

SUDAS Revision Submittal Form

Status Date: As of 2/19/2026 Topic: PCC joint types
Manual: Design Manual Location: Section 5G-2, C

Requested Revision:

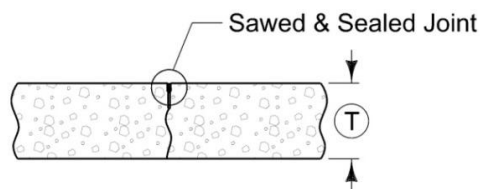
C. Joint Types

Contraction joints for concrete pavements are generally sawed. Transverse joints can be sawed with conventional sawing or early concrete sawing equipment. Longitudinal joints are formed with conventional sawing. Some joints, including construction joints, are formed. The figures in this subsection are derived from [SUDAS Specifications Figure 7010.101](#).

1. Transverse Contraction Joints: Contraction joints constructed transversely across pavement lanes are spaced to control natural initial and mature cracking of the concrete pavement. Under certain conditions, such as rapidly dropping air temperature during the night, transverse cracks may occur early. Therefore, early formation of the transverse joints is required.

a. Plain Contraction Joints: Plain contraction joints are normally used in local streets and minor collectors where load transfer is not a major factor. Load transfer for plain contraction joints occurs through the adjacent irregular fractured faces. Generally, they are used when the slab thickness is less than 8 inches. The joints are constructed by sawing to a depth of $T/4$ and are spaced at 12 foot intervals for slab thickness of 6 inches and 15 foot intervals for slab thickness of 8 inches or less. See SUDAS Specifications Figure 7010.901 for joint spacing for 6 and 8 inch thick slabs. Plain contraction joints are sometimes used when the pavement thickness is 9 inches or greater such as at intersections in boxouts near curbs where load transfer is not a concern. Approved early concrete sawing equipment may be used to cut the joint to a depth of 1 1/4 inch. For sealing, the joint width must be a minimum of 1/4 inch wide.

Figure 5G-2.01: 'C' Plain Contraction Joint



Continued with C, 2 (longitudinal contraction joints), after Figure 5G-2.03:

An important consideration when establishing the distance between longitudinal joints for jointed plain concrete pavements is the prevention of random longitudinal cracking at the quarter point, which is the midpoint between the centerline and the back of the curb. Pavements less than 9 inches thick may not crack through a longitudinal joint placed close to the gutter, which could cause longitudinal cracks at the quarter point. ~~For this reason, it is preferred to use quarter point jointing for 31-foot-wide pavements. Third point jointing, which eliminates the centerline joint, is frequently used for pavement narrower than 30 feet because of the narrower panel width and for 31-foot-wide pavements with a depth greater than 8 inches. However, some jurisdictions desire a centerline joint and a gutterline joint, typically 3 to 3 1/2 feet from the back of curb. A gutterline joint should only be used if the pavement has depth of at least 9 inches or pavement widening is likely to occur.~~

- a. **Quarter Point Jointing** is the preferred layout for longitudinal pavement joints. This pattern, for all pavement widths, is the best option to induce cracking at the planned locations.
- b. **Third Point Jointing**, which eliminates the centerline joint, is frequently used and recommended for pavements 30 feet or narrower. It is only recommended for pavements wider than 30 feet when pavement depths are greater 8 inches.
- c. **Gutterline Jointing** with a centerline joint is favored by some jurisdictions. This pattern has a centerline joint with gutterline joints 3 to 3 1/2 feet from the back of curb. It is recommended that this jointing pattern be only used on pavements depths of at least 9 inches or pavements where a widening is likely to occur, because, as stated above, the longitudinal joints close to the gutter may not activate. This would increase the likelihood of random cracking at the quarter point.

