installation and quality control procedures.

C. Surface Preparation

a. Remove all deteriorated concrete to the extents detailed on the plans.
b. Thoroughly clean concrete surface by abrasive blasting, water blasting or similar approved methods to remove all oil, grease, dirt, loose concrete, and any other material that would prevent proper bonding prior to installing the galvanic anode

system.

c. Sandblast exposed reinforcing steel surfaces to SSPC-SP6 Commercial Blast Cleaning / NACE No. 3 before installing the galvanic anode system.

D. Electrical Continuity

a. The existing reinforcing steel shall be confirmed to be electrically continuous prior to anode installation. The Contractor shall confirm electrical continuity of the reinforcing steel by conducting quality control tests in the presence of the Engineer using a voltmeter with a minimum impedance of 10 Mohm.

b. Existing reinforcing shall be fully exposed and cleaned for continuity testing in at least ten (10) locations per element. These test locations are often used for tying anodes to the reinforcing network. At a minimum, test locations should be located on either end of each row of anodes, and intermediate locations shall be spaced not more than fifteen (15) feet along each row of anodes. In the event discontinuous steel is located, more test locations/openings may be required.

c. A resistance measurement between two test locations less than or equal to 1.0 ohm shall be considered continuous.

d. A voltage difference between two test locations less than or equal to 1.0 mV shall be considered continuous.

e. Any discontinuous steel identified may be corrected by tying the reinforcing steel with uncoated steel wire to adjacent continuous steel, resistance welding the intersections of bars if approved by the Engineer, or welding a solid steel wire or bar between the discontinuous steel and adjacent continuous steel.

f. All reinforcing steel connections shall receive a coat of 100% solids, non-conductive epoxy such that no wire or brazing material will be in contact with the concrete when placement is complete. The contractor shall verify continuity between the connections and the ties prior to coating with epoxy.

g. Continuity corrections shall be verified by the Engineer.

E. Anode Installation

a. Anodes shall be installed such that there is at least 1 inch of concrete cover.

b. The new reinforcing in the encasement is not intended to be electrically connected to the anode system.

c. Electrical connections between the galvanic anodes and the existing reinforcing steel shall be completed using uncoated steel wire and/or stainless steel split-bolt fasteners where applicable.

d. The Contractor shall test and verify electrical continuity between the existing reinforcing steel and galvanic anodes.

e. Electrical continuity of the anodes and existing reinforcing steel network shall be confirmed by the Engineer prior to form installation.

f. Any wire connections between steel and other metals, such as copper, must be electrically isolated from the concrete electrolyte using medium or heavy-walled adhesive–lined heat shrink tubing, waterproof rubber electrical tape, or encapsulated with 100% solids epoxy.

V. PAYMENT

Payment for materials, installation, and all incidental items necessary to complete the work in

accordance with this Special Note and as shown on the attached detail drawing(s) shall be incidental to Item 8150 Steel Reinforcement.

SPECIAL NOTE FOR ELIMINATING TRANSVERSE JOINTS ON BRIDGES USING LINK SLABS
B00287R & B00287L

I. DESCRIPTION. Perform all work in accordance with the Kentucky Transportation Cabinet, Department of Highway's 2008 Standard Specifications for Road and Bridge Construction and applicable Supplemental Specifications, the Standard Drawings, this Note, and the rehabilitation plans (Drawing No. 17535, dated December 2007). Section references are to the Standard Specifications.

This work consists of the following: (1) Furnish all labor, materials, tools, and equipment; (2) Remove existing transverse joint, joint filler, and specified areas of concrete and steel reinforcement in order to eliminate the transverse joint; (3) Remove the shear studs from the steel girders in specified locations; (4) Install additional steel reinforcement and new concrete as specified and in accordance with the rehabilitation plans; (5) Maintain and control traffic; and (6) Any other work specified as part of this contract.

II. MATERIALS.

A. Class "AA" Concrete. See Section 601.

B. Epoxy Coated Steel Reinforcement. Use Grade 60. See Section 602.

C. Epoxy Bond Coat. See Section 511.

D. Silicone Rubber Joint Sealant. See Section 807.03.05.

III. CONSTRUCTION.

A. Remove Existing Materials. Remove the existing transverse joints, joint filler, and specified areas of concrete as shown on the rehabilitation plans or as directed by the Engineer. Dispose of all removed material entirely away from the job site. This work is incidental to the contract unit price for "Eliminate Transverse Joint Using Link Slab".

Remove existing longitudinal reinforcement 3'-1" on each side of the joint centerline as shown in the rehabilitation plans. Clean and leave the remainder of existing steel reinforcement in place. Damaged steel reinforcement will be repaired/replaced as directed by the Engineer at no additional cost to the Department.

Remove existing shear studs from steel girders as specified on the rehabilitation plans.

B. Epoxy Coated Steel Reinforcement. Provide reinforcement as directed by the Engineer and shown on the rehabilitation plans. See barbill on the rehabilitation plans for steel reinforcement details. Splice new reinforcement to the existing reinforcement, whenever possible, in the deck and curb in the areas of removed concrete to tie the slabs together as shown on the rehabilitation plans. Ensure that all exposed steel reinforcement is installed and tied in accordance with Sections 602.03.04 and 602.03.05 prior to pouring the new Class "AA" concrete.

C. Place New Concrete. After all specified existing materials have been removed, place new Class "AA" Concrete to the scarified grade and finish to receive the new overlay as shown on the rehabilitation plans.

Blast clean all areas of existing concrete and structural steel to come in contact with new concrete until free of all laitance and deleterious substances immediately prior to

the placement of the Class "AA" Concrete. The surface areas of existing concrete to come in contact with the new Class "AA" Concrete are to be coated with an epoxy bond coat immediately prior to placing new concrete in accordance with Section 511. The interfaces of the new and old concrete shall be as nearly vertical and horizontal as possible.

D. Finishing Joint. After concrete overlay is placed and cured, saw cut a ¼" x ½" joint at the center of the new link slab, from curb to curb, and fill the joint with Silicone Rubber Joint Sealant as specified by this note and the rehabilitation plans.

IV. MEASUREMENT.

A. Eliminate Transverse Joint Using Link Slab. The Department will measure the quantity in linear feet from gutterline to gutterline along the centerline of the joint.

B. Epoxy Coated Steel Reinforcement. See Section 602.

V. PAYMENT.

A. Eliminate Transverse Joint Using Link Slab. Payment at the contract unit price per linear foot is full compensation for removing and disposing of the specified existing materials, furnishing and installing the concrete, and all incidental items necessary to complete the work (except the overlay material) within the specified pay limits as specified by this note and as shown on the rehabilitation plans.

B. Epoxy Coated Steel Reinforcement. See Section 602.

The Department will consider payment as full compensation for all work required by this note and the rehabilitation plans.

SPECIAL NOTE FOR EPOXY INJECTION CRACK REPAIR

04-10001.00 Green 044C00023N

I. DESCRIPTION

Perform all work in accordance with the Kentucky Transportation Cabinet, Department of Highways 2012 Standard Specifications for Road and Bridge Construction and applicable Supplemental Specifications, the Standard Drawings, this Note, and the Contract Documents. Section references are to the Standard Specifications.

This work consists of the following:

1. Furnish all labor, materials, tools, equipment, and incidental items necessary to complete the work.
2. Provide safe access to the bridge, in accordance with Section 107.01.01, for the Engineer to sound possible repair areas and for workers to complete the construction.
3. Drill injection port holes.
4. Epoxy injection.
5. Finish the repaired surface.
6. Obtain core samples for the Engineer's visual inspection.
7. Repair core holes.
8. Any other work specified as part of this contract.

