

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
SECTION 704—PAVEMENT MARKINGS AND MARKERS

January 14, 2014

SECTION 704—PAVEMENT MARKINGS AND MARKERS of the Specifications is amended as follows:

Section 704.02—Materials is amended to add the following:

- (d) **Flexible temporary pavement markers (FTPMS)** are pavement markings that the Contractor may choose to substitute for Type D or Type F pavement markings. FTPMS may be used on surface treatment, slurry seal, latex emulsion treatment, and plant mix. FTPMS may be used to simulate skip-line and solid-line centerline markings and to simulate skip-line and solid-line lane-division markings (in accordance with the details furnished herein) installed on the newly-placed roadways once the surface has cured. **Please note:** Temporary edge-line markings will not be required.

The color of FTPM units and their reflective surfaces (white or yellow) shall be the same as the temporary pavement markings for the type of application (skip-line, solid line) they are being used in substitution.

Flexible temporary pavement markers (FTPMS) shall consist of products from the Department's current Approved List found in the Materials Division's *Manual of Instructions* (See Flexible temporary pavement marker (FTPM) or web site <http://www.virginiadot.org/business/materials-download-docs.asp>). All FTPMS shall be new product. FTPMS are suitable for use one year after the date of receipt when stored in accordance with the manufacturer's recommendations.

Section 704.03—Procedures is amended to replace the first 6 paragraphs:

PAVEMENT MARKING AND FLEXIBLE TEMPORARY PAVEMENT MARKER (FTPM) OPERATIONS

The Contractor shall have a Pavement Marking Technician, certified in accordance with the Department's Materials Certification Program for Pavement Marking, present during all pavement marking and marker operations except FTPM operations. When the Contractor chooses to substitute FTPMS for temporary pavement markings, a certified Pavement Marking Technician will not be required for the FTPM operation.

- **Temporary pavement markings:** The type, class, installation procedures and time limits of temporary pavement markings shall be in accordance with the provisions specified herein and Section 704 of the Specifications.

Temporary pavement markings, including skip lines and solid lines, shall be installed at the same locations that permanent pavement markings shall be installed.

Once temporary pavement marking operations have begun, all skip-line and solid-line centerline markings, and skip-line and solid-line lane-division markings shall be completed before the marking operation is stopped. The installation of temporary edge-line markings will not be required unless otherwise specified in the notes section of the schedule of routes, within the contract documents.

Installation and refreshing of (as authorized by the Engineer, if necessary) temporary pavement markings shall not affect the 30 calendar-day time limitation between pavement placement and completion of permanent pavement marking installation.

- **Flexible temporary pavement markers (FTPMS):** The type, installation procedures and time limits for the use of FTPMS shall be in accordance with the manufacturer's recommendations, the provisions specified herein and Section 704 of the Specifications.

Prior to installing FTPMS the Contractor shall submit a plan for substituting FTPMS for temporary pavement markings to the Engineer for approval. The Contractor's plan for FTPMS shall be in accordance with the requirements and drawings designated as "**TYPICAL PLAN FOR FTPM PLACEMENT**" included herein.

FTPMS shall include skip-line and solid-line centerline markings, and skip-line and solid-line lane-division line markings installed on the newly-placed surfaces, once the surface has cured or on milled surfaces within the time limits for unmarked pavement for the respective volumes of vehicles herein.

The pavement surface shall be free of dirt, dust, debris, moisture, oil, and any residue that may be detrimental to successful application. If such is present, the Contractor shall prepare the pavement surface by air blowing or a thorough brushing. FTPMS used to simulate skip lines and solid lines shall be installed at the same locations that permanent pavement markings shall be installed.

Once FTPM operations have begun, all skip-line and solid-line centerline markings, and skip-line and solid-line lane-division markings shall be completed before the operation is stopped. Temporary edge-line markings will not be required.

FTPMS shall be removed and properly disposed of when permanent pavement markings are accomplished as required in accordance with the time limits specified herein. Used FTPMS removed from the pavement when no longer needed or permitted, including all containers, packaging, damaged FTPMS and all other miscellaneous items of waste shall be appropriately disposed of in a properly permitted waste container in accordance with applicable local, state and federal laws and regulations.

