

ORIGINATION FORM

THE INFORMATION BELOW IS TO BE PROVIDED BY THE ORIGINATOR

(The person who receives or originates the issue and needs to forward the issue for action.)

Modify Specification 7090000SS .
Section/File number

New Section _____ .
Section number

Subject: Traffic Stripes and Markings - Two Reactive Components

Origination date: July 8, 2003

Originator: Chester Henson
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Userid:

Problem statement: Industry standard method of measurement of retroreflectivity has changed from 15 meter geometry to 30 meter geometry.

Information source: Input was provided from materials lab, construction and maintenance.

Background data: Materials Lab, construction and maintenance currently have the equipment to measure retroreflectivity using the new 30 meter geometry.

**Recommended
usage uote:**

**Desired
implementation
date:** **Beginning with the July 2005 letting.**



Florida Department of Transportation

JEB BUSH
GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

JOSÉ ABREU
SECRETARY

MEMORANDUM

DATE: May 27, 2005

TO: Specification Review Distribution List

FROM: Duane F. Brautigam, P.E., State Specifications Engineer

SUBJECT: **Proposed Specifications Change: 7090000-Traffic Stripes and Markings-Two Reactive Components**

In accordance with Specification Development Procedures, we are sending you a copy of a proposed specification change to Traffic Stripes and Markings-Two Reactive Components.

This change was proposed by Chester Henson of the Roadway Design Office, this spec is a complete rewrite.

Please share this proposal with others within your responsibility. Review comments are due within four weeks and should be sent to Mail Station 75 or to my attention via e-mail at SP965DB or duane.brautigam@dot.state.fl.us. Comments received after June 24, 2005 may not be considered. Your input is encouraged.

DFB/sh

Attachment

COMMENTS:

Submitted by:

Phone #:

709—TRAFFIC STRIPES AND MARKINGS – TWO REACTIVE COMPONENTS.

~~—(REV 8-27-015-2-05)-(FA 12-19-01)-(1-04)~~

SECTION 709 (of the Supplemental Specifications) 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 details shown in the Contract Documents ~~and remove traffic stripes and markings when required.~~

709-2 Materials.

709-2.1 Two Reactive Components: Use only Two Reactive Component materials listed on the Qualified Products List (QPL), and meet the requirements of 971-1 and 971-~~114~~. 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: Use only glass spheres listed on the Qualified Products List (QPL), and meet the requirements of 971-1 and 971-~~244~~. The Engineer will take random samples of the glass spheres in accordance with ASTM D 1155 and the Department's Sampling, Testing and Reporting Guide schedule.

709-2.3 Sand: Use materials meeting the requirements of 971-5.4.

709-3 Equipment.

Use equipment capable of ~~Apply~~ applying the Two Reactive Component material to the pavement. Use equipment which can ~~utilizing equipment that will~~ produce continuously uniform dimensions of the stripe, of varying widths ~~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 to the surface of the completed stripe by an automatic sphere dispenser attached to the striping machine such that the glass spheres are dispensed closely behind the installed line. Use a glass spheres dispenser equipped with an automatic cut-off control synchronized with the cut-off of the ~~thermoplastic~~ material and applies the glass spheres in a manner such that the spheres appear uniform on the entire traffic stripes and markings surface with, 50 to 60% embedment. ~~Provide each nozzle with suitable line guides, either metallic shrouds or air blasts.~~

(c) capable of providing the manufacturer's recommended mixing ratio between the components in a through 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. Payment for marking removal will be in accordance with Section 102-5.9.*

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 [50 mm] 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 [5 °C] 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, not more 2 inches [50 mm] on either end and not more than 1 inch [25 mm] on either side of the existing line shall be visible.

