Blue Springs, Missouri
Public Works Department

SECTION 2300 – INCIDENTAL CONSTRUCTION

CITY OF BLUE SPRINGS, MISSOURI
CONSTRUCTION SPECIFICATIONS

The City of Blue Springs hereby adopts Section 2300 of the Kansas City Metropolitan Chapter of APWA Construction and Material Specifications, the latest edition. The following additions, deletions and/or revisions are adopted as a part of Section 2300 for use within the City of Blue Springs. Text in bold italics indicates revisions or additions to the APWA standard.

Section 2301 Standard Sidewalks, Sidewalk Ramps, Driveways, and Bicycle/Pedestrian Paths

2301.3.A – Concrete

Add the following:

"All concrete materials shall conform to the currently approved KCMMB 4k mix specifications, except residential driveways where sidewalk is not present."

2301.3 – Materials

Add the following:

"F. ADA Detectable Warning Surfaces: ADA detectable warning surface shall meet the requirements as shown on the City of Blue Springs Standard Details MIS-01 and MIS-04."

2301.4 – Construction

Delete paragraph 2301.4 and replace with the following:

"The sidewalks, sidewalk ramps, driveway or bicycle/pedestrian paths shall be constructed or reconstructed to the configuration, and to the lines and grades as shown on the Plans, and shall be constructed with concrete within the Right of Way. Generally, sidewalks, sidewalk ramps, driveways, and bicycle/pedestrian paths should be constructed after the curbing. Sidewalk ramp construction shall comply fully with all requirements for sidewalks in this section and shall comply with the requirements of ADAAG for elements outside of the Right-of-Way and the most current version of PROWAG for elements within the Right-of-Way, as adopted by MoDOT."

2301.4.E – Grades and Slopes

Delete paragraph 2301.4 and replace with the following:

"Grades and Slopes: The grade and slope along the length of the walk, or shared use path within the Right-of-Way, shall conform to the most current version of PROWAG. Unless shown otherwise on the Plans or as directed by the Engineer, the cross slope shall be toward the street. The sidewalk and shared use path cross slope shall be carried through the driveways and street intersections."

2301.4.F.1.a – Joint Patterns

Delete paragraph 2301.4.F.1.a and replace with the following:

"Sidewalk or shared use path surfaces shall be marked with a transverse joint spaced at a distance equal to the width of the sidewalk or shared use path. Sidewalks or shared use paths greater than six (6) feet in width shall be divided by longitudinal joints spaced not less than 30 inches nor more than 60 inches with transverse joints spaced to form a square pattern. Edger tool marks (Picture frame) shall be removed, unless approved by the Engineer. Slip-formed sidewalks or shared use path transverse joints shall be saw cut. Curb joints should align with the sidewalk or shared use path joints where they abut."

2301.4.F.2.a – Isolation Joints

Delete paragraph 2301.4.F.2.a and replace with the following:

"General: The preformed isolation joint material shall be flush with the surface."

2301.4.F.3.a – Contraction Joints

Delete paragraph 2301.4.F.2.a and replace with the following:

"Edger tool marks (Picture frame) shall be removed, unless approved by the Engineer. Slip-formed sidewalks or shared use path transverse joints shall be saw cut."

2301.4.G.2.d – Finishing

Delete paragraph 2301.4.G.2.d and replace with the following:

"In all cases, the finished sidewalk, driveway, or bicycle/pedestrian path shall have a true surface, free from sags, twists, or warps, shall have a uniform color and appearance, and shall meet all current ADA/PROWAG guidelines and standards.

2301.4.G.5 – Temperature Limitations

Delete paragraph 2301.4.G.5 and replace with the following:

"Temperature Limitations: Limitations on Mixing and Placing. No concrete shall be mixed, placed, or finished when the natural light is insufficient, unless an adequate and approved artificial lighting system is operated."

a. Cold Weather. Unless authorized in writing by the Engineer, mixing and concreting operations shall be discontinued when a descending air temperature in the shade and away from artificial heat reaches 40 degrees F and shall not be resumed until an ascending air temperature in the shade and away from artificial heat reaches 35 degrees F.

