

## ORIGINATION FORM

### THE INFORMATION BELOW IS TO BE PROVIDED BY THE ORIGINATOR

(The person who receives or originates the issue and needs to forward the issue for action.)

Modify Specification \_\_\_\_\_ 347\_\_\_\_\_.  
Section/File number

New Section \_\_\_\_\_.  
Section number

**Subject:** Portland Cement Concrete – Class I (Nonstructural)

**Origination date:** March 7, 2005

**Originator:** Michael Bergin

**Office/Phone:** State Material Office 352-955-6666

**Email address/** michael.bergin@dot.state.fl.us

**Userid:**

**Problem statement:** Make clarification for use of small quantities of concrete, allow for the use of volumetric mixers, develop a more performance related specification.

**Information source:** District Concrete Technologists and State Materials Office  
Engineers

**Background data:** The intent is to allow more versatility in the requirements for non structural concrete and to make better use of the available materials.

**Recommended  
Usage Note:** Jobs with concrete..

**Desired  
implementation  
date:** Beginning with the January 2006 letting.



# Florida Department of Transportation

JEB BUSH  
GOVERNOR

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JOSÉ ABREU  
SECRETARY

## MEMORANDUM

**DATE:** May 19, 2005

**TO:** Specification Review Distribution List

**FROM:** Duane F. Brautigam, P.E., State Specifications Engineer

**SUBJECT:** **Proposed Specifications Change: 3470000 - Portland Cement Concrete - Class I (Nonstructural).**

In accordance with Specification Development Procedures, we are sending you a copy of a proposed specification change to Portland Cement Concrete - Class I (Nonstructural).

This change was proposed by Mike Bergin of the State Materials Office to update and make clarifications of the entire Section.

Please share this proposal with others within your responsibility. Review comments are due within four weeks and should be sent to Mail Station 75 or to my attention via e-mail at SP965DB or duane.brautigam@dot.state.fl.us. Comments received after June 16, 2005 may not be considered. Your input is encouraged.

DFB/jho

Attachment

COMMENTS:

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Submitted by:

Phone #:

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**PORTLAND CEMENT CONCRETE – CLASS I (NONSTRUCTURAL).**  
**(REV ~~05-05-055-19-05~~)**

SECTION 347 (Pages 301-304) is deleted and the following substituted:

**SECTION 347**  
**PORTLAND CEMENT CONCRETE - CLASS I**  
**(NONSTRUCTURAL)**

**347-1 Description.**

The requirements of this Section are applicable to concrete designated as Class I (Nonstructural), hereinafter referred to as concrete. Use concrete composed of a mixture of portland cement, aggregates, and water, with or without chemical admixtures, slag, or pozzolanic materials. Deliver concrete to placement site in a freshly mixed, unhardened state. *Ensure the hardened concrete meets its intended purpose free of cracks or deficiencies.*

**347-2 Materials.**

**347-2.1 General:** Certify that all materials used in concrete are from Department approved sources, and free from frozen or other detrimental matter.

Meet the following requirements:

- (a) Portland Cement .....Section 921\*  
..... *and AASHTO M 85 or ASTM C 150,*
- (b) Fine Aggregate .....Section 902
- (c) Coarse Aggregate .....Section 901
- (d) Water .....Section 923
- (e) Chemical Admixtures .....Section 924
- (f) Pozzolans and Slag .....Section 929

*\* Meet the requirements of Section 921 except that the heat of hydration requirements will not apply.*

**347-2.2 Admixture Requirements:** Chemical admixtures may be added at the dosage rates recommended by the manufacturer.

**347-2.3 Substitution of Materials:** Approved material sources may be substituted for similar materials indicated on the originally approved mix design. Use originally approved mix components and proportions, when unsatisfactory test results are obtained from the use of the substituted material(s).

**347-2.4 Material Storage:** Use a concrete production facility that meets the following requirements:

**347-2.4.1 Cementitious Materials Storage:** Provide a separate and clearly labeled weatherproof facility to store each brand or type of cementitious material without mixing or contamination. Provide a suitable, safe and convenient means of collecting cementitious material samples at each storage facility.

**347-2.4.2 Aggregate Storage:** Provide suitable bins, stockpiles or silos to store and identify aggregates without mixing, segregating or contaminating different grades or types of materials. Identify Department approved pit number and aggregate type/gradation. Handle the aggregates in a manner to minimize segregation and meet the specification requirements when recovered from storage. Continuously and uniformly sprinkle coarse aggregate with water, for 24 hours preceding introduction into the concrete mix. Maintain stored aggregates in a well-drained condition to minimize free water content. Provide access for the Engineer to sample the aggregates from the recovery side of the storage facility.

### **347-3 Production, Mixing and Delivery.**

**347-3.1 Concrete Production Requirements:** Deliver concrete from a production facility that is certified by the National Ready-Mixed Concrete Association (NRMCA) or approved by the District Materials Office ~~and on the Department's approved plant list.~~ *The District Materials Office may inspect the concrete production facility to verify compliance to the production facilities quality control plan and the specifications.* Produce concrete utilizing equipment that is in good operating condition and operated in a manner to ensure a consistent product. Within two hours prior to each day's batching, ensure that the concrete production facility determines the free moisture for the coarse and fine aggregates. On concrete placements expected to exceed three hours, perform an additional moisture test approximately half way through the batching operations and adjust batch proportions accordingly.

