



Florida Department of Transportation

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Tallahassee, FL 32399-0450

JARED W. PERDUE, P.E.
SECRETARY

November 2, 2023

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

Re: State Specifications Office
Section: 701
Proposed Specification: **7010201 Profiled Thermoplastic Pavement Markings.**

Dear Mr. Nguyen:

We are submitting, for your approval, two copies of the above referenced Supplemental Specification.

The changes are proposed by Awilda Merced to add language in general application regarding open graded surfaces, correct unit of reflectivity, and specify project acceptance method.

Please review and transmit your comments, if any, within two weeks (10 business days). Comments should be sent via email daniel.strickland@dot.state.fl.us.

If you have any questions relating to this specification change, please call me at (850) 414-4130.

Sincerely,

Signature on File

Daniel Strickland, P.E.
State Specifications Engineer

DS/jb

Attachment

cc: Florida Transportation Builders' Assoc.
State Construction Engineer

PROFILED THERMOPLASTIC PAVEMENT MARKINGS.
(REV 7-7-23)

ARTICLE 701-2 is deleted and the following substituted:

701-2 Materials.

Use only materials listed on the Department's Approved Product List (APL) as an approved system and meeting the following requirements:

Profiled Thermoplastic..... 971-1 and 971-9

Retroreflective Elements* 971-1.7

Glass Spheres* 971-1 and 971-2

*Use retroreflective elements or glass spheres recommended by the manufacturer.

The Engineer will take random samples of the materials in accordance with the Department's Sampling, Testing and Reporting Guide schedule.

ARTICLE 701-4 is deleted and the following substituted:

701-4 Application.

701-4.1 General: Remove existing thermoplastic pavement markings and raised bumps using a method approved by the Engineer such that pavement surface scars or traces of the removed thermoplastic pavement markings will not conflict with new pavement markings. Do not use paint to blackout, hide, or disguise existing pavement markings.

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

Before applying pavement markings to any portland cement concrete surface, apply a primer, sealer or surface preparation adhesive of the type recommended by the manufacturer. Offset longitudinal lines at least 2 inches from construction joints of portland cement concrete pavement.

Apply thermoplastic material thickness according to 701-4.2. Application on open graded friction surfaces may require more thermoplastic material to achieve the required thickness above the pavement surface.

Apply pavement markings to dry surfaces only, and when the ambient air and surface temperature is at least 50°F and rising for asphalt surfaces and 60°F and rising for concrete surfaces.

Apply pavement markings to the same tolerances in dimensions and in alignment specified in 710-5. When applying pavement marking over existing markings, ensure that no more than 2 inches on either end and not more than 1 inch on either side of the existing line is visible.

Conduct field tests in accordance with FM 5-541, **Part A**. Take test readings representative of the pavement marking performance. Remove and replace pavement markings not meeting the requirements of this Section at no additional cost to the Department.

701-4.2 Thickness: Apply flat base lines having a minimum thickness of 0.100 inches or 100 mils and to not exceeding a thickness of 0.150 inches or 150 mils, exclusive of the bumps, when measured above the pavement surface.

Measure, record and certify on a Department approved form and submit to the Engineer, the thickness of white and yellow pavement markings in accordance with FM 5-541, [Part A](#).

The Engineer will verify the thickness of the pavement markings in accordance with FM 5-541, [Part A](#) within 30 days of receipt of the Contractor's certification.

701-4.3 Dimensions of Raised Bumps: Apply the raised bumps with a profile such that the leading and trailing edges are sloped at a sufficient angle to create an audible and vibratory warning.

Bumps on edge line and centerline markings shall be at least 0.45 inches at the highest point of the bump, above the pavement surface, including the base line. The height shall be measured after application of drop-on retroreflective elements or glass spheres. Bumps shall have a minimum baseline coverage dimension of 2.5 inches in both transverse and longitudinal directions. The bumps may have a drainage channel, the width of each drainage channel will not exceed 1/4 inch at the bottom of the channel. The longitudinal distance between bumps shall be approximately 30 inches.

701-4.4 Retroreflectivity: Apply white and yellow profiled thermoplastic markings that will attain an initial retroreflectance of not less than 300 $\frac{\text{mcd}}{\text{lx} \cdot \text{m}^2}$ $\frac{\text{mcd}}{\text{m}^2/\text{lx}}$ and not less than 250 $\frac{\text{mcd}}{\text{lx} \cdot \text{m}^2}$ $\frac{\text{mcd}}{\text{m}^2/\text{lx}}$, respectively. Measure, record and certify on a Department approved form and submit to the Engineer, the retroreflectivity of white and yellow pavement markings in accordance with FM 5-541, [Part A](#).

701-4.5 Color: Use pavement marking materials that meet the requirements of 971-1.