The aggregate shall be free of ice, snow, and frozen lumps before entering the mixer. The temperature of the mixed concrete shall not be less than 50 degrees F at the time of placement. Concrete shall not be placed on frozen material nor shall frozen aggregates be used in the concrete.

When concreting is authorized during cold weather, water and/or the aggregates may be heated to not more than 150 degrees F. The apparatus used shall heat the mass uniformly and shall be arranged to preclude the possible occurrence of overheated areas which might be detrimental to the materials.

b. Hot Weather. During periods of hot weather when the maximum daily air temperature exceeds 85 degrees F, the following precautions shall be taken:

The forms and/or the underlying surface shall be sprinkled with water immediately before placing the concrete. The concrete shall be placed at the coolest temperature practicable, and in no case shall the temperature of the concrete when placed exceed 90 degrees F. The aggregates and/or mixing water shall be cooled as necessary to maintain the concrete temperature at or not more than the specified maximum.

The finished surfaces of the newly placed concrete until the pavement is covered by the curing medium. If necessary, wind screens shall be provided to protect the concrete from an evaporation rate in excess of 0.2 psf per hour as determined in accordance with Figure 2.1.5 in ACI 305R, Hot Weather Concreting, which takes into consideration relative humidity, wind velocity, and air temperature.

When conditions are such that problems with plastic cracking can be expected, and particularly if any plastic cracking begins to occur, the Contractor shall immediately take such additional measures as necessary to protect the concrete surface. Such measures shall consist of windscreens, more effective fog sprays, and similar measures commencing immediately behind the paver. If these measures are not effective in preventing plastic cracking, paving operations shall be immediately stopped.

c. Temperature Management/Stress Management Program. Prior to the start of paving operation for each day of paving, the contractor shall provide the engineer with a Temperature Management Program for the concrete to be placed to assure that uncontrolled cracking is avoided. As a minimum the program shall address the following items:

1. ***Anticipated tensile strains in the fresh concrete as related to heating and cooling of the concrete material.***
2. ***Anticipated weather conditions such as temperatures, wind velocity, and relative humidity.***
3. ***Anticipated timing of initial sawing of joints."***

2301.4.K – Joint Sealing and Clean-Up:

Delete paragraph 2301.4.K

2301.4.N – Detectable Warnings:

Delete paragraph 2301.4.N and replace with the following:

"Detectable Warnings: Detectable warnings are required standardized surface features built in or applied to walking surfaces on sidewalks, ramps, or shared use path to warn visually impaired people of hazards on a circulation path. Those hazards include, but are not limited to interfaces between sidewalks and areas where moving vehicles may be present. Detectable warning shall be in accordance with the most current version of PROWAG and as shown on the City of Blue Springs Standard Details MIS-01 and MIS-04."

Section 2302 Asphalt Sidewalks, Driveways, and Bicycle/Pedestrian Paths

2302.1 – Asphalt Sidewalks, Driveways, and Bicycle/Pedestrians Paths:

Add the following statement to Paragraph 2302.1

"Asphalt shall not be allowed for sidewalks, driveways, and shared use paths within the public Right-of-Way."

Section 2305 Maintenance of Traffic

2305 – Maintenance of Traffic:

Delete section 2305 in its entirety and replace with the following:

"For maintenance of traffic, see Blue Springs Specification Section 3000."

Section 2306 Pavement Markings

2306.4 – Striping Applicability Chart:

Delete the first table regarding Marking Material and replace with the following:

Marking Material	Roadway Surface	Application	Durability
Thermoplastic	New asphalt	Permanent	High
Aggressive bond thermoplastic	Aged asphalt	Permanent	High
Preformed thermoplastic	Asphalt, concrete	Permanent	High
Cold plastic	Concrete	Permanent	Moderate
Paint	All surfaces	Temporary	Low
Epoxy	All surfaces	Permanent	High
Temporary Tape (Type I)	All surfaces	Temporary	Low
Temporary Tape (Type II)	All surfaces	Temporary	Low
Line masking tape	All surfaces	Temporary	Low

Section 2309 Colored Concrete:

Section 2309 Colored Concrete:

Add the following section:

"Section 2309 Colored Concrete:

a. Description – This work shall consist of constructing stamped concrete streetscapes in accordance with Standard Plan R-29 (Series) and the Missouri Department of Transportation Standard Specifications for Construction, except as modified herein.

b. Materials – The materials shall meet the following requirements.

