

CITY OF LANSING

FORM OF SUMMARY FOR PUBLICATION OF ORDINANCE

Ordinance No. 908: An Ordinance Amending the Technical Specifications and Design Criteria for Public Improvements Projects for the City of Lansing, Kansas.

Pursuant to the general laws of the State, a general summary of the subject matter contained in this ordinance shall be published in the official City newspaper in substantially the following form:

Ordinance No. 908 Summary:

On October 18, 2012, the City of Lansing, Kansas, adopted Ordinance No. 908, revising Division 2000 – Concrete, pages TS/20-1 – TS/20-2, of the Technical Specifications. A complete copy of this ordinance is available at www.lansing.ks.us or at City Hall, 800 First Terrace, Lansing, KS 66043. This summary certified by Gregory Robinson, City Attorney.

This Summary is hereby certified to be legally accurate and sufficient pursuant to the laws of the State of Kansas.

DATED: October 18, 2012

Gregory Robinson, City Attorney

ORDINANCE NO. 908

AN ORDINANCE AMENDING THE TECHNICAL SPECIFICATIONS AND DESIGN CRITERIA FOR PUBLIC IMPROVEMENTS PROJECTS FOR THE CITY OF LANSING, KANSAS

**BE IT ORDAINED BY THE GOVERNING BODY OF THE CITY OF LANSING,
KANSAS:**

Section 1. To revise the following division: Division 2000 – Concrete, pages TS/20-1 – TS/20-2, as shown in “Exhibit A”.

Section 2. Effective Date. This Ordinance shall be in effect upon passage and approval of the governing body of the City of Lansing, Kansas.

PASSED AND APPROVED by the Governing Body of the City of Lansing, County of Leavenworth, State of Kansas, this 18th day of October, 2012.

CITY OF LANSING

ATTEST

Mayor Kenneth W. Bernard

Amber McCullough, City Clerk

APPROVED AS TO FORM:

Gregory Robinson, City Attorney

Published: Leavenworth Times
Publication Date:

EXHIBIT “A”

DIVISION 2000 – CONCRETE MATERIALS

Section 2001 SCOPE. This section covers all cast-in-place slip-formed concrete, and concrete for precast structures.

Section 2002 GENERAL. All cast-in-place and slip-formed concrete shall be accurately formed, and properly placed and finished as shown on the drawings and specified herein.

Where governing specifications are referred to, material and construction requirements shall conform to the governing specification as modified herein. “KSS” shall refer to Standard Specifications for State Road and Bridge Construction, Kansas Department of Transportation, current edition including special provisions.

The contractor shall inform the Engineer at least 24 hours in advance of the times and places at which he intends to place concrete.

Section 2003 MATERIALS. All material used in the manufacture of concrete shall conform to the following:

Cement	KSS Section 2001. Refer to part I. Field Blended Cement Concrete” for additional supplementary cementitious material (SCM) requirements. All concrete mix designs shall contain SCM’s as required per this part of the KSS Section 2001 and meet the requirements of ASTM C 1567
Water	KSS Section 2401.
Fine Aggregate sand will not be	KSS Section 1102, Type FA-A, except that artificial or manufactured acceptable.
Coarse Aggregate	Coarse aggregate shall meet the requirements set forth in the current ASTM C33 for Class 5S aggregate, and Coarse aggregate shall be entirely granite, quartzite, or trap rock. All coarse aggregate shall come from a large, accessible, uniform geological formation and be easily field identifiable in concrete. Coarse aggregates shall meet the gradation requirements of the current ASTM C33. The acceptable gradation sizes shall be numbered 1 through 7, 56, 57, 67, 357, or 467. Mix designs shall specify the gradation designation. Max absorption shall be 0.5%.
Air-Entraining Agent And other Admixtures	KSS Section 1401 and 1402

Section 2004 PRELIMINARY REVIEW. A report shall be submitted to the Engineer two weeks prior to the placement of concrete and shall include on the proposed use for the concrete, the design strength, concrete mix proportions, maximum water/cement ratio, slump designated at the

point of delivery, the percent of air in the concrete for air-entrained concrete and the fine and coarse aggregate gradation.

