

710 PAINTED PAVEMENT MARKINGS.
(REV 6-10-03) (7-16-03) (1-04)

SECTION 710 (Pages 748-752) is deleted and the following substituted:

SECTION 710
PAINTED PAVEMENT MARKINGS

710-1 Description.

Apply Painted Pavement Markings in accordance with the details shown in the Contract Documents, and remove Painted Pavement Markings when required.

710-2 Materials.

Use only materials listed on the Qualified Products List (QPL) meeting the following requirements:

Raised Retro-reflective Pavement Markers and Bituminous Adhesive	Section 970
Work Zone Pavement Markings	971-1 and 971-19
Paint	971-19
Glass Spheres	971-14
Preformed Pavement Stripes and Markings.....	971-18

710-3 Equipment.

Use equipment that will produce continuously uniform dimensions of Painted Pavement Markings of varying widths and meet the following requirements:

(a) 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 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 traffic paint and applies the glass spheres in a manner such that the spheres appear uniform on the entire Painted Pavement Markings surface with, 50 to 60% embedment.

(c) 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. Provide each nozzle with suitable line guides, either metallic shrouds or air blasts.

710-4 Application:

710-4.1 General: 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. The Engineer will conduct field testing in accordance with FM 5-541. Remove and replace Painted Pavement Markings not meeting the requirements of this Section at no additional cost to the Department.

Ensure that existing Painted Pavement Markings are removed, such that scars or traces of removed markings will not conflict with new Painted Pavement Markings, by a method approved by the Engineer.

Prior to applying Painted Pavement Markings, remove any material that would adversely affect the bond of the Painted Pavement Markings by a method approved by the Engineer.

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

Apply Painted Pavement 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 Painted Pavement Markings when winds are sufficient to cause spray dust.

Apply Painted Pavement Markings, having well defined edges, over existing Painted 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 Painted Pavement Markings prior to opening the road to traffic.

710-4.1.1 Final Surface: Painted Pavement Markings (Final Surface) will include two applications of Painted Pavement Markings and one application of Retro-reflective Pavement Markers applied to the final surface. When Painted Pavement Markings (Final Surface) are required on the project, apply the second application of Painted Pavement Markings a minimum of 14 days after first application but prior to final acceptance of the project. Apply all Retro-reflective Pavement Markers meeting the requirements of Section 706.

710-4.2 Corrections for Deficiencies to Applied Painted Pavement Markings: Remove and reapply a 1.0 mile [1.0 kilometer] LOT centered around any deficiency, at no additional cost to the Department.

710-4.3 Retroreflectivity: Apply white and yellow Painted Pavement Markings that will attain an initial retroreflectance of not less than 250 cd/fc·ft² [250 mcd/lx·m²] and not less than 175 cd/fc·ft² [175 mcd/lx·m²], respectively.

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.

Ensure that the intermittent and final retroreflectance of white and yellow Painted Pavement Markings are not less than 150 cd/fc·ft² [150 mcd/lx·m²]. Re-stripe whenever the reflectivity falls below the intermittent retroreflectance. Compensation will be at the Contract unit price for the appropriate material when the material used appears on the QPL and is properly installed.

Painted Pavement Markings (Final Surface) shall meet the initial reflectivity values stated above.

Measure and certify (on Department approved form), no later than the next working day after the application of Painted Pavement Markings, the reflectivity of white and yellow Painted Pavement Markings in accordance with Florida Method FM-5-541. Use an approved 30-meter instrument for measuring retroreflectivity.

710-4.4 Color: Use white Painted Pavement Marking material that is pure white, free from any tint and showing no deviations from magnesium oxide color standard greater than the following:

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 Painted Pavement Marking 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

710-5 Tolerances in Dimensions and in Alignment.

710-5.1 Dimensions:

710-5.1.1 Longitudinal Lines: Apply painted skip segments of 10 foot [3 m], with a 30 foot [9 m] unpainted gap between segments. Apply painted segments with no more than ± 12 inches [± 300 mm] variance, so that over-tolerance and under-tolerance lengths will approximately balance. Apply longitudinal lines at least 2 inches [50 mm] 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 ± 1 inch [± 25 mm].

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 [3 m] segments following each longitudinal skip line.

710-5.2 Alignment: Apply painted stripes that will not deviate more than 1 inch [25 mm] from the stringline on tangents and curves one degree or less. Apply painted stripes that will not deviate more than 2 inches [50 mm] from the stringline on curves greater than one degree. Apply painted edge stripes uniformly, not less than 2 inches [50 mm] or more than 4 inches [100 mm] from the edge of pavement, without noticeable breaks or deviations in alignment or width.

710-5.3 Correction Rates: Make corrections of variations in width at a maximum rate of 10 feet [3 m] for each 0.5 inch [13 mm] of correction. Make corrections of variations in alignment at a maximum rate of 25 feet [8 m] for each 1 inch [25 mm] of correction, to returned to the stringline.

