

**CITY OF KANSAS CITY, MISSOURI
SUPPLEMENT NO. 1
TO APWA STANDARD SPECIFICATIONS AND DESIGN CRITERIA
DIVISION II SECTION 2200, PAVING**

The following additions, deletions and/or revision shall become a part of the adopted standard specifications:

2201 SUBGRADE PREPARATION

- 2201.3.B. Paragraph 2201.3.B. shall be deleted and the following 2201.3.B. shall be added in lieu thereof:
- 2201.3.B. **Compacting the Subgrade:** The top 6 inches (15.24 cm) of subgrade for pavements shall be compacted to 95% of the standard proctor maximum density for the material used as determined by ASTM D 698 and within a tolerance of plus 2% and minus 3% of the optimum moisture content.
- 2201.3.C. Paragraph 2201.3.C. shall be deleted and the following 2201.3.C. shall be added in lieu thereof:
- 2201.3.C. **Protection and Maintenance of Subgrade:** The subgrade shall be protected from action of the elements or others. Any action (eg. settlement or erosion) that damages the subgrade *or any subgrade that has become unacceptable* prior to placing the pavement thereon shall be repaired and the specific lines, grades, cross-section, tolerance, density, and moisture content range reestablished.
- 2201.3.E. Delete the second paragraph of 2201.3.E. and the following second paragraph of 2201.3.E. shall be added in lieu thereof:
- 2201.3.E. Equipment for roll testing shall be a tandem dump truck (one front and two rear axles) *carrying a twenty ton load.*

2205 ASPHALTIC CONCRETE SURFACE AND BASE

- 2205.2. The first paragraph of 2205.2. shall be deleted and the following 2205.2. shall be added in lieu thereof:
- 2205.2. **Materials:** No material shall be used until approved by the engineer. All costs associated with material testing, certification and the preparation of trial mixes to determine the job mix formula shall be the responsibility of the contractor. Representative

samples of all materials proposed for use under these specifications shall be submitted to *a City approved private* testing laboratory by the contractor, at the contractor's expense, for testing and the preparation of trial mixes to determine the job-mix formula. Additional tests necessary for determining conformance with the requirements specified herein will be performed under the supervision of the engineer without cost to the contractor, unless testing is the responsibility of the contractor.

- 2205.3.B. Delete the entire first paragraph, after the chart, beginning "Generally mix Types 1-01, 2-01, 3-01 and 4-01.", the entire "second paragraph" beginning "Mix Type 2-01 is acceptable for surfacing" ... and the third paragraph beginning "Mix Type 4-01 is very susceptible to rutting.....".
- 2205.3.C.2. The first phrase of paragraph 2205.3.C.2. shall be deleted and the following phrase of 2205.3.C.2. shall be added in lieu thereof:

2205.3.C.2. **Materials Evaluation:** All recycled materials shall have the following *tests performed in addition to those required in 2205.3.D.:*
- 2205.3.J.1. Paragraph 2205.3.J.1. shall be deleted in its entirety and the following 2205.3.J.1. shall be added in lieu thereof:

2205.3.J.1. **Tests:** During production the *engineer* will have the following test performed by an approved laboratory: AC content, *aggregate gradation after removal of AC*, marshall density, stability, voids, vma, vfa, and *maximum* theoretical density.
- 2205.3.J.2. Paragraph 2205.3.J.2. shall be deleted in its entirety and the following 2205.3.J.2. shall be added in lieu thereof:

2205.3.J.2. **Availability of Test Reports:** The results of the latest current test report shall be furnished to the engineer upon request. If the mix is found to be outside of tolerance, or outside the specification limits as specified in 2205.3., correction shall be made. Test reports shall be furnished on the following "Asphalt Concrete Test" form *or a similar form containing equivalent information.*
- 2205.3.J.3. Paragraph 2205.3.J.3. shall be deleted in its entirety and the following paragraph 2205.3.J.3. shall be added in lieu thereof:

2205.3.J.3. **Frequency of Testing:** For mixes 1-01 through 4-01, the tests listed in paragraph 2205.3.J.1. shall be performed *a minimum of once for* every 3000 tons (2700 metric tons) of asphalt production

except during initial startup, or whenever the production asphalt fails one of the following conditions at which time they will be tested every 1000 tons (900 metric tons) until four consecutive tests show compliance with the specifications:

- a. Production void content measured at the plant discharge is 1% below laboratory mix design void content, or more than 5% of total void content.
- b. Extracted gradation of the production asphalt exceeds the permissible gradation variation for the mix type being produced.
- c. Asphalt cement exceeds the content variation for the mix type being produced.