701-4.6 Retroreflective Elements or Glass Spheres: -Apply retroreflective elements or [drop on](#) glass spheres to all markings [as identified on the APL and](#) at the rates determined by the manufacturer's recommendations. ~~as identified for the APL System~~

701-4.7 Loss: If more than 1% of the bumps or more than three consecutive bumps are missing or broken (less than half a bump remaining) within the first 45 days under traffic, replace all failed bumps at no expense to the Department. If more than 2% of the bumps fail within the first 45 days under traffic, the replacement period will extend an additional 45 days from the date all replacement bumps were installed. If, at the end of the additional 45 days, more [than](#) 2% of all bumps (initial and replacement) fail, replace all failed bumps at no expense to the Department. Measure, record and certify on a Department approved form and submit to the Engineer, the loss of bumps.

**PROFILED THERMOPLASTIC PAVEMENT MARKINGS.
(REV 7-7-23)**

ARTICLE 701-2 is deleted and the following substituted:

701-2 Materials.

Use only materials listed on the Department's Approved Product List (APL) as an approved system and meeting the following requirements:

Profiled Thermoplastic.....	971-1 and 971-9
Retroreflective Elements*	971-1.7
Glass Spheres	971-1 and 971-2

*Use retroreflective elements or glass spheres recommended by the manufacturer.

The Engineer will take random samples of the materials in accordance with the Department's Sampling, Testing and Reporting Guide schedule.

ARTICLE 701-4 is deleted and the following substituted:

701-4 Application.

701-4.1 General: Remove existing thermoplastic pavement markings and raised bumps using a method approved by the Engineer such that pavement surface scars or traces of the removed thermoplastic pavement markings will not conflict with new pavement markings. Do not use paint to blackout, hide, or disguise existing pavement markings.

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

Before applying pavement markings to any portland cement concrete surface, apply a primer, sealer or surface preparation adhesive of the type recommended by the manufacturer. Offset longitudinal lines at least 2 inches from construction joints of portland cement concrete pavement.

Apply thermoplastic material thickness according to 701-4.2. Application on open graded friction surfaces may require more thermoplastic material to achieve the required thickness above the pavement surface.

Apply pavement markings to dry surfaces only, and when the ambient air and surface temperature is at least 50°F and rising for asphalt surfaces and 60°F and rising for concrete surfaces.

Apply pavement markings to the same tolerances in dimensions and in alignment specified in 710-5. When applying pavement marking over existing markings, ensure that no more than 2 inches on either end and not more than 1 inch on either side of the existing line is visible.

Conduct field tests in accordance with FM 5-541, Part A. Take test readings representative of the pavement marking performance. Remove and replace pavement markings not meeting the requirements of this Section at no additional cost to the Department.

701-4.2 Thickness: Apply flat base lines having a minimum thickness of 0.100 inches or 100 mils and not exceeding a thickness of 0.150 inches or 150 mils, exclusive of the bumps, when measured above the pavement surface.

Measure, record and certify on a Department approved form and submit to the Engineer, the thickness of white and yellow pavement markings in accordance with FM 5-541, Part A.

The Engineer will verify the thickness of the pavement markings in accordance with FM 5-541, Part A within 30 days of receipt of the Contractor's certification.

701-4.3 Dimensions of Raised Bumps: Apply the raised bumps with a profile such that the leading and trailing edges are sloped at a sufficient angle to create an audible and vibratory warning.

Bumps on edge line and centerline markings shall be at least 0.45 inches at the highest point of the bump, above the pavement surface, including the base line. The height shall be measured after application of drop-on retroreflective elements or glass spheres. Bumps shall have a minimum baseline coverage dimension of 2.5 inches in both transverse and longitudinal directions. The bumps may have a drainage channel, the width of each drainage channel will not exceed 1/4 inch at the bottom of the channel. The longitudinal distance between bumps shall be approximately 30 inches.

701-4.4 Retroreflectivity: Apply white and yellow profiled thermoplastic markings that will attain an initial retroreflectance of not less than $300 \text{ mcd/m}^2/\text{lx}$ and not less than $250 \text{ mcd/m}^2/\text{lx}$, respectively. Measure, record and certify on a Department approved form and submit to the Engineer, the retroreflectivity of white and yellow pavement markings in accordance with FM 5-541, Part A.

701-4.5 Color: Use pavement marking materials that meet the requirements of 971-1.

701-4.6 Retroreflective Elements or Glass Spheres: Apply retroreflective elements or drop on glass spheres to all markings as identified on the APL and at the rates determined by the manufacturer's recommendations.

701-4.7 Loss: If more than 1% of the bumps or more than three consecutive bumps are missing or broken (less than half a bump remaining) within the first 45 days under traffic, replace all failed bumps at no expense to the Department. If more than 2% of the bumps fail within the first 45 days under traffic, the replacement period will extend an additional 45 days from the date all replacement bumps were installed. If, at the end of the additional 45 days, more than 2% of all bumps (initial and replacement) fail, replace all failed bumps at no expense to the Department. Measure, record and certify on a Department approved form and submit to the Engineer, the loss of bumps.