Florida Department of Transportation

RON DESANTIS
GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

KEVIN J. THIBAULT, P.E.
SECRETARY

June 23, 2021

Khoa Nguyen
Director, Office of Technical Services
Federal Highway Administration
3500 Financial Plaza, Suite 400
Tallahassee, Florida 32312

Re: State Specifications Office
Section: **LAP 334**
Proposed Specification: **LAP3440000 Concrete for Local Agency Program (LAP) (Class D).**

Dear Mr. Nguyen:

We are submitting, for your approval, two copies of the above referenced Supplemental Specification.
The changes are proposed by Jose Armenteros from the State Materials Office to update the language to the LAP Big 4 Specifications. Please review and transmit your comments, if any, within two weeks. Comments should be sent via email to daniel.strickland@dot.state.fl.us.

If you have any questions relating to this specification change, please call me at 414-4130.

Sincerely,

Signature on file

Daniel Strickland, P.E.
State Specifications Engineer

DS/ra
Attachment
cc: Florida Transportation Builders' Assoc.
State Construction Engineer

CONCRETE FOR LOCAL AGENCY PROGRAM (LAP) (CLASS - D~~OFF-SYSTEM~~).
(REV ~~12-20-11~~62-~~9~~22-2021) ~~(FA 2-27-12)~~

SECTION 344 is deleted and the following substituted:

SECTION 344
CONCRETE FOR LAP (OFF-SYSTEM)

344-1 Description.

344-1 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: I~~i~~ncludes but are not limited to reinforced and non-reinforced concrete pipes, french drains, underdrains~~ing concrete barriers, traffic railing barriers, parapets, sound barriers~~, inlets, manholes, junction boxes, endwalls, pipe culverts, storm sewers, and box culverts.

344-1.2.2.1 Incidental Precast/Prestressed Concrete Structures: 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 p~~P~~ortland cement, aggregates, and water, with or without chemical or mineral admixtures and supplementary cementitious materials that meet the following requirements:

344-2.1.1 Portland Cement: Portland cements meeting the requirements of AASHTO M ~~-~~85 or ASTM C~~-~~150 is required. Different brands of cement, cement of the same brand from different facilities or different types of cement shall be stored separately and shall not be mixed.

344-2.1.2 Coarse and Fine Aggregates: Aggregates shall meet ASTM C~~-~~33. ~~Source approval by the FDOT is not required.~~

344-2.1.3 Water: Water shall meet the requirements of ASTM C 1602.

344-2.1.4 Chemical Admixtures: Use c~~C~~hemical admixtures shall be listed on the FDOT ~~Qualified~~ Approved Products List (APL). Admixtures may be added at the dosage rates recommended by the manufacturer.

344-2.1.5 Types of Cement: Unless a specific type of cement is designated in the Contract Documents, use Type I, Type IL, Type IP, Type IS, Type II, Type II (MH) or Type III cement in all classes of concrete. Use Type IL or Type II (MH) for all mass concrete elements.

344-2.1.~~5~~ 6 ~~Pozzolans and Slag~~Supplementary Cementitious Materials: ~~Pozzolans and Slag~~Supplementary Cementitious Materials shall meet the requirements of ASTM C618 and ASTM C 989, respectively~~Table 344-1~~. Fly ash shall not include the residue resulting from the burning of municipal garbage or any other refuse with coal, or the burning of industrial or municipal garbage in incinerators.

~~Table 344-1~~

~~Type or Class~~	~~Test Method~~	~~Exceptions~~
~~Class C Fly Ash~~	~~ASTM C 618~~	~~Not to be used with Types IP or IS cements.~~
~~Class F Fly Ash~~	~~ASTM C 618~~	~~Not to be used with Types IP or IS cements.~~
~~Petroleum Coke Class F~~	~~ASTM C 618~~	~~Not to be used with Types IP or IS cements.~~
~~Bark Ash Class F~~	~~ASTM C 618~~	~~Not to be used with Types IP or IS cements.~~
~~Silica Fume~~	~~ASTM C 1240~~	
~~Metakaolin~~	~~ASTM C 618~~	
~~Slag~~	~~ASTM C 989~~	~~Use only ground granulated blast-furnace slag grade 100 or 120.~~
~~Ultra Fine Fly Ash~~	~~ASTM C 618~~	~~Not to be used with Types IP or IS cements.~~

344-3 Production, Mixing and Delivery of Concrete.