- 2205.4.A. The second paragraph of 2205.4.A. shall be deleted and the following second paragraph of 2205.4.A. shall be added in lieu thereof:
- 2205.4.A. The contractor shall also furnish necessary laboratory sieves and a powered shaker device for sieve analysis, scales, **ignition oven** and supplementary equipment to make aggregate sieve analysis, asphaltic concrete paving mixture analysis, and paving mixture density tests.
- 2205.4.B. Paragraph 2205.4.B. shall be deleted in its entirety and the following 2205.4.B. shall be added in lieu thereof:
- 2205.4.B. The asphalt producer shall establish a quality control plan and shall maintain records. The quality control plan **will be reviewed and approved by the City.**
- 2205.7.A. The second paragraph of 2205.7.A. shall be deleted and the following second paragraph of 2205.7.A. added in lieu thereof:
- 2205.7.A. Pavers shall be **in good working condition**, equipped with quick and efficient steering devices and shall be capable of traveling both forward and in reverse. They shall be equipped with hoppers and distributing screws that place the mix evenly in front of the adjustable screeds. They shall be equipped with either a vibrating screed or a tamping bar immediately preceding a static screed. **The paver shall be equipped with a shoe that will produce a joint between laying strips having its face inclined at an angle of thirty degrees (30°) from the vertical. This type joint shall be used with all asphaltic concrete mixes. The shoe shall be designed in such**

manner that it will be capable of beveling depths up to 4 inches (10.16 cm).

- 2205.7.A.1. Paragraph 2205.7.A.1. shall be deleted in its entirety and the following 2205.7.A.1. shall be added in lieu thereof:
- 2205.7.A.1. **Automatic Screed Controls:** The paver shall be equipped with and use an approved system capable of automatically controlling the elevation and transverse slope of the paver screed unless otherwise directed by the engineer. An erected stringline, traveling stringline or other approved device operating on the roadbed being paved or the surface of the previously placed lane shall be used to establish the grade reference. The grade reference device shall operate on either or both sides of the paver as required and shall be capable of maintaining the desired transverse slope regardless of changes in the screed elevation. *In the event of failure of the automatic screed control system, the contractor will be permitted to continue placing the asphaltic concrete mix for the rest of the day in which the failure occurred. The contractor will not be permitted to continue operations without using automatic screed controls unless permission has been granted by the engineer on each succeeding day following the failure.*
- 2205.7.B. The first paragraph of 2205.7.B. shall be deleted and the following first paragraph of 2205.7.B. shall be added in lieu thereof:
- 2205.7.B. **Rollers:** Compaction equipment shall consist of vibratory steel wheel, static steel wheel and pneumatic-tired rollers unless otherwise directed by the engineer. They shall be self-propelled and equipped with such controls that starting, stopping and reversing direction can be accomplished without displacing the hot asphaltic concrete pavement. *Compaction equipment shall be in good working condition.*
- 2205.7.B.1. Paragraph 2205.7.B.1. shall be deleted in its entirety and the following 2205.7.B.1. shall be added in lieu thereof:
- 2205.7.B.1. **Steel-Wheel Rollers:** Steel wheeled rollers shall be vibratory *or static* two-axle tandem rollers. *Vibratory* rollers shall develop contact pressure of 250 to 350 pounds per inch of width (45 to 62.5 kg per cm of width) (vibratory mode) and 150 to 180 pounds per inch of width (26.8 to 32 kg per cm of width) (static mode). *Static rollers shall be an 8 to 12 ton roller. The weight of the roller will be varied, by order of the engineer, to obtain contact pressures that will result in the required density.*

