KANSAS DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION TO THE
STANDARD SPECIFICATIONS, EDITION 2007

Delete SECTION 833 and replace with the following:

SECTION 833

PAVEMENT PATCHING

833.1 DESCRIPTION

a. General. Patch the existing PCCP pavement as shown in the Contract Documents or at locations directed by the Engineer. Patches will be either full depth or partial. The purpose is to repair surface spalls at joint and cracks or repair joints and slabs that are cracked or shattered.

b. Asphalt Pavement Patching. This procedure is for the repair of PCCP pavement. This should be considered temporary in nature.

c. PCCP Patching (Full Depth). This procedure is for patching full depth deterioration of PCCP at joints and cracks.

d. PCCP Edge Joint Patching.

1. PCCP Edge Joint Patching (Partial Depth). This procedure is for repair of longitudinal joints or pavement edges with shallow spalls or honeycombing that are in the upper half of the pavement.
2. PCCP Edge Joint Patching (Full Depth). This procedure is for patching full depth deterioration or honey-combed pavement edges.

e. PCCP Joint and Crack Patching.

1. PCCP Joint and Crack Patching (Partial Depth). This procedure is for the repair of joint spalls, midpanel cracks and interior surface spalls (high steel).
2. PCCP Joint and Crack Patching (Full Depth). This procedure is for patching of full depth deterioration of transverse and longitudinal joints and their intersections.

f. Extra Work Saw Cuts. Make additional saw cuts, when required, to expand a patch, or to change a partial depth patch to a full depth patch.

BID ITEMS	**UNITS**
Asphalt Pavement Patching	Ton
PCCP Patching (Full Depth) (*) (**)	Square Yard
PCCP Edge Joint Patching (***)	Square Yard
PCCP Joint and Crack Patching (***)	Square Yard
Extra Work Saw Cuts (Set Price)	Linear Foot

*Thickness
**Sound or Unsound
***Partial Depth or Full Depth

833.2 MATERIALS

Provide materials that comply with the applicable requirements.

HMA-Commercial Grade ..... **SECTION 611**
Emulsified Asphalt (SS-1H and CSS-1H) ..... **DIVISION 1200**
Concrete (AE) ..... **DIVISION 400**
Aggregates..... **DIVISION 1100**
Concrete Curing Materials ..... **DIVISION 1400**

Joint Sealer and Filler Material ..... **DIVISION 1500**
Reinforcing Steel ..... **DIVISION 1600**
Rapid-Set Concrete Patching Material ..... **DIVISION 1700**
Cement ..... **DIVISION 2000**
Grade 2 Calcium Chloride ..... **DIVISION 1700**
Bond Breaker ..... **DIVISION 1700**

833.3 CONSTRUCTION REQUIREMENTS

a. General. Prepare the areas for patching according to the Contract Documents. Unless otherwise provided in the Contract Documents, restrict the pavement patching operations to 1 traffic lane at all times.

Schedule the patching operations so that the areas prepared for patching are patched the same day the deteriorated pavement is removed. If unavoidable delays prevent patching the same day, and traffic will be routed back onto the lane, fill the excavated areas with a compacted (temporary) asphalt mixture before nightfall. If there are safety issues with adjacent traffic encroaching on the prepared patch areas, fill the excavated areas before nightfall with a compacted (temporary) material such as AB-3, reclaimed concrete or asphalt millings, or as approved by the Engineer

Delineate the limits of the patch by sawing the existing pavement to the depth indicated before removing the deteriorated pavement. Use a saw that will produce a smooth cut for the required depth. Coordinate the pavement sawing and patching operations so that the sawed areas are patched within 3 working days.

Prepare the areas for patching by removing the deteriorated pavement to the limits designated in the Contract Documents. If the removal of the deteriorated pavement to the designated limits reveals further deterioration in the existing pavement, extend the limits of the patch to include the exposed deficient pavement, as directed by the Engineer.

When removing the deteriorated pavement, do not damage the remaining pavement. Repair or replace any damaged, remaining pavement. Do not disturb the base or subgrade while preparing the areas for patching, except to accommodate the thickness of pavement patching shown in the Contract Documents. If the base or subgrade is disturbed, adjust and re-compact the base or subgrade to the required lines and grades.

