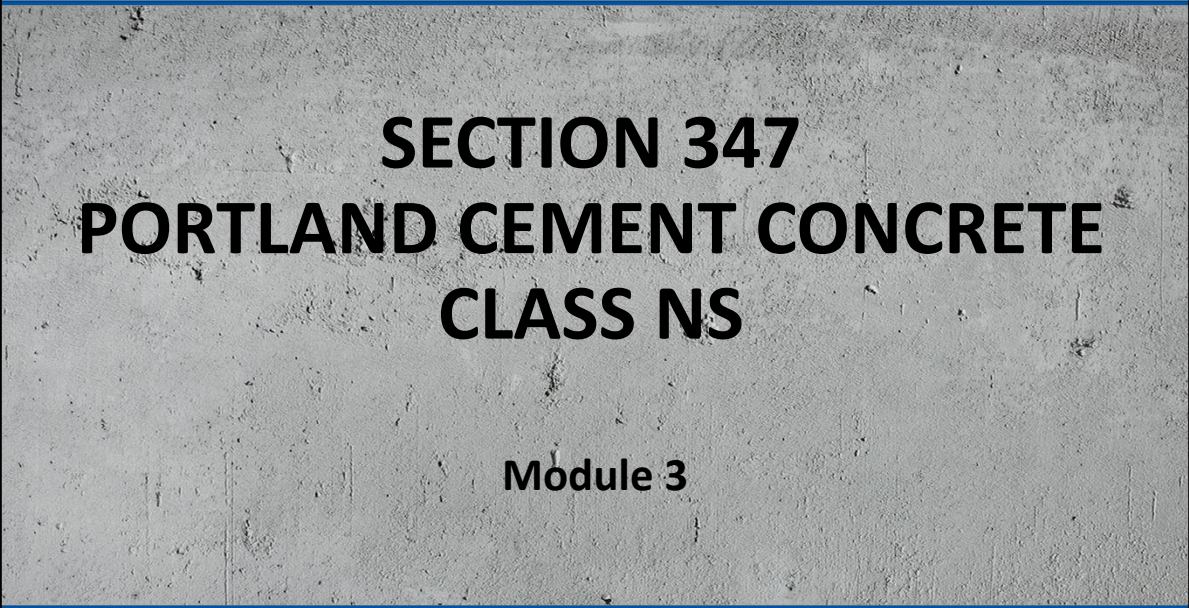




Florida Department of
TRANSPORTATION



Construction
Training Qualification Program



SECTION 347
PORTLAND CEMENT CONCRETE
CLASS NS

Module 3

October 2021

Concrete Field Inspector Specifications

Release 11, Module 3-1



Section 347 Portland Cement concrete class NS

- The class of concrete used for non-structural applications is defined as Class NS to differentiate it from structural concrete classes as defined by Section 346
- Non-structural portland cement concrete is composed of a mixture of portland cement, aggregates, water and , where specified, chemical admixtures and/or supplementary cementitious materials
- The Contractor is responsible to ensure that the concrete is placed and cured in such a way that it meets the requirements of this Section