II. MATERIALS, EQUIPMENT, PERSONNEL

A. Type IV Epoxy Resin. Use either Category I or II suitable for epoxy injection applications. See Section 826. All cracks shall be injected using an adhesive suitable for the field conditions (crack width, temperature, humidity, etc.) recommended by the adhesive manufacture as shown on material data sheets.

B. Equipment. Equipment used to inject the epoxy shall meet the recommendations of the epoxy injection material manufacturer.

C. Personnel. Arrange to have a manufacturer's representative at the job site to familiarize him and the Engineer with the epoxy materials, application procedures and recommended pressure practice. The representative shall direct at least one complete crack or area injection and be assured prior to his departure from the project that the personnel are adequately informed to satisfactorily perform the remaining repairs.

Furnish the Engineer a copy of the manufacturer's comprehensive preparation, mixing and application instructions which have been developed especially for use with the proposed epoxy injection system. Ensure that any significant changes to these instructions which are recommended by the representative for an unanticipated situation have been approved by the Engineer prior to the adoption of such changes.

III. CONSTRUCTION

A. Investigate Remedial Action. If the crack is larger than or equal to 0.025" wide or has rust stains, repair the crack by epoxy injection. If the crack is less than 0.025" wide, the crack shall be sealed in accordance with the Special Note for Concrete Sealing. Areas of map cracking are to be sounded by the Engineer with a hammer. If the areas are delaminated or spalled, they shall be repaired in accordance with the Special Note for Concrete Patching. Otherwise, the cracks shall be repaired in accordance with this Note.

B. Drill Injection Port Holes. Install injection ports or tees in cracks to be injected. Space injection ports or tees at 6 to 12 inches vertically and 6 to 18 inches horizontally but in no case closer together than the thickness of the concrete member if full depth penetration is desired unless otherwise specified or directed. Set ports or tees in dust free holes made either with vacuum drills or chipping hammers.

C. Epoxy Injection. Seal all surface cracks in the area to be repaired, after injection ports or tees have been inserted into the holes, with paste epoxy between ports to insure retention of the pressure injection within the confines of the member. An alternate procedure of sealing the cracks before the injection holes have been made can be submitted to the Engineer for approval. Limit the application of paste epoxy to clean and dry surfaces. Limit substrate temperatures to not less than 45°F during epoxy applications.

Begin the epoxy injection at the bottom of the fractured area and progress upward using a port or tee filling sequence that will ensure the filling of the lowermost injection ports or tees first.

Establish injection procedures and the depths and spacings of holes at injection ports or tees. Use epoxy with flow characteristics and injection pressure that ensure no further damage will be done to the member being repaired. Ensure that the epoxy will first fill the innermost portion of the cracked concrete and that the potential for creating voids within the crack or epoxy will be minimized.

D. Finish the Repaired Surface. Remove the injection ports or tees flush with the concrete surface after the fractured area has been filled and the epoxy has partially cured (24 hours at ambient temperature not less than 60°F, otherwise not less than 48 hours). Roughen the surfaces of the repaired areas to achieve uniform surface texture. Remove any injection epoxy runs or spills from concrete surfaces.

E. Obtain Core Samples. Obtain two 4-inch diameter core samples in the first 25 linear feet of crack repaired and one core for each 25 linear feet thereafter. Take the core samples from locations determined by the Engineer and for the full crack depth. Cores will be visibly examined by the Engineer to determine the extent of epoxy penetration.

F. Repair Core Holes. Repair core holes in the concrete with non-shrink grout in accordance with Section 601.03.03(B) within 24 hours.

IV. MEASUREMENT

The Department will measure the quantity in linear feet along the centerline of the cracks. The Department will not measure preparation of the site for the Engineer's access or removal and reapplication of repairs that do not satisfy the Engineer's approval for payment and will consider them incidental to "Epoxy Injection Crack Repair".

V. PAYMENT.

The Department will make payment for the completed and accepted quantities of concrete cracks repaired with epoxy injection under the following:

Code	***Pay Item***	***Pay Unit***
23744EC	Epoxy Injection Crack Repair	Linear Feet

The Department will consider payment as full compensation for all work required.

SPECIAL NOTE FOR JACKING AND SUPPORTING BRIDGE SPAN

I. DESCRIPTION. Perform all work in accordance with the Kentucky Transportation Cabinet, Department of Highway's 2008 Standard Specifications for Road and Bridge Construction and applicable Supplemental Specifications, the Standard Drawings, this Note, and the attached detail drawing(s). Section references are to the Standard Specifications.

This work consists of the following: (1) Furnish all labor, materials, tools, and equipment; (2) Submit for approval jacking plans, procedures, drawings, and details prepared by a Professional Engineer licensed to practice in the Commonwealth of Kentucky; (3) Jack the entire structure or portions thereof and as required to complete the work as shown on the drawings and Special Notes and provide temporary supports as needed for the duration of the work; (4) Remove and reposition jacks and supports as required to complete the contract work; (5) Remove jacking and temporary supports when no longer required; (5) Maintain and control traffic; and (6) Any other work specified as part of this contract.

II. CONSTRUCTION.

A. Working Drawings. Prior to preparation of jacking plans and working drawings, the Contractor shall verify in the field, conditions and dimensions as necessary to perform the work. The Contractor shall submit to the Engineer for approval, jacking plans, working drawings and design calculations for the jacking and temporary supports. Such plans, drawings, and design calculations shall be prepared, sealed, and signed by an engineer who is licensed to practice in the Commonwealth of Kentucky. The content and number of sets of drawings and design calculations and times for review for temporary supports shall be the same as shown in the Standard Specifications for falsework working drawings. The jacking plan is to provide for a jacking scheme that will limit the load in the jacks to specified loads plus or minus 5%. Jacks are to be sized to provide a minimum factor of safety of 2 (two) when compared to the required working or jacking load. In addition to a minimum horizontal force of 2% of the dead load reaction of the structure, the Contractor's jacking plan is to include provisions for resisting horizontal loads that may occur as a result of the jacking operations and clearly show methods to resist those loads. The jacking plan is to take into consideration the longitudinal movement of the centerline of bearings as the superstructure is raised. The jacking locations and loads, if shown on the detail drawings, may be revised by the contractor. If not shown on the detail drawings, the contractor shall select jacking locations and/or loads consistent with his proposed jacking plans and procedures. Jacking loads and jack locations required by the Contractor's jacking method shall be shown on the jacking and supporting plan submitted for approval. The contractor is permitted to temporarily remove existing bracing as necessary and to replace said bracing with contractor provided jacking frames, to install contractor provided jacking stiffeners, or otherwise modify the structure, as necessary to implement his jacking plan, with the written approval of the Engineer. If loads are transferred to or if the spans are supported at locations other

than those already having appropriate stiffeners or as shown in the detail drawings, the contractor shall, unless otherwise noted or shown in the detail drawings, provide steel plate or angle jacking stiffeners designed by a Professional Engineer which meet current AASHTO requirements for bearing stiffeners and which may remain in place at the conclusion of the construction. Jacking stiffeners may be welded or bolted to the beam webs, but must be milled to bear on the top flange at the piers and may be close fit and welded to the flange at other locations. Jacking schemes which require modifications to the structure shall be considered permanent and shall remain in the structure unless otherwise shown in the contract documents or directed by the Engineer. All steel which will remain in the finished structure shall be painted in accordance with the Specifications and notes excepting that paint coats may be shop applied.