- If the subgrade is crushed stone subgrade, bring back to line and grade with Aggregates for Backfill.
- If the base is cement treated base or aggregate base, bring back to line and grade with AB-3.
- If the base is granular base, bring back to line and grade with Aggregate for Granular Base.
- If the base is asphaltic treated base, bring back to line and grade with HMA.
- If the base is bound drainable base, bring back to line and grade with Coarse Aggregate for Structural Concrete SCA-4, **TABLE 1102-2**.

Adjusting, re-compacting and bringing back base or subgrade to the required lines and grades is subsidiary to the patching item.

When consecutive multiple slabs are being replaced and lane closure time needs to be limited, at the Contractor's option and with the Engineer's approval, concrete may be used to fill the removed base material. Concrete used to fill the base is subsidiary to the patching item.

Remove all waste materials the same day they are excavated.

b. Asphalt Pavement Patching. After the location of the patch is defined, saw and remove the deteriorated pavement. Then, clean the exposed edges of the existing pavement. Before placing the HMA patch, apply a thin tack coat of emulsified asphalt to the clean edges of the existing pavement.

Place the HMA in uniform layers of 3 inches or less in thickness. Compact each layer until no further consolidation is observed. Clean the surface of the preceding layer of compacted HMA before the succeeding layer of asphalt material is placed.

c. PCCP Patching Location. Reference the location of the existing joints in the concrete pavement before removing the deteriorated pavement. During the patching operations, establish new joints at the same locations as the original joints.

d. PCCP Patching Removal.

(1) Full Depth Patches. Define and saw the limits of full depth patches the full depth of the existing concrete pavement. If the existing concrete pavement will receive an overlay the same construction season, a rock

saw is allowed for the sawing. If the boundaries of consecutive areas to be repaired are less than 6 feet apart, also remove and replace the areas between the patches.

(2) Partial Depth Patches. The minimum patch size for partial depth patches is 4 inches by 12 inches. Delineate the limits of partial depth patches a minimum of 2 inches beyond the area of deteriorated pavement. If areas defined for partial depth patches are less than 12 inches apart, include the areas into a single patch.

(a) Removal (Longitudinal Joint).

- **Saw and Jackhammer.** Saw the limits of partial depth patches according to the Contract Documents. Use jackhammers to remove the deteriorated pavement to the depth shown in the Contract Documents. Cut out or chip away the connecting edges below the sawed portion to as near true lines with vertical faces, as possible; or
- **Saw, Mill and Jackhammer.** Saw the limits of partial depth patches according to Contract Documents. Mill within the limits of the sawcut without damaging the vertical edges of the patch. Carefully, jackhammer any material left at the edges; or
- **Mill.** The Engineer may approve a milling process based on the satisfactory performance of the equipment and the Contractor's process. The operation shall result in minimal edge spalling at the surface.

(b) Removal (Transverse Joint).

- **Saw and Jackhammer.** Saw the limits of partial depth patches according to contract documents. Use jackhammers to remove the deteriorated pavement to the depth shown in the Contract Documents. Cut out or chip away the connecting edges below the sawed portion to as near true lines with vertical faces as possible; or
- **Saw, Mill and Jackhammer.** Saw the limits of partial depth patches according to Contract Documents. Mill within the limits of the sawcut without damaging the vertical edges of the patch. Carefully, jackhammer any material left at the edges.

Use jackhammers (30 pounds maximum size) to remove the deteriorated pavement to the depth shown in the Contract Documents.

Use only self-propelled milling machines designed to perform only milling operations. Mills attached to other equipment are prohibited, except in small irregular areas.

After the deteriorated pavement is removed to the saw or mill depth, use a steel-faced hammer or steel chain drag to check for unsound concrete below this depth. If unsound concrete is detected, use jackhammers (30 pounds maximum size) to remove the deteriorated pavement below the saw or mill depth.

If the unsound concrete encountered is more than 4 inches deep and constitutes more than 50% of the surface area of the patch, the Engineer will determine if the patch should be repaired according to **subsection 833.3d.(1)** Full Depth Patches.

If the pavement patch is started according to the details for Joint and Crack Patching (Partial Depth) and the Engineer changes the patch to a full depth patch, construct the full depth patch according to the details for Full Depth Joint and Crack Patching. See PCCP Joint and Crack Patching standard details.

If the pavement patch is started according to the details for Edge Joint Patching (Partial Depth) and the Engineer changes the patch to a full depth patch, construct the full depth patch according to the details for Full Depth Edge Joint Patching. See PCCP Edge Joint standard details.

e. PCCP Patch Preparation. Clean the partial depth patches using compressed air or a stiff rotary broom. Sandblast the cavities of the partial depth patches to expose aggregate and mortar. Clean with compressed air as the final preparation prior to placing the grout and concrete.