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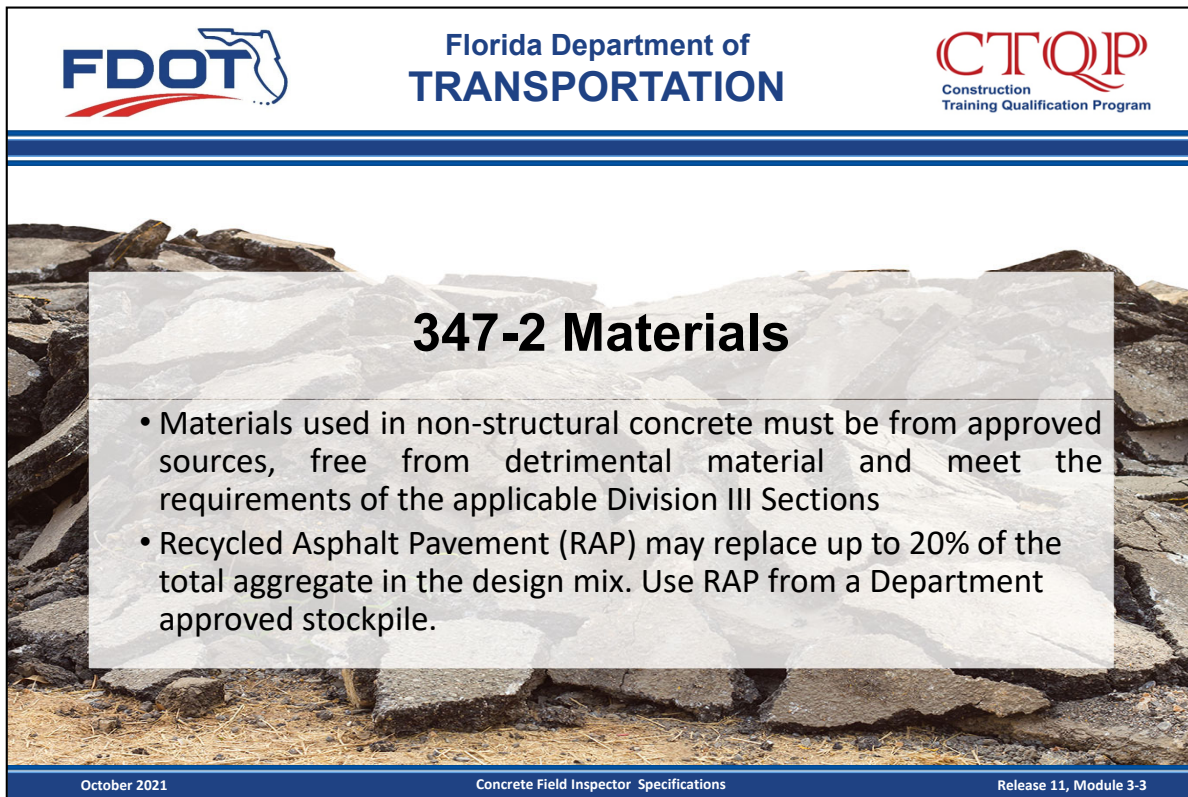
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The contractor needs to ensure that the concrete is cured, and the temperature of non-structural concrete is controlled so as not to cause cracking.

347-1 Description.

The requirements of this Section are applicable to concrete designated as nonstructural portland cement concrete, (Class NS) hereinafter referred to as concrete. Use concrete composed of a mixture of portland cement, aggregates, water; and where specified chemical admixtures, or supplementary cementitious 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.



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347-2 Materials

- Materials used in non-structural concrete must be from approved sources, free from detrimental material and meet the requirements of the applicable Division III Sections
- Recycled Asphalt Pavement (RAP) may replace up to 20% of the total aggregate in the design mix. Use RAP from a Department approved stockpile.

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347-2 Materials.

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

Meet the following requirements:

Portland Cement	Section 921
Coarse Aggregate*	Section 901
Fine Aggregate*	Section 902
Water	Section 923
Chemical Admixtures	Section 924
Supplementary Cementitious Materials	Section 929

* Recycled Asphalt Pavement (RAP) may replace up to 20% of the total aggregate in the design mix. Use RAP from a Department approved stockpile.



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347-3 Production, Mixing and Delivery

347-3.1 Concrete Production Requirements

- The Contractor must obtain concrete from a Plant that is on the Department's list of Nonstructural Concrete Production Facilities.
- The DMRO approves the Plants.
- Volumetric Mixers must meet the requirements of Volumetric Mixer Standards of the Volumetric Mixer Manufacturers Bureau (VMMB) 100-01.
- The Contractor can deliver a structural concrete meeting the requirements of Section 346 in lieu of non-structural concrete, if approved by the Engineer. Acceptance of NS concrete is based on the requirements of Section 347.

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Non-structural concrete is not a QC program material as defined in Section 105. Plants on the list of structural concrete Production Facility Listing may be used for non-structural concrete. In addition, the DMRO may approve other production facilities or different types of mixers for use in non-structural concrete. If the project personnel have any questions related to non-structural concrete, they should contact the local DMRO.