B. Jacking and Temporary Support. The jacking operation is to be performed in such a manner that the vertical position of the members supported by the bearings will remain in approximately the same relative position throughout the jacking operation. A maximum of ¼" relative difference in position is allowed in a lift between any of the jacks and between jacked and unjacked girders. Traffic shall remain on the portion of the structure to be jacked at all times unless otherwise approved by the Engineer. A redundant system of supports shall be provided during the entire jacking operation for backup should any of the jacks fail. The redundant system shall include stacks of steel plates or other steel sections added as necessary to maintain the redundant supports at each jack location within ¼" of the jacking sill or corbels.

Each jack shall be equipped with either a pressure gage or a load cell for determining the jacking force. Pressure gages shall have an accurately reading dial at least 6" in diameter. Each jack shall be calibrated by a private laboratory within 6 months prior to use. Each jack and its gage shall be calibrated as a unit with the cylinder extension in the approximate position that it will be in at final jacking force and shall be accompanied by a certified calibration chart. Load cells shall be calibrated and provided with an indicator by which the jacking force is determined.

Vandal-resistant displacement monitoring equipment shall be provided and maintained. Vertical and horizontal displacements of the temporary supports and the existing structure shall be monitored continuously during jacking operations and shall be accurately measured and recorded at least weekly during removal and reconstruction work. As a minimum, elevations shall be taken prior to the start of jacking operations, immediately after jacking is complete, before permanently re-connecting the superstructure to the substructure, and after the temporary supports have been removed. As a minimum, the existing structure shall be monitored at the abutments, piers, and at mid-point of spans. Control points at each location shall be located near the center and the superstructure gutterlines. The records of vertical and horizontal displacement shall be delivered to the Engineer at the completion of the work described herein.

A force equal to the initial jacking load or the dead load shown on the plans shall be applied to the structure by the temporary support system and the force held until all initial compression and settlement of the system is complete. The structure shall then be lifted by the jacks to the final position and the force held until the temporary support system is installed and the system is stable, before remaining work at the location being supported is begun.

Jacking operations shall be carefully controlled and monitored to ensure that the jacking loads are applied in a manner to prevent distortion and excessive stresses that would damage the structure. The superstructure shall be jacked as necessary to maintain the total vertical displacements at control points to less than ¼" from the elevations recorded prior to jacking plus the desired jacking height as shown on the plans or as modified by the Engineer. For bearing replacements and when no other desired jacking height is shown in the plans, detail drawings, or notes, the superstructure shall be jacked only as necessary to facilitate removal and replacement of the bearings and in no case more than 1/4" if traffic is to remain on the structure during the work.

Should unanticipated displacements, cracking or other damage occur, the construction shall be discontinued until corrective measures satisfactory to the Engineer are performed. Damage to the structure as a result of the Contractor's operations shall be repaired by the Contractor at no expense to the Department.

Following completion of the reconstruction, the monitored control points shall not deviate from the vertical position by more than ¼" from the initial survey elevations or the elevations as modified by the Engineer or detail drawing(s).

IV MEASUREMENT.

A. Jacking and Supporting Bridge Span. The Department will not measure the quantity.

V. PAYMENT.

A. Jack and Support Bridge Span. Payment at the contract lump sum price is for all labor, materials, manufactured assemblies, furnishing and operating jacks, plates, jacking stiffeners, jacking beams, painting, etc. and all incidental items necessary to perform any jacking and supporting operations required to complete the work in accordance with this Note, the Standard Specifications, or as shown on the attached detail drawing(s), or as noted elsewhere in the contract, or as directed by the Engineer.

SPECIAL NOTE FOR PAINTING STRUCTURAL STEEL REPAIRS

I. DESCRIPTION

Perform all work in accordance with the Kentucky Transportation Cabinet, Department of Highways 2012 Standard Specifications for Road and Bridge Construction and applicable Supplemental Specifications, the Standard Drawings, this Note, and the Contract Documents. Section references are to the Standard Specifications.

This work consists of the following:

1. Furnish all labor, materials, tools, equipment, and incidental items necessary to complete the work.
2. Provide safe access to the bridge, in accordance with Section 107.01.01, for the Engineer to sound possible repair areas and for workers to complete the construction.
3. Clean and prime the existing structural steel in accordance with this note and the attached detail drawings.
4. Prepare and prime the new structural steel in accordance with this note and the attached detail drawings.
5. Any other work specified as part of this contract.

Residual lead paint may still be on bridge. The Contractor is advised to take all necessary protective measures including worker safety and environmental regulations when performing surface preparation. The Department will not consider any claims based on residual lead paint.

II. MATERIALS

A. Paint. Conform to Section 607.

III. CONSTRUCTION

A. Clean and Prime existing structural steel. All existing faying surfaces where new steel is to be installed shall be cleaned and receive the prime coat as specified in Section 607.03.23 of the Standard Specifications before any new steel is installed. Level of cleaning shall be to an **SSPC-SP 15** (Commercial Grade Power Tool Cleaning). All Power tools shall be equipped with vacuum shrouds and fitted with HEPA filters at their air exhausts. Maintain and operate all vacuum shrouded power tools to collect generated debris.

B. Prepare and Prime new structural steel. New structural steel shall receive shop surface preparation and shop applied prime coat in accordance with Section 607. Faying surfaces shall receive only the prime coat specified. Necessary touch up/repair of the shop applied prime coat on the new steel may be performed in the field. Finish coatings will be field applied by others as part of a separate contract.

IV. MEASUREMENT

All items of work necessary to complete cleaning and painting as specified in this Note shall be considered incidental to the unit prices bid for the repairs being completed.

V. PAYMENT

The Department will make payment for the completed and accepted quantities of cleaning and painting structural steel repairs as part of the unit prices bid for the repairs being completed. The Department will consider payment as full compensation for all work required.

SPECIAL NOTE FOR PLACING BRIDGE OVERLAY APPROACH PAVEMENT

Bundle 19.03.09
Grant County 06-10002.10 041B00013N
Grant County 06-10002.00 041B00014N
Grant County 06-10010.00 041B00011N

I. DESCRIPTION

Perform all work in accordance with the Kentucky Transportation Cabinet, Department of Highway's 2012 Standard Specifications for Road and Bridge Construction and applicable Supplemental Specifications, the Standard Drawings, this Note, and the Contract Documents. Section references are to the Standard Specifications.

This work consists of the following:

1. Furnish all labor, materials, tools, and equipment.
2. Removal of existing abutment backfill, if needed.
3. Structural Granular Backfill, as needed.
4. Mill the existing pavement.
5. Place new DGA, asphalt base, and asphalt surface
6. Repair the roadway shoulders, if needed.
7. Provide Pavement Markings if needed.
8. Any other work specified as part of this contract.

II. MATERIALS

A. Structural Granular Backfill. See Section 8.05.11
B. DGA. See Section 302.
C. Tack Coat. This material shall be in accordance with the Standard Specifications.
D. CL2 ASPH BASE 1.0D PG 64-22. See Standard Specifications
E. ASPHALT LEVEL AND WEDGE. See Standard Specifications
F. CL2 ASPH SURF 0.38D PG 64-22. This material shall be in accordance with the Standard Specifications.
G. GRANULAR EMBANKMENT. This material shall be in accordance with the Standard Specifications.
H. Pavement Striping. See Section 713.

