

2024 TECHNICAL SPECIFICATIONS UPDATES

Summary of Changes

Revisions and additions in bold italics and DELETIONS

S-102 SPECIFICATIONS

1. Added the following sentence: ***The “Standard Specifications” shall govern all work not covered by these Specifications.***

S-104 MATERIAL REQUIREMENTS AND SUBMITTALS:

1. Revised Item No. 5 in the table to include ***Cement and Lime.***

S-105 SAMPLING AND TESTING

1. Made minor edits to the table heading and layout.
2. Revised Bituminous Mixtures testing frequency to state the following: ***Daily Quality Control shall be run when 500 tons will be place on a project. Testing performed by contractor.***

S-212 SUBGRADE

1. Revised A.2. last sentence Proof-rolling with a loaded tandem dump truck which has a minimum GVW of ~~15 tons (30,000 lbs)~~ ***25 tons (50,000 lbs)*** will be required before acceptance of finish grade.
2. Added new A.4. - ***Stringline shall be installed prior to Modified Subgrade operations. Grade checks shall be completed at a minimum of 50’ intervals and the Contractor shall assist the Engineer in performing the grade checks. Tolerance prior to Modified Subgrade shall be +/- 0.10’, tolerance for finished subgrade shall be +/- 0.05’.***

S-300 ASPHALTIC CONCRETE

1. Added new A.2. - ***Recycled Asphalt Shingles (RAS) or Reclaimed Asphalt Pavement (RAP) that contains RAS is not allowed. Documentation shall be provided on the Superpave Asphaltic Concrete Test to report if visual evidence is found of fiberglass retained on the #2 sieve.***
2. Revised A.4 - ***FRAP shall be prequalified in accordance with the current KCMMB Asphalt Material Submittal Requirements.***

3. Revised A.5. - Aggregates: ***The virgin aggregate shall be listed on the most current, active KDOT web published list “Hot Mix Aggregate Specific Gravity Values” at the following link: <https://www.ksdot.gov/htmxAggravValu.asp>. If aggregate is only to be used in Missouri, currently approved MoDOT aggregate sources may be submitted for approval. The resultant aggregate composite specific gravity value of each aggregate material shall be used in all specific gravity related calculations.*** The total aggregate (coarse aggregate, fine aggregate, and the material passing the No. 200 sieve) shall contain not less than 85 percent crushed material. Coarse aggregate (***plus #4 material***) shall be tested in accordance with KT-31, ASTM D5821, or AASHTO TP 61. Aggregate shall contain not more than 8% of flat and elongated particles by weight (5:1) as tested in accordance with ASTM D4791. ***The Sand Equivalent value of the total fine aggregate portion (minus #4 material) of the virgin aggregate shall be tested in accordance with ASTM D2419 or AASHTO T 176. The measured Sand Equivalent values of the virgin aggregate shall be a minimum of 40.***
4. Revised Table 3: Gradation Requirements for KCMMB Asphalt Mixes

Table 3: Gradation Requirements for KCMMB Asphalt Mixes				
Sieve Size	KCMMB A1 KCMMB A2		KCMMB A3	
	Percent Passing 12.5 mm Nominal Size Control Points		Percent Passing 19 mm Nominal Size Control Points	
25 mm (1 in.)	-	-	-	100
19 mm (3/4 in.)	-	100	90	100
12.5 mm (1/2 in.)	90	100	-	90
9.5 mm (3/8 in.)	75	90	-	-
4.75 mm (No. 4)	-	-	-	-
2.36 mm (No. 8)	34	48	35	49
1.18 mm (No. 16)	-	-	-	-
600 µm (No. 30)	-	-	-	-
300 µm (No. 50)	-	-	-	-
150 µm (No. 100)	-	-	-	-
75 µm (No. 200)	2	8	2	8

5. Revised note I for Table 3 - The exact gradation shall be determined by the Contractor’s laboratory. ***Natural Sand is limited to a maximum 15.0% of the total aggregate blend.***

6. Added new Table 4 Aggregate Quality Testing.

Table 4. Aggregate Quality Testing	
	Max. Allowable %
ASTM C131 LA Abrasion	
% Loss	40.0%
ASTM C88 Sulfate Soundness (MgSO ₄) Weighted % Loss	
% Loss (5 cycles)	18.0%