- 2205.7.B.2. Paragraph 2205.7.B.2. shall be deleted in its entirety and the following 2205.7.B.2. shall be added in lieu thereof:
- 2205.7.B.2. **Pneumatic-Tired Rollers:** *Pneumatic-tired rollers shall consist of two axles on which are mounted an odd number of pneumatic tired wheels of equal size and diameter. The roller shall have at least nine pneumatic-tired wheels mounted in such a manner that the rear group of wheels will not follow in the tracks of the forward group, but shall be spaced to give essentially uniform coverage with each pass. There shall be a minimum of 1/4 inch (0.636cm) overlap in the tracking between the forward and rear wheels. Axles shall be mounted in a rigid frame provided with a loading platform or body suitable for ballast loading. Tires shall be smooth and inflated to 90 p.s.i. (620 kPa). Construction of the roller shall be such that each wheel is loaded to a minimum of 2,300 pounds (1043 kg). Wheel loadings may be varied by order of the engineer to obtain contact pressures that will result in the required density.*
- 2205.8.C.1.h. Paragraph 2205.8.C.1.h. shall be deleted in its entirety and the following 2205.8.C.1.h. shall be added in lieu thereof:
- 2205.8.C.1.h. Any irregularities in alignment left by the pavers shall be corrected ***directly behind the machine. Immediately after the correction, the edge of the course shall be thoroughly compacted by tamping.*** Distortion of the pavement during this operation shall be avoided.
- 2205.8.D.1. This second paragraph pf 2205.8.D.1. shall be deleted and the following second paragraph of 2205.8.D.1. shall be added in lieu thereof:
- 2205.8.D.1. Immediately after spreading, each course of the pavement mixture shall be compacted by rolling. The initial or “breakdown” rolling shall be accomplished with a steel-wheeled roller ***meeting the requirements of 2205.7.B.1. and shall take place as closely behind the laydown machine as the temperature and condition of the mat will allow.*** The pneumatic-tired roller shall be used to knead and compact the pavement mixture following the initial rolling and preceding the final rolling. Care shall be exercised in the use of the pneumatic-tired roller to ensure that the pavement mixture is sufficiently cooled to avoid “picking up” of the mixture on the tires of the roller, and also to ensure that the pneumatic-tired rolling is completed before the mixture becomes too cool to allow satisfactory finish rolling. Final, or finish rolling shall be done with a steel-wheeled roller. The sequence of rolling operations may be changed with the approval of the engineer. All rolling

shall be longitudinal, starting near the edge of the pavement *and progressing toward the center, overlapping on successive trips by not less than one-third (1/3) and no more than one-half (1/2) the width of the roller. Alternate trips of the roller shall be of slightly different lengths.*

2205.8.D.5. Paragraph 2205.8.D.5. shall be deleted in its entirety and the following 2205.8.D.5. shall be added in lieu thereof:

2205.8.D.5. **Edges:** The edges of the pavement shall be rolled concurrently with or immediately after rolling the longitudinal joint. *Care shall be exercised in consolidating the material along the entire length of the edges. Before compaction, the materials along the unsupported edges shall be slightly elevated with a tamping tool or lute. This will permit the full weight of the roller wheel to bear on the material to the extreme edges of the mat. In rolling pavement edges, roller wheels shall extend approximately two inches (5cm) beyond the pavement edge, provided lateral displacement is not excessive.*

2207 COLD MILLING

2207.3.A.3. Paragraph 2207.3.A.3. shall be deleted in its entirety and the following paragraph 2207.3.A.3. shall be added in lieu thereof:

2207.3.A.3. **Material Disposal:** *All material from the milling operation shall immediately be removed from the surface of the pavement and properly disposed of by the contractor at an approved disposal area.*

2208 PORTLAND CEMENT CONCRETE PAVEMENT

2208.0. *The following paragraph 2208.0. shall be added:*

2208.0. **General:** *The term expansion joint, when used in plans, standard drawings or other specifications shall be understood to mean isolation joint.*