Concrete mix design submittals shall include:

- Mix designation.
- 28 day compressive strength that meet the requirements of ACI 318 current edition
- Design slump and allowable range after addition of all admixtures.
- Proportions/weights of all mix materials.
- Source of all mix materials.
- Design water to cement ratio minimum 0.25 and maximum 0.44. Mix designs shall be submitted for each combination of materials, differing material proportions, or differing water to cement ratios Design unit weight at the design air content.
- Proportion of admixtures (admixtures for water reduction, set acceleration, or set retardation may be shown as optional provided they are Kansas Department of Transportation approved and the mix design shows the allowable application rates or dosages for each optional admixture.)
- Gradation designation for the coarse aggregate.
- A certification that the coarse aggregate meets the current ASTM C33 5S requirements (including the magnesium sulfate test for soundness.)
- Test results performed by a qualified laboratory for coarse and fine aggregate gradations.
- Test results performed by a qualified laboratory that meet specifications listed in KSS Section 1102, Type FA-A (natural sand).

Failure to get a mix design approved from the Engineer prior to concrete placement is just cause for removal of the concrete at the contractor's expense.

A certification from the cement supplier per KSS 2001.5 is required for acceptance of the finished product. A certification that admixtures are approved by the Kansas Department of Transportation. is required for acceptance of the finished product.

Section 2005 CONCRETE MIX DESIGNATIONS. . Unless otherwise specified in Plans/Contract Documents, or otherwise approved in writing by the Engineer, all concrete shall be Grade 4.0 (AE) .

Section 2006 LIMITING REQUIREMENTS. Each concrete mix shall be designed and concrete shall be controlled within the limits shown in KSS Section 401. except as modified herein.

The practice of withholding a portion of the water at the batch plant to be added at the job site is not permitted without prior approval of the engineer In no case shall the design water/cement ratio be exceeded.

The initial set as determined by ASTM C403 shall be attained 5½ hours, plus or minus one hour, after the water and cement are added to the aggregates. If such use has been approved by the Engineer, the quantity of retarding or accelerating admixture shall be adjusted to compensate for variations in temperature and job conditions.

The use of admixtures other than air-entraining agents shall not be allowed without the approval of the Engineer. When approved for specific purposes the admixture content shall be in accordance with the recommendations of the manufacturer for compliance with these specifications.

The total volumetric air content of concrete after placement shall be six (6.5) percent, plus or minus one (1.5) percent.

As the work progresses, the Engineer reserves the right to change the proportions from time to time if conditions warrant such changes to produce a satisfactory job. Any such changes may be made within the limits of the specifications at no additional compensation to the contractor.

Supplementary cementitious materials (SCM) are required for alkali-silica reaction mitigation (ASR).

Section 2007 BATCHING AND MIXING. KSS Section 401.

Section 2008 PLACEMENT. KSS Section 401.

Section 2009 COLD WEATHER CONCRETING. KSS Section 401.

Section 2010 HOT WEATHER CONCRETING. KSS Section 401

Section 2011 CURING AND PROTECTION.

Curing Materials Shall conform to KSS Section 1405

Concrete shall be cured by protecting it against loss of moisture, rapid temperature changes and mechanical injury for at least four days or a time period designated by the Engineer after placement. Acceptable methods shall be moist curing, white polyethylene sheeting, liquid membrane-forming compounds. After finishing operations have been completed and immediately after the free water has left the surface, the entire surface of the newly-placed concrete shall be covered by the curing medium applicable to local conditions and acceptable to the Engineer. The contractor shall have the necessary equipment for adequate curing on hand and be ready to install prior to concrete placement.

Moist curing shall be accomplished by a covering of burlap or other approved fabric mat used singly or in combination. Curing mats shall be thoroughly wet when applied and kept continuously wet and in intimate contact with the surface for the duration of the moist-curing period. Burlap or fabric mats shall be long enough to cover the entire surface of the work and lapped a minimum of 18" at joints to prevent drying between adjacent sheets.

White polyethylene sheets shall be large enough to cover the entire surface of the work and shall be lapped not less than eighteen (18) inches. The sheets shall be adequately weighted to prevent displacement or billowing due to wind. Tear holes appearing in the material during the curing period shall be immediately repaired or replaced with material in acceptable condition.