III. CONSTRUCTION – DECK, SUPERSTRUCTURE, AND FULL BRIDGE REPLACEMENTS

A. Foundation Preparation. For projects involving the removal and replacement of the asphalt and backfill behind the existing abutments and new abutments or end bents, the required excavation, Type IV geotextile fabric, 4" perforated pipe, and new Structural Granular Backfill as shown in Figure 1 as well as any excavation and grading needed to shape the bridge approaches to match the existing roadway template, will be paid for by the bid item for Foundation Preparation. See Special Provision 69 and the Standard Drawings regarding additional construction details as required.

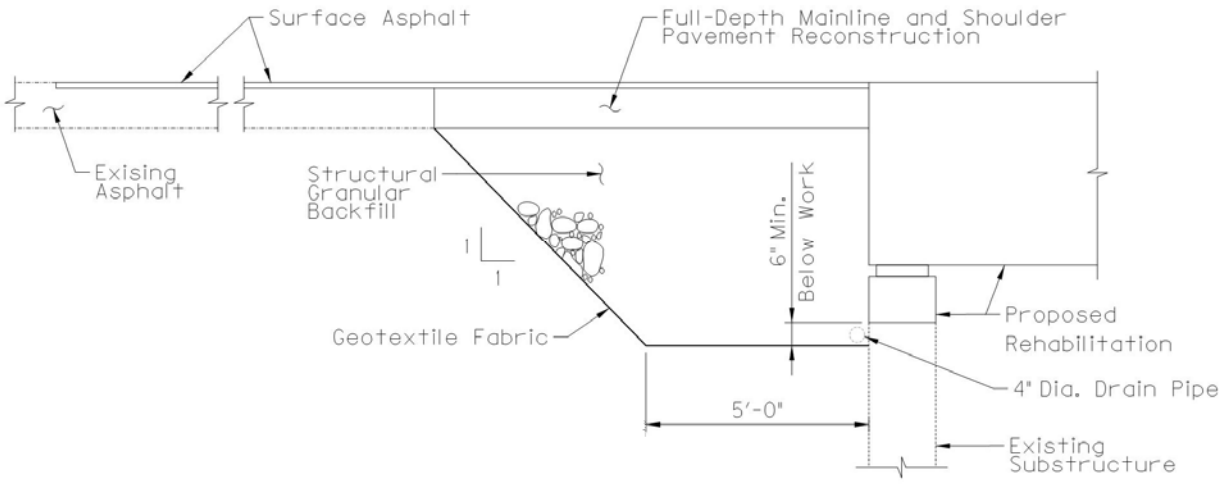


Figure 1: Detail showing proposed work for deck and superstructure replacements

B. Remove Existing Asphalt Surface. Remove the existing pavement material beyond the limits of full depth asphalt replacement to provide for a minimum of 1¼" new pavement surface from the bridge end extending approximately 25 feet, or as shown in the plans, into the approach pavement and across the width of the approach pavement. The Engineer shall determine the actual length and width of the milling depending on site conditions at each bridge approach. Mill the existing surface so that the new asphalt surface will match the elevation of the end of the full depth asphalt replacement and the bridge end. The Engineer shall approve the Contractor's plan for restoring the approach grade prior to the removal of the existing surface. Dispose of all removed material entirely away from the job site or as directed by the Engineer.

C. Produce and Place New Asphalt Base. Replace any full depth mainline and shoulder pavement removed as part of bridge backwall construction, superstructure replacement, or other work (if included in the Contract Documents) with a minimum of 8 inches of DGA, placed in two lifts of 4 inches each compacted and 8 inches of CL2 ASPH BASE 1.0D PG 64-22, placed in two lifts of 4 inches each compacted. Final elevation of the Asphalt Base at the approaches to match the width and new elevation of the riding surface on the bridge less the New Asphalt Surface to be placed. Shoulders shall receive identical treatment to the mainline pavement.

D. Produce and Place New Asphalt Surface. Apply an asphalt tack coat in accordance with Section 406. Produce and place the new 1 ¼" Asphalt Surface in accordance with Section 403 and compact under Option B. The new asphalt surface mixture required for this project shall be "CL2 ASPH SURF 0.38D PG 64-22". Place the new asphalt surface to smoothly connect the existing roadway grade at the end of the project, and/or the new abutment backwall.

E. Granular Embankment for Guardrails. When necessary to ensure compliance with standards, widen shoulders behind guardrail with granular embankment and cap with

DGA in accordance with plans or as directed by the Engineer. Remove existing topsoil as needed and place embankment in a manner to ensure proper compaction.

F. Pavement Markings. Pavement striping will be required to match the existing pavement striping on both approaches and the structure. Pavement striping shall be in accordance with applicable sections of the Standard Specifications and shall be incidental to the work. Raised pavement markers within the limits of the "Bridge Overlay Approach Pavement" shall be removed prior to the milling operation. The marker castings shall be cleaned and returned to the Engineer.

IV. CONSTRUCTION – OVERLAY PROJECTS

A. Remove Existing Materials. Remove the existing pavement material to provide for a minimum of 1¼" new pavement surface from the bridge end extending approximately 25 feet, or as shown in the plans, into the approach pavement and across the width of the approach pavement. The Engineer shall determine the actual length and width of the milling depending on site conditions at each bridge approach. Mill the existing surface so that the new asphalt surface will tie into the new armored edge, if applicable, and matches the elevation of the bridge end. The Engineer shall approve the Contractor's plan for restoring the approach grade prior to the removal of the existing surface. Dispose of all removed material entirely away from the job site or as directed by the Engineer.

B. Mainline and Shoulder Reconstruction. Replace shoulders in kind at the approaches to match the width and new elevation of the riding surface on the bridge. Shoulders shall receive identical treatment to the mainline pavement.

C. Produce and Place New Asphalt Surface. Apply an asphalt tack coat in accordance with Section 406. Produce and place the new 1 ¼" Asphalt Surface in accordance with Section 403 and compact under Option B. The new asphalt surface mixture required for this project shall be "CL2 ASPH SURF 0.38D PG 64-22". Place the new asphalt surface to smoothly connect the existing roadway grade at the end of the project and the bridge end.

For bridge decks specified to receive a new asphalt overlay as part of the work, place asphalt level and wedge and CL2 ASPH SURF 0.38D PG 64-22 as detailed in the plans to smoothly connect to the bridge approaches. If plans call for use of a waterproof membrane, this shall be addressed as a separate bid item.

D. Granular Embankment for Guardrails. When necessary to ensure compliance with standards, widen shoulders behind guardrail with granular embankment and cap with DGA in accordance with the plans or as directed by the Engineer. Remove existing topsoil as needed and place embankment in a manner to ensure proper compaction.

E. Pavement Markings. Pavement striping will be required to match the existing pavement striping on both approaches and the structure. Pavement striping shall be in accordance with applicable sections of the Standard Specifications and shall be incidental to the work. Raised pavement markers within the limits of the "Bridge

Overlay Approach Pavement" shall be removed prior to the milling operation. The marker castings shall be cleaned and returned to the Engineer.

V. MEASUREMENT

A. Granular Embankment: The Department will measure the quantity in cubic yards. The Department will measure along the centerline to determine a linear foot of placement multiplied by a theoretical cross section of 12 square feet to achieve the quantity per side of the roadway.