When required, place edge forms and joint fillers before concrete placement.

Apply bondbreaker to exposed dowel bars.

If required, drill holes and grout the specified steel reinforcement into the existing concrete pavement according to **SECTION 842**.

f. PCCP Patch Concrete Placement. For partial depth patches, apply concrete grout (1 part cement, 3 parts water by weight) to the prepared surfaces of the patch just prior to concrete placement. If the grout dries before the concrete is placed, remove the dried grout by sandblasting and re-apply fresh grout. Place and consolidate the specified concrete in the areas prepared for patching, strike-off the concrete flush with surface of the existing

pavement, and finish the surface with a wooden float or another method approved by the Engineer. Provide a broom or burlap drag surface texture to the plastic concrete.

Remove the backer board from formed joints or flush sawed joints with water. Sand blast the vertical faces of the joints to be sealed. Clean the sand blasted joints with compressed air and seal the joints according to the Contract Documents.

Do not place concrete patches if the ambient air temperature is below 40ºF. If the ambient air temperature is below 60°F when the concrete patches are placed, the Engineer may require additional curing time. Apply the curing materials before the undue loss of moisture occurs.

g. PCCP Patch Curing. Unless directed otherwise by the Engineer, cure the concrete patches by applying liquid membrane-forming compound at the rate of 1 gallon per 100 square feet to the finished patch. If the existing concrete pavement will be overlayed with HMA in the near future, the Engineer may require that concrete patches are cured with emulsified asphalt.

h. Joints. When repairs include joints in existing pavement, re-establish the joint in the plastic concrete, or saw when the concrete has reached sufficient strength according to the Contract Documents. "Early entry" saws may be required to cut joints in green concrete to match existing joints.

(1) Patches to be overlaid. Do not seal joints.

(2) Patches not overlaid. See KDOT standard drawing.

i. Opening to Traffic. Perform testing to determine when the patch can be opened to traffic.

- When a minimum flexural strength of 380 psi or minimum compressive strength of 1800 psi is obtained from properly cured specimens.
- If the temperature falls below 60°F during the cure period, use the Schmidt rebound hammer to determine when the patch can be opened to traffic. The patch may be opened to traffic when the results of the rebound hammer test equal or exceed results obtained on materials previously tested and known to meet the strength requirements or 60% of the rebound on adjoining pavement.
- When maturity is used to determine when the patch is opened to traffic, make cylinders from the same mix to be used. Cure and break the cylinders under a time and temperature plan to develop a concrete maturity curve. Use the concrete maturity curve to determine when the patch has gained the strength to be opened to traffic.
- If Grade 2 calcium chloride is used, see **subsection 401.3i.(1), (special provision 07-04002, latest version)**.
- When approved by the Engineer, other methods may be used to determine when the patch has gained the strength to be opened to traffic.

833.4 MEASUREMENT AND PAYMENT

The Engineer will measure asphalt pavement patching by the ton of HMA used.

The Engineer will measure the various types of concrete pavement patching by the square yard.

Removal of the existing pavement for either asphalt or concrete pavement will not be measured for separate payment.

If the Contractor chooses to use a milling machine to remove the deteriorated pavement, and the area removed is greater than the area originally defined for the partial depth patch, the Engineer will base the measurements of the partial depth patch on the dimensions originally defined for the patch.

The Engineer will measure a patch started as partial depth patch, but completed as a full depth patch, as a full depth patch.

A patch started according to the details for Joint and Crack Patching (Partial Depth) and completed as a full depth patch is measured and paid as Joint and Crack Patching (Full Depth).

A patch started according to the details for Edge Joint Patching (Partial Depth) and completed as a full depth patch is measured and paid as Joint and Crack Patching (Full Depth).

Patches started according to Partial Depth, but completed as Full Depth due to Contractor’s negligence will be measured as Partial Depth patches.

If additional saw cuts are required to expand a patch, or to change a partial depth patch to a full depth patch, the Engineer will measure the additional saw cuts by the foot.

Payment for "Asphalt Pavement Patching", "PCCP Patching (Full Depth)", "PCCP Edge Joint Patching" and "PCCP Joint and Crack Patching" at the contract unit prices and "Extra Work Saw Cuts (Set Price)" at the contract unit set price is full compensation for the specified work.

11-16-11 C&M
Feb-12 Letting