White membrane curing compound shall be applied after finishing operations have been completed and immediately after the free water has left the surface. The surface of the work shall be completely coated and sealed with a uniform layer of the curing compound at a rate of not less than one gallon per 200 square feet. The compound shall not be thinned and shall be kept agitated to prevent settlement of pigment. On surfaces where forms are removed prior to the end of the specified curing period, the entire exposed surface shall be coated at the specified rate of coverage. If rain falls on the newly-coated surface before the film dries sufficiently to resist damage, or if the film is damaged in any other way, the contractor will be required to apply a new coat of the same or equivalent compound to the affected area.

During cold weather concreting when the ambient air temperature is expected to drop below 40°F, a sufficient supply of burlap, straw, hay, or other blanketing material shall be provided along the work to protect the concrete and maintain a minimum temperature of 40°F in the concrete as measured on the surface. An approved moisture barrier such as wet burlap or plastic sheeting shall be placed on the concrete prior to placement of the blanketing material. This type of curing shall be maintained for a period of six days as the initial cure. Contractor shall provide adequate supervision of the curing process to ensure that discoloration does not occur on concrete covered by plastic, burlap or other means.

Sidewalks, curb and gutter, and miscellaneous concrete shall be protected and cured for a period of not less than seventy-two (96) hours or a time period designated by the Engineer after the placing of the concrete by covering with wet burlap, white polyethylene sheeting, or by the application of a membrane curing compound as specified above.

Section 2012 FORMS. Forms shall be designed to produce hardened concrete having the shape, lines, and dimension shown on the drawings. They shall be sufficiently tight to prevent leakage of mortar and shall be braced or tied to maintain the desired position, shape, and alignment during and after concrete placement.

Forms may be of wood or metal and shall be designed to permit easy removal without injury to the concrete. Forms for all exterior exposed surfaces which will be visible after backfilling shall be prefabricated plywood panel forms, job-built plywood forms, or forms that are lined with plywood or fiberboard. Forms shall be coated with an approved light oil to prevent concrete from adhering and shall be thoroughly cleaned and re-oiled before re-use.

Forms shall not be removed or disturbed until the concrete has attained sufficient strength to safely support all dead and live loads. Care shall be taken in form removal to avoid surface gouging, corner or edge breakage, and other damage to the concrete. The following table gives the approximately minimum time that forms shall be left in place.

Average Air Temperature Greater Than Structural Member		70°	60°	50°	40°
		Time in Place (24 Hour Days)			
Slab Shoring	10	12	14	21	
Beams Soffits and Shoring		10	12	14	21
Beam Side Forms		1	1	2	3
Wall Side Forms		2	2	3	4

Section 2013 FINISHING FORMED SURFACES. Fins and other surface projections shall be removed from all formed surfaces except exterior surfaces that will be in contact with backfill. A power grinder shall be used, if necessary, to remove projections and provide a flush surface. Surfaces to be damp-proofed shall have fins removed and tie holes filled, but no additional finishing will be required, unless otherwise specified in the plans or by the Engineer. Tie holes in all formed surfaces shall be cleaned, wetted, and filled with a non-shrinking, expansive cement mortar. Tie hole patches shall be left flush, sound, smooth, even and shall match the texture and color of the adjacent concrete.

Unless provided otherwise in the plans all exposed edges shall be beveled by using dressed, triangular molding, having three-fourths (3/4) inch sides.

Section 2014 REPAIRING DEFECTIVE AND DAMAGED CONCRETE. Any concrete found not to be formed as indicated on the plans, or out of alignment or level, having a defective surface, or cracked or damaged, or found not to pass the tests for air content and for 28 day strength prior to acceptance of the project by the City, shall be considered as not conforming to the intent of these specifications and may be ordered removed and replaced by the contractor at his expense unless the Engineer authorizes patching of the defective or damaged area. Defective surfaces include: Shrinkage cracks, plastic cracks, stress cracks or construction damage, crazing, scaling, discoloration, spalling, over-worked and badly boomed or tooled surfaces. Surface defects such as ridges and bulges may be removed by grinding with the approval of the Engineer.

Honeycombed and other defective concrete that does not affect the structural integrity of the structure shall be chipped out and the vacated area shall be filled. The methods used in this type of repair shall be approved by the Engineer. Material used for patching shall be a non-shrink, non-metallic epoxy-type grout with a minimum 28-day compressive strength of 5000 psi or a similar material approved by the Engineer. Prior to placement of the repair filling, the contact surface of the affected area shall be thoroughly cleaned of all loose and foreign material and shall be coated with an epoxy bonding agent.

