

**344 CONCRETE FOR LOCAL AGENCY PROGRAM (LAP) (CLASS - D).  
(REV 1-29-25) (FA 7-2-21) (FY 2025-26)**

SECTION 344 is deleted and the following substituted:

**SECTION 344  
CONCRETE FOR LAP (OFF-SYSTEM)**

**344-1 Description.**

**344-1.1 General:** Construct concrete structures and other concrete members, based on the type of work as described in the Contract Documents and the concrete work categories as defined below.

**344-1.2 Work Categories:** Construction will fall into one of the following concrete work categories:

**344-1.2.1 Concrete Work Category 1:** Includes the construction of cast-in-place nonstructural concrete; including sidewalks, curb and gutter, ditch and slope pavement, or other non-reinforced cast-in-place elements.

**344-1.2.2 Concrete Work Category 2:** Includes the construction of precast and prestressed concrete products.

**344-1.2.2.1 Precast Concrete Drainage Structures and Box Culverts:** Includes but are not manholes, junction boxes, endwalls, pipe culverts limited to reinforced and non-reinforced concrete pipes, french drains, underdrains, inlets, storm sewers, and box culverts.

**344-1.2.2.1 Incidental Precast/Prestressed Concrete Products:** Includes the fabrication, storage, transportation, and erection of prestressed concrete poles, concrete bases for light poles, highway sign foundations, retaining wall systems, traffic separators, sound barriers or other structural precast elements.

**344-1.2.3 Concrete Work Category 3:** Includes the work associated with the placement and/or construction of structural cast-in-place concrete meeting the requirements of this section.

**344-2 Materials.**

**344-2.1 General:** Use concrete composed of a mixture of portland or blended cement, aggregates, and water, with or without chemical admixtures or supplementary cementitious materials. Deliver concrete to placement site in a freshly mixed, unhardened state. Ensure concrete is placed and cured in a manner that ensures the strength and durability of the concrete are maintained. Ensure all materials used in concrete are free from deleterious materials. Meet the following requirements:

**344-2.1.1 Portland Cement:** Use portland cement meeting the requirements of AASHTO M 85 or ASTM C150. Do not comingle cement of different types or from different sources.

**344-2.1.2 Blended Cement:** Use blended cement meeting the requirements of AASHTO M 240 or ASTM C595. Store different brands of cement, cement of the same brand from different facilities, or different types of cement separately.

**344-2.1.3 Coarse and Fine Aggregates:** Use aggregates meeting the requirements of ASTM C33.

**344-2.1.4 Water:** Use water meeting the requirements of ASTM C1602.

**344-2.1.5 Chemical Admixtures:** Use chemical admixtures meeting the requirements of ASTM C494 and ASTM C260. Add admixtures at the dosage rates recommended by the manufacturer.

**344-2.1.6 Supplementary Cementitious Materials:** Use supplementary cementitious materials meeting the requirements of ASTM C618 and ASTM C989, as applicable. Do not use coal ash derived from the burning of municipal garbage or other refuse.

### **344-3 Production, Mixing and Delivery of Concrete.**

#### **344-3.1 Concrete Production Requirements:**

**344-3.1.1 Concrete Work Category 1:** Use a concrete production facility that is certified by the National Ready Mixed Concrete Association (NRMCA) or listed on the FDOT's Non-Structural Concrete Production Facility Listing with an Accepted QC Plan. Concrete production facilities listed on the FDOT Structural Concrete Production Facility Listing with an Accepted QC Plan may also be used for Category 1.

**344-3.1.2 Concrete Work Category 2:** Obtain precast concrete products from plants with an approved by National Cert Program or that are currently on the FDOT's Concrete Production Facility Listing with an Accepted QC Plan for the types of products that they are producing.

**344-3.1.3 Concrete Work Category 3:** Use a concrete production facility that is certified by the National Ready Mixed Concrete Association (NRMCA) or listed on the FDOT's Structural Concrete Production Facility Listing with an Accepted QC Plan.

