Make this section a part of the Standard Specifications:

"SECTION 404 - SLURRY SEAL

404.01 Description. This section describes furnishing and applying slurry seal on an existing asphalt surface.

404.02 Materials.

Emulsified Asphalt (Type CQS-1h with 2% Polymer Latex)	702.04
Aggregate for Slurry Seal	703.11
Filler	703.15
Water	712.01

(A) General. Slurry seal shall include uniform blend of emulsified asphalt, aggregate, water, and if required by job-mix formula, filler.

(B) Job-Mix Formula and Tests. Unless otherwise specified, design and test job-mix formula in accordance with ASTM D 3910 and International Slurry Seal Association (ISSA) technical bulletins, for Type III slurry seal, and as indicated in the contract documents.

Tolerance of plus or minus 1 percent will be allowed in residual asphalt content from that specified in job-mix formula accepted by the Engineer.

(C) Submittals. Submit slurry seal job-mix formula for each type of slurry seal mix indicated in the contract documents as follows:

(1) Design percent of aggregate passing each required sieve size.

(2) Design percent of residual asphalt added to aggregate, based on dry weight of aggregate.

(3) Source of aggregate.

(4) Grade of emulsified asphalt.

(5) Test data used to develop job-mix formula.

(6) Slurry seal equipment calibration and production settings for approved job-mix formula.

If design requirements are modified after the Engineer accepts job-mix formula, submit new job-mix formula before using slurry seal produced from modified mix design.

(D) Material Storage & Handling. A barrier shall be placed under the aggregate stockpile to prevent underlying material from being incorporated into the slurry seal aggregate. Prior to loading aggregates into mixing machine bins, aggregates shall be screened to remove oversized material.

404.03 Construction.

(A) Test Section. Before production and after calibration as specified in Subsection 404.03(C)(6) - Equipment Calibration, apply slurry seal onto test section using same mixture, equipment, and method proposed for use in the work. Test section shall be at least 10 feet by 50 feet and applied under typical project environmental conditions. A separate test section is required for each piece of equipment that will be used on the project. The test sections shall also include a demonstration of the equipment change-out procedure for material resupply to verify the consistency of the slurry material upon restart and the ability to construct an acceptable construction joint. The Engineer will determine location of test section. Prior to continuation of slurry seal production, mixture samples may be taken and the test strip will be evaluated to verify mix consistency, proportioning, application rate, and set time.

(B) Paving Plan. Submit a slurry seal paving plan for review and acceptance prior to the start of slurry seal activity. The paving plan shall include the sequence of work for the slurry application areas, equipment application runs, and designated handwork application areas.

(C) Weather Limitation. Application of slurry seal will not be allowed under the following conditions:

(1) On wet surfaces as determined by the Engineer.

(2) When air temperature is below 60 degrees F and falling. Slurry seal may be applied when air temperature is above 50 degrees F and rising. Air temperature will be measured in shade and away from artificial heat.

(3) When weather conditions prevent proper method of construction.

(D) Equipment.

(1) General. Keep equipment, tools, and machinery clean and maintained in satisfactory condition.

(2) Mixing Equipment. Use self-propelled machine specifically designed and manufactured to lay slurry seal. Mixing machine shall be either truck-mounted or continuous-run design. A continuous-run machine is defined as one that is equipped to self-load while continuing to lay slurry seal. Either type machine shall be able to accurately deliver and proportion aggregate, emulsified asphalt, water, and if specified by job-mix formula, filler to maintain adequate supply to the proportioning controls.

If continuous-run machine is used, equip to allow operator to have full control of forward and reverse speeds during slurry seal application; and to include opposite-side driver stations and forward and reverse speed controls.

(3) Proportioning Devices. Provide and label individual volume or weight controls for proportioning each material to be added to mix.

(4) Spreading Equipment. Spread mixture uniformly by means of conventional surfacing spreader box attached to mixer and equipped to agitate and spread material evenly throughout box. Provide front seal that prevents loss of mixture at road contact point and adjustable rear seal the functions as final strike-off. Design and operate spreader box and rear strike-off such that uniform consistency is achieved to produce free flow of material to rear strike-off. Equip spreader box with means to side shift box to compensate for variations in pavement geometry. Burlap drag or other accepted screed may be attached to rear of spreader box to provide uniform, highly textured mat.

(5) Auxiliary Equipment. Provide other tools or equipment, such as brushes, hose equipment, tank trucks, water distributors and flushers, power sweepers, and power blowers.

(6) Equipment Calibration. Calibrate in the Engineer's presence all equipment to be used in performance of the work. Submittal of previous calibration documents may be used in lieu of calibration in the Engineer's presence if documented calibration were made within one calendar year of submittal. Include individual calibration of each material at various settings, which can be related to machine's metering devices. No machine will be allowed

to be used on project until calibration has been completed and accepted.