7. Revised Table 5: Superpave Design and Testing Properties

Table 5: Superpave Design and Testing Properties			
	KCMMB A1	KCMMB A2	KCMMB A3
N _{initial} (gyrations)	6	6	6
N _{design} (gyrations)	60	60	60
G _{mm} at N _{ini} (%)	85 – 91	85 – 91	85 – 91
Design Air Voids (%)	3.2	3.4	3.0
Production Allowable Air Voids (%)	2.5 - 3.9	2.7 - 4.1	2.3 – 3.7
¹ Minimum Design VEA (%)	10.8	10.6	10.0
Production VEA Minimum (%)	9.8	9.6	9.0
Dust to Binder Ratio (%)	0.5 - 1.4	0.5 - 1.5	0.5 - 1.6
Maximum Temperature of the Mixture (°F)	315	315	315

f¹VEA% = Volume of Effective Asphalt (%) which is the numerical difference between VMA and Air Voids. **KCMMB A1 and A2 use a minimum VMA of 14.0. KCMMB A3 uses a minimum VMA of 13.0.**

f²Refer to paragraph “Resistance of Compacted Bituminous Mixture to Moisture Induced Damage”.

8. Added items 7.e. through 7.n.

- e. **The material for the theoretical specific gravity (G_{mm}) and the material for the Gyro Compactor specimens (pucks) shall be cured at 140+/-3° C (285+/-5° F) for four hours in a closed oven after the mix is produced in the laboratory. Also, the plant-produced mixture shall cure for four hours prior to testing.**
- f. **The mixture shall be transported to the laboratory in an insulated container and then stored in a laboratory oven at 140 +/-3° C (285 +/-5° F) minimum temperature for the remainder of the curing period. The curing oven shall be the forced air type and may be operated at a temperature not to exceed the maximum temperature at which the mixture may be discharged from the plant as specified in Section 6.**

- g. *This procedure shall be used when the water-absorption as determined by ASTM C127 and ASTM C128 of any individual aggregate stockpile in the aggregate blend exceeds 1.25 percent. The mixture shall be compacted at 140 +/-3° C (285 +/-5° F).*
 - h. *The theoretical specific gravity (G_{mm}) shall be performed using the Type E-A 4500ml metal vacuum pycnometer with a clear polymethyl methacrylate PMMA lid. The vacuum shall be applied for 15 minutes to gradually reduce the residual pressure in the vacuum vessel to 28 mm Hg.*
 - i. *The G_{se} of the FRAP material shall be used as aggregate G_{sb} in volumetric calculations provided that the asphaltic cement content of the FRAP fraction is determined through the use of AASHTO T 164 Standard Method of Test for Quantitative Extraction of Asphalt Binder from Hot-Mix Asphalt (HMA) (ASTM Designation: D2172/D2172M). The AASHTO Specification shall be used when references are made to the AASHTO number.*
 - j. *When the aggregate absorption is high, the produced mixture will be tender until the asphalt is absorbed into the aggregate. Therefore, it may be beneficial to silo the mixture at the plant for a time before delivering to the project site. This is more important when the truck haul is short.*
 - k. *Superpave Asphaltic Concrete Testing: A daily quality control Superpave Asphaltic Concrete Test shall be run when over 500 tons of material will be placed on a project.*
 - l. *The Owner's Engineer may request a quality acceptance companion sample to be sampled in conjunction with the Producer and tested by the Owner's laboratory.*
 - m. *All sampling of materials shall be obtained at the asphalt plant for quality control (QC) and quality acceptance (QA) testing purposes.*
 - n. *All sampling of materials shall be coordinated between the producer and respective QC and QA laboratories in order to obtain a safe and representative material sample and ensure the delivery of materials for testing to the respective laboratory.*
9. Revised B.3.b. - Material Transfer Devices: A material transfer device (MTD) shall be used for the placement of asphalt during surface paving operations. An MTD, however, is not required for paving in parking lots, on driveways, and on **residential** streets. The MTD equipment shall be approved by the Engineer prior to its use. Remix pavers will NOT be allowed. Refer to KDOT Standard Specifications, latest edition, for more information. **The Engineer may waive this requirement for short placements.**
10. Revised B.3.d. - Special Procedures to Prevent Segregation The wings of the spreader hopper shall not be emptied (flipped **or folded**) between truck loads.
11. Revised B.3.g. - Heavy pneumatic-tired rollers shall be self-propelled and shall consist of two axles on which are mounted an odd number of pneumatic-tired wheels. The roller shall have at least nine pneumatic-tired wheels in such manner that the rear group of wheels will not follow in the tracks of the forward