344-3.1 Concrete Production Requirements:

344-3.1.1 Category 1: Use a concrete production facility that is certified by the National Ready Mixed Concrete Association (NRMCA) or listed on the FDOT list of non-structural concrete producers. Concrete production facilities listed on the FDOT Producers with Accepted QC Programs list for structural concrete may also be used for Category 1.

344-3.1.2 Category 2: Obtain precast concrete products from plants that are currently on the FDOT's Production Facility Listing for the types of products that they are producing~~Use a prestressed and or precast facility listed on the FDOT Producers with Accepted QC Programs for precast or prestressed concrete~~.

344-3.1.3 Category 3: Obtain structural concrete from a plant that is currently on the FDOT's Production Facility Listing~~Use a structural concrete facility listed on the FDOT Producers with Accepted QC Programs~~ for structural concrete.

344-3.2 Classes of Concrete: Meet the requirements of Table 344-~~2~~1.

Table 344-1
Master Proportion Table (7)

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^3)	Target Slump Value (inches) (3)

Category 1				
Class NS	2,500	N/A	N/A	N/A
Category 3				
I [(1)]	3,000	0.53	470	3 [(2)]
I (Pavement)	3,000	0.50	470	1.5 or 3 [(5)]
II [(1)]	3,400	0.53	470	3 [(2)]
II (Bridge Deck)	4,500	0.44	600 [(8)]	3 [(2)]
III [(4)]	5,000	0.44	600 [(8)]	3 [(2)]
III (Seal)	3,000	0.53	600 [(8)]	8
IV	5,500	0.41 [(6)]	600 [(8)]	3 [(2)]
IV (Drilled Shaft)	4,000	0.41	600 [(8)]	8.5
V (Special)	6,000	0.37 [(6)]	600 [(8)]	3 [(2)]
V	6,500	0.37 [(6)]	600 [(8)]	3 [(2
VI	8,500	0.37 [(6)]	600 [(8)]	3 [(2)]
VII	10,000	0.37 [(6)]	600 [(8)]	3 [(2)]

Notes:

(1) 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 I or Class II concrete for precast endwalls, inlets, manholes and junction boxes.

(2) The Engineer may allow a maximum target slump of 7 inches when a Type F, G, I or II admixture is used. When flowing concrete is used, meet the requirements of Section 8.6 of the FDOT Materials Manual.

(3) For a reduction in the target slump for slip-form operations, submit a revision to the mix design to the Engineer. The target slump for slip-form mix is 1.50 inches.

(4) When precast three-sided culverts, box culverts, endwalls, inlets, manholes or junction boxes require a Class III concrete, the minimum cementitious materials content is 470 pounds per cubic yard. Do not apply the air content range and the maximum target slump shall be 6 inches, except as allowed in (2).

(5) Meet the requirements of Section 350 of FDOT Specifications.

(6) 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.

(7) Tolerance for slump is ± 1.5 inches and Air Content range is 0.0% to 6.0%.

(8) 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 lb/yd^3 and 510 lb/yd^3, respectively.

Table 344-2						
Class	Minimum Strength (28 day) (psi)	Target Slump (inches)	Target Range (inches)	Air Content Range (%)	Minimum Total Cementitious Materials Content (lb/yd^3)	Maximum Water to Cementitious Material Ratio (lb/lb)
Category 1						
Class NS	2,500	N/A	N/A	N/A	N/A	N/A
Category 3						
I	3,000	3	± 1.5	1.0 to 6.0	470	0.53
I (Pavement)	3,000	2	± 1.5	1.0 to 6.0	470	0.50
II	3,400	3	± 1.5	1.0 to 6.0	470	0.53
II (Bridge Deck)	4,500	3	± 1.5	1.0 to 6.0	611	0.44
III	5,000	3	± 1.5	1.0 to 6.0	611	0.44
III (Seal)	3,000	8	± 1.5	1.0 to 6.0	611	0.53
IV	5,500	3	± 1.5	1.0 to 6.0	658	0.41
IV (Drilled Shaft)	4,000	8.5	± 1.5	0.0 to 6.0	658	0.41
V (Special)	6,000	3	± 1.5	1.0 to 6.0	752	0.37
V	6,500	3	± 1.5	1.0 to 6.0	752	0.37
VI	8,500	3	± 1.5	1.0 to 6.0	752	0.37