710-5.4 Alignment of Stripes: Remove and replace at no additional cost to the Department traffic stripes that deviates more than 1 inch [25 mm] in any 40 feet [12 m] from 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 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.

710-7 Protection of Newly Painted Pavement Markings.

Do not allow traffic onto newly applied Painted Pavement Markings until they are sufficiently dry to permit vehicles to cross them without damage. Remove and replace any portion of the Painted Pavement Markings damaged by passing traffic or from any other cause, at no additional cost to the Department.

710-8 Submittals.

710-8.1 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 to the Engineer. The Department will not pay for any disputed items until the Engineer approves the certification of quantities.

710-8.2 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) Contract Number, FPID Number, Certification Number, Certification Date and the period that the certification represents.

(b) 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.

710-9 Method of Measurement.

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

- (1) The length, in gross miles [kilometers], of Skip Traffic Stripes.
- (2) The length, in net miles [net kilometers], of Solid Traffic Stripes.
- (3) The length, in feet [meters], of Solid Traffic Stripes and Skip Traffic Stripes.
- (4) The number of directional arrows and pavement messages, painted.
- (5) The area, in square feet [square meters], of Reflective Paint (Island Nose).
- (6) The area, in square feet [square meters], of Remove Existing Markings.
- (7) Lump Sum, as specified in 710-4.1.1 when the item for Painted Pavement

Markings (Final Surface) is included in the proposal.

The quantities to be paid for will also include 6' - 10' skip [2 m - 3 m skip] traffic stripe sections as indicated in the plans. Measurement will be taken as the distance from the beginning of the first painted stripe to the end of the last painted stripe 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 gross-mile [gross-kilometer] measurement of Skip Traffic Stripes will be taken as the distance from the beginning of the first painted stripe to the end of the last painted stripe, and will include the unpainted intervals. It will not include any lengths of unpainted intervals which, by design or by other intent of the Department, are greater than 30 feet [9 m]. Final measurement will be determined by plan dimensions or stations, subject to 9-1.3.1.

710-10 Basis of Payment.

710-10.1 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.

710-10.2 Lump Sum Payment: When the item for Painted Pavement Markings (Final Surface) is included in the proposal, price and payment will be full compensation for all work specified in this Section, including two applications of all Painted Pavement Markings applied to the final surface, and one application of Retro-reflective Pavement Markers applied to the final surface in accordance with Section 706.

Payment will be made under:

Item No. 710- 6-	Directional Arrow, Painted - each.
Item No. 2710- 6-	Directional Arrow, Painted - each.
Item No. 710- 7-	Pavement Messages, Painted - each.
Item No. 2710- 7-	Pavement Messages, Painted - each.
Item No. 710- 11-	Remove Existing Markings (Paint) - per square foot.
Item No. 2710- 11-	Remove Existing Markings (Paint) - per square meter.
Item No. 710- 21-	Skip Traffic Stripe (White/Black) - per gross mile.
Item No. 2710- 21-	Skip Traffic Stripe (White/Black) - per gross kilometer.
Item No. 710- 22-	Skip Traffic Stripe (Yellow) - per gross mile.
Item No. 2710- 22-	Skip Traffic Stripe (Yellow) - per gross kilometer.
Item No. 710- 23-	Solid Traffic Stripe (White/Black) - per net mile.
Item No. 2710- 23-	Solid Traffic Stripe (White/Black) - per net kilometer.
Item No. 710- 24-	Solid Traffic Stripe (Yellow) - per net mile.
Item No. 2710- 24-	Solid Traffic Stripe (Yellow) - per net kilometer.
Item No. 710- 25-	Solid Traffic Stripe (White/Black) - per foot.
Item No. 2710- 25-	Solid Traffic Stripe (White/Black) - per meter.
Item No. 710- 26-	Solid Traffic Stripe (Yellow) - per foot.
Item No. 2710- 26-	Solid Traffic Stripe (Yellow) - per meter.
Item No. 710- 27-	Skip Traffic Stripes (White/Black) - per foot.
Item No. 2710- 27-	Skip Traffic Stripes (White/Black) - per meter.
Item No. 710- 28-	Skip Traffic Stripe (Yellow) - per foot.
Item No. 2710- 28-	Skip Traffic Stripe (Yellow) - per meter.
Item No. 710- 29-	Reflective Paint (Island Nose) (White) - per square foot.
Item No. 2710- 29-	Reflective Paint (Island Nose) (White) - per square meter.
Item No. 710- 30-	Reflective Paint (Island Nose) (Yellow) - per square foot.
Item No. 2710- 30-	Reflective Paint (Island Nose) (Yellow) - per square meter.
Item No. 710- 79-	Alternating Skip Traffic Stripe - per gross mile.
Item No. 2710- 79-	Alternating Skip Traffic Stripe - per gross kilometer.
Item No. 710- 90-	Painted Pavement Markings (Final Surface) - lump sum.
Item No. 2710- 90-	Painted Pavement Markings (Final Surface) - lump sum.