Sound Earth……205
Granular Materials Class II……....902
Joint Fillers……..914

1. Concrete – Concrete shall be a 4,000 psi mix design, maximum aggregate 3/8". Submit two (2) copies of quarried limestone gradation as specified in Section 902 of the Standard Specifications for Construction.

All course or fine aggregate used in the concrete mixture shall be from the same MoDOT approved source.

The mix shall conform to Lafarge "ultrastamp" mix no. RMXUS40LFW or approved equal.

2. ***Concrete Admixtures – All shall meet the requirements of Section 903 Standard Specifications for Construction. Admixtures containing calcium chloride are not permitted.***

3. ***Integral Color – Integral coloring shall be P1840 Red Barn, manufactured by Prism Pigments, or approved equal. All integral color shall meet ASTM C979 for color steadfastness. Independent laboratory testing shall be submitted if requested.***

4. ***Color Hardener – Dry-shake color hardener shall be, manufactured by Matcrete, or approved equal. Recommended coverage is 60 lbs./100ft^2.***

5. ***Release Agent – Dry-shake powder is facilitating release of imprinting tools shall be liquid, manufactured by Matcrete, or approved equal.***

6. ***Acidic Based Stain – Pre-packaged acidic based stain containing color fast metallic salts. Color shall be N/A, manufactured by Cimarron Wholesale – Sedona Acid Stain, or approved equal.***

7. ***Surface Sealer – The final surface seal shall be two coats of solvent based, non-yellowing, crystal clear, Class A standards or better, with non-skid additive or approved equal.***

    A. ***TK Products:***

        1. ***TK-AK2 Achro Kure 1315 (curing compound – day of pour)***
        2. ***TK Bright Glaze (High Gloss Final Seal 7-10 days later)***
        3. ***Or TK Bright Kure N Seal (Less Gloss Final Seal 7-10 min days later)***

c. ***Equipment – The concrete surface shall be patterned as shown on plans. Acceptable manufacturers and styles of imprinting tools are as follows:***

Pattern:	***12" sandstone Tile Proline***
Pattern Manufacturer Source:	***Matcrete (800) 777-7063*** ***Proline Concrete Tools – Local Distributor*** ***Decorative Concrete Supply (913) 422-4443***

d. ***<u>Construction Methods</u>***

1. ***Preparation of Base – Excavation shall be made to the required depth and to a width that will permit forming. All unsuitable material shall be removed below the required depth and replaced with sound earth. The prepared base shall be compacted to 95% of its maximum unit weight in accordance with Section 205 of the Standard Specifications for Construction. Granular material base shall be placed and compacted on the sound earth, as directed by the Engineer. A vapor barrier shall not be used.***

2. ***Forms – Forms and forming shall meet the requirements of Subsection 803.03.B of the Standard Specifications for Construction.***

3. ***Stamped Mock-ups - Provide (2) when possible. (1) could be used for repairs. 4' x 4' stamped and colored mock-ups shall be constructed from approval by the Engineer and Owner prior to construction. Mock-ups shall include integral coloring, color hardener, release agent, and two coats of sealer.***

4. ***Concrete Coloring – The coloring pigment must be added at the batch plant. The truck mixer drum shall be rotated a minimum of 50 revolutions at mixing speed after adding the coloring pigment. The amount of coloring pigment to be added shall be as specified by the pigment manufacturer.***

5. ***Protection of Surrounding Surfaces – All surrounding surfaces, including, but not limited to walls, store fronts, should be protected to prevent discoloration from the concrete. All clean-up and reports shall be the responsibility of the contractor.***

6. ***Placing Concrete – Concrete placement shall meet the requirements of Subsection 803.03.C of the Standard Specifications for Construction, and as described herein.***

   The surface shall be struck off and floated to produce a smooth even surface with a maximum surface variance of plus or minus 1/8-inch in 10 feet in any direction. All edges and joints shall be rounded to the specified radius with an approved finishing tool.