B. Bridge Overlay Approach Pavement: The Department will measure the quantity of in square yards. The Department will measure along the centerline from each end of the limits of the work as detailed on the plans to the point where the new pavement ties into the exiting pavement and across the width of the new pavement perpendicular to the centerline of the roadway.

C. Foundation Preparation: See Section 603.

VI. PAYMENT

A. Granular Embankment: Payment at the contract unit price per cubic yard of granular embankment is full compensation for granular embankment and DGA used for widening the shoulder for guardrail as directed. Variance of actual cross sectional quantities versus theoretical quantities will not be considered for additional payment.

B. Bridge Overlay Approach Pavement: Payment at the contract unit price per square yard of is full compensation for removing existing pavement markers, mobilization of milling equipment, removing specified existing pavement material, reconstruct shoulders as needed, furnishing and installing the asphalt tack coat, producing and placing the new asphalt and DGA, and all incidental items necessary to complete the work within the specified pay limits as specified by this note and as shown in the Contract Documents.

C. Foundation Preparation: See Section 603. Payment for Structural Granular Backfill to be incidental to Foundation Preparation.

Code	***Pay Item***	***Pay Unit***
02223	Granular Embankment	Cubic Yards
03304	Bridge Overlay Approach Pavement	Square Yards
08803	Foundation Preparation	Lump Sum

The Department will consider payment as full compensation for all work required.

SPECIAL NOTE FOR REPLACING EXPANSION DAMS AND/OR INSTALLING ARMORED EDGES FOR CONCRETE ON BRIDGES

I. DESCRIPTION. Perform all work in accordance with the Kentucky Transportation Cabinet, Department of Highway's 2012 Standard Specifications for Road and Bridge Construction and applicable Supplemental Specifications, the Standard Drawings, this Note, and the attached detail drawings. Section references are to the Standard Specifications.

This work consists of the following: (1) Furnish all labor, materials, tools, and equipment; (2) Remove existing concrete and expansion device(s) and/or bridge ends; (3) Install armored edges and new concrete as specified and in accordance with the attached detail drawings; (4) Install new joint seals (where required); (5) Maintain and control traffic; and (6) Any other work specified as part of this contract.

II. MATERIALS.

A. Class "M" Concrete. Use either "M1" or "M2". See Section 601.

B. Structural Steel. Use new, commercial grade steel suitable for welding. The Engineer will base acceptance on visual inspection. For armored edges that make up the 4" neoperene joint, use Steelflex Strip Seal expansion joint by DS Brown, or approved equal. To be approved, armored edge extrusions must be embedded.

C. Stud Anchors. The armored edge stud anchors are ¾" embedded stud shear connectors conforming to ASTM A108, Grade 1015 (Nelson Studs or equal).

D. Steel Reinforcement. Use Grade 60. See Section 602.

E. Epoxy Bond Coat. See Section 511.

F. (2"/2 ½") Expansion Joint System. It shall have a cellular, or micro-cell, polyurethane foam impregnated with a hydrophobic acrylic emulsion, or a hydrophobic polymer. The polyurethane foam external facing shall be factory coated and cured with highway-grade, fuel resistant silicone or a highway-grade elastomeric coating at a width greater than the maximum joint expansion.

G. Neoprene Strip Seals. See attached detail drawings and Section 807.

III. EQUIPMENT.

A. Hammers. See Section 606.02.10 B.

B. Sawing Equipment. See Section 606.02.10 C.

C. Hydraulic Impact Equipment. See Section 606.02.10 D.

IV. CONSTRUCTION.

A. Remove Existing Materials. Remove existing Expansion Dam, Bridge End, Armored Edges and specified areas of concrete as shown on the attached sketches. Remove debris and/or expansion joint filler as directed by the Engineer. Clean and leave all existing steel reinforcement encountered in place. Damaged steel reinforcement will be repaired/replaced as directed by the Engineer at no additional cost to the Department.

Dispose of all removed material entirely away from the job site. This work is incidental to the contract unit price for "Expansion Joint Replacement" or "Armored Edge for Concrete".

B. Place New Concrete and Armored Edges. After all specified existing materials have been removed; place new armored edges to match the grade of the proposed overlay or to match the original grade (See attached detail drawings). Place the new Class “M” concrete to the scarified grade and finish to receive the new overlay or place the new Class “M” concrete to the original grade and finish with broom strokes drawn transversely from curb to curb.

All new structural steel shall be cleaned and painted in accordance with requirements of Section 607.03.23, except that surfaces to come in contact with concrete are not to be painted.

Blast clean all areas of existing concrete and structural steel to come in contact with new concrete until free of all laitance and deleterious substances immediately prior to the placement of the Class "M" Concrete. The surface areas of existing concrete to come in contact with the new Class "M" Concrete are to be coated with an epoxy bond coat immediately prior to placing new concrete in accordance with Section 511. The interfaces of the new and old concrete shall be as nearly vertical and horizontal as possible.

C. Additional Steel Reinforcement. Furnish for replacement, as directed by the Engineer, 2,700 linear feet of #4 steel reinforcing bars in 20’ lengths. Place these bars in areas deemed by the Engineer to require additional reinforcement. Field cutting and bending is permitted. Do not place any additional steel reinforcement above the height of the top row of Nelson Studs on the armored edges. Ensure that all exposed steel reinforcement is tied in accordance with Section 602.03.04 prior to pouring the new Class “M” concrete. Deliver unused bars to the Local County Maintenance Barn. Payment will be made in accordance with Section 602.

D. Stage Construction. Installation of concrete and armored edges in two (or more if specified) stages is necessary. Join the armored edges at or near the centerline of the roadway or lane line, field weld and grind smooth.

E. (2”/2 ½”) Expansion Joint System. System shall be installed in accordance with manufacturer’s recommendations concerning approved adhesives, welds between sticks and appurtenances, and adhesion to concrete deck or armored edges. Joint seal is to be installed ½” recessed from the surface.

F. Preformed Neoprene Strip Seal. Place the preformed joint seal in one continuous, unbroken length. Place neoprene strip seals as recommended by the manufacturer and in accordance with Section 609.03.04

G. Shop Plans. Shop plans will <u>not</u> be required. The Contractor is responsible for obtaining field measurements and supplying properly sized materials to complete the work.

V. MEASUREMENT.

A. Expansion Joint Replacement – 2", 2 ½", 4". The Department will measure the quantity in linear feet from gutterline to gutterline along the centerline of the joint.

B. Armored Edge for Concrete. The Department will measure the quantity in linear feet from gutterline to gutterline along the face of the bridge end.

C. Steel Reinforcement. See Section 602.

VI. PAYMENT.

A. **Expansion Joint Replacement – 2", 2 ½", 4".** Payment at the contract unit price per linear foot is full compensation for removing specified existing materials, furnishing and installing the new armored edges, concrete, neoprene strip seal or pre-compressed horizontal expansion joint system, and all incidental items necessary to complete the work (except the overlay material) within the specified pay limits as specified by this note and as shown on the attached detail drawings.
B. **Armored Edge for Concrete.** Payment at the contract unit price per linear foot is full compensation for removing specified existing materials, furnishing and installing the new armored edges, concrete and all incidental items necessary to complete the work (except the overlay material) within the specified pay limits as specified by this note and as shown on the attached detail drawings.
C. **Steel Reinforcement.** See Section 602.

