

**OKLAHOMA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISIONS
FOR
FIBER REINFORCED, BONDED PORTLAND CEMENT CONCRETE OVERLAY**

These special provisions amend and where in conflict, supersede applicable sections of the 2009 Standard Specifications for Highway Construction, English and Metric.

(Add the following:)

**SECTION 435
FIBER REINFORCED, BONDED PORTLAND CEMENT CONCRETE OVERLAY**

435.01 DESCRIPTION

This work consists of placing a fiber reinforced, bonded PCC pavement overlay of an existing PCC pavement to the thickness as shown on the plans, and associated patching work.

435.02 MATERIALS

- *Cement.* Provide cement conforming to subsection 701.02. The use of Type III and Type IIIA cement will not be permitted.
- *Aggregate.* Provide aggregate conforming to subsection 701.05 and 701.06. Provide No. 67 size gradation for the coarse aggregate in the PCC overlay. Provide the same type of coarse aggregate in the overlay as in the original pavement to reduce stresses due to the coefficients of thermal expansion of different materials.
- *Concrete.* Provide concrete conforming to Section 701.01 for Class 'AA' concrete. Ensure the bond shear strength between the original pavement and overlay is a minimum of 200 psi, as tested with an Iowa Shear Strength test fixture or other similar device. Submit a Type 'A' certification, as shown in subsection 106.04C, for each lane-mile (or major portion thereof) of the overlay.
- *Grout.* Do not grout or dampen the slab prior to overlaying.
- *Joint Filler and Sealer.* Provide Joint filler and sealer that is a preformed elastomeric compression joint seal, conforming to subsection 701.08(C), or a low modulus silicone joint sealant conforming to subsection 701.08(F).
- *Admixtures.* Provide admixtures conforming to subsection 701.03.
- *Fiber Reinforcement.* Provide fibers conforming to subsection 701.15.

435.03 EQUIPMENT

Furnished equipment is subject to approval of the Engineer and must comply with the following:

A. Shot Blasting Equipment

Furnish shot blasting equipment meeting the requirements of 414.03K.

B. Milling Machine

Furnish a power-operated milling machine meeting the requirements of 412.03.

C. Proportioning and Mixing Equipment

Provide proportioning and mixing equipment conforming to subsection 414.03A. Sufficient mixing capacity of mixers shall be provided to permit the intended pour to be placed without interruption.

D. Placing and Finishing Equipment

Provide placing and finishing equipment conforming to subsection 414.03B.

435.04 CONSTRUCTION METHODS

A. Full Depth PCC Patches

Construct full depth PCC patches according to the plans with HES Class 'A' Concrete. Place dowels as required as shown on the Plans. The patches will be half or full lane width, and the minimum length of patch, measured parallel to the centerline, will be 6 feet. Complete Full depth patches in an area before overlay work is done. Construct full depth patches in accordance with applicable requirements of section 414 and standard PCPR-2.

Do not use calcium chloride.

Do not allow traffic on the patch until the concrete has cured to a minimum of 2,500 psi compressive strength.

B. Preparation of Surface

Include the entire surface in the preparation of the surface to be overlaid. Thoroughly clean the surface with shotblasting equipment. Remove all dirt, oil, and other foreign materials, as well as any laitance or loose material from the surface and edges against which new concrete is to be placed. Remove all pavement markings and raised pavement markings. Dispose of materials removed in the preparation operation in a manner approved by the Engineer.

C. Placing and Finishing Overlay Concrete

Ensure the concrete placing equipment places the material to the proper elevation by string line or by operating the equipment on a pad line that is constructed to a true grade line. Place overlay concrete in accordance with applicable requirements of section 414 with the following modifications:

(1) Surface Cleaning

Clean the entire surface with an oil-free, compressed air blast prior to applying the overlay to the surface. Acceptable cleaning will be determined by increasing the average surface macrotexture at least 0.030 from the unimproved value to an average minimum value of 0.060, as measured with latest ASTM E 965 standard volumetric method. Except for the paving machine and batch trucks, do not allow construction or other traffic on the cleaned surface. Prevent contamination of the cleaned pavement surface prior to overlaying.

(2) Joint Identification

Identify the exact location of each contraction and expansion joint in the existing pavement and joints to be sawed at each full depth patch on both sides by a reliable method.