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

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

~~Ensure that existing pavement markings are removed, such that scars or traces of removed markings will not conflict with new stripes and markings by a method approved by the Engineer.~~

~~Prior to applying pavement stripes and markings, remove any material that would adversely affect the bond of the pavement stripes and markings by a method approved by the Engineer.~~

~~Apply traffic stripes or markings only to dry surfaces, and when the ambient air and surface temperature is at least 40°F [5°C] and rising. Follow the manufacturer's recommendations for application temperature. Do not apply pavement markings when winds are sufficient to cause spray dust.~~

~~Offset longitudinal lines at least 2 inches [50 mm] from construction joints of portland cement concrete pavement.~~

~~Apply traffic stripes or markings, having well defined edges, over existing pavement markings such that not more than 2 inches [50 mm] on either end and not more than 1 inch [25 mm] on either side is visible.~~

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

~~Apply striping to the same tolerances in dimensions and in alignment specified in 710-5.~~

~~**709-4.2 Corrections for Deficiencies:** Remove and reapply a 1.0 mile [1.0 kilometer] LOT centered around any deficiency, as determined by the Engineer, at no additional cost to the Department.~~

~~**709-4.23 Thickness:** Apply traffic stripes or markings such that, after application of drop-on glass spheres (AASHTO M 247 Type I), the stripes or markings will have a thickness above the pavement surface as designated on the Qualified Products List for the particular product used.~~

~~**709-4.4 Glass Spheres:** Apply reflective glass spheres to all white and yellow traffic stripes or markings, at the rate of 0.1 lb/ft² [0.5 kg/m²] of Two Reactive Component material with 50 to 60% embedment.~~

~~Apply a mixture consisting of 50% glass spheres and 50% sharp silica sand to all transverse lines, bike lane symbols and longitudinal lines adjacent to or in a proposed bike lane, at a rate of 0.1 lb/ft² [0.5 kg/m²] of Two Reactive Component material.~~

~~**709-4.35 Retroreflectivity:** Apply white and yellow pavement markings that will attain an initial retroreflectance of not less than 300 mcd/lx-m² and not less than 250 mcd/lx-m², respectively. Ensure that the intermittent and final retroreflectance of white and yellow pavement markings are not less than 150 mcd/lx-m². Apply white and yellow traffic stripes and markings that will attain an initial retroreflectivity of not less than 300 mcd/lx-m² and not less than 250 mcd/lx-m², respectively for all longitudinal and transverse lines. This does not apply to transverse lines, bike lane symbols and messages longitudinal lines adjacent to or in a proposed bike lane.~~

~~Measure, certify (on Department approved form) and submit to the Engineer, no later than the next working day after the application of pavement markings, the retroreflectivity of white and yellow pavement markings in accordance with Florida Method FM-5-5XX41.~~

If the Department retests within 3 days of initial application and reflectivity values measure below values shown above, the striping will be reapplied at the Contractor's expense. Project personnel performing any retesting should take into consideration events beyond the control of the Contractor and not due to material application failures before requiring re-striping at Contractor expense. The retest readings should be representative of the Contractor's striping performance.

709-4.46 Color: Use materials that meets the requirements of 971-1.

709-4.5 Glass Spheres: Apply reflective glass spheres to all white and yellow traffic stripes or markings, at the rates determined by the manufacturer's recommendations.

~~Apply a mixture consisting of 50% glass spheres and 50% sharp silica sand to all pedestrian crosswalk lines and bike lane symbols, at the rates determined by the manufacturer's recommendations. Use white two reactive component material that is pure white, free from any tint and showing no deviations from magnesium oxide color standard greater than the following:~~

102-8.6

Scale Definition	Magnesium Oxide Standard	Sample
RD	100	75% minimum
Reflectance		
a. Red-Green	0	-5 to +5
b. Yellow-Blue	0	-10 to +10

~~Use yellow Two Reactive Component material which visually matches Federal Test Standard Number 595 color 33538, and meet the following criteria for chromaticity coordinates (x,y):~~

X	0.455	0.510	0.472	0.530
Y	0.444	0.485	0.400	0.456

~~**709-4.7 Durability:** Durability is the measured percent of Two Reactive Component material completely removed from the pavement. The Two Reactive Component material line loss must not exceed 5.0%.~~

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 LOT numbers of the materials and glass spheres to be used. Ensure that the approved LOT numbers appear on the materials and glass spheres packages. Submit a certified test report to the Engineer indicating that the materials meet all requirements specified.