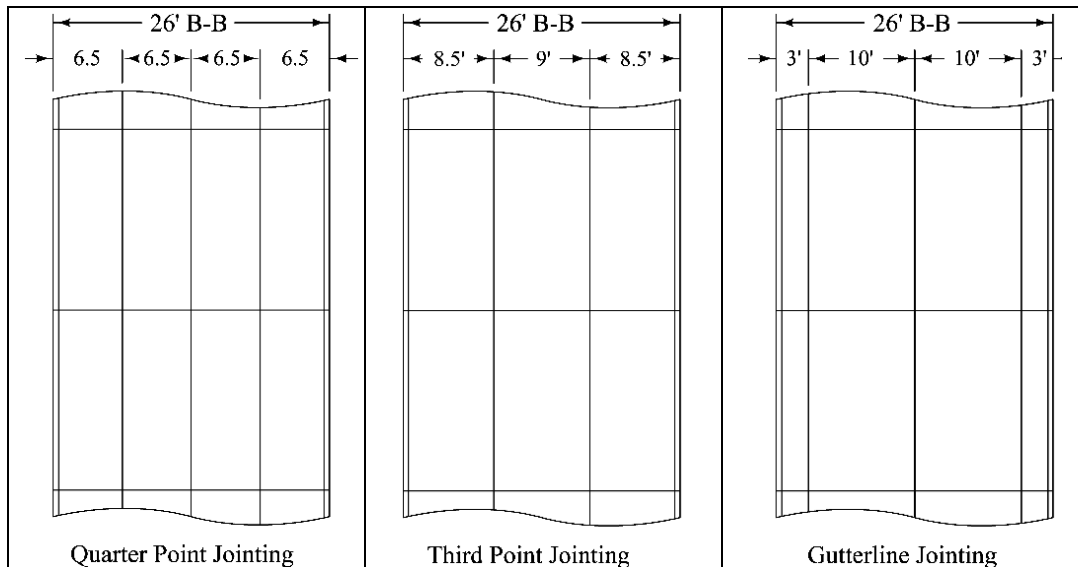
The following examples depict jointing options for 26 foot and 31 foot wide pavements. The principles involved with jointing for these pavement widths can be extended to other pavement widths.

- a. **26 Foot B-B Pavement:** Three longitudinal joint options for 26 foot wide plain jointed concrete pavements are provided:

Rearranged the order in this text and the figure below from most preferred to least

- 1) Quarter point jointing includes a centerline joint and two joints at the quarter points. This option is used when centerline crack control is desired.
- 2) Third point jointing provides for a single 9 foot center panel with two joints, each 8 1/2 feet from the back of curb.
- 3) Gutterline jointing provides two 10 foot lanes with a centerline joint and gutterline joints 3 feet from the back of curb. As stated above, care must be exercised with this option to prevent random cracking at the quarter point. This option is typically used for streets 9 inches or greater in thickness.