Ensure that the calibration of the measuring devices of the concrete production facilities meets the requirements of Chapter 531 of the Florida Statutes. At least quarterly, ensure that all scales, meters and other weighing or measuring devices are checked for accuracy by a qualified representative of a scale company registered with the Bureau of Weights and Measures of the Florida Department of Agriculture. Have the accuracy of admixture measuring dispensers certified annually by the admixture supplier.

**347-3.2 Mixers:** Ensure that mixers are capable of combining the components of concrete into a thoroughly mixed and uniform mass, free from balls or lumps of cementitious materials, and capable of discharging the concrete uniformly. Operate concrete mixers at speeds per the manufacturer's design. Do not exceed the manufacturer's rated capacity for the volume of mixed concrete in the mixer, mixing drum, or container.

**347-3.3 Delivery:** The maximum allowable mixing and agitation time of concrete is 120 minutes. Water may be added at the job site before discharging concrete, provide the ratio values for water to cementitious materials and slump remain below the maximum allowable values specified in the approved mix design. *When Volumetric Mixers are used deliver concrete in accordance with the requirements of Volumetric Mixer Manufactures Bureau (VMMB).*

**347-3.4 Small Quantities of Concrete:** *With approval of the District Materials Engineer, small quantities of concrete, less than 3 yd<sup>3</sup> placed in one day and less than 0.5 yd<sup>3</sup> placed in a single placement may be accepted using a pre-bagged mixture. The pre-bagged mixture will be prepared in accordance with the manufactures recommendations and will meet the requirements of this Specification.*

**347-4 Control of Quality.**

**347-4.1 Concrete Mix Design:** Before producing any concrete, submit the proposed mix design to the Engineer on a form provided by the Department. Use only concrete mix designs ~~meeting the following requirements and~~ having prior approval of the Engineer.

<del>Maximum water to cementitious materials ratio</del>	0.55 lbs/lbs [0.55 kg/kg]
<del>Minimum 28-Day Compressive Strength</del>	2,500 psi [17 MPa]
<del>Minimum Cementitious Materials Content</del>	470 lbs/yd <sup>3</sup> [280 kg/m <sup>3</sup> ]
<del>Slump</del>	0 to 6 inch [0 to 150 mm]

Materials may be adjusted provided that the theoretical yield requirement of the approved mix design is met. Show all required original approved design mix data and batch adjustments and substituted material on the Department concrete delivery ticket. The Engineer may disqualify any concrete production facility for non-compliance with Specification requirements.

**347-4.2 Sampling and Testing:** The Engineer may sample and test the concrete at ~~his~~ *their* discretion to verify its quality. *The minimum compressive strength requirement for this concrete is 2,500 psi [17 MPa].*

**347-4.3 Records:** Maintain the following records for review for at least three years *after final acceptance of the project:*

1. Approved concrete mix designs.
2. Materials source (delivery tickets, certifications, certified mill test reports).
3. A copy of the scale company or testing agency report showing the observed deviations from quantities checked during calibration of the scales and meters.
4. A copy of the documentation certifying the admixture weighing/measuring devices.
5. Recent NRMCA or Department inspection records certifying plant can produce concrete and documentation showing that action has been taken to correct deficiencies noted during the inspections.

**347-5 Certification and Acceptance.**

Furnish an *electronic* Delivery Ticket with each batch of concrete before unloading at the placement site. The Department will provide *an example of* the Delivery Ticket Form. The concrete producer may use an alternate form provided that it contains the required information. Record material quantities incorporated into the mix on the Delivery Ticket. Ensure that the Batchers responsible for production of the concrete, certifying that the batch was produced in accordance with specification requirements, signs the Delivery Ticket. Sign the Delivery Ticket certifying that the ~~maximum specified water to cementitious materials ratio was not exceeded due to any jobsite adjustments to the batch, and that the concrete was batched, was~~ delivered and placed in accordance with Specification requirements.

~~Concrete~~ Acceptance by the Department will be by Certification on the Delivery Ticket, as described herein, by the Batchers and the Contractor. The Engineer will hold the contractor responsible for rejecting loads of concrete that do not meet ~~specification~~ *the minimum*

## Jobs with Non-Structural concrete

~~compressive strength requirements, or exceeds the allowable slump or water to cementitious materials ratio.~~ Replace, at no cost to the Department, all concrete that does not meet the 28-day compressive strength requirements *or has 50 feet or more of cracks greater than 0.020 inches in width in 200 square feet of placed concrete.* At the sole option of the Department, the Engineer may accept concrete at a reduced pay when it is determined that the concrete may not serve its intended function.

*If any uncontrolled cracks appear during the life of the Contract unacceptable to the Engineer, remove and replace the concrete at no expense to the Department. Repair by removing and replacing the concrete at the full depth of all affected concrete. Investigate and implement immediate effective solutions to eliminate further cracks, in consultation with, and subject to the approval of, the Engineer.*