**344-3.2 Classes of Concrete:** Meet the requirements of Table 344-1.

Table 344-1 Concrete Class Requirements <sup>(10)</sup>				
Class of Concrete	28-day Specified Minimum Compressive Strength (f'c) (psi)	Maximum Water to Cementitious Materials Ratio (pounds per pounds)	Minimum Total Cementitious Materials Content (lb/yd <sup>3</sup> )	Target Slump Value (inches) <sup>(9)</sup>
Category 1				
Class NS <sup>(8)</sup>	2,500	N/A	N/A	N/A
Category 3				
I (Seal)	3,000	0.53	470 <sup>(6)</sup>	8
I (Pavement) <sup>(4) (11)</sup>	3,000	0.50	470 <sup>(6)</sup>	1.5 or 3
II <sup>(2)</sup>	3,400	0.53	470	3 <sup>(1)</sup>
II (Bridge Deck)	4,500	0.44	600 <sup>(5)</sup>	3 <sup>(1)</sup>
III	5,000	0.44	600 <sup>(5) (7)</sup>	3 <sup>(1)</sup>
III (Seal)	3,000	0.53	600 <sup>(5)</sup>	8
IV	5,500	0.41 <sup>(3)</sup>	600 <sup>(5)</sup>	3 <sup>(1)</sup>
IV (Drilled Shaft)	4,000	0.41	600 <sup>(5)</sup>	8.5
V (Special)	6,000	0.37 <sup>(3)</sup>	600 <sup>(5)</sup>	3 <sup>(1)</sup>
V	6,500	0.37 <sup>(3)</sup>	600 <sup>(5)</sup>	3 <sup>(1)</sup>
VI	8,500	0.37 <sup>(3)</sup>	600 <sup>(5)</sup>	3 <sup>(1)</sup>
VII	10,000	0.37 <sup>(3)</sup>	600 <sup>(5)</sup>	3 <sup>(1)</sup>
Notes: (1) For increased slump concrete, flowing concrete, SCC and slip form concrete meet the requirements of 346-3.1. (2) For precast three-sided culverts, box culverts, endwalls, inlets, manholes and junction boxes, the target slump value and air content will not apply. The maximum allowable slump is 6 inches, except as noted in (2). The Contractor is permitted to use concrete meeting the requirements of ASTM C478 (4,000 psi) in lieu of the specified Class II concrete for precast endwalls, inlets, manholes and junction boxes. (3) When silica fume or metakaolin is required, the maximum water to cementitious material ratio will be 0.35. When ultrafine fly ash is used, the maximum water to cementitious material ratio will be 0.30. (4) If 28-day strength is 2,500 or greater, concrete may be accepted if 28-day compressive strength is reached by 56 days. (5) The minimum total amount of cementitious materials content of 600 pounds per cubic yard is required for extremely aggressive environment. For moderately and slightly aggressive environments, the required amounts are 550 pounds per cubic yard and 510 pounds per cubic yard, respectively. (6) Request the use of concrete mixes with a lower amount of total cementitious materials content at the Contractor's option. The mix design must meet the requirements of Section 9.2 Volume II of the Materials Manual. (7) When precast three-sided culverts, box culverts, endwalls, inlets, manholes or junction boxes require a Class III concrete, minimum cementitious materials content may be reduced to 470 pounds per cubic yard. (8) Recycled Asphalt Pavement (RAP) may replace up to 20% of the total aggregate in the design mix. Use RAP from a Department approved stockpile. (9) Tolerance for slump is $\pm 1.5$ inches. (10) The required air content for all classes of concrete is less than or equal to 6.0%. (11) For Class I (Pavement), air content testing is not required.				

**344-3.3 Contractors Quality Control:** , Assume full responsibility for controlling all operations and processes such that the requirements of these Specifications are always met.

For Concrete Work Category 3, furnish a Quality Control (QC) plan to identify to the Engineer how quality will be ensured at the project site. During random inspections, the Engineer will use this document to verify that the construction of the project agrees with the QC plan.

**344-3.4 Concrete Mix Design:** Before producing any concrete, submit the proposed mix designs to the Engineer for approval. Materials amounts may be adjusted provided that the theoretical yield requirement of the approved mix design is met. Show all required mix data and batch adjustments on an Engineer approved concrete delivery ticket.

**344-3.5 Delivery:** For concrete for Concrete Work Category 3, the maximum allowable transit time of concrete is 90 minutes. With the Engineer's approval, the transit time may be extended.

Furnish a delivery ticket on a form approved by the Engineer with each batch of concrete before discharging at the placement site. Record material quantities incorporated into the mix on the delivery ticket. Ensure that the Batchers responsible for producing the concrete signs the delivery ticket certifying that the batch was produced and delivered in accordance with these requirements. Sign the delivery ticket certifying that the concrete was placed in accordance with these requirements.

**344-3.6 Placing Concrete:**

**344-3.6.1 Concreting in Cold Weather:** Do not mix or place concrete when the air temperature at placement is below 40°F.

During the curing period, if the National Oceanic and Atmospheric Administration (NOAA) predicts the ambient temperature to fall below 35°F for 12 hours or more or to fall below 30°F for more than 4 hours, enclose the structure in such a way that the air temperature within the enclosure can be kept above 50°F for a period of 3 days after placing the concrete or until the concrete reaches a minimum compressive strength of 1,500 psi.