   Controls shall be laid out prior to stamping the concrete with any necessary strings and stakes for lining up the stamping tools. Unless otherwise specified, ungrouted installations shall be stamped 5/16-inch. The concrete is ready to be stamped when a 2-inch deep impression made with the finger does not fill with water and the concrete maintains its shape.

   The stamps must be clean of foreign matter prior to the stamping operation. It is generally recommended to clean stamps and reapply powdered or clear liquid release to all contact surfaces approximately every 25-30 square yards.

The freshly placed concrete surface shall be barricaded against access for at least 24 hours after the release powder has been applied. The concrete shall not be opened to pedestrian traffic until the release powder has been washed off.

Avoid the use of jitterbug for placements.

(In Freeze-thaw areas 7% +/= 1.5 air entrainment needs to be part of the mix design.)

7. ***Joints – The control joints shall be sawed as soon as the concrete has hardened such that no raveling or spalling occurs, but before any random uncontrolled cracking develops. Joint depths shall be maintained at ¼ of the slab(s) thickness. Layout control joints to follow stamping pattern as closely as possible.***

   Joints shall be sawed with their faces perpendicular to the surface of the sidewalk and shall not vary more than 3/16-inch from their designated position. Transverse joints shall be constructed at right angles to the centerline of the sidewalk and longitudinal joints parallel to the centerline. Locations for longitudinal and transverse joints shall be as directed by the Engineer.

   When the sidewalk is constructed adjacent to a previously placed slab, transverse joints in the succeeding slab shall be aligned with like joints in the adjacent slab.

   Expansion joint filler shall extend to the full depth of the joint with its top surface ¼ - ½-inch below the finished surface.

8. ***Acid Washing – Apply a one (1) part muriatic acid to 10 parts water to the surface and agitate the concrete with the side of a straw broom a minimum of 36 hours after placement. Wash surface until proper color has been achieved and then flush thoroughly. The contractor shall attempt to remove 80% or more of the color release prior to sealing.***

9. ***Detailing – If squeeze joints are present, a grinder or chisel shall be used to remove. Ground areas shall be burnished with dry release agent using a camel back sponge or 1 – 2-inch wide brush with bristles cut down to ½-inch. Blow away excess release with a high velocity blower.***

10. ***Acid Staining – Provide mock-ups when possible. Stain shall be applied per manufacturer's direction on a clean concrete surface that is a minimum of 28 days old. Staining shall be done on random individual bricks so that there is a minimum of 20-inches of the decorative area stained.***

11. ***Sealing Decorative Surface – The surface must also be allowed to completely dry prior to sealing. Surface sealer shall be applied within 24 hours of acid washing.***

    The surface temperature of the concrete shall not exceed 80-degrees F or be below 40-degrees F at the time the sealer is applied. Two (2) uniform thin coats shall be applied to the concrete at the manufacturer's recommendation rate. The concrete surface shall be barricaded against access from the time of the casting to at least 24 hours after the sealer is applied.

12. ***Maintaining Traffic. – The concrete shall not be opened to pedestrian traffic until at least 24 hours after the sealer has been applied. During such period, entrance to all residents and businesses shall be maintained at all times. Construction should be staged to allow for such access.***

e. Measurement and Payment – The completed work as measured for Stamped and Colored Concrete, will be paid for at the contract unit price for the following contract item (pay item).

Contract Item (Pay Item)	***Pay Unit***
Stamped and Colored Concrete, ……..……..	***Square Foot***

Stamped and Colored Concrete, will be measured in place by area in square feet. Payment for Stamped and Colored Concrete, shall include all labor, material and equipment required to perform all work in accordance with this special provision and as shown on the plans, including but not limited to providing the Engineer and the City of Blue Springs with the final documentation of the concrete mix design and a unit of each stamping tool used to complete the project.

The contractor is responsible for all costs associated with construction and disposal of mock-up slabs, with no additional compensation permitted."