2208.2.B. Paragraph 2208.2.B. shall be deleted in its entirety and the following paragraph 2208.2.B. shall be added in lieu thereof:

2208.2.B. **Concrete:** *Concrete shall conform to MCIB entitled and shall be MCIB Mix No. A658-1-2-0.365 or No. WA561-1-2-0.410. All coarse aggregate shall be*

limestone from the Bethany Falls Ledge and meet the following gradation:

Coarse Aggregate Gradation Limits, % Passing

<i>Sieve Size</i>	<i>Nominal Maximum Size</i>		
	<i>1"</i>	<i>3/4"</i>	<i>1/2"</i>
<i>1 1/2"</i>	<i>100</i>		
<i>1"</i>	<i>93-97</i>	<i>100</i>	
<i>3/4"</i>	<i>62-82</i>	<i>90-97</i>	<i>100</i>
<i>1/2"</i>	<i>25-60</i>	<i>45-70</i>	<i>80-97</i>
<i>3/8"</i>	<i>16-44</i>	<i>20-55</i>	<i>40-70</i>
<i>No. 4</i>	<i>0-10</i>	<i>0-10</i>	<i>0-15</i>
<i>No. 8</i>	<i>0-5</i>	<i>0-5</i>	<i>0-5</i>

Concrete for ultra-thin whitetopping (UTW) projects shall also include fiber reinforcement conforming to 2208.2.C.4., and shall have a maximum nominal coarse aggregate size of 1/3 the thickness of the concrete overlay.

If Fly Ash is to be substituted for cement in the production of concrete, it shall be in accordance with Subsection 2212 – Fly Ash Concrete.

2208.4.B.1. Paragraph 2208.4.B.1. shall be deleted in its entirety and the following paragraph 2208.4.B.1. shall be added in lieu thereof:

2208.4.B.1. **Method: *Contraction joints shall be sawed.***

2208.4.B.3. Paragraph 2208.4.B.3. shall be deleted in its entirety and the following paragraph 2208.4.B.3. shall be added in lieu thereof:

2208.4.B.3. For portland cement concrete pavements, contraction joints shall ***be one forth (1/4) the thickness of the slab (minimum)***

2208.5.C. Paragraph 2208.5.C. shall be deleted in its entirety and the following paragraph 2208.5.C. shall be added in lieu thereof:

2208.5.C. **Concrete Finishing :**

- 1. Longitudinal Floating: After the concrete has been struck off and consolidated, it shall be further smoothed by means of a mechanical longitudinal float or by float finishers using a longitudinal hand float. If a longitudinal hand float is used, it***

shall be operated from foot bridges spanning the pavement, and shall be worked with a wiping motion parallel to the centerline, and passing from one side of the pavement to the other. Movement ahead along the centerline of the pavement shall be in successive advances of not more than ½ of the length of the float. The float shall not be less than 3 feet (91.44cm) in length and 6 inches (15.24 cm) in width, and shall be properly stiffened and provided with handles at each end. The operation may be eliminated if specified tolerances can be attained by some other approved method.

In cases where the longitudinal floating operation has been eliminated, the pavement shall be scraped with a straight edge 10 feet (3.05m) long, equipped with a handle to permit it to be operated from the edge of the pavement. The longitudinal float and straightedge shall be operated so that any excess water and laitance are removed from the surface of the pavement. After the scraping operation, the surface of the pavement shall be within the specified tolerances.