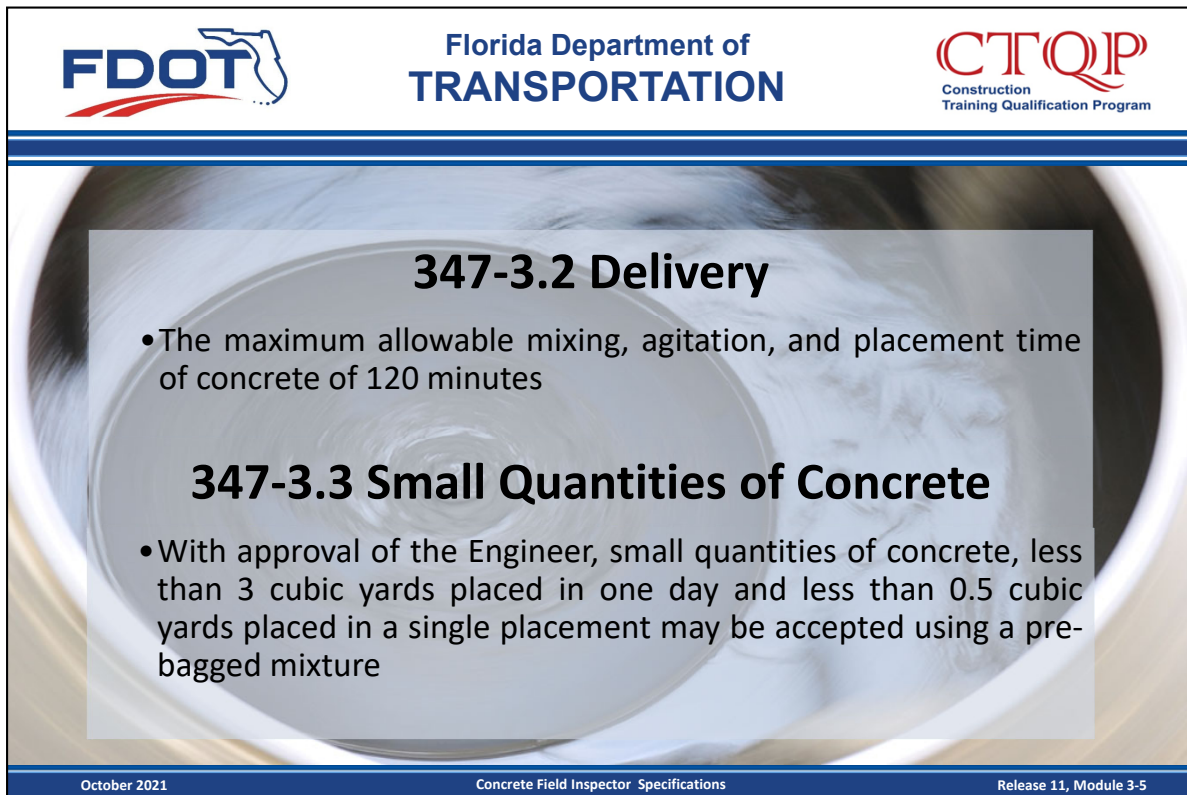
347-3 Production, Mixing and Delivery.

347-3.1 Concrete Production Requirements: Obtain concrete from a plant that is currently on the Department's Nonstructural Concrete Production Facility Listing. Producers seeking inclusion on the list must contact the local District Materials Office for approval.

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

Substitution of structural concrete in lieu of non-structural concrete may be used if approved by the Engineer. If structural concrete is used in lieu of non-structural concrete, obtain the concrete from a production facility meeting the requirements of Section 346. Acceptance is based on the requirements of Section 347.

The Engineer may disqualify any concrete production facility for non-compliance with Specification requirements.



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347-3.2 Delivery

- The maximum allowable mixing, agitation, and placement time of concrete of 120 minutes

347-3.3 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

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347-4 Certification and Acceptance

- Furnish a delivery ticket with each batch of concrete
- Delivery ticket must include the information about material quantities, sources of materials, batch adjustments, batch size, time loaded, time discharged, and allowable jobsite water addition
- Batchers must sign the delivery ticket
- Record water added at the jobsite and sign the delivery ticket
- Acceptance of concrete is based on the certification on the signed delivery ticket
- Certify that the concrete meets a minimum compressive strength of 2,500 psi at 28 days

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It requires DMRE's approval and engineer is to verify mixing is in accordance with manufacturer's recommendations.

1. 347-4 Certification and Acceptance.