(3) Placing and Finishing Overlay Concrete

Ensure a smooth riding surface. Prior to the placement operation, review the equipment, procedures, personnel, previous results, and the inspection procedure with the Engineer to assure a coordinated effort. Ensure the following:

- (a) Assurance that the concrete can be produced and placed to the proper thickness and cross section within the specified limits, continuously and with uniformity,
- (b) The thickness of all new concrete above the prepared surface will be as specified on the plans,
- (c) The use of mechanical tining will be as directed by the fiber manufacturer's field representative. Use a 4" to 6" blanking band around joints (i.e., 2" to 3" on each side of the joint) where no tining will be done.
- (d) At those times when the evaporation rate (see attached nomograph) exceeds 0.10 LB/SF/HR for a period of time as specified by the Engineer, or greater than 20 minutes, or the difference in ambient temperature at the time of placement verses the expected low temperature in a 24-hour period exceeds 35°F, take measures to control the moisture content of the newly placed concrete overlay. Use Fogging, wet mat curing, or other measures, as directed by the Engineer, to control the moisture content. These measures are in addition to the membrane curing required. Protect the entire day's placement when such conditions occur. Maintain the protection in place for a minimum of 36 hours, or until such a time as directed by the Engineer. Remove the protection as directed by the Engineer,
- (e) At those times when the difference in the ambient temperature at the time of placement verses the expected low temperature is expected to exceed 35°F, place the overlay no later than 12 o'clock noon the preceding day, or a minimum of 18 hours prior to the time the maximum temperature difference is expected,
- (f) Use a white pigmented curing compound meeting the requirements of subsection 701.07C applied at the rate of one gallon to not more than 100 square feet.

(4) Joints

Saw joints in the overlay directly over existing transverse and longitudinal joints. Saw the joints to the full depth of the new overlay concrete plus one-half inch. Saw joints in the widened section 1/3 of thickness of pavement in these areas. Saw the joints as soon as possible without causing excessive raveling. Clean and seal all joints in accordance with Subsection 701.08, or according to the manufacturer's recommendation.

D. Limitations of Operations

Conform overlay operations to subsections 414.04(D), 414.04(M) and 414.04(N). Do not place PC concrete when the air or pavement temperature is at or expected to be below 40°F during placement. At the time of the overlay construction, the sum of the free air temperature and temperature of the plastic concrete delivered to the paver shall not exceed 180°F. Do not deliver the plastic PCC at a temperature exceeding 90°F. If ice is substituted for mix water in concrete to lower the plastic concrete temperature, melt all of the ice and mix all of the water thoroughly in the plastic PCC prior to placement.

435.05 METHOD OF MEASUREMENT

The quantities of the various items of work involved in the construction of PCC overlay will be measured in accordance with the following provisions:

A. Portland Cement Concrete for Bonded Pavement Overlay

The quantity of overlay concrete furnished shall be measured in cubic yards, using the ticket count, or other approved documentation, of batches incorporated. The Contractor shall use an approved automatic batch weight and printer system. The approved automatic batch weight and printer system shall be electronically controlled and capable of determining the net batch weight of material being delivered to the transporting truck. Such weights shall be evidenced by a weight ticket containing separate weights of each material incorporated into the load. Tickets shall also include quantities of admixtures and volume of water incorporated into load. The automatic batch weight and printer system shall be subject to calibration, inspection, and certification requirements as provided in section 109. This quantity will include concrete placed in the overlay and any areas of backfill for dowel bar retrofit only.

B. Portland Cement Concrete Pavement, Bonded Overlay, Placement Only

The area of Portland cement concrete overlay placement only will be computed in square yards from surface measured longitudinally and the nominal pavement width. This area will be measured in accordance to Section 414.05.

C. Full Depth PCC Patches

Full depth PCC patches will be measured in square yards of the nominal surface area of the patches. This area will be measured in accordance to Section 414.05.

435.06 BASIS OF PAYMENT

The Department will pay for each item at the contract unit price per the specified pay unit as follows:

Pay Item:	Pay Unit:
<i>PORTLAND CEMENT CONCRETE FOR BONDED PAVEMENT OVERLAY</i>	Cubic Yard [Cubic Meter]
<i>PORTLAND CEMENT CONCRETE PAVEMENT OVERLAY, PLACEMENT ONLY</i>	Square Yard [Square Meter]
<i>H.E.S. CONCRETE (FULL DEPTH PATCHING)</i>	Square Yard [Square Meter]

Payment is considered full compensation for furnishing all material, equipment, labor and incidentals necessary for the proportioning, mixing, delivery and placement of the concrete. This includes the placement of bars, cleaning and sealing the joints in accordance with the plans and this special provision.