Figure 5G-2.04: 26 Foot B-B Pavement

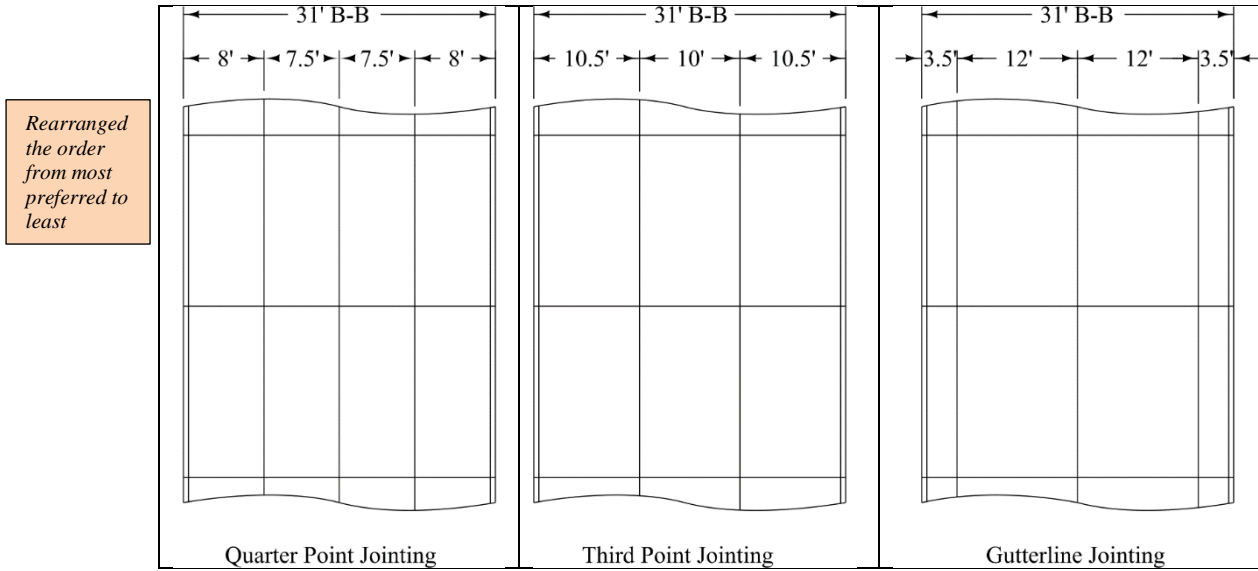


- b. **31 Foot B-B Pavements:** Three longitudinal joint options for 31 foot wide pavements are provided.

- 1) Quarter point jointing provides for a centerline longitudinal joint and two quarter point joints and is not intended to delineate driving lanes.
- 2) Third point jointing provides three nearly equally spaced panels, without a centerline joint. It typically is used as an option to quarter point jointing to minimize the number of longitudinal joints.
- 3) Gutterline jointing utilizes a centerline joint and gutterline joints 3 to 3 1/2 feet from the back of curb that delineate driving lanes. This jointing pattern is typically used when the pavement may be widened in the future, and the delineation of the lanes is desired. Care must be exercised

with this option to prevent random cracking at the quarter point. Typically, gutterline jointing is used on streets with pavement thickness greater than or equal to 9 inches.

Figure 5G-2.05: 31 Foot B-B Pavements



Reason for Revision: Industry requested revisions.

Comments: None.

Region: Central East West **2/19/2026 Webinar**

Comments: None.

SUDAS Revision Submittal Form

Status Date: As of 4/9/2026 Topic: Concrete updates
Manual: Specifications Manual Location: Section 7010

Requested Revision:

1.08 MEASUREMENT AND PAYMENT

A. PCC Pavement:

- 1. Measurement:** Measurement will be in square yards for each different thickness of PCC pavement. The area of manholes, intakes, or other fixtures in the pavement will not be deducted from the measured pavement area.
- 2. Payment:** Payment will be at the unit price per square yard for each thickness of PCC pavement.

Change also applies to E, F, G, & K
- 3. Includes:** Unit price includes, but is not limited to, final trimming of subgrade or subbase, integral curb, bars and reinforcement, joints and **sealing filling**, surface curing and pavement protection (excluding cold weather protection; see Section 7010, 1.08, N), safety fencing, concrete for rigid headers, boxouts for fixtures, pavement smoothness testing, and quality control for stringless paving.

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2.01 MATERIALS

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L. Joint Fillers and Sealers:

- 1. Joint Sealers Fillers:** Comply with [Iowa DOT Article 4136.02](#).

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M. Liquid Curing Compound: Comply with [Iowa DOT Section 4105](#) and furnish from an approved supplier listed in [Iowa DOT Materials I.M. 405, Appendix A \(MAPLE\)](#).

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2.02 CONCRETE MIXES

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B. Consistency and Workability:

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- 2. Air Content:** Use an approved air entraining agent.
 - For machine-placed pavement, use a target air content of 8% with a tolerance of plus or minus 2% when measured on the grade just prior to consolidation, as determined by [Iowa DOT Materials I.M. 318](#). The target air content may be adjusted by the Engineer based on random tests of the consolidated concrete behind the paving machine. **When random testing is performed, test a minimum of twice per day (the first load and midway through the placement)**. These additional tests will be used to consider the need for a target value change and will not be used in the acceptance decision.
 - For hand-placed pavement, use a target content for hand finish of 7% with a tolerance of plus or minus 1.5% when measured on the grade and just prior to consolidation, as determined by [Iowa DOT Materials I.M. 318](#).

