

ORIGINATION FORM

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Specification: 709-2

Subject: Traffic Stripes and Markings – Two Reactive Components, Materials

Origination date: September 22, 2009

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Problem statement: Article 709-2.2 states, “Use only glass spheres listed on the QPL, and meet the requirements of 971-1 and 971-2.” 971-2 provides a choice of 5 glass sphere types; however, manufacturers have identified other types which when applied as a system will meet the retroreflectivity requirements for the traffic marking.

Proposed solution: Modify Section 709 to allow the use of different glass spheres.

- Change glass spheres to reflective elements to be more general.
- In 709-2.1, add the requirement that the two reactive component to be used on a project will be the system consisting of the stripe and reflective elements listed on the QPL.
- In 709-2.2, remove the QPL requirement and references to 971-1 and 971-2, but add the requirement that the reflective elements used must be part of the system listed on the QPL.
- In 709-2.2, provide a reference to 971-1.7 for RCRA requirements for maximum lead content.

Information source: Manufacturers of striping and reflective elements.

Recommended Usage Note: ALL JOBS

Estimated fiscal impact, if implemented:

Implementation: Due to the availability and scheduling of test decks, these changes will be implemented as a mandatory to the January 2010 Workbook and then incorporated into the July 2010 Workbook as a supplemental.

**TRAFFIC STRIPES AND MARKINGS – TWO REACTIVE COMPONENTS.
(REV 9-24-09) (1-10)**

SECTION 709 (Pages 793 – 795) is deleted and the following substituted:

**SECTION 709
TRAFFIC STRIPES AND MARKINGS –
TWO REACTIVE COMPONENTS**

709-1 Description.

Apply Two Reactive Component traffic stripes and markings in accordance with the Contract Documents.

709-2 Materials.

709-2.1 Two Reactive Components: Use only Two Reactive Component materials listed on the Qualified Products List (QPL) *as an approved system* and meet the requirements of 971-1 and 971-8. The Engineer will take random samples of the materials in accordance with the Department's Sampling, Testing and Reporting Guide schedule.

709-2.2 ~~Glass Spheres~~ *Reflective elements*: Use only ~~glass spheres~~ *reflective elements recommended by the manufacturer that meet the requirements of 971-1.7 and are part of the system* listed on the Qualified Products List (QPL). ~~and meet the requirements of 971-1 and 971-2. The Engineer will take random samples of the glass spheres in accordance with ASTM D 1214 and the Department's Sampling, Testing and Reporting Guide schedule.~~

709-3 Equipment.

Use equipment capable of applying the Two Reactive Component material to the pavement. Use equipment which can produce varying width traffic stripes and which meets the following requirements:

(a) capable of traveling at a uniform rate of speed, both uphill and downhill, to produce a uniform application of the Two Reactive Component material and capable of following straight lines and making normal curves in true arcs.

(b) capable of applying ~~glass spheres~~ *reflective elements* to the surface of the completed stripe by an automatic ~~reflective elements~~ *reflective elements* dispenser attached to the striping machine such that the ~~glass spheres~~ *reflective elements* are dispensed closely behind the installed line. Use a ~~glass spheres~~ *reflective element* dispenser equipped with an automatic cut-off control that is synchronized with the cut-off of the material and applies the ~~glass spheres~~ *reflective elements* in a manner such that the ~~spheres~~ *reflective elements* appear uniform on the entire traffic stripes and markings surface with, 50 to 60% embedment.

(c) capable of providing the manufacturer's recommended mixing ratio between the components in a thorough and consistent manner.

709-4 Application.

709-4.1 General: Remove existing pavement markings, such that scars or traces of removed markings will not conflict with new stripes and markings by a method approved by the Engineer.

Before applying traffic stripes and markings, remove any material by a method approved by the Engineer that would adversely affect the bond of the traffic stripes.

Offset longitudinal lines at least 2 inches from construction joints of portland cement concrete pavement.

Apply traffic stripes or markings only to dry surfaces, and when the ambient air and surface temperature is at least 40°F and rising. Do not apply pavement markings when winds are sufficient to cause spray dust.