- 2. Straightedging: While the concrete is still plastic, the slab surface shall be tested for smoothness with a 10-foot (3.05m) straightedge swung from handles 3 feet (91.44cm) longer than one-half the width of the slab. Straightedging shall be done on the pavement surface parallel to the centerline and at not more than 5 foot (1.52m) intervals transversely. After each test the straightedge shall be moved forward one-half its length and the operation repeated. When irregularities are discovered, they shall be corrected by adding or removing concrete. All disturbed places shall be smoothed with a float not less than 3 feet (91.44 cm) long and not less than 6 inches (15.24 cm) wide, and again straightedged. The pavement surface shall have no depression in which water will stand.*
- 3. Edging: Before final finishing is completed and before the concrete has taken its initial set, the edges of the slab and curb shall be finished to the radius shown on the plans or standards by the paving equipment, or with hand edging tools.*
- 4. Final Surface Finish:*
 - a. Dragged Surface Treatment:*
 - 1) For roadways with a design speed of 45 MPH (70 KM/H) or less to be posted 45*

MPH (70 KM/H) or less, astroturf or burlap shall be dragged longitudinally over the finished surface to produce a tight, uniform textured surface and the edges shall be rounded in a workmanlike manner.

- 2) For roadways to be posted 50 MPH (80 KM/H) or more astroturf or burlap shall be dragged longitudinally over the finished surface to produce a tight, uniform, textured surface and the edges shall be rounded in a workmanlike manner. The texture achieved by the astroturf or burlap drag shall be tested by the contractor in accordance with ASTM E 965, "Test Method for Measuring Surface Macrotexture Depth Using a Sand Volumetric Technique", to ensure the texture is adequate for skid resistance. Test locations will be determined by the engineer. The results of ASTM E 965 shall show an average texture depth of any lot, as defined below and shall have a minimum value of 0.032 inch (0.80 mm). Any lot showing an average of less than 0.032 inch (0.80 mm) but equal to or greater than 0.024 inch (0.60 mm) will be accepted as substantial compliance but the contractor shall amend their operation to achieve the required 0.032 inch (0.80 mm) minimum depth. (It is not the intention of this tolerance to allow the contractor to continuously pave with an average texture depth of less than 0.032 inch [0.80mm]). Any lot showing an average texture depth of less than 0.024 inch (0.60 mm) shall require diamond grinding of the pavement represented by this lot to attain the necessary texture. Any individual test showing a texture depth of less than 0.020 inch (0.50 mm) shall require diamond grinding of the pavement represented by this lot to attain the necessary texture. Limits of any failing individual test shall be determined by running additional tests at 100 foot (30 m) intervals before and after the failing test location. All testing of the*

surface texture shall be completed no later than the day following pavement placement.

- b. Groove Treatment: Unless otherwise specified the texture surface of travel lanes of pavement shall be given a suitable transverse or longitudinal grooving, or a dragged surface treatment as described in paragraph 2208.5.C.4.a.2. for roadways to be posted at 50 MPH (80 KM/H) or more. If grooving is required, surface grooving shall be done with a mechanical device such as a wire broom or comb or by hand. The broom or comb shall have a single row of spring steel tines, rectangular in cross section, 1/8 inch to 3/16 inch (3 mm to 4.8 mm) wide; spaced on 3/4 inch (19 mm) centers of sufficient length, thickness, and resilience to form grooves to a depth of a minimum of 1/8 inch (3 mm) to a maximum of approximately 3/16 (4.8 mm) inch in the plastic concrete. If grooves are to be hand installed, the equipment to be used shall be reviewed and approved by the engineer. This operation shall be done at such time and in such manner that the desired surface texture will be achieved while minimizing displacement of the larger aggregate particles and before the surface permanently sets. Where abutting pavement is to be placed, the grooving should extend as close to the edge as possible without damaging the edge. If abutting pavement is not to be placed, the 6 inch (150 mm) area nearest the edge or 1 foot (300 mm) from the face of the curb is not required to be grooved. For small or irregular areas or during equipment breakdown, grooving may be done by hand methods.*
- 5. Curing: As soon as practical after the concrete is finished, it shall be cured with one of the acceptable methods. Curing shall conform to the requirements of MCIB Section 4-4 Standard Concrete Specifications, except water proof paper or polyethylene sheeting are not acceptable mediums. If a liquid curing membrane is used, it shall be applied in accordance with the manufacturer's directions.*

 - a. Methods of Applying Curing Membrane: A nozzle producing a uniform fan pattern will be used on all spray equipment when applying the liquid curing membrane. The curing compound should be applied*

immediately after final finishing, and before the loss of all free water on the surface of the concrete. Normally, one smooth even coat shall be applied at a rate of 150 to 200 square feet per gallon (3.7 to 3.8 square meters per liter), but two coats may be necessary to ensure complete coverage and effective protection. Second coat should be applied at right angles to the first coat.

b. Curing Formed Surfaces: If the forms are removed from finished concrete pavement within a period of 72 hours or if a slip form paving machine has been used, these surfaces shall also be cured. Curing membrane damaged by joint sawing operations shall be repaired by the contractor as directed by the engineer.