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C. Use of Fly Ash and Ground Granulated Blast Furnace Slag (GGBFS) as Supplementary Cementitious Materials:

- Mix proportions for the various mixes using fly ash and GGBFS are included in [Iowa DOT Materials I.M. 529](#). The maximum allowable fly ash substitution rate is 20%. Do not use a GGBFS substitution rate of more than 35% by weight (mass). The total supplementary cementitious material substitution rate is not to exceed ~~40%~~ **50%**.

Further discussion on Class F allowed fly ash substitution with slag

2. If C-SUD or CV-SUD mixes are specified, the maximum allowable Class F fly ash substitution rate is 25% and the maximum Class C fly ash substitution rate is 35%. The maximum combination rate is 20% Class C fly ash and 20% GGBFS.
3. When Type IP, IT, or IS cement is used in the concrete mixture, only fly ash substitution will be allowed. Between October 16 and March 15, use of Type IL cement with fly ash and GGBFS or Type IP, IS, or IT cement with fly ash will be allowed only when maturity method is used to determine time of opening. Transport, store, haul, and batch fly ash and GGBFS in such a manner to keep it dry.

3.01 EQUIPMENT

A. Batching and Mixing Equipment:

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3. Mixing:

a. Construction ~~or Stationary~~ Mixer:

- 1) Ensure the concrete is uniform in composition and consistency. If this condition is not produced because of the size of the batch, the size of the batch may be reduced or the mixing time increased, or both, until this result is obtained. If non-uniform, corrective action must be taken.
- 2) Ensure the methods of delivering and handling the concrete are such that objectionable segregation or damage to the concrete will not occur, and they will facilitate placing with a minimum of handling.

b. Central or Stationary On-site Mixed Concrete:

- 1) Ensure central or stationary mixer has all required Iowa DOT certifications and calibration reports. The certified plant inspector will monitor the plant.
- 2) Ensure the concrete is uniform in composition and consistency. If non-uniform, concrete producers must take corrective action.
- 3) Central or stationary on-site mixed concrete is defined as concrete proportioned in a central plant set-up to service a single project and mixed in a stationary mixer for transportation in trucks without agitation, proportioned at a central plant, and only partially mixed in a stationary mixer for transportation and finish mixing in a transit mixer, or proportioned at a central plant, and then mixed in a transit mixer prior to or during transit.
- 4) Ensure each delivery vehicle is capable of discharging concrete having a slump not over 2 inches at an overall rate for its entire load of not less than 1.25 cubic yards per minute. Ensure the concrete is delivered at a rate sufficient to maintain a sustained rate of progress of not less than 100 feet per hour for the width and depth of pavement to be placed.

bc. Ready Mixed Concrete:

- 1) Ensure the concrete is uniform in composition and consistency. If non-uniform, concrete producers must take corrective action.
- 2) ~~Ready mixed concrete is defined as concrete proportioned in a central plant and mixed in a stationary mixer for transportation in trucks without agitation, proportioned at a central plant, and only partially mixed in a stationary mixer for transportation and finish mixing in a transit mixer, or proportioned at a central plant, and then mixed in a transit mixer prior to or during transit.~~ Ready mixed concrete is defined as concrete proportioned in a plant set up to service multiple projects with different mix requirements, and mixed in a stationary mixer for transportation in trucks without agitation. The concrete can either be proportioned at a wet batch plant, only partially mixed in a stationary mixer for transportation and finishing in a transit mixer, or proportioned at a dry batch plant, and then mixed in a transit mixer prior to or during transit.

- 3) When necessary to add additional mixing water at the site of placement, mix the batch at least an additional 30 revolutions of the drum at mixing speed.
- 4) Ensure each vehicle in which concrete will be delivered is capable of discharging concrete having a slump not over 2 inches at an overall rate for its entire load of not less than 1.25 cubic yards per minute. Ensure the concrete is delivered at a rate sufficient to maintain a sustained rate of progress of not less than 100 feet per hour for the width and depth of pavement to be placed.

ed. All Methods: Identify each truck load by a plant charge ticket showing plant name, contractor, project data, quantity, class, time batched, and water added at site.

