

ORIGINATION FORM
Proposed Revisions to the Specifications

Date:

Specification Section:

Originator:

Articles/Subarticles:

Telephone:

email:

Why does the existing language need to be changed?

Summary of the changes:

Are these changes applicable to all Department jobs? Yes No
If not, what are the restrictions?

Will these changes result in an increase or decrease in project costs? Yes No
If yes, what is the estimated change in costs?

With who have you discussed these changes?

What other offices will be impacted by these changes?

Will this revision necessitate changes to the following: BOE PPM SDG CPAM

Design Standards List Affected Index Nos.

Other manual?

Are all references to external publications current? Yes No
If not, what references need to be updated (please include changes in the redline)?

Will this revision necessitate any of the following:

Design Bulletin

Construction Bulletin

Estimates Bulletin

Contact the State Specifications Office for assistance in completing this form.

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JIM BOXOLD, P.E.
SECRETARY

MEMORANDUM

DATE: January 12, 2015

TO: Specification Review Distribution List

FROM: Daniel Scheer, P.E., State Specifications Engineer

SUBJECT: Proposed Specification: **7100000 Painted Pavement Markings.**

In accordance with Specification Development Procedures, we are sending you a copy of a proposed specification change.

This change was proposed by Paul Gentry of the Department's Product Evaluation Office to incorporate language from Developmental Specification 710 to the Standard Specifications. The required 18 month weathering test has been successfully completed. Formatting changes were also made for consistency with current Department practice.

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 online at <http://www2.dot.state.fl.us/SpecificationsEstimates/Development/IndustryReview.aspx> . Comments received after **February 6, 2015**, may not be considered. Your input is encouraged.

DS/dt
Attachment

PAINTED PAVEMENT MARKINGS.

(REV ~~12-17-14~~**1-8-15**)

SECTION 710 is deleted and the following substituted:

**SECTION 710
PAINTED PAVEMENT MARKINGS**

710-1 Description.

Apply ~~P~~Painted ~~Traffic Stripes and~~**pavement M**arkings, in accordance with the Contract Documents.

710-2 Materials.

Use only materials listed on the Department’s Approved Product List (APL) meeting the following requirements:

Raised Retroreflective Pavement Markers and Bituminous AdhesiveSection 970

Standard ~~Waterborne Fast Dry Traffic~~ Paint 971-1 and 971-3

~~Durable Waterborne Traffic~~**Fast Dry Solvent** Paint971-1 and 971-4

Glass Spheres 971-1 and 971-2

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

710-3 Equipment.

Use equipment that will produce continuous uniform dimensions of pavement markings of varying widths and meet the following requirements:

~~(a)~~**1.** Capable of traveling at a uniform, predetermined rate of speed, both uphill and downhill, in order to produce a uniform application of paint and capable of following straight lines and making normal curves in a true arc.

~~(b)~~**2.** Capable of applying glass spheres to the surface of the completed ~~stripeline~~ 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 that is synchronized with the cut-off of the traffic paint and applies the glass spheres in a manner such that the spheres appear uniform on the entire pavement markings surface ~~with, 50 to 60% embedment.~~

~~(c)~~**3.** Capable of spraying the paint to the required thickness and width without thinning of the paint. Equip the paint tank with nozzles equipped with cut-off valves, which will apply broken or skip lines automatically.

710-4 Application:

710-4.1 General: Remove existing pavement markings, such that scars or traces of removed markings will not conflict with new pavement markings, by a method approved by the Engineer. Payment for marking removal will be in accordance with 102-5.8.

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

Apply *standard* ~~waterborne traffic stripes and markings~~ *paint* only to dry surfaces, and when the ambient air and surface temperature is at least 40°F and rising.

Apply durable ~~waterborne traffic stripes and markings~~ *paint only to dry surfaces. Do not apply durable* ~~waterborne traffic~~ *paint when the ambient air and surface temperature is below 50°F, relative humidity is above 80% or when the dewpoint is within 50°F.*

Do not apply ~~traffic stripes and~~ *painted pavement* markings when winds are sufficient to cause spray dust.

Apply ~~traffic stripes and~~ *painted pavement* markings, having well defined edges, over existing pavement markings such that not more than ~~2~~ *two* inches on either end and not more than ~~1~~ *one* inch on either side is visible. When stencils are used to apply symbols and messages, the areas covered by the stencil reinforcing will not be required to be painted.

Mix the paint thoroughly prior to pouring into the painting machine. Apply paint to the pavement by spray or other means approved by the Engineer.

Conduct field testing in accordance with FM 5-541. Remove and replace ~~traffie stripes and~~ *painted pavement* markings not meeting the requirements of this Section at no additional cost to the Department.