Assume all risks connected with the placing and curing of concrete. Although the Engineer may give permission to place concrete, the Contractor is responsible for satisfactory results. If the placed concrete is determined to be unsatisfactory, remove, dispose of, and replace the concrete at no expense to the Agency.

**344-3.6.2 Concreting in Hot Weather:** Hot weather concreting is defined as the production, placing and curing of concrete when the concrete temperature at placing exceeds 86°F but is less than 100°F. Unless the specified hot weather concreting measures are in effect, reject concrete exceeding 85°F at the time of placement. Regardless of special measures taken, reject concrete exceeding 100°F.

Spray reinforcing bars and metal forms with cool fresh water just prior to placing the concrete in a method approved by the Engineer.

Assume all risks associated with the placing and curing of concrete. Although the Engineer may give permission to place concrete, the Contractor is responsible for satisfactory results. If the placed concrete is determined to be unsatisfactory, remove, dispose of, and replace the concrete at no expense to the Agency.

**344-3.7 Mixers:** Operate all concrete mixers at speeds and volumes per the manufacturer's design or recommendation as stipulated on the mixer rating plate. Produce a completely uniform mixed concrete in a truck mixer for a minimum of 70 revolutions at the mixing speed designated by the truck manufacturer.

When Volumetric Mixers are used, for concrete for Concrete Work Category 1, deliver concrete in accordance with the Volumetric Mixer Standards of the Volumetric Mixer Manufacturers Bureau (VMMB) VMMB 100-01.

**344-3.8 Small Quantities of Concrete:** For Concrete Work Category 1, with approval of the Engineer, small quantities of concrete, less than 3 cubic yards placed in one day and less than 0.5 cubic yards placed in a single placement may be accepted using a pre-bagged mixture.

### 344-3.9 Sampling and Testing:

Perform concrete sampling and testing in accordance with the following methods:

Table 344-2 Concrete Sampling and Testing Methods	
Description	Method
Slump of Hydraulic Cement Concrete	ASTM C143
Air Content of Freshly Mixed Concrete by the Pressure Method	ASTM C231
Air Content of Freshly Mixed Concrete by the Volumetric Method	ASTM C173
Making and Curing Test Specimens in the Field	ASTM C31
Compressive Strength of Cylindrical Concrete Specimens	ASTM C39
Obtaining and Testing Drilled Core and Sawed Beams of Concrete	ASTM C42
Initial Sampling of Concrete from Revolving Drum Truck Mixers or Agitators	FM 5-501
Low Levels of Chloride in Concrete and Raw Materials	FM 5-516
Density (Unit Weight), Yield and Air Content (Gravimetric) of Concrete	ASTM C138
Temperature of Freshly Mixed Portland Cement Concrete	ASTM C1064
Sampling Freshly Mixed Concrete <sup>(1)</sup>	ASTM C172
Concrete Resistivity as an Electrical Indicator of its Permeability	AASHTO T 358
Notes: (1) Take the test sample from the middle portion of the batch in lieu of collecting and compositing samples from two or more portions, as described in ASTM C172.	

**344-3.9.1 Concrete for Concrete Work Category 1:** The Engineer may sample and test the concrete to verify its quality. The minimum 28-day compressive strength requirement for this concrete is 2,500 psi.

**344-3.9.2: Concrete for Concrete Work Category 2:** No sampling and testing is required by the Engineer for Category 2.

**344-3.9.3 Concrete for Concrete Work Category 3:** The Engineer will randomly select a sample from each LOT to determine its plastic properties and to make a minimum of three 4 x 8-inch cylinders for testing by the Engineer at 28 days to ensure that the designed compressive strength has been met for the class of concrete as specified in Table 344-1. A LOT is defined as the concrete placement of 200 cubic yards or one day's production, whichever is less.

### 344-4 Acceptance of the Work.

**344-4.1 Concrete Work Category 1:** Concrete will be accepted based on certification by the batcher and contractor on the delivery ticket.

**344-4.2 Concrete Work Category 2:** Certify that the precast elements were produced by production facilities that are currently on the FDOT's Concrete Production Facility Listing, with an Approved QC Plan, for the types of products that they are producing. In addition, the producer's logo shall be stamped on the element. The producer shall not use the Florida Department of Transportation QC stamp on elements used on this project. Provide a statement of certification from the manufacturer of the precast element that the element meets the requirements of this Specification.

**344-4.3 Concrete Work Category 3:** Concrete will be accepted based on certification by the batcher and contractor on the delivery ticket as described in 344-3.5 and the Engineer's test

results for plastic properties and compressive strength requirements for the class of concrete as defined in Table 344-2.

**344-5 Method of Measurement.**

The quantities to be paid for will be the items shown in the plans, completed and accepted.

**344-6 Basis of Payment.**

Prices and payments will be full compensation for all work and materials specified in this Section.