C. Concrete Placement Equipment:

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8. **Joint Sealing Filling Equipment:** Use equipment capable of cleaning the joint and heating and installing sealant filler in joints according to manufacturer's recommendations.

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3.02 PAVEMENT CONSTRUCTION

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I. Finishing:

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5. Surface Treatment:

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- b. **Surface Tining:** When surface tining is specified, use a longitudinal tining. Under special circumstances, when specified in the contract documents, transverse tining may be required.

1) Longitudinal:

- a) Complete longitudinal surface tining using a machine with a wire broom or comb. For small or irregular areas, or during equipment breakdown, hand methods may be used. Use a broom or comb with a single row of tines 1/8 inch (+/- 1/64 inch) in width and uniformly spaced at 3/4 inch intervals. The depth of the grooves must be a minimum of 1/8 inch to a maximum of 3/16 inch in the plastic concrete.
- b) Use equipment with horizontal and vertical string line controls to ensure straight grooves.
- c) Conduct this operation 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.
- d) At longitudinal joints, leave a 2 to 3 inch wide strip of pavement surface (centered along the joint) that is not grooved for the length of the joint.

~~2) Transverse:~~

- ~~a) If transverse surface tining is required or allowed, use a machine with a wire broom or comb. For small or irregular areas, or during equipment breakdown, hand methods may be used. Use a broom or comb with a single row of tines 1/8 inch (+/- 1/64 inch) in width and randomly spaced from 3/8 inch to 1 5/8 inch with no more than 50% of the spacing exceeding 1 inch. The depth of the grooves must be a minimum of 1/8 inch to a maximum of approximately 3/16 inch in the plastic concrete.~~
- ~~b) Conduct this operation 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.~~
- ~~c) Where abutting pavement is to be placed, the tining should extend as close to the edge as possible without damaging the edge.~~
- ~~d) If abutting pavement is not to be placed, do not tine the 6 inch area nearest the edge or 1 foot from the face of the curb.~~

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J. Surface Curing:

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6. If, due to other operations, the coating is damaged within 72 hours after being applied, immediately re-coat the affected areas. Coating of the sawed surface with curing compound will not be allowed on joints that are to be sealed filled. When pavement is opened to traffic prior to 72 hours after application of the curing coating, a re-coating will not be required.

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L. Joint Sealing Filling:

1. Timing:

- a. Unless otherwise allowed or approved by the Engineer, before any portion of the pavement is opened to the Contractor's equipment or to general traffic, clean and seal joints that require sealing filling.
- b. The Engineer may limit the wheel loads and axle loads of equipment operating on the pavement during this operation, if prior to the age and strength specified in Section 7010, 3.05. Additional tests to determine the pavement strength may be required.

2. Cleaning:

- a. For those joints that are not to be sealed filled, cleaning is not required.
- b. Within 3 hours after a joint has been wet sawed to the finished dimension, flush the wet sawing residue away from the sawed faces using a high pressure water blast operating with a minimum pressure of 1,000 pounds per square inch. Within 3 hours after a joint has been dry sawed to the finished dimension, blow the dry sawing residue from the joint using air compressors that provide moisture and oil free compressed air.
- c. Immediately prior to installation of sealant filler, clean joints with an air blast. Do not perform sealing filling until visual examination verifies the joint surfaces appear dry, in addition to being clear of dust and contamination.