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

710-4.1.1 Final Surface: *When permanent pavement markings (thermoplastic, tape, etc.) are placed on newly constructed asphalt, painted pavement markings (final surface) will include one application of standard* ~~painted pavement markings~~ *and one application of retroreflective pavement markers applied to the final surface; otherwise, painted pavement markings (final surface) will include two applications of standard* ~~painted pavement markings~~ *and one application of retroreflective pavement markers applied to the final surface. Wait at least 14 days after the first application to apply the second application of* ~~painted pavement markings (final surface)~~ *. Second application must be applied prior to final acceptance of the project.*

Apply all retroreflective pavement markers per the requirements of Section 706.

710-4.2 Thickness: Apply *standard* ~~waterborne~~ *paint* to attain a minimum wet film thickness in accordance with the manufacturer's recommendations. ~~For~~ *Apply durable* ~~waterborne paint, apply paint to attain a minimum 25-wet mil film thickness of 0.025 inches or 25 mils. Measure, record, and certify on a Department approved form, and submit to the Engineer the wet film thickness using a wet film thickness gauge on panels. For longitudinal testing, use FM 5-541, section 4.1.2. For transverse testing locations, use in accordance with FM 5-541, section 4.1.4.~~

710-4.3 Retroreflectivity: Apply white and yellow standard ~~waterborne pavement markings~~ *paint* that will attain an initial retroreflectance of not less than 300 mcd/lx·m² and not less than 250 mcd/lx·m², respectively. *Apply white and yellow durable paint that will attain an initial retroreflectance of not less than 450 mcd/lx·m² and not less than 300 mcd/lx·m², respectively.* Measure, record and certify on a Department approved form and submit to the Engineer, the retroreflectivity of white and yellow ~~pavement markings~~ *standard and durable paint* in accordance with FM 5-541.

Apply white and yellow durable ~~waterborne pavement markings that will attain an initial retroreflectance of not less than 450 mcd/lx·m² and not less than 300 mcd/lx·m²;~~

~~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.~~

The Department reserves the right to test the markings within ~~3~~*three* 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, reapply the striping at no additional cost to the Department.

For standard ~~waterborne pavement markings~~*paint*, ensure that the minimum retroreflectance of white and yellow pavement markings are not less than 150 mcd/lx m². If the retroreflectivity values *for standard paint* fall below the 150 mcd/lx m² value within six months of initial application, the striping will be reapplied at the Contractor's expense.

~~For durable waterborne pavement markings, ensure that the minimum retroreflectance of white and yellow pavement markings are not less than 150 mcd/lx m². If the retroreflectivity values for durable paint fall below the initial values of 1450 mcd/lx m² value for white and 300 mcd/lx m² for yellow within 18 six months of initial application, the striping will be reapplied at the Contractor's expense.~~

710-4.4 Color: Use paint material that meets the requirements of 971-1.

710-4.5 Glass Spheres: Apply glass spheres on all pavement markings immediately and uniformly following the paint application. The rate of application shall be based on the manufacturer's recommendation.

For longitudinal durable paint markings, apply a double drop of Type 1 and Type 3 glass spheres. For transverse durable paint markings, apply a single drop of Type 3 glass spheres.

The rate of application shall be based on the manufacturer's recommendation.

710-5 Tolerances in Dimensions and in Alignment.

Establish tack points at appropriate intervals for use in aligning ~~stripes~~*pavement markings*, and set a stringline from such points to achieve accuracy.

710-5.1 Dimensions:

710-5.1.1 Longitudinal Lines: Apply painted skip line segments with no more than plus or minus 12 inches variance, so that over-tolerance and under-tolerance lengths between skip line and the gap will approximately balance. Apply longitudinal lines at least ~~2~~*two* inches from construction joints of portland cement concrete pavement.

710-5.1.2 Transverse Markings, Gore Markings, Arrows, and Messages: Apply paint in multiple passes when the marking cannot be completed in one pass, with an overall line width allowable tolerance of plus or minus ~~1~~*one* inch.

710-5.1.3 Contrast Lines: Use black paint to provide contrast on concrete or light asphalt pavement, when specified by the Engineer. Apply black paint in 10 foot segments following each longitudinal skip line.

710-5.2 Alignment: Apply painted ~~stripes~~*pavement markings* that will not deviate more than ~~1~~*one* inch from the stringline on tangents and curves one degree or less. Apply painted ~~stripes~~*pavement markings* that will not deviate more than ~~2~~*two* inches from the stringline on curves greater than one degree. Apply painted edge ~~stripes~~*markings* uniformly, not less than ~~2~~*two* inches or more than ~~4~~*four* inches from the edge of pavement, without noticeable breaks or deviations in alignment or width.