Residual lead paint may still be on bridge. The Contractor is advised to take all necessary protective measures including worker safety and environmental regulations when executing this work. The Department will not consider any claims based on residual lead paint.

SPECIAL NOTE FOR RESET BEARING SHOE

I. DESCRIPTION. Perform all work in accordance with the Kentucky Transportation Cabinet, Department of Highway's 2008 Standard Specifications for Road and Bridge Construction and applicable Supplemental Specifications, the Standard Drawings, this Note, and the attached detail drawings. Section references are to the Standard Specifications.

This work consists of the following: (1) Furnish all labor, materials, tools, and equipment; (2) Jack and Support Bridge Span; (3) Shim as necessary and reset rockers or rollers to correct position. (4) Reposition and/or Remove jacking and temporary supports (5) Maintain and control traffic; and (6) Any other work specified as part of this contract.

II. CONSTRUCTION.

A. Jacking Guidelines. All jacking and supporting required to complete the work by this note shall be in accordance with the Special Note For Jack and Support Bridge Span and the Detail Drawings.

B. Shim Plates. If the contractor's field measurements or observations indicate that roller bearings are not in bearing contact with their sole plates, provide ¼" steel shim plates sized to fit the existing sole plates. Field weld shims to sole plates prior to resetting bearings. If more than 2 shims are required, replace the masonry plate in accordance with the Special Note for Replace Masonry Plate.

C. Reset Bearing Shoe. Move rollers/rockers to alignment under bearing stiffeners if present or other position as directed by the Engineer if bearing stiffeners are not present or as shown in the Detail Drawings. Rotate rockers to a vertical position plus any adjustment required for temperature or other position as directed by the Engineer or shown in the Detail Drawings.

IV MEASUREMENT.

A. Jack and Support Bridge Span. Measurement will not be made.

B. Reset Bearing Shoe. Measurement will be the number of bearings reset

V. PAYMENT.

A. Jack and Support Bridge Span. See the Special Note for Jack and Support Bridge Span.

B. Reset Bearing Shoe. Payment at the contract unit price each shall include all items necessary to complete the work and is full compensation for providing and setting steel shim plates and resetting the bearing shoe in the appropriate position as directed by the engineer, shown in the Detail Drawings, or specified by this Note .

SPECIAL NOTE FOR STRUCTURES WITH FIBER REINFORCED POLYMER WRAP

Bundle 19.03.09
Grant County 06-10010.00 041B00011N

I. DESCRIPTION

Perform all work in accordance with the Kentucky Transportation Cabinet, Department of Highways 2012 Standard Specifications for Road and Bridge Construction and applicable Supplemental Specifications, the Standard Drawings, this Special Note, and the Contract Documents. Section references are to the Standard Specifications.

This work consists of the following:

1. Furnish all labor, materials, tools, equipment, and incidental items necessary to complete the work.
2. Provide safe access to the bridge, in accordance with Section 107.01.01, for the Engineer to sound possible repair areas and for workers to complete the construction.
3. Repair cracks as applicable in accordance with the Special Note for Epoxy Injection Crack Repair.
4. Repair delaminated or spalled areas as applicable in accordance with the Special Note for Concrete Patching.
5. Design and install a carbon fiber reinforced polymer (CFRP) strengthening and protection system.
6. Any other work as specified as part of this contract.

II. MATERIALS

One manufacturer shall supply all materials required for the CFRP system. The manufacturer shall be one of three listed below or approved equal for the carbon fiber reinforced polymer (CFRP) strengthening and protection system.

Tyfo Fiberwrap System
Fyfe Company, LLC
4995 Murphy Canyon Road
Suite 110
San Diego, CA 92123

MasterBrace System
BASF Corporation
889 Valley Park Drive
Shakopee, MN 55379

QuakeWrap
6840 S Tucson Blvd
Tucson, AZ 85756

To be an approved equal CFRP material manufacturer, the manufacturer of the material shall have a history of at least 5 years for supplying the specified materials to highway or similar structural projects. The CFRP manufacturer must provide a history of a minimum of 15 installations completed in the last 2 years, durability testing, independent laboratory testing for corroded concrete repairs, design equivalence to the specified system, and all proposed material data.

CFRP materials shall have a current international code council evaluation service report (ICC ESR #) compliant with the 2018 IBC. Materials must provide structural and durability testing as defined in ICC AC125.

Polyester or other resins will not be allowed as a substitute to epoxy resins. Glass composite systems will not be allowed as a substitute to carbon composite systems.

III. CONSTRUCTION

A. Design CFRP System. The CFRP system shall be designed for the resistance(s) shown in the attached detail drawings and according to AASHTO FRPS-1 and ACI 440. Design calculations and details must be sealed by a Professional Engineer licensed in the State of Kentucky and must be submitted and approved by the Engineer prior to installation. Submittal information shall include:

a. Manufacturer's product data sheets and material test data.
b. Installation and maintenance instructions.
c. Drawings detailing the type, locations, dimensions, number of layers, and orientations of all FRP materials to be installed.
d. Calculations to determine the layout of the FRP materials to be installed.
e. Quality control plan.

B. Surface Preparation. Concrete sealer is to be removed from the existing surfaces to the installer's satisfaction prior to the concrete cleaning and spall repair. Any deteriorated concrete is to be patched per the Special Note for Concrete Patching, then cleaned and prepared to the installer's satisfaction prior to the installation of the CFRP system. The repaired concrete surfaces shall be allowed to cure a minimum of 14 days. The surfaces shall be clean and free of fins, depressions, or other conditions that may affect the intended performance of the CFRP system. Corners perpendicular to the strong fiber direction shall be rounded to a minimum radius of 3/4". The certified and experienced installer responsible shall verify that all required surface preparation has been completed properly and that the CFRP system is cleared for installation.

C. Composite Application. The CFRP system shall only be installed by individuals certified in writing by the material supplier. To be an approved installer for the CFRP material, the installer must provide a history of a minimum of 15 installations completed in the last 2 years using the proposed CFRP material or an approved equal. The manufacturer shall be required to provide training to the crew that does the actual installation as well as construction oversight throughout the duration of the CFRP installations to ensure the materials are applied according to their design and specific material requirements. The manufacturer must submit the name of the installer's

company and provide certification the installer meets the quality and experience requirements to perform the work with the bid documents. References of these installations including descriptions and contact information will be reviewed by the Engineer. Installers without the proper certifications, experience, and references will not be allowed to complete this work.

Temperatures of the substrate to receive the composite, ambient temperatures, and the temperature of the CFRP materials shall be between 50°F and 95°F at the time of mixing of epoxy. The CFRP system shall be applied when the relative humidity is less than 85% and the substrate temperature is more than 5°F above the dew point. Applications of the CFRP shall begin within one hour of the mixing of epoxies.

The manufacturer shall designate the proper mixing procedure for the epoxy resins. Apply a primer coating of epoxy to surfaces of the substrate to receive the CFRP system. Saturate the carbon fiber in a documented successful manner that ensures full saturation of the carbon fiber prior to the installation of the CFRP. Saturation of the carbon fiber in place is not allowed. Apply the CFRP to the prepared and primered substrate using methods that proved a uniform tensile force over the width of the saturated carbon fabric. Strong fibers shall not deviate from the intended fiber direction more than 1/2" per 12” length of composite. Inspection of the installed composite shall be completed prior to the curing of the CFRP to ensure that all edges, seams, and other areas are properly adhered. During this inspection process, releasing of entrapped air and other identified deficiencies shall be addressed.