6. Protection: The contractor shall, at his own expense, protect the concrete work against damage or defacement of any kind until it has been accepted by the engineer. All vehicular traffic shall be prohibited from using new concrete pavement until it has attained a minimum of 70% of the 28 day design strength. Concrete pavement that is not acceptable to the engineer because of damage or defacement, shall be removed and replaced, or repaired to the satisfaction of the engineer, at the expense of the contractor.

7. Diamond Grinding: If required by the contract, or if pavement smoothness criteria are not achieved, the contractor shall grind the riding surface to reduce or eliminate the irregularities.

a. A self-propelled grinding machine with diamond blades mounted on a multi-blade arbor shall be used. Equipment that causes excessive ravels, aggregate fractures, or spalls will not be acceptable. A uniform texture of the full lane width is required.

b. Transverse grooving will not be required.

c. Vacuum equipment or other continuous methods to remove grinding slurry and residue shall be used. Grinding slurry shall not flow across lanes being used by traffic.

d. After corrections have been made to the riding surface, the pavement shall be tested for smoothness using the

same technique used to determine smoothness originally. The contractor shall furnish and operate the smoothness measurement equipment, and evaluate the results as specified in Section 2211.

e. Additional grinding as required shall be performed to attain the required pavement smoothness. All deviations (in excess of 1/2 inch [12.5 mm] in a length of 25 feet [7.5 m]) within each section regardless of the initial average profilograph measurements shall be corrected.

8. *Temperature Limitation: Concrete work shall be in accordance with the requirements of MCIB Section 10 and 11.*

2208.8. The third paragraph of 2208.8. shall be deleted and the following third paragraph of 2208.8. shall be added in lieu thereof:

2208.8. Steel curb forms or integral slip forming shall be required to form all curbs except where impractical because of small radii street returns or other special sections.

2209 CURBING

2209.0. *The following paragraph 2209.0. shall be added:*

2209.0. *General: The term expansion joint, when used in plans, standard drawings or other specifications shall be understood to mean isolation joint.*

2209.2. Paragraph 2209.2. shall be deleted in its entirety and the following paragraph 2209.2. shall be added in lieu thereof:

2209.2. *Materials: Concrete shall conform to 2208.2.B. and shall be MCIB Mix No. WA610-1-4-0.410 or WA561-1-2-0.410, except for the Central Business District of Kansas City, MO (defined as being bounded by Interstate Highway I-70 on the north and east, I-35 on the south and I-29 on the west) where Mix No. WA585-3/4-2-0.410 or Mix No. WA634-3/4-4-0.410 with special aggregate shall be used. The special aggregate shall be Iron Mountain Trap Rock, Nepheline Syenite or approved equal conforming to the gradation requirements of 2208.2.B.. In addition to the gradation requirements, the following shall be required for the special coarse aggregate:*

The fineness modulus for the aggregate shall not vary more than plus or minus 0.20 from the fineness modulus of the gradation on which the mix is designed.

The combined weight of sulfides such as Pyrite, Marcasite and Chalcopyrite shall not exceed 0.1% of the weight of the special aggregate sample. Material finer than the No. 200 (75 μ m) sieve shall not exceed 1% of the weight of the special aggregate sample.

Methods of sampling and testing shall conform to the application portions of Section 10 of ASTM Designation C33, Concrete Aggregates.

2209.3.B. The third paragraph of 2209.3.B. beginning with “The top 6 inches (15 cm) of the subgrade shall be compacted.....” shall be deleted.