Apply striping to the same tolerances in dimensions and in alignment specified in 710-5. When applying traffic stripes and marking over existing markings, ensure that not more than 2 inches on either end and not more than 1 inch on either side of the existing line is visible.

Apply the Two Reactive Component product to the pavement in accordance with the manufacturer's instructions or as directed by the Engineer.

Conduct field tests in accordance with FM 5-541. Remove and replace traffic stripes and markings not meeting the requirements of this Section at no additional cost to the Department.

Apply all final pavement markings prior to opening the road to traffic.

709-4.2 Thickness: Apply traffic stripes and markings to attain a minimum wet film thickness in accordance with the manufacturer's recommendations *as identified on the QPL system*.

709-4.3 Retroreflectivity: Apply white and yellow traffic stripes and markings that will attain an initial retroreflectivity of not less than 450 mcd/lx·m² and not less than 350 mcd/lx·m², respectively for all longitudinal and transverse lines.

Measure, record and certify on the Department approved form and submit to the Engineer, the retroreflectivity of white and yellow pavement markings in accordance with Florida Method FM-5-541.

The Department reserves the right to test the markings within 3 days of receipt of the Contractor's certification. Failure to afford the Department opportunity to test the markings will result in non-payment. The test readings should be representative of the Contractor's striping performance. If the retroreflectivity values measure below values shown above, the striping will be removed and reapplied at the Contractor's expense.

709-4.4 Color: Use materials that meets the requirements of 971-1.

709-4.5 Glass Spheres *Reflective elements*: Apply reflective ~~glass spheres~~ *elements* to all white and yellow traffic stripes or markings, at the rates determined by the manufacturer's recommendations *as identified on the QPL system*.

709-5 Contractor's Responsibility for Notification.

Notify the Engineer prior to the placement of the materials. Furnish the Engineer with the manufacturer's name and batch numbers of the materials and ~~glass spheres~~ *reflective elements* to be used. Ensure that the approved batch numbers appear on the materials and ~~glass spheres~~ *reflective elements* packages.

709-6 Protection of Newly Applied Traffic Stripes and Markings.

Do not allow traffic onto or permit vehicles to cross newly applied pavement markings until they are sufficiently dry. Remove and replace any portion of the pavement markings damaged by passing traffic or from any other cause, at no additional cost to the Department.

709-7 Observation Period.

Pavement markings are subject to a 180 day observation period under normal traffic. The observation period shall begin with the satisfactory completion and acceptance of the work. The pavement markings shall show no signs of failure due to blistering, excessive cracking, chipping, discoloration, poor adhesion to the pavement, loss of reflectivity or vehicular damage. The retroreflectivity shall meet the initial requirements of 709-4.3. The Department reserves the right to check the color and retroreflectivity any time prior to the end of the observation period.

Replace, at no additional expense to the Department, any pavement markings that do not perform satisfactorily under traffic during the 180 day observation period.

709-8 Corrections for Deficiencies.

Deficiencies will be corrected by removal and reapplication of a 1.0 mile section centered around the deficiency at no additional cost to the Department.

709-9 Method of Measurement.

The quantities to be paid for under this Section will be as follows:

- (a) The length, in net miles, of 6 inch Solid Traffic Stripe, authorized and acceptably applied.
- (b) The total traversed distance in gross miles of 10-30 or 3-9 skip line. The actual applied line is 25% of the traverse distance for 1:3 ratio. This equates to 1,320 feet of marking per mile of single line.
- (c) The net length, in feet, of all other types of lines and stripes, authorized and acceptably applied.
- (d) The area, in square feet, of Remove Existing Pavement Markings, acceptably removed.

709-10 Basis of Payment.

Prices and payments will be full compensation for all work specified in this Section, including, all cleaning and preparing of surfaces, furnishing of all materials, application, curing and protection of all items, protection of traffic, furnishing of all tools, machines and equipment, and all incidentals necessary to complete the work. Final payment will be withheld until all deficiencies are corrected.

Payment will be made under:

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| Item No. 709 | Two Reactive Components |
| | Traffic Stripes, Solid – per net mile. |
| | Traffic Stripes, Solid – per foot. |
| | Traffic Stripes, Skip – per gross mile. |
| | Traffic Stripe – Two Reactive Components, Remove – per square foot. |