group but spaced to give essentially uniform coverage with each pass. Axles shall be mounted in a rigid frame provided with a loading platform or body suitable for ballast loading. Tires shall be smooth, inflated to 90 p.s.i.. Construction of the roller shall be such that each wheel can be loaded to a minimum of 2,300 pounds. Combination rollers are not allowed, **except that they may be permitted in cul-de-sacs at the Engineer's discretion.**

12. Revised B.4.b - The speed of rollers shall be slow enough at all times to avoid displacement of the hot mixture. Displacement of the mixture resulting from reversing the direction of the roller or from any other cause shall be corrected at once by raking or removing and replacing fresh mixture when necessary. Alternate passes of the roller shall be varied slightly in length. During rolling, the wheels of steel-drum rollers and plates of vibro plate compactors shall be moistened to prevent adhesion of the mixture to the drums or plates, but excess water will not be permitted. **The use of diesel is not permitted.** Tires of heavy pneumatic roller shall be moistened with soapy water when required to prevent mixture from sticking to tires during rolling. Rollers shall not be permitted to stand on finished courses until the courses have thoroughly cooled. The contractor shall supply ample rollers to obtain the specified density. Places inaccessible to rollers shall be thoroughly compacted with hot hand-tampers or vibro plate compactors.

S-306 PAVEMENT PATCHING

1. Revised B. - The bituminous mixture shall be prepared in accordance with applicable requirements specified in section **S-300 Asphaltic Concrete of this specification** (KDOT BM-2 is only allowed when specified in the Plans or Contract or when approved by the Engineer).
2. Revised C.8. - All edges not abutting remaining concrete pavement shall be formed for the full depth of the patch.

Normal Cure: In areas where pavement repair and patching can be cured a minimum of 24 hours, the following shall apply:

- A minimum of eight sacks (752 lbs.) of either Type I or Type II cement will be used.
 - The minimum length of time after placement of the concrete patches before opening the pavement to traffic will be 24 hours when the minimum **ambient** temperature in that period is 60° F. (15.5° C.) or above.
 - If the **ambient** temperature falls below 60° F. (15.5° C.) during the cure period, opening to traffic shall be delayed an additional 24 hours.
- Accelerated Cure
- When conditions are such that an accelerated cure is necessary, the following shall apply: Quickrete - fast set cement mix or equal shall be used. The minimum length of time after placement of the concrete patches before opening the pavement to traffic will be two (2) hours.

S-309 TACK COAT

1. Revised to: This work shall consist of applying emulsified asphalt tack coat as specified below. Emulsified Asphalt (**CSS-1H**) shall be required prior to placing Asphaltic Concrete Surface. The rate of application shall be 0.05 to 0.12 gallons per square yard of **CSS- 1H**, or as otherwise directed by the Engineer. At locations where asphalt is being placed on top of existing concrete pavement uncut emulsified asphalt (**SS-1H**) shall be used. Tack shall be applied as far in advance of the paving train as necessary to allow evaporation time for the tack to “break” before asphalt paving will be allowed. Tack material that is removed by construction traffic shall be re-applied to the required rate as specified above.
Tack Coat is required between each lift of asphaltic concrete.

S-400 CONCRETE BRICK PAVERS

1. Revised A.10. - ... Geotextile fabric shall be placed on top of the **entire** concrete base, free of wrinkles and gaps and trimmed 1 inch to 2 inches above the concrete base. ***The geotextile fabric shall extend up the sides of the curb and gutter.*** In no case shall the fabric be left higher than the brick pavers. The fabric shall not be folded or laid over the sand bedding, allowing water to drain between the concrete and brick. The fabric shall keep water from washing the sand into the contraction joints, causing uneven settlement of the pavers. Special care shall be taken to have sufficient fabric at locations where there is a saw joint in the curb to keep the sand from washing out from under the brick and causing paver settlement. Splices in fabric are to be no less than 8 inches overlapped....