After calibration and prior to production, make test strips for each machine. Test strips shall be part of test section specified in Subsection 404.03(A) - Test Section. Upon failure of test for mix consistency, proportioning, or rate of application, or combination thereof, additional test strips at no increase in contract price or contract time will be required until each machine is accepted for work. Machine failing to pass specified tests after three trials will not be allowed to be used on project.

(E) Preparation of Surfaces. Immediately before applying slurry seal, clean existing pavement in accordance with Section 310 - Brooming Off.

Remove all pavement markers and eradicate the existing thermoplastic pavement striping.

Cold plane the existing pavement to provide a smooth transition between the slurry seal and any existing pavement or structure. The cold planed or ground transition shall be a minimum width of one foot from the edge of the existing pavement or structure and deep enough for the slurry seal to match the grades of the existing pavement or structure. This work shall be completed and paid for under the pay item, Cold Planing.

Distressed areas on the existing pavement indicated for removal and replacement with hot-mix asphalt shall be completed at least seven days prior to the start of slurry seal placement. The reconstructed areas shall not be higher than the existing pavement surface and may be recessed up to 1/8-inch below the existing pavement surface. This work shall be completed and paid for under the pay item, Reconstruction of Weakened Pavement Areas.

Application of Crack Sealer shall be in accordance with section 408 – Crack Seal. Crack Sealing shall be completed at least thirty (30) calendar days prior to the start of slurry seal placement. This work shall be completed and paid for under the pay item, Crack Seal.

Contaminated areas on the existing pavement including but not limited to chemical spills/stains and accumulation of debris or organic matter shall be removed, cleaned with an approved biodegradable cleaning solution, and thoroughly rinsed. Persistent stains shall be removed by spot-grinding or torching and sealed with an approved oil spot primer. High pressure washing is not permitted.

Manholes, valve boxes, drop inlets and other service entrances as well as survey and centerline monuments, shall be protected from the

slurry seal by a suitable method. Contractors shall be held liable for any service entrances and monuments covered up resulting from construction. The clean up of any service entrances and monuments shall be at the expense of the contractor.

The Engineer shall approve surface prior to application of slurry surfacing.

(F) Application of Slurry Seal. Apply slurry seal in accordance with ASTM D 3910, ISSA A105, and as indicated in the contract documents. Pour slurry seal into spreader box in sufficient quantity to completely cover full width of spreader. Do not overload the spreader or allow slurry seal to flow out of the sides of the spreader box. The slurry seal shall possess sufficient stability so that the premature breaking of the material in the spreader box does not occur. The mixture shall be homogeneous during and following mixing and spreading. It shall be free of excess water and emulsion and free of segregation of the emulsion and aggregate fines from the coarser aggregate. Spraying of additional water into the spreader box will not be permitted.

Apply slurry seal in one uniformly blended coat. Use hand spreaders only in areas where spreader box cannot be used.

Lumping, balling, or unmixed aggregate in the slurry seal shall not be permitted. No streaks, such as those caused by oversized aggregate, shall be left in the finished surface. If excess oversize develops, the job will be stopped until the Contractor is able to prove that the situation has been corrected. All cost and time expense related to the stoppage will be the responsibility of the Contractor.

(G) Joints, Trimming Edges, Removal of Excess Material, and Corrective Measures. Excess buildup, uncovered areas, or unsightly appearance shall not be permitted. All excess slurry seal build-up on longitudinal and transverse joints shall be removed. Place longitudinal joints on lane lines. Half passes and odd-width passes may only be used in minimum amounts and only when authorized by the Engineer. The contractor shall provide suitable width-spreading equipment to minimize the number of longitudinal joints throughout the project. Longitudinal lane line joints shall not overlap more than six inches.

Excess slurry seal on areas such as shoulders, gutters, curbs, utility covers, and pavement markers and striping to remain shall be removed.

All deficiencies in the slurry seal, resulting from but not limited to poor workmanship, contractor's operations, removal of temporary traffic control measures, and early opening to vehicular traffic, shall be repaired

before acceptance. All corrective measures shall be considered incidental to the slurry seal. The corrective methods shall be approved by the Engineer.

(H) Protection of Slurry Seal. Except for construction equipment used for slurry seal operations, keep traffic off slurry seal until such time that mixture has cured sufficiently so that slurry seal will not adhere to and be picked up by vehicle tires. Ensure that cured slurry seal adheres firmly to existing surface.

404.04 Measurement. The Engineer will measure slurry seal per square yard in accordance with the contract documents.

The Engineer will not measure preparation of surfaces except for cold planing and distressed asphalt reconstruction work. All other work mentioned in the preparation of surfaces shall be considered incidental to slurry seal activities.

404.05 Payment. The Engineer will pay for the accepted slurry seal at the contract unit price basis, as shown in the proposal schedule. Payment will be full compensation for the work prescribed in this section and the contract documents.

The Engineer will pay for the following pay item when included in the proposal schedule:

Pay Item	**Pay Unit**
Slurry Seal	Square Yard

Engineer will pay 100 percent of the contract bid price upon completion of the slurry seal installation."

END OF SECTION 404