

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.

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

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. 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.

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 discretion to verify its quality.

347-4.3 Records: Maintain the following records for review for at least three years:

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 a Delivery Ticket with each batch of concrete before unloading at the placement site. The Department will provide 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 batch 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 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. 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.