Florida Department of Transportation

JEB BUSH
GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

DENVER J. STUTLER, JR.
SECRETARY

August 3, 2005

Mr. Donald Davis
Program Operations Engineer
Federal Highway Administration
227 N. Bronough Street, Suite 2015
Tallahassee, Florida 32301

Re: Office of Design, Specifications
Section 347
Proposed Specification: 3470000.D02 - Portland Cement Concrete - Class I (Nonstructural).

Dear Mr. Davis:

We are resubmitting, for your approval, two copies of a proposed Supplemental Specification for Portland Cement Concrete - Class I (Nonstructural).

These changes are proposed by Mike Bergin of the State Materials Office to update and make clarifications of the entire Section.

Please review and transmit your comments, if any, within two weeks. Comments should be sent via Email to SP965DB or duane.brautigam@dot.state.fl.us.

If you have any questions relating to this specification change, please call Duane F. Brautigam, State Specifications Engineer at 414-4110.

Sincerely,

Signature on file

Duane F. Brautigam, P.E.
State Specifications Engineer

DFB/jho
Attachment
cc: General Counsel
Florida Transportation Builders' Assoc.
State Construction Engineer

PORTLAND CEMENT CONCRETE – CLASS I (NONSTRUCTURAL).
(REV ~~05-05-05~~*~~5-19-05~~*~~7-19-05~~*~~8~~-3-05*)

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 concrete is placed and cured in a manner to ensure that the strength and durability of the concrete is maintained.*

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*
(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

** The heat of hydration requirements of Section 921 is not applicable to nonstructural concrete. Portland cements meeting the requirements of AASHTO M-85 or ASTM C 150 are allowed for nonstructural concrete.*

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's to verify compliance with 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.

When Volumetric Mixers are used, deliver concrete in accordance with the requirements of Volumetric Mixer Manufactures Bureau (VMMB) and ensure that the vehicle has a VMMB registered rating plate.

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.~~

347-3.4 Small Quantities of Concrete: *With approval of the District Materials Engineer, small quantities of concrete, less than 3 yd^3 placed in one day and less than 0.5 yd^3 placed in a single placement may be accepted using a pre-bagged mixture. The Engineer will verify that the pre-bagged mixture is 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.

~~Maximum water to cementitious materials ratio~~	~~0.55 lbs/lbs [0.55 kg/kg]~~
~~Minimum 28-Day Compressive Strength~~	~~2,500 psi [17 MPa]~~
~~Minimum Cementitious Materials Content~~	~~470 lbs/yd^3 [280 kg/m^3]~~

~~Slump~~	~~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 28-day 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*, VMMB* or Department inspection records certifying *the* plant *or truck* can produce concrete and documentation showing that action has been taken to correct deficiencies noted during the inspections.

347-5 Certification and Acceptance.

347-5.1 General: 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 Batcher responsible for producing the concrete, certifies that the batch was produced in accordance with Specification requirements, signs the Delivery Ticket. Sign the Delivery Ticket certifying that the concrete was batched, delivered and placed in accordance with *these* Specification~~s requirements~~.

Acceptance by the Department will be by Certification on the Delivery Ticket, as described herein, by the Batcher and the Contractor. The Engineer will hold the Contractor responsible for rejecting loads of concrete that do not meet the minimum compressive strength requirements. Delineate and replace, at no cost to the Department, all concrete that does not meet the 28-day compressive strength requirements or has any ~~uncontrolled~~ cracking *greater than 1/4 inch [0.63 mm] in width or 1/4 inch [0.63 mm] in vertical displacement. Any spalling or flaking off of the surface layer that exposes the rough, pitted aggregate surface in excess of 10 square inches [255 mm^2] is to be removed and replaced in accordance with 347-5.2. Sidewalk, ditch pavement, slope pavement, Traffic Separator, or curb and gutter having any intersecting cracks visible in the dry concrete (regardless of size) will be removed and replaced in accordance with 347-5.2.*

At the sole option of the Department, the Engineer may accept concrete at a reduced pay when it is determined that the concrete will serve its intended function.

If any uncontrolled cracks appear during the life of the Contract unacceptable to the Engineer, remove and replace the concrete *in accordance with 347-5.2* 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.~~

347-5.2 Remedial Action: *Remedial action will be the removal and replacement of all concrete to the full depth and width.*

Sidewalk, Curb and Gutter, Ditch Pavement and Traffic Separator: Begin saw cutting 2 1/2 feet [0.76 m] either side or above and below the crack or at the nearest joint, remove and replace the 5 foot section [1.5 m] encompassing the crack.

Slope Pavement: Saw cut each scored joint above and below the crack and replace the entire section between the saw cuts, ensuring the section removed and replaced encompasses the crack.

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