S-403 CURBS AND GUTTERS

1. Revised A.4. - Joints shall be sawed or trowelled to D/4 into the curb as soon as the concrete has hardened sufficiently to allow sawing or trowelling. Joints must be placed prior to the appearance of shrinkage cracks in the concrete. ***Any trowelled joint not meeting the D/4 requirement shall be saw cut.***

S-510 STORM SEWERS

1. Revised B - ... If it is necessary to remove an existing street or highway surface in constructing the sewer the surface shall be repaired according to the ***Standard Details D-105 Utility Trenching***. In no case shall backfill be placed on frozen ground. In no case shall frozen material be used for backfill.
2. Revised C - ... The trench shall be backfilled per ***Standard Details D-105 Utility Trenching and D-302 Storm Sewer 1***. All pipes shall be backfilled per Standard Detail D-302 Table 1, unless otherwise shown on the plans.
3. Revised Method of Measurement - “Storm Sewers” shall be measured by the linear foot of the size of conduit specified in the Plans (i.e. 36", etc.) measured from inside face of structure. Excavation, installation, backfill, ***flowable fill, street restoration (all***

types), and restoration of any disturbed areas will be subsidiary to “Storm Sewer” of the specified size.

S-601 DITCH CHECKS

1. Revised Method of Measurement - "Ditch Check" shall be measured **per each** of completed and accepted work in place. Said measurement shall include all labor, material, equipment, and other incidentals necessary for the installation.

S-607 SEDIMENT TRAP

1. Revised Basis of Payment - “Sediment Traps” shall be paid for at the contract unit price, per each, for “Sediment Trap”, and shall include all materials, labor, equipment, tools, and incidentals necessary to complete the item. **Maintenance and sediment removal are subsidiary to “Sediment Traps”.**

S-711 MULCHING

1. Revised B.4. - The **prairie hay, wheat straw, or brome grass** mulching material shall be punched into the soil so that it is partially covered. The punching operation shall be performed longitudinally with a mulching puncher. Care shall be exercised to obtain a reasonably even distribution of mulch partly incorporated into the soil. It may be necessary to use weights or hydraulic pressure to ensure that the mulch is punched into the soil.

S-715 SEEDING

1. Revised to - This work shall consist of the furnishing and planting of seed at the locations, in reasonably close conformity with those shown on the Plans or as designated by the Engineer and in accordance with these Specifications. The work shall also include the preparation of the ground for the seedbed **and fertilizer per S-706 Fertilizer** in accordance with the type of seeding required.

S-716 SODDING

1. Revised A. - All sod provided shall be grown within 100 miles of the project site. **Contractor shall provide delivery tickets showing species, and total square yards delivered.**

S-802 TRAFFIC SIGNAL INTERCONNECT/FIBEROPTIC COMMUNICATIONS

1. Revised S. Installation 1. The cabinet shall be mounted on a concrete foundation constructed of poured-in-place **KCMMB 4K concrete.**
2. Revised W. Method of Payment - Conduit - per **horizontal** lineal foot installed. Backfilling and surface restoration shall be subsidiary to conduit installation.

S-803 PERMANENT SIGNING

1. Revised A.1. All sign hardware shall be galvanized or **zinc**. Sign banding shall be 3/4" stainless steel.
2. Revised A.2. - ... Anchors for stop sign assemblies that will include street name signs **including Stop, Yield or street name signs by themselves** will be 2.25" square by 48" long....
3. Revised A.8. Whether the road has been officially opened to traffic or not, temporary street name signs shall be installed and maintained by the Contractor **prior to any type of pavement being constructed**. "Any type of pavement" includes a single lift of asphaltic concrete base. Temporary street name signs shall consist of minimum 6" white lettering on green background mounted a minimum of 7 feet from the top of the nearest edge of pavement to the bottom of the sign at or near each intersection. Street name signs shall be double-sided. The minimum height of the sign shall be 12 inches and will vary in length. The sign may be made of wood, metal or plastic and shall be mounted on wood or metal posts. The street names shall match the names on the approved plat. The Contractor shall maintain these signs through the duration of the project.