Concrete repair work shall conform to Chapter 9 of ACI 546R-04 and shall be performed in a manner that will not interfere with thorough curing of surrounding concrete. Repair work shall be adequately cured and protected from further damage.

Section 2015 REINFORCEMENTS. The metal reinforcement shall be protected by the thickness of concrete indicated on the construction drawings. Where not otherwise shown, the thickness of concrete over the reinforcement shall be as follows:

Location of Reinforcement	Cover in Inches
Surfaces where concrete is deposited directly against the ground.	3
Formed surfaces exposed to the ground, to water, or to weathering.	2
Beams, girder, and columns not exposed to ground, water, or weathering.	1½

All surfaces other than those above.

1

Reinforcing steel shall be accurately placed and positioned on supports, spacers, hangers, or other reinforcing steel as approved by the Engineer and shall be secured in place with wire ties or suitable clips. The minimum clear distance between parallel bars shall not be less than $1\frac{1}{2}$ times the diameter of round bars, except that in no case shall clear spacing between parallel bars be less than 2 inches or less than $1\frac{1}{2}$ times the nominal size of the coarse aggregate.

Splices in reinforcing steel will not be permitted at points of maximum stress. When it becomes necessary to splice reinforcing steel at points other than those shown on the contract drawings the character and location of the splice shall be approved by the Engineer. Welding or tack welding of reinforcement will not be permitted. Reinforcements upon which unauthorized welding has been done shall be removed and replaced as directed by the Engineer. Spliced bars shall be placed in contact and securely tied together.

Metal reinforcement at the time concrete is placed shall be free from rust, scale, or other contaminants that will destroy or reduce the bond.

Woven Wire Fabric shall be supported on “support chairs”. Under no circumstances shall WWF be “walked-in” to place or pulled up with hooks during placement operations.

Reinforcing Steel Shall conform to KSS Sections 1601 and 1602; All Bars – Grade 60

Reinforcing Steel Splices Shall conform to KSS Section 1605

Welded Wire Fabric Shall conform to KSS Section 1603

Helical Reinforcing Shall conform to KSS Section 1604

Section 2016 CONSTRUCTION JOINTS. Construction joints shall be made at locations indicated on the drawings or specified, and shall be constructed in accordance with the plans and specifications, or as directed by the Engineer. When the contractor desires to make construction joints at other locations, he shall anticipate such changes at least 10 business days ahead of the construction operations to allow the Engineer to investigate such changes and approve additional construction joints.

Section 2017 EXPANSION AND CONTRACTION JOINTS. Expansion and contraction joints shall be at locations indicated on the drawings or as specified.

Contraction joints shall consist of planes of weakness created by forming or cutting grooves in the surface of the concrete. Formed grooves shall be made by depressing an approved tool or device into the plastic concrete. Sawed joints shall be constructed by sawing through the surface of the concrete with an approved concrete saw. Sawing of the joints shall begin as soon as the concrete has cured sufficiently to prevent excessive raveling. Unless otherwise specified, all joints shall be minimum $\frac{1}{3}$ the depth of the placed slab.

Expansion joints shall be formed with pre-formed expansion joint filler Type B, or Redwood in accordance with KSS Subsection 1503.

Section 2018 REINFORCED CONCRETE BOX FORMING SEQUENCE. Wall forms may be placed the day following the placement of the bottom slab, as long as care is taken to protect the slab against rough or abusive handling of forms and or placing equipment. The actual placement of concrete shall not occur prior to the fifth day after placing the bottom slab. Top forms may be placed with wall forms if the walls and top are to be monolithic construction, otherwise top forms are not to be placed until the third day after placing the walls. The actual placement of concrete for the top shall not occur prior to the fifth day after placing the walls (for base to top shoring) or until the walls have reached their design strength for slab forms shored by the walls. Wall forms shall remain in place a minimum of two days after the walls are poured. Supports for the top slab shall be left in place according to the schedule shown in Section 2012 Forms.

The above guidelines for placing forms for reinforced concrete boxes are based on the use of standard forming procedures and with the use of concrete containing no admixtures to achieve high early strength. Variations in forming techniques and/or the use of high early strength concrete shall only be allowed after the contractor obtains the written approval of the Engineer.