After the CFRP system has been installed, use thickened epoxy to detail all edges and seams to provide a smooth finish. Apply a final layer of thickened epoxy to the installed CFRP system for protection.

D. Coating System Application. After the epoxy sets, yet prior to the application of the urethane top coat, all defects (including bubbles, delaminations, and fabric tears) more than 1 square inch of the surface area, or as specified by the Engineer, shall be repaired as such:

a. Small defects (on the order of 6” diameter) shall be injected or back filled with epoxy.
b. Bubbles less than 12” in diameter shall be repaired by injecting the epoxy. Two holes shall be drilled into the bubble to allow injection of the epoxy and escape of the entrapped air.
c. Bubbles, delaminations, and fabric tears greater than 12” in diameter shall be repaired by removing and reapplying the required number of layers of the composite and the required finish coatings. All repairs shall be approved by the Engineer.

The urethane top coat shall then be applied to the final epoxy coat, as determined by manufacturer.

E. Quality Control. Installer must follow the quality control manual for the installation of the CFRP Systems, produced by the manufacturer.

IV. MEASUREMENT

The Department will measure the quantity by square footage covered. The number of layers will not be counted.

V. PAYMENT

Payment at the contract unit price per square feet is full compensation for CFRP design, materials and installation, and all incidental items necessary to complete the work in accordance with this Special Note and as shown on the attached detail drawing(s).

Code	***Pay Item***	***Pay Unit***
25015EC	FRP Wrap	Square Feet

SPECIAL NOTE FOR TRAFFIC CONTROL ON BRIDGE REPAIR CONTRACTS

I. TRAFFIC CONTROL GENERAL

Except as provided herein, traffic shall be maintained in accordance with the 2012 Standard Specifications, Section 112. Except for the roadway and traffic control bid items listed, all items of work necessary to maintain and control traffic will be paid at the lump sum bid price to "Maintain and Control Traffic".

Contrary to Section 106.01, traffic control devices used on this project may be new or used in new condition, at the beginning of the work and maintained in like new condition until completion of the work.

II. TRAFFIC COORDINATOR

Furnish a Traffic Coordinator as per Section 112. The Traffic Coordinator shall inspect the project maintenance of traffic, at least three times daily, or as directed by the Engineer, during the Contractor's operations and at any time a lane closure is in place. The personnel shall have access on the project to a radio or telephone to be used in case of emergencies or accidents.

The Traffic Coordinator shall report all incidents throughout the work zone to the Engineer on the project. The Contractor shall furnish the name and telephone number where the Traffic Coordinator can be contacted at all times.

III. SIGNS

Contractor shall sign all closures in accordance with the detailed MOT drawings, the Standard Drawings, and the MUTCD.

The Contractor is to install warning signs for wide loads in advance of the bridge under the direction of the Engineer. The Department will not measure installation, maintenance, or removal for payment, and will consider these incidentals to Maintain and Control Traffic.

IV. TEMPORARY PAVEMENT STRIPING

Skip lines and/or solid lines through the length of the tapers for lane closures and other striping as directed by the Engineer shall be temporarily covered with 6" black removable tape. Permanent removal of all other pavement striping for traffic control shall be considered incidental to Maintain and Control Traffic. Temporary pavement striping shall be paid only once per course in accordance with Section 112.04.07. The Contractor shall replace any temporary striping that becomes damaged or fails to adhere to the pavement.

V. PROJECT PHASING & CONSTRUCTION PROCEDURES

The Contractor shall maintain two lanes of traffic on the interstate at all times in accordance with the detailed MOT drawings. All work shall be completed in weekend lane closures from 8:00pm on Friday to 5:00am the following Monday (57 hours). Lane closures are only permitted during the "57 hour weekend lane closure" periods. Lane and shoulder closures will not be permitted at any other times. In addition to the detailed MOT drawings, the contractor may also restrict each bridge to one lane, in accordance with TTC-125, for up to 8 hours, in the beginning and in the end of the 57 hour weekend closure, for the purposes of striping and setting temporary barrier wall and crash cushions. The 8 hour period in the beginning of the 57 hour closure would be from 8:00pm Friday to 4:00am Saturday. The 8 hour period in the end of the 57 hour closure would be from 9:00pm Sunday to 5:00am Monday.

If the contractor chooses to work on multiple bridges in a 57 hour lane closure, each bridge shall have the minimum barrier wall quantities and crash cushions as shown in the diagram in this note. The Contractor may extend barrier wall lengths for additional buffer zones for construction activities at no cost to the Department.

The clear lane width required is:

Structure	Clear Lane Width
056B00391N	2 lanes @ 11 feet each
056B00394N	1 lane @ 12 feet each

Interstate lane closures will not be permitted on these days:

Thunder Over Louisville Event (Saturday, April 13, 2019)
Easter Weekend (Friday, April 19, 2019 thru Sunday, April 21, 2019)
Kentucky Derby Weekend (Thursday, May 2, 2019 thru Sunday, May 5, 2019)
Memorial Day Weekend (Friday, May 24, 2019 thru Monday, May 27, 2019)
Labor Day Weekend (Friday, August 30, 2019 thru Monday, September 2, 2019)

Additional to the above date restrictions, 056B00391N I-65 **Ramp** closures will not be permitted on these days:

Saturday November 9, 2019 thru Friday November 22, 2019 (KY Expo Center Event)

VI. BARRIER WALL

Payment of the contract unit price per linear foot for "CONCRETE BARRIER WALL TYPE 9T" shall be full compensation for furnishing, installing, maintaining, adjusting alignment as needed, removing the barrier when no longer needed, and all incidental items necessary to complete the work.

Provide one side mounted barrier wall delineator per each section of barrier. See Standard Drawing RBM-020 for types. No direct payment allowed for delineators.

VII. CRASH CUSHION / END TREATMENTS

To the satisfaction of the Engineer extend Barrier wall out of the clear zone. If Barrier wall is not extended out of the clear zone to the satisfaction of the engineer provide crash cushions / end treatments for the barrier wall.

Provide Barrier end treatments that comply with MASH-16.