344-3.3 Contractors Quality Control: For Categories 1 and 2, assume full responsibility for controlling all operations and processes such that the requirements of these Specifications are always met at all times.

For 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 is in agreement with the QC plan.

344-3.4 Concrete Mix Design: Before producing any Category 1 or Category 2 concrete, submit the proposed mix designs to the Engineer on a form provided by the Engineer. For Category 3, submit to the Engineer for approval, FDOT approved mix designs. Do not use concrete mix designs without prior approval of the Engineer.

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 on an Engineer approved concrete delivery ticket.

344-3.5 Delivery: For Category 3, the maximum allowable transit time of concrete is 90 minutes. For critical placements, with the Engineer's approval, the transit time may be extended to the allowable mixing time shown in the mix design.

Furnish a delivery ticket on a form approved by the Engineer with each batch of concrete before unloading at the placement site. Record material quantities incorporated into the mix on the delivery ticket. Ensure that the Batcher 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 ~~45~~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: For Category 3, hot weather concreting is defined as the production, placing and curing of concrete when the concrete temperature at placing exceeds 86ºF but is less than 100ºF.

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.

Unless the specified hot weather concreting measures are in effect, reject concrete exceeding ~~86ºF~~ 85ºF at the time of placement. Regardless of special measures taken, reject concrete exceeding 100ºF. Predict the concrete temperatures at placement time and implement hot weather measures to avoid production shutdown.

344-3.7 Mixers: For Category 3 concrete, do not place concrete from a truck mixer that does not have a current FDOT mixer identification card.

344-3.8 Small Quantities of Concrete: 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. The Engineer may verify that the pre-bagged mixture is prepared in accordance with the manufacturer's recommendations and will meet the requirements of this Specification.

344-3.9 Sampling and Testing:

344-3.9.1 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: Category 2: No sampling and testing is required by the Engineer for category 2.

344-3.9.3 Category 3: The Engineer will randomly select a sample from each ~~200 cubic yards or one day's production~~LOT to determine its plastic properties and to make three 4 x 8 inch cylinders for testing by the Engineer at 28 days to ensure that the design compressive strength has been met for the class of concrete as specified in Table 344-~~2~~1. A LOT is defined as the concrete placement of 200 cubic yards or one day's production, whichever is less.

344-3.10 Records: Ensure the following records are available for review for at least 3 years after final acceptance of the project:

1. Accepted concrete Plant QC Plan.
2. Approved concrete mix designs.

23. Materials source (delivery tickets, certifications, certified mill test reports).

34. A copy of the scale company or testing agency report showing the signature of the scale company representative, date of inspection, observed deviations from quantities checked during calibration of the scales and meters.

45. A copy of the documentation certifying the admixture weighing/measuring devices.

6. Aggregate moisture control records including date and time of test.

7. Manufacturer's mixer information.

8. Certification documents for admixture weighing and measuring dispensers.

9. A daily record of all concrete batched for delivery to the projects, including respective mix design numbers and quantities of batched concrete.

344-4 Acceptance of the Work.

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

344-4.2 Category 2 Work: Certify that the precast elements were produced by a production facility facilities that are currently on the FDOT's Production Facility Listing for the types of products that they are producinglist of Producers with Accepted QC Programs for precast or prestressed concrete. 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 Category 3 Work: Category 3 concrete will be accepted based on the Engineer's test results for plastic properties and compressive strength requirements for the class of concrete as defined in Table 344-2. In addition, a Delivery Ticket as described in 344-3.5 will be required for acceptance of the material at the project site.