347-4.1 General: Furnish a delivery ticket with each batch of concrete before discharging concrete at the placement site. Ensure the delivery ticket includes material quantities incorporated into the batch, sources of materials, batch adjustments, batch size, time loaded, time discharged, and the allowable jobsite water addition.

Ensure the batcher responsible for producing the concrete signs the delivery ticket, certifying that the batch was produced in accordance with the Contract Documents.

Record water added at the jobsite. Sign the delivery ticket certifying that the concrete was placed in accordance with the Contract Documents.

Acceptance by the Department will be by certification on the delivery ticket signed by the batcher and the Contractor. Certify that the concrete meets a minimum compressive strength of 2,500 psi at 28 days. The Engineer may verify the strength of the concrete.



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**Prior to unloading at the site
A Delivery Ticket must be provided**

Form 675-050-10
Materials
05/01

Delivery Ticket for Nonstructural Concrete

Financial Project No.: 1 Serial No.: 2

Plant No.: 3 Date: 4

Concrete Supplier: 5 Delivered to: 6

Address: 7 Address: 8

Truck No.: <u>9</u>	DOT Class: <u>10</u>	DOT Mix No.: <u>11</u>	Cubic Yards This Load: <u>12</u>
Time Loaded: <u>13</u>	Time Arrived: <u>14</u>	Time Discharged: <u>15</u>	Cubic Yards Total Today: <u>16</u>
Allowable Jobsite Water Addition: <u>17</u>	Jobsite Slump: <u>18</u>	Jobsite W/C Ratio: <u>19</u>	

Cement	Air Entrainment Admixture
Source: <u>20</u> Amount: _____	Brand: <u>21</u> Amount: _____
Coarse Agg.: <u>22</u> Amount: _____	Admixture: <u>23</u> Amount: _____
Pit Num.: <u>24</u> % Moisture: _____ Amount: _____	Brand: <u>25</u> Amount: _____
Fine Agg.: <u>24</u> % Moisture: _____ Amount: _____	Fly Ash or Slag: <u>25</u> Amount: _____
Batch Water (gals. or lbs.): <u>26</u> Amount: _____	

Issuance of this ticket constitutes certification that the concrete batched was produced and information recorded in compliance with Department specification requirements (347-5).

Signature of Plant Batcher: 27

Water added at Job Site: 28 gals. / lbs.

Issuance of this ticket constitutes certification that the maximum specified water cementitious ratio was not exceeded and the batch was delivered and placed in compliance with Department specification requirements (347-5).

Signature of Contractor: 29

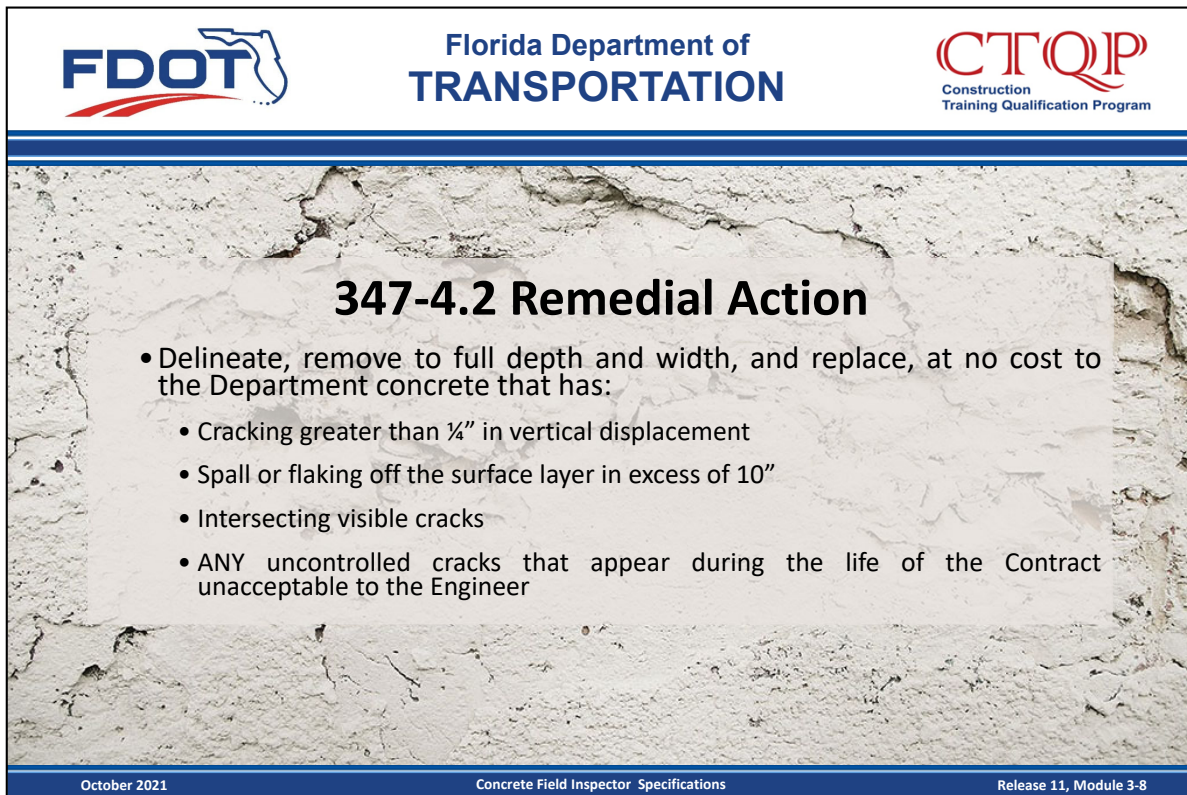
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Example nonstructural concrete delivery ticket