3. Sealing Filling:

- a. Prepare and install joint sealer filler in the joint and to the proper level specified in the contract documents and as recommended by the manufacturer.
- b. Heat hot-poured sealers filler in a thermostatically controlled heating kettle; heat the material to the temperature required for use, but not above that recommended by the manufacturer. After sealing filling, remove excess sealer filler from the pavement surface.
- c. Seal Fill joints the same day they are cleaned. Apply sealant filler only when the joint surfaces appear dry by visual examination.
- d. Place joint sealer filler only when the pavement and ambient air temperatures are 40°F or above. When near this minimum, additional air blasting or drying time, or both, may be necessary to ensure a satisfactory bond to the joint faces. When this sealer filler cannot be properly placed due to late fall work, submit a joint construction plan and sealing filling details to the Engineer for approval before commencing paving. Delay the cleaning, sealing filling, and, if required, resawing of joints until the following spring. This delay requires the Engineer's approval.
- e. When surface correction is required, repair seals filler damaged from the corrective work. Joint preparation, cleaning, and sealing filling may be delayed until after corrective work, provided the pavement is not opened to traffic before corrective work is performed.

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3.04 PAVEMENT PROTECTION

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2. Hot Weather:

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- c. If the evaporation rate exceeds 0.15 pounds per square foot per hour but is less than 0.3 pounds per square foot per hour, provide the following concrete evaporation protection.
 - 1) Immediately apply after initial floating is done with an approved evaporation retarder per the manufacturer's recommendations to the concrete pavement and curbs or increase the surface cure application to 1.5 times the standard specified rate.

3.05 USE OF PAVEMENT

Time for opening pavement for use is determined by maturity method complying with [Iowa DOT Materials I.M. 383](#) or age and test results. The minimum age and test results needed for opening are shown in Table 7010.01.

Table 7010.01: Minimum Age and Tested Strength of Pavement Before Opening

Class of Mix	Type of Cement	Minimum Age For Opening ¹	Minimum Compressive Strength (psi)	Minimum Flexural Strength Center Point (psi)
C	Type I	7 Days ²	3,000	500
M	Type I	48 Hours	3,000	500

¹ Opening without testing only allowed upon approval of Engineer

² Five calendar days for concrete 9 inches thick or more. If maturity testing is used to determine opening, minimum flexural strength may be lowered to 350 psi if approved by the Engineer.

3.07 QUALITY CONTROL

Table 7010.02: Material Certifications and Testing

Material or Construction Item	Tests	Applicable Standard ¹	Methods of Acceptance of Sampling and Testing	Field Sampling and Testing	
				Frequency (minimum)	Responsible Party
Fine Aggregates	Gradation	I.M. 302, 306, 336	Cert. Plant Insp. ²	1/250 CY or min 1/day	Supplier/ Contractor
	Moisture	I.M. 308, 527	Cert. Plant Insp. ²	1 per 1/2 day	
	Specific Gravity	I.M. 307	Cert. Plant Insp. ²	1/250 CY or min 1/day	
	Quality	I.M. 209	Approved Source	Prior to use	
Coarse Aggregates	Gradation	I.M. 302, 306, 336	Cert. Plant Insp. ²	1/250 CY or min 1/day	
	Moisture	I.M. 308, 527	Cert. Plant Insp. ²	1 per 1/2 day	
	Specific Gravity	I.M. 307	Cert. Plant Insp. ²	1/250 CY or min 1/day	
	Quality	I.M. 209	Approved Source	Prior to use	
Portland Cement	Quality	I.M. 401	Approved Source	Prior to use	
Fly Ash	Quality	I.M. 491.17	Approved Source	Prior to use	
GGBFS	Quality	I.M. 491.14	Approved Source	Prior to use	
Curing Compound	Quality	Iowa DOT Section 4105	Approved Source	Prior to use	
Joint Sealer Filler	Quality	I.M. 436.01	Approved Source	Prior to use	
Epoxy Dowel Bars and Assemblies	Quality	I.M. 451.03B	Approved Source	Prior to use	
Tie Bars	Quality	I.M. 451	Approved Source	Prior to use	
Plastic Concrete	Air Content ⁴	I.M. 318, 327	Field Test	1/200 CY or min. 1/day	Engineer
	Slump ⁵	I.M. 317	Field Test	1/200 CY or min. 1/day	
	Cylinders	I.M. 315	Field Test	Set of 3/500 CY or two sets/day	
	Beams	I.M. 316, 327, 328	Field Test	Set of 3/500 CY or two sets/day	
	Thickness	-----	Field Test	1/200 CY	
Hardened Concrete	Smoothness	SUDAS 7010, 3.07	Field Test - Straightedge	Project length	Contractor
	Smoothness	SUDAS 7010, 3.07	Field Test - Inertial Profiler	Project length	
	Thickness	SUDAS 7010, 3.07	Field Test	1 core/1000 SY or 3 cores/project	
	Strength	I.M. 383	Maturity Tests ³	Prior to placement	

¹ Refers to the Iowa DOT Materials I.M.s, Iowa DOT Standard Specifications, or SUDAS Standard Specifications.