2209.4.B. Paragraph 2209.4.B. shall be deleted in its entirety and the following 2209.4.B. shall be added in lieu thereof:

2209.4.B. **Contraction Joints:** Curbing shall have contraction joints *installed* at intervals of not less than 10 feet (3.05 m) or more than 15 feet (4.57 m). They shall extend through the entire curb section from the top of the curb to a depth 2 inches (5.0 cm) below pavement surface.

1. **Method:** Contraction joints shall be formed or sawed.

- a. When sawing joints, the contractor shall begin as soon as the concrete hardens sufficiently to prevent excessive raveling along the saw cut and shall finish before conditions induce uncontrolled cracks, regardless of the time or weather. When joint sealing backup material is specified with sawed joints the first stage, which provides a relief cut shall be approximately 1/8 inch (3 mm) wide, and shall be to plan depth. The second stage which widens the joints to allow the insertion of joint sealing backup material to plan depth shall not be performed until the concrete is at least 48 hours old, and shall be delayed longer when the sawing causes raveling of the concrete. If second stage sawing is performed prior to the completion of the curing period, the contractor shall maintain the cure by use of curing tapes, plastic devices, or other materials approved by the engineer.

b. *When forming joints, templates shall be 1/8 inch (0.32 cm) metal cut to the configuration of the curbing section. The templates shall be secured at the proper locations so that they will not be disturbed by the depositing of concrete. The templates shall be removed as soon as the concrete has attained its initial set and finished with a 1/4 inch (0.64 cm) radius on all exposed edges.*

2. **Joint Sealer:** *If specified, joint sealants shall conform to Section 2208.2.*

2209.5.A. Paragraph 2209.5.A. shall be deleted in its entirety and the following paragraph 2209.5.A. shall be added in lieu thereof:

2209.5.A. **Concrete Placement:** *Concrete shall be mechanically vibrated except for Mixes No. WA-610-1-4-0.410 and WA-634-3/4-4-0.410 and shall not be allowed to extrude below the forms to cause an irregular alignment of the abutting street pavement.*

2209.7. Paragraph 2209.7. shall be deleted in its entirety and the following paragraph 2209.7. shall be added in lieu thereof:

2209.7. **Joint Sealing and Clean-Up:** *Only the sidewalk portion of the curbing will require joint sealing. An approved joint sealer shall be applied in accordance with the manufacturer's directions within 7 days of the placement of the concrete.*

The contractor shall be responsible for the removal of excess dirt, rock, broken concrete, concrete spatters and overspray from the area of the construction.

2210 MEASUREMENTS AND PAYMENTS

2210.0. The following paragraph 2210.0. shall be added:

2210.0. **General:** *The term Bid Form – Unit Prices or Itemized Proposal shall be understood to mean Proposal.*

2211 SMOOTHNESS

2211.3. Table 1 Pay Adjustment at the end of paragraph 2211.3. shall be deleted and the following table shall be added in lieu thereof:

2211.3. Table 1 Pay Adjustments

<i>Initial Average Profilograph Measurements</i> (inches/mile) (cm/kilometer)		Percent of Contract Unit Prices
0-10	(0-15.8)	105.0
10.1-15	(15.9-23.7)	100.0
15.1-20	(23.8-31.6)	90.0
20.1-25	(31.7-39.6)	80.0
<i>Greater than 25</i>	<i>(39.5)</i>	<i>Rejection</i>

2212 The following section 2212 shall be added:

2212 FLY ASH CONCRETE

- 2212.1. *Scope: This section governs the substitution of fly ash for cement in the production of concrete.*
- 2212.2. *General: All materials used in fly ash concrete shall be approved by the Materials Engineer prior to concrete production. Fly ash replacement of cement shall be on a pound for pound basis. This replacement can range from 15% to a maximum of 25% of Class C fly ash substituted for Type I or Type II cement. Fly ash shall not be used as a replacement for Type IP cement or Type I (PM) cement. Fly ash shall not be used in trap rock or special aggregate concrete or concrete mixes requiring Type III cement. The same sources of fly ash approved for each project shall be used exclusively for its duration. Fly ash shall not be used in concrete placed between October 15 and April 15.*
- 2212.3. *Fly Ash Concrete Control and Quality:*
- A. *All fly ash used in concrete shall conform to the requirements of ASTM C618, Class C, (Specifications for Fly Ash and Raw or Calcined Natural Pozzolan for use as a Mineral Admixture in Portland Cement Concrete) except as modified herein.*
 - B. *Fly ash used in concrete shall be only from sources prequalified in accordance with these specifications.*
 - C. *The loss on ignition of the fly ash shall be no more than 1.5%.*