Standard Operating Procedures, Attachment E, Delivery Ticket/Certification-Information

1. Financial Project Number.
 2. Serial number of delivery ticket.
 3. Plant number assigned by the Department.
 4. Date of batching.
 5. Concrete Supplier name.
 6. Contractor's name.
 7. Concrete Supplier address
 8. A description of the delivery location. Normal information to permit truck drivers to find location of placement operation.
 9. Truck number making the concrete delivery.
 10. Class of concrete.
 11. FDOT Design mix number.
 12. Cubic yards (meters) in this load.
 13. Time all materials are introduced into mixer.
 14. Arrival time at job site.*
 15. Time that concrete mix has been completely discharged.*
 16. Cumulative total cubic yards (meters) batched for job on date of delivery.
 17. Maximum allowable water addition at the job site.
 18. Slump*
 19. Water/cementitious materials ratio*
 20. Name of cement producer, Total weight of cement batched in pounds (kilograms).
 21. Brand, Supplier and total amount of air entraining agent used.
 22. Coarse aggregate source (Department assigned Pit No.), Percent of free moisture in coarse aggregate, Actual weight of coarse aggregate batched in pounds (kilograms),
 23. Brand, Supplier and total amount of admixtures used.
 24. Fine aggregate source (Department assigned Pit No.), Percent free moisture in fine aggregate, Actual weight of fine aggregate batched in kilograms.
 25. Brand name and class of Fly Ash, Total amount of Fly Ash batched in pounds (kilograms).
 26. Total amount of water batched at the plant in gals. (liters) or pounds (kilograms).
 27. Original signature of Plant Operator.
 28. Total gallons (liters) of water added at the jobsite.*
 29. Signature of Contractor=s representative who received the concrete and requested or permitted water to be added at the jobsite.
- *This information to be completed or verified by the Engineer.

***Denotes items that may be
verified by Engineer, generally
YOU**



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347-4.2 Remedial Action

- Delineate, remove to full depth and width, and replace, at no cost to the Department concrete that has:
 - Cracking greater than ¼" in vertical displacement
 - Spall or flaking off the surface layer in excess of 10"
 - Intersecting visible cracks
 - ANY uncontrolled cracks that appear during the life of the Contract unacceptable to the Engineer

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347-4.2 Remedial Action: Delineate, remove to the full depth and width, and replace, at no cost to the Department, concrete that has:

1. Any cracking greater than 1/4 inch in vertical displacement.
2. Any spalling or flaking off of the surface layer that exposes the rough, pitted aggregate surface in excess of 10 square inches.
3. Any intersecting cracks visible in the hardened concrete (regardless of size) in sidewalk, ditch pavement, slope pavement, traffic separator, or curb and gutter.
4. Any uncontrolled cracks that appear during the life of the Contract unacceptable to the Engineer



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**Any
Questions?**

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