VIII. PORTABLE CHANGEABLE MESSAGE SIGNS

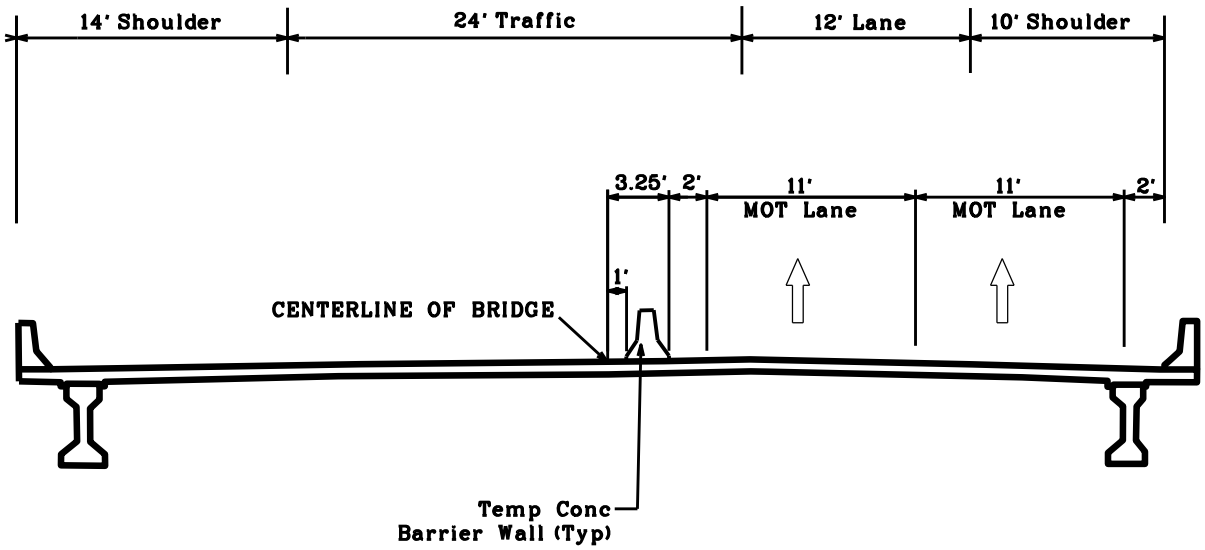
The contractor shall provide a minimum of two (2) Portable Changeable Message Signs located in advance of, or on the project at locations to be determined by the Engineer, at each phase of the project. Portable Changeable Message Signs shall be in operation during all road closures and for the immediate seven (7) days prior to the closure. The message required to be provided shall be designated by the Engineer. The Portable Changeable Message Signs shall be in operation at all times. In the event of damage or mechanical/electrical failure, the Contractor shall repair or replace the Portable Changeable Message Sign within 24 hours.

IX. RAMP CLOSURE BARRICADE

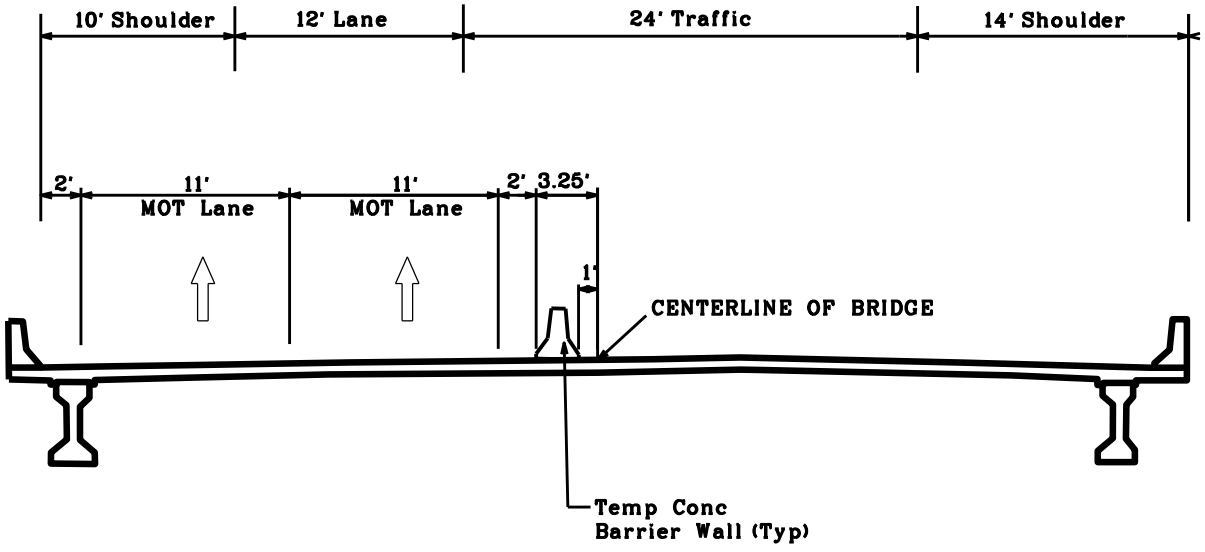
For 056B00391N I-65 Ramp, Type III Barricades shall be placed in accordance with the MUTCD and the 2012 Standard Specifications, Section 112. Barricades will be paid per each used under the bid item “BARRICADE – TYPE III”.

TYPICAL LANE CLOSURES
I-65

056B00391N



CONFIGURATION 1

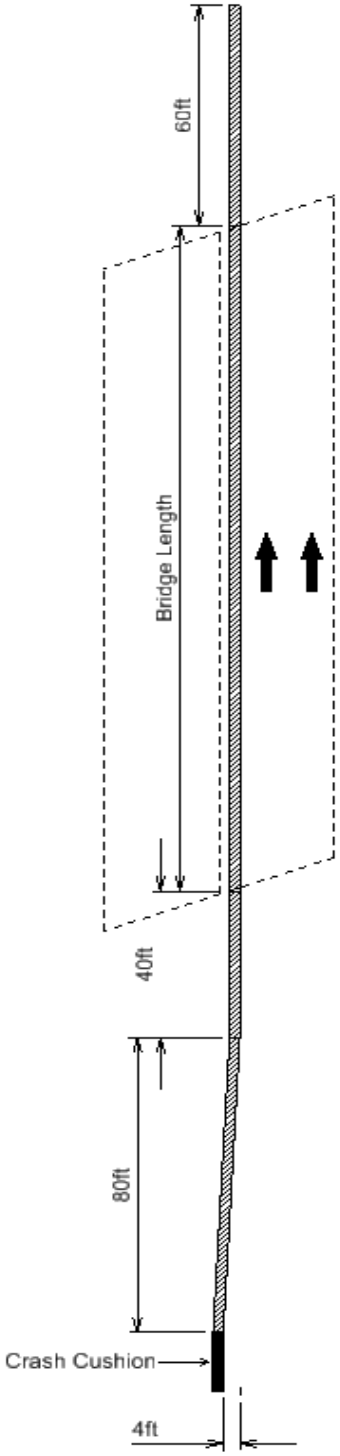


CONFIGURATION 2

CID 192601, JEFFERSON COUNTY

TYPICAL BARRIER WALL ARRANGEMENT (Fast Lane Closure Shown)

BRIDGE	LENGTH (FT)
056B00391N	593
056B00394N	559



SPECIAL NOTE
UTILITIES

BEFORE YOU DIG

The contractor is instructed to call 1-800-752-6007 to reach KY 811, the one-call system for information on the location of existing underground utilities. The call is to be placed a minimum of two (2) and no more than ten (10) business days prior to excavation. The contractor should be aware that owners of underground facilities are not required to be members of the KY 811 one-call Before-U-Dig (BUD) service. The contractor must coordinate excavation with the utility owners, including those whom do not subscribe to KY 811. It may be necessary for the contractor to contact the County Court Clerk to determine what utility companies have facilities in the area.

COORDINATION WITH UTILITY FACILITY OWNERS

The Roadway Contractor will be responsible for contacting all utility facility owners on the subject project to have existing facilities located in the field. The Roadway Contractor will coordinate his activities with the utility facility owners to minimize and, where possible, avoid conflicts with utility facilities. Where conflicts with utility facilities are unavoidable the Roadway Contractor will coordinate any necessary relocation work with the facility owner.

PROTECTION OF UTILITY FACILITIES

The location of utilities provided in the contact document has been furnished by the facility owners and/or by reviewing record drawings and may not be accurate. It will be the Roadway Contractor’s responsibility to locate the utilities before excavating by calling the various utility owners and by examining any supplemental information supplied by the Cabinet. If necessary, the Roadway Contractor shall determine the exact location and elevation of utilities by hand digging to expose utilities before excavating in the area of the utility. The cost for repair and any other associated costs for any damage to utilities caused by the Roadway Contractor’s operation shall be borne by the Roadway Contractor.