- D. Fly ash may only be used with the type of cement used in the pre-qualification test. The type and source of cement used by the manufacturer shall be shown on all test reports.**
- E. The course aggregate used in fly ash concrete shall meet the gradation and quality requirements of 2208.2.B.**
- F. The fine aggregate used in fly ash concrete shall meet the requirements of 2208.2.B.**
- G. The cement used in fly ash concrete shall conform to ASTM C-150 (Portland Cement) Type I or Type II.**
- H. The air content of fly ash concrete shall be maintained at a minimum of 6%. Air entrainment admixtures used in fly ash concrete shall conform to ASTM C-260 (Air-Entraining Admixtures for Concrete).**
- I. All fly ash concrete mixes shall be water-reduced. The water-reducing admixtures shall conform to ASTM C-494 (Chemical Admixtures for Concrete) Type A or Type D.**
- J. Maximum mixing water used in fly ash concrete shall be based on total cementitious material.**

2212.4. Pre-qualification Procedures for Class C Fly Ash:

Prior to use of fly ash, the fly ash marketer shall submit in writing to the City of Kansas City the following information:

- A. Name, address, and owner of fly ash source.**
- B. Name of coal mine. If more than one mine is used, list all sources.**
- C. Type of coal burned.**
- D. Verifications that Class C fly ash is being supplied.**
- E. Description of production procedures, including, but not limited to, pulverization techniques, additives mixed with coal, precipitation additives, and ash collection methods.**
- F. Copies of test results to document history of ash quality**

and

consistency including, but not limited to, a record of 10 tests for fineness, specific gravity, and loss on ignition, and two complete chemical and physical tests complying with ASTM C618.

G. Complete description of quality control program used to monitor fly ash production.

H. The manufacturer shall perform complete chemical and physical tests on each 1000 tons of fly ash produced and/or at the discretion of the Engineer.

I. Each shipment or load of fly ash delivered to the ready mix plant from the approved source shall carry the following statement:

“This is to certify that this fly ash meets the requirements of the contract specifications and was loaded from a tested and certified source.”

Name of Manufacturer

Shipping Facility

Date Tested

By _____
Signature

2212.5. Mix Design Requirements and Prequalification Tests:

A specific combination of both fly ash and cement sources shall be approved for a project. A change in the cement source will not require a new mix design provided the cement type does not change.

- A. *28-day strength verifications of fly ash concrete mixes are required from a private testing lab to assure that the design strengths are attained.*
- B. *The maximum cement reduction for mix design of fly ash concrete shall be 25%.*
- C. *Calculations for W/C ratio and yield for fly ash concrete shall be based on cement plus fly ash (W/C+P) for total cementitious material.*
- D. *Sources of all ingredients used in the mix design for fly ash concrete shall be included with the submitted certified mix design.*

2212.6. Ready Mix Plant Requirements:

All delivery tickets for fly ash concrete shall show batch weights of all materials used in the mix. Computerized print cuts of mixes will be accepted.

An inspector is required during plant batching operation for all non-computerized batching and non-ticket printout plants. If the City for whatever reason cannot make this plant inspection, then the supplier shall provide inspection by a private testing laboratory as approved by the Materials Engineer.

This supplement shall become effective February 15, 2002. It supercedes all previous supplements to this section.

Approved and adopted as Official Document No. _____ this _____, day of _____ 2002.

George E. Wolf Jr., P.E.
 Director of Public Works
 of Kansas City, Missouri