Remove and replace at no additional cost to the Department, ~~traffic stripes~~*pavement markings* that deviate more than the above stated requirements.

710-5.3 Correction Rates: Make corrections of variations in width at a maximum rate of 10 feet for each 0.5 inches of correction. Make corrections of variations in alignment at a maximum rate of 25 feet for each ~~1~~*one* inch of correction, to return to the stringline.

710-6 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 to be used. Ensure that the approved batch numbers appear on the materials and glass spheres packages.

710-7 Protection of Newly Painted Pavement 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.

710-8 Corrections for Deficiencies to Applied Painted Pavement Markings.

Reapply a 1.0 mile section, centered around any deficiency, at no additional cost to the Department.

710-9 Submittals.

710-9.1 Submittal Instructions: Prepare a certification of quantities, using the Department's current approved form, for each project in the Contract. Submit the certification of quantities and daily worksheets to the Engineer. The Department will not pay for any disputed items until the Engineer approves the certification of quantities.

710-9.2 Contractor's Certification of Quantities: Request payment by submitting a certification of quantities no later than Twelve O'clock noon Monday after the estimate cut-off date or as directed by the Engineer, based on the amount of work done or completed. Ensure the certification of quantities consists of the following:

~~(a)~~*1.* Contract Number, FPID Number, Certification Number, Certification Date and the period that the certification represents.

~~(b)~~*2.* The basis for arriving at the amount of the progress certification, less payments previously made and less any amount previously retained or withheld. The basis will include a detailed breakdown provided on the certification of items of payment.

710-10 Method of Measurement.

The quantities, *authorized and acceptably applied*, ~~to be paid for~~ under this Section will be *paid* as follows:

~~(a)~~*1.* The length, in net miles, of 6 inch solid ~~traffic stripe, authorized and acceptably applied~~*line*.

~~(b)~~*2.* 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 a 1:3 ratio. This equates to 1,320 feet of marking per mile of single~~*length, in gross miles, of 10-30 or 3-9 skip line*.

~~(c)~~*3.* The ~~net~~ length, in *linear* feet, of ~~each of~~ all other types of lines ~~and stripes, authorized and acceptably applied~~.

~~(d)~~*4* The number of pavement messages, symbols, and directional arrows; ~~authorized and acceptably applied~~.

(e)5 Lump Sum, as specified in 710-4.1.1 ~~when the item for painted pavement markings (final surface) is included in the proposal.~~

~~The net length, in feet, of Guide lines and dotted and skip stripes, other than 10-30 and 3-9, extension lines~~ will be *paid per linear foot*, measured as the distance from the beginning of the first painted ~~stripe line~~ to the end of the last painted ~~stripe line~~ with proper deductions made for unpainted intervals as determined by plan dimensions or stations, subject to 9-1.3. Unpainted intervals will not be included in pay quantity.

The net mile measurement will be taken as the distance from the beginning of the solid line to the end of the solid line. The gross- mile measurement of 10-30 and 3-9 skip ~~traffic stripes line~~ will be taken as the distance from the beginning of the first painted ~~stripeskip line~~ to the end of the last painted ~~stripeskip line~~; and will include the unpainted intervals. *The actual applied line is 25% of the traversed distance for a 1:3 ratio. This equates to 1,320 feet of marking per mile of single line.* It will not include any lengths of unpainted intervals which, by design or by other intent of the Department, are greater than 30 feet. Final measurement will be determined by plan dimensions or stations, subject to 9-1.3.1.

710-11 Basis of Payment.

710-11.1 General: 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.

710-11.2 Lump Sum Payment: ~~When the item for painted pavement markings (final surface) is included in the proposal, p~~Prices and payments *for painted pavement markings (final surface)* will be full compensation for ~~two-all~~ applications of ~~all~~ painted pavement markings ~~applied~~ to the final surface, and one application of retroreflective pavement markers applied to the final surface in accordance with Section 706.

Payment will be made under:

Item No. 710	Painted Pavement Markings. Traffic Stripes, Solid - per net mile. Traffic Stripes, Solid - per linear foot. Traffic Stripes, Skip - per gross mile. Traffic Stripes, Skip - per foot. Dotted <i>Extension</i> /Guide L Line - per <i>linear</i> foot. Messages -each. Arrows - each. Yield Markings Line - per <i>linear</i> foot. <i>Island Nose - per square foot.</i>
Item No. 710-90	Painted Pavement Markings (Final Surface) - lump sum.