S-804 STREET LIGHTING

1. Revised D. Method of Measurement 2. **measurement for 3-1 c #4 USE distribution cable should be per linear foot for the bundle of cable consisting of three wires. Cable should be measured from the center of pole, junction box or control center to the center of pole, junction box or control center. Additional cable quantities are added to account for sweeps, to provide slack and to make connections. The additional length is computed as follows: add 5' of slack at each pole; add 5' of slack at each junction or service box for each circuit contained within; add 5' of slack at each control center for each circuit contained within. Pole and bracket cable shall be subsidiary to the pole, installed and accepted.**
2. Revised D. Method of Measurement 5. **per linear foot measured from the center of one appurtenance to the center of another appurtenance plus additional lengths for conduit sweeps. Conduit elbows, conduit fittings or couplings shall be considered subsidiary to the conduit. Add 4' of conduit to the center to center distance between two street light poles; add 3' of conduit to the center to center distance between a street light pole and a junction box; add 2' of conduit to the center to center distance between a street light pole and a service box; add 3' of conduit to the center to center distance between a control center and a junction box; add 2' of conduit to the center to center distance between two junction boxes; add 0' of conduit to the center to center distance between two service boxes; add 3' per conduit up the pole for anti-theft device, installed and accepted.**

S-805 TRAFFIC CONTROL

1. Revised A.20. - Permanent street name signs will be installed by the City at each intersection, with the exception of signalized intersections, roundabouts, **and CIP projects**, once the project has been completed and accepted. At signalized intersections, street name signs shall be installed on the traffic signal mast arms by the Contractor, as shown in the plans.
2. Revised A.38. - Type A or Type C warning lights used on traffic control devices shall be kept lighted from sunset to sunrise and when conditions exist, as determined by the Engineer, which tend to obscure vision. All warning lights shall be used and installed in accordance with details shown on the plans, the Traffic Control Plan or in accordance with the MUTCD. **The Contractor shall check warning lights weekly and replace batteries immediately upon notification.**
3. Added new A.48. - **Use Shoulder Drop-off signs (W9-9A and W7-3A) per the MUTCD and construct a 1:1 wedged slope when the drop-off at the edge of pavement is greater than 2 inches but less than 4 inches. Any drop-off of 4 inches or greater shall be wedged at a slope of 3:1 using Modified AB-3 aggregate base or asphalt as directed by the Engineer.**

S-806 CONDUIT

1. Revised D. Method of Measurement to include - **Street Lighting Conduit shall be measured per linear foot measured from the center of one appurtenance to the center of another appurtenance plus additional lengths for conduit sweeps. Conduit elbows, conduit fittings or couplings shall be considered subsidiary to the conduit. Add 4' of conduit to the center to center distance between two street light poles; add 3' of conduit to the center to center distance between a street light pole and a junction box; add 2' of conduit to the center to center distance between a street light pole and a service box; add 3' of conduit to the center to center distance between a control center and a junction box; add 2' of conduit to the center to center distance between two junction boxes; add 0' of conduit to the center to center distance between two service boxes; add 3' per conduit up the pole for anti-theft device, installed and accepted.**

S-1002 SANITARY SEWER ENCASEMENT

1. Revised JCCB-5K concrete reference to **KCMMB 5K**.

S-1106 MODIFIED SUBGRADE

1. Revised A. General - The purpose of this specification is to secure a completed section of treated material which contains a uniform mixture of fly ash or cement and pulverized material with no loose or segregated areas, has a uniform density and moisture content, and is well bound for its full depth. ***Proof-rolling with a loaded tandem dump truck which has a minimum GVW of 25 tons (50,000 lbs) will be required immediately prior mixing operations.*** It shall be the responsibility of the Contractor to regulate the sequence of his work; to process a sufficient quantity of material to provide full depth as shown on the Plans, or as directed by the Engineer; to use the proper amounts of fly ash or cement; to maintain the work; and to rework areas as necessary to meet the above requirements.
2. Revised A.17. - 17. After the modified subgrade section has been finished as specified herein, the surface shall be protected against damage. ***No equipment or vehicles, except a water truck, are permitted on the finished surface during the 3 day cure period.***

S-1107 FLOWABLE FILL

1. Added new C.3. - ***Flowable fill shall cure a minimum of 12 hours prior to backfilling or paving operations.***