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.

~~Do not allow traffic onto newly applied traffic stripes and markings until they are sufficiently dry to permit vehicles to cross them without damage. Remove and replace any portion of the traffic stripes and 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 Department

reserves the right to check the color and retroreflectivity within 30 days 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 [1.0 kilometer] LOT centered around the deficiency at no additional cost to the Department.

709-97 Method of Measurement.

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

(a) The net length, in feet [meters], of each of the various types of lines, stripes and bands, authorized and acceptably applied.

~~(b) The number of pavement messages and directional arrows, authorized and acceptably applied.~~

~~(be)~~ (be) The total traversed distance in gross miles [kilometers] of 10-30 skip line. The actual applied line is 25% of the traverse distance for 1:3 ratio. This equates to 1,320 feet [250 m] of marking per mile [kilometer] of single line.

~~(d) The area, in square feet [square meters], of Remove Existing Pavement Markings, acceptably removed.~~

~~(ce)~~ (ce) The length, in net miles [kilometers], of Solid Traffic Stripe, authorized and acceptably applied.

~~(d)~~ (d) The number of pavement messages, symbols and directional arrows, authorized and acceptably applied.

~~(e)~~ (e) The length, in gross miles [kilometers], of Alternating Skip Traffic Stripe, authorized and acceptable applied.

709-108 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: ~~Item No. 709.~~

Item No. 709- 11-	Skip Traffic Stripe, Two Reactive Component (White/Black) - per gross mile.
Item No. 2709- 11-	Skip Traffic Stripe, Two Reactive Component (White/Black) - per gross kilometer.
Item No. 709- 12-	Skip Traffic Stripe, Two Reactive Component (Yellow) - per gross mile.
Item No. 2709- 12-	Skip Traffic Stripe, Two Reactive Component (Yellow) - per gross kilometer.
Item No. 709- 21-	Solid Traffic Stripe, Two Reactive Component (White/Black) - per foot.
Item No. 2709- 21-	Solid Traffic Stripe, Two Reactive Component (White/Black) - per meter.
Item No. 709- 22-	Solid Traffic Stripe, Two Reactive Component (Yellow) - per foot.
Item No. 2709- 22-	Solid Traffic Stripe, Two Reactive Component (Yellow) - per meter.
Item No. 709- 3-	Pavement Messages, Two Reactive Component - each.

- Item No. 2709- 3- Pavement Messages, Two Reactive Component - each.
Item No. 709- 31- Solid Traffic Stripe, Two Reactive Component (White/Black) -
per net mile.
- Item No. 2709- 31- Solid Traffic Stripe, Two Reactive Component (White/Black) -
per net kilometer.
- Item No. 709- 32- Solid Traffic Stripe, Two Reactive Component (Yellow) - per
net mile.
- Item No. 2709- 32- Solid Traffic Stripe, Two Reactive Component (Yellow) - per
net kilometer.
- Item No. 709- 4- Directional Arrows, Two Reactive Component - each.
Item No. 2709- 4- Directional Arrows, Two Reactive Component - each.
- Item No. 709- 41- Alternating Skip Traffic Stripe, Two Reactive Component
(white/Black) - per gross mile.
- Item No. 2709- 41- Alternating Skip Traffic Stripe, Two Reactive Component
(white/Black) - per gross kilometer.
- Item No. 709- 5- Guide Lines, Two Reactive Component (Dotted) - per foot.
Item No. 2709- 5- Guide Lines, Two Reactive Component (Dotted) - per meter.
- Item No. 709- 7- Remove Existing Pavement Markings - per square foot.
Item No. 2709- 7- Remove Existing Pavement Markings - per square meter.