344-4.4 Small Quantities of Concrete: Category 3 concrete meeting the definition of 344-3.8 will be accepted in accordance with 344-4.3 based on test results for plastic properties and compressive strength.

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.

CONCRETE FOR LOCAL AGENCY PROGRAM (LAP) (CLASS - D).
(REV 6-9-2021)

SECTION 344 is deleted and the following substituted:

SECTION 344
CONCRETE FOR LAP (OFF-SYSTEM)

344-1 Description.

344-1 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: Includes but are not limited to reinforced and non-reinforced concrete pipes, french drains, underdrains, inlets, manholes, junction boxes, endwalls, pipe culverts, storm sewers, and box culverts.

344-1.2.2.1 Incidental Precast/Prestressed Concrete Structures: 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 cement, aggregates, and water, with or without chemical or mineral admixtures and supplementary cementitious materials that meet the following requirements:

344-2.1.1 Portland Cement: Portland cements meeting the requirements of AASHTO M 85 or ASTM C150 is required. Different brands of cement, cement of the same brand from different facilities or different types of cement shall be stored separately and shall not be mixed.

344-2.1.2 Coarse and Fine Aggregates: Aggregates shall meet ASTM C33.

344-2.1.3 Water: Water shall meet the requirements of ASTM C 1602.

344-2.1.4 Chemical Admixtures: Use chemical admixtures shall be listed on the FDOT Approved Products List (APL). Admixtures may be added at the dosage rates recommended by the manufacturer.

344-2.1.5 Types of Cement: Unless a specific type of cement is designated in the Contract Documents, use Type I, Type IL, Type IP, Type IS, Type II, Type II (MH) or Type III cement in all classes of concrete. Use Type IL or Type II (MH) for all mass concrete elements.

344-2.1.6 Supplementary Cementitious Materials: Supplementary Cementitious Materials shall meet the requirements of ASTM C618 and ASTM C 989, respectively. Fly ash shall not include the residue resulting from the burning of municipal garbage or any other refuse with coal, or the burning of industrial or municipal garbage in incinerators.

344-3 Production, Mixing and Delivery of Concrete.

344-3.1 Concrete Production Requirements:

344-3.1.1 Category 1: Use a concrete production facility that is certified by the National Ready Mixed Concrete Association (NRMCA) or listed on the FDOT list of non-structural concrete producers. Concrete production facilities listed on the FDOT Producers with Accepted QC Programs list for structural concrete may also be used for Category 1.

344-3.1.2 Category 2: Obtain precast concrete products from plants that are currently on the FDOT's Production Facility Listing for the types of products that they are producing.

344-3.1.3 Category 3: Obtain structural concrete from a plant that is currently on the FDOT's Production Facility Listing for structural concrete.

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

Table 344-1
Master Proportion Table [7]

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^3)	Target Slump Value (inches) [3]
Category 1				
Class NS	2,500	N/A	N/A	N/A
Category 3				
I [1]	3,000	0.53	470	3 [2]
I (Pavement)	3,000	0.50	470	1.5 or 3 [5]
II [1]	3,400	0.53	470	3 [2]
II (Bridge Deck)	4,500	0.44	600 [8]	3 [2]
III [4]	5,000	0.44	600 [8]	3 [2]
III (Seal)	3,000	0.53	600 [8]	8
IV	5,500	0.41[6]	600 [8]	3 [2]
IV (Drilled Shaft)	4,000	0.41	600 [8]	8.5
V (Special)	6,000	0.37 [6]	600 [8]	3 [2]

V	6,500	0.37 (6)	600 (8)	3 (2
VI	8,500	0.37 (6)	600 (8)	3 (2)
VII	10,000	0.37 (6)	600 (8)	3 (2)

Notes:

(1) 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 I or Class II concrete for precast endwalls, inlets, manholes and junction boxes.