² Certified plant inspection per [Iowa DOT Materials I.M. 527](#).

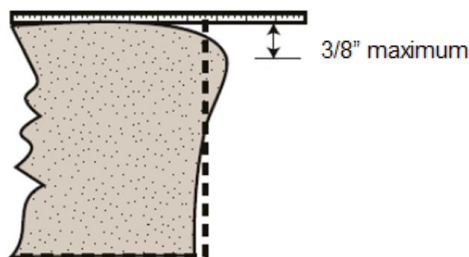
³ The Contractor is responsible for developing the maturity curve for the specified mix, taking maturity readings, and delivering a copy of the results to the Engineer.

⁴ If central or stationary on-site mixed concrete is being used and air content and consistency are being monitored as required at the mixing site, field testing can be reduced to 1/500 CY or minimum 1 per day.

⁵ Slump testing is not required for slipform paving operations. Edge slump of the pavement behind the paver will be monitored by the Contractor and the Inspector.

C. **Edge Slump:** Edge slump behind the paver will be observed to ensure proper stiffness of the concrete mix. If the Engineer notes the pavement is slumping, it will be measured to verify. For pavement without a curb, edge slump must be less than 3/8 inch as measured below. For curbed profiles, do not exceed 1 inch more than the designated back to back pavement width. In cases of the edge slump exceeding the maximum allowable, immediately adjust the concrete stiffness.

DISCUSS →



D. **Pavement Smoothness:** Evaluate pavement smoothness for all PCC pavement and overlay surfaces. Parking lots are not evaluated for smoothness due to low speeds. ←DISCUSS

1. **Straightedge Irregularities:** The Engineer will check PCC pavement surfaces with a 10-foot straightedge placed parallel to the centerline within 5 days of placement. Areas showing high spots of more than ~~1/4~~ 1/2 of an inch in 10 25 feet will be marked. Complete surface corrections according to the following procedures to an elevation where the area or spot will not show surface deviations in excess of 1/8 1/2 inch when tested with a 10 25 foot straightedge span.

To align with Iowa DOT. Measurement has historically been too restrictive. Contractor cannot comply without additional precautions taken such as bump cutters

DISCUSS further

- Complete surface corrections by diamond grinding, placing a PCC overlay, or replacement.
- Use grinding and texturing equipment complying with Iowa DOT Section 2532. Use a minimum 36 inch wide cutting head, unless a 24 inch cutting head is necessary due space limitations.
- Perform surface correction parallel to lane lines or edge lines as directed by the Engineer. Make each pass parallel to the previous pass. Ensure the ground surface is of a uniform texture.
- Do not allow adjacent passes to overlap more than 1 inch or have a vertical difference of 1/8 inch as measured from bottom of groove to bottom of groove.
- Begin and end smoothness corrections at lines normal to the pavement lanes lines or edge lines within any one corrected area. Proceed from the centerline or lane line toward the pavement edge to maintain pavement cross slope.

Surface corrections will be completed at the direction of the Engineer with no additional cost to the Contracting Authority.

Reason for Revision: Requested revisions from the concrete industry.

Comments: None.

Region: Central East West 2/19/2026 Webinar

- Comments:**
- Delete #4 under the central plant item. Note - done.
 - One request to leave transverse tining in.
 - Not sure about the parking lot smoothness sentence.
 - Availability of contractors who can perform high speed profilometers.
 - Liked having the straightedge requirement for those area where smoothness is not required but they notice an issue.