(2) The Engineer may allow a maximum target slump of 7 inches when a Type F, G, I or II admixture is used. When flowing concrete is used, meet the requirements of Section 8.6 of the FDOT Materials Manual.

(3) For a reduction in the target slump for slip-form operations, submit a revision to the mix design to the Engineer. The target slump for slip-form mix is 1.50 inches.

(4) When precast three-sided culverts, box culverts, endwalls, inlets, manholes or junction boxes require a Class III concrete, the minimum cementitious materials content is 470 pounds per cubic yard. Do not apply the air content range and the maximum target slump shall be 6 inches, except as allowed in (2).

(5) Meet the requirements of Section 350 of FDOT Specifications.

(6) 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.

(7) Tolerance for slump is ± 1.5 inches and Air Content range is 0.0% to 6.0%.

(8) 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 lb/yd^3 and 510 lb/yd^3, respectively.

344-3.3 Contractors Quality Control: For Categories 1 and 2, assume full responsibility for controlling all operations and processes such that the requirements of these Specifications are always met.

For 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 Category 1 or Category 2 concrete, submit the proposed mix designs to the Engineer. For Category 3, submit to the Engineer for approval, FDOT approved mix designs. Do not use concrete mix designs without prior approval of the Engineer.

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 on an Engineer approved concrete delivery ticket.

344-3.5 Delivery: For Category 3, the maximum allowable transit time of concrete is 90 minutes. For critical placements, with the Engineer's approval, the transit time may be extended to the allowable mixing time shown in the mix design.

Furnish a delivery ticket on a form approved by the Engineer with each batch of concrete before unloading at the placement site. Record material quantities incorporated into the mix on the delivery ticket. Ensure that the Batcher 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: For Category 3, hot weather concreting is defined as the production, placing and curing of concrete when the concrete temperature at placing exceeds 86ºF but is less than 100ºF.

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.

Unless the specified hot weather concreting measures are in effect, reject concrete exceeding 85ºF at the time of placement. Regardless of special measures taken, reject concrete exceeding 100ºF. Predict the concrete temperatures at placement time and implement hot weather measures to avoid production shutdown.

344-3.7 Mixers: For Category 3 concrete, do not place concrete from a truck mixer that does not have a current FDOT mixer identification card.

344-3.8 Small Quantities of Concrete: 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. The Engineer may verify that the pre-bagged mixture is prepared in accordance with the manufacturer's recommendations and will meet the requirements of this Specification.

344-3.9 Sampling and Testing:

344-3.9.1 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: Category 2: No sampling and testing is required by the Engineer for category 2.

344-3.9.3 Category 3: The Engineer will randomly select a sample from each LOT to determine its plastic properties and to make three 4 x 8 inch cylinders for testing by the Engineer at 28 days to ensure that the design 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.

344-3.10 Records: Ensure the following records are available for review for at least 3 years after final acceptance of the project:

1. Accepted concrete Plant QC Plan.
2. Approved concrete mix designs.
3. Materials source (delivery tickets, certifications, certified mill test reports).
4. A copy of the scale company or testing agency report showing the signature of the scale company representative, date of inspection, observed deviations from quantities checked during calibration of the scales and meters.
5. A copy of the documentation certifying the admixture weighing/measuring devices.
6. Aggregate moisture control records including date and time of test.
7. Manufacturer's mixer information.
8. Certification documents for admixture weighing and measuring dispensers.
9. A daily record of all concrete batched for delivery to the projects, including respective mix design numbers and quantities of batched concrete.

344-4 Acceptance of the Work.

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

344-4.2 Category 2 Work: Certify that the precast elements were produced by production facilities that are currently on the FDOT's Production Facility Listing 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 Category 3 Work: Category 3 concrete will be accepted based on the Engineer's test results for plastic properties and compressive strength requirements for the class of concrete as defined in Table 344-2. In addition, a Delivery Ticket as described in 344-3.5 will be required for acceptance of the material at the project site.

344-4.4 Small Quantities of Concrete: Category 3 concrete meeting the definition of 344-3.8 will be accepted in accordance with 344-4.3 based on test results for plastic properties and compressive strength.

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.