Replacement of FTPMS, required to maintain temporary markings, shall not affect the 30 calendar-day time limitation between pavement placement and completion of permanent pavement marking installation.

For surface treatment, slurry seal or latex emulsion treatment operations, the appropriate FTPMS shall be installed prior to placing new pavement or treatment. Upon completion of surface treatment, slurry seal or latex emulsion treatment placement, the Contractor shall remove the protective covering from the reflective lens of the FTPM prior to leaving the work site. Failure to remove such covering may result in the non-payment for that portion type (skip or solid) of temporary pavement marking.

For plant mix operations, the appropriate FTPMS shall be installed on the newly-placed pavement after the pavement is thoroughly compacted, has cooled to the FTPMS manufacturer's recommended temperature for installation, and the surface has cured.

- **Permanent Pavement Markings:** The type, class, installation procedures and time limits of permanent pavement markings shall be in accordance with the provisions specified herein and Section 704 of the Specifications.

For newly-placed asphalt surfaces (including plant mix, surface treatment, latex slurry, etc), permanent pavement marking, temporary pavement marking or FTPM installation shall be

completed in accordance with the time limits specified below unless otherwise directed by the Engineer. Exceptions to the below time limits will be granted only for weather restrictions and for installation of Type B, Class VI and epoxy resin or polyurea pavement markings, on plant mix roadways. Installation of Type B, Class VI, pavement markings on plant mix roadways are not applicable to these requirements if they are inlaid with the last pass of the asphalt roller or directly after the asphalt roller using a separate roller. Installation of epoxy resin or polyurea pavement markings on newly placed plant mix pavement shall not commence until after 24 hours of final surface placement.

PERMANENT AND TEMPORARY PAVEMENT MARKINGS AND FLEXIBLE TEMPORARY PAVEMENT MARKERS (FTPMs)

- **Permanent pavement markings** are durable pavement markings that, when installed, provide final traffic guidance after all operations related to the project are complete in accordance with the provisions herein, Section 704 of the Specifications and as specified elsewhere in the Contract.

Permanent pavement markings shall include skip-line and solid-line centerline markings, skip-line and solid-line lane-division markings and, solid-line edge-line markings installed on the newly-placed roadways once the surface has cured.

- **Temporary pavement markings** are pavement markings that, when installed, provide limited-duration traffic guidance until permanent pavement markings are installed in accordance with Section 704 of the Specifications, as specified elsewhere in the Contract, and as follows:

The VTM-94 moisture test is optional for temporary pavement marking. However, if the VTM-94 moisture test is not performed, the Contractor shall make a qualitative surface wetness assessment and note the result on the C-85.

If the surface is visibly dry and does not have puddling or free-standing water present, the Contractor is responsible for installing and maintaining the temporary pavement markings. If the Contractor opts not to perform the VTM-94 moisture test and the temporary markings applied to a visibly dry surface do not sufficiently adhere to the surface, no additional payment will be made by VDOT for temporary pavement marking reapplication.

If the surface has puddling or free-standing water present or, if a VTM-94 moisture test result indicates that the condition of the surface is not suitable for temporary pavement marking application, the Engineer may direct the Contractor to install temporary pavement markings on the surface in order to avoid having traffic operate on an unmarked road. In such circumstances VDOT will pay for one subsequent reapplication of the temporary markings once the surface has dried if the previous installation did not satisfactorily adhere to the road.

The Contractor may employ approved methods of drying the pavement surface that will not damage the pavement. Methods that may damage the pavement, such as “torching” of the pavement, will not be allowed.

Temporary pavement markings applied to planed (milled) surfaces or other non-final surfaces shall consist of an application of Type F, temporary traffic paint 15 mils thick, representing 100 percent of the final pavement marking width and length with 6 pounds of glass beads per gallon of material.

Type F for final paved surfaces shall be modified. Such modification shall consist of the application of Type F, temporary traffic paint, 8 to 10 mils thick representing 75

percent of the final pavement marking width and with 3 pounds of glass beads per gallon of material. Skip lines shall be applied in 8-foot lengths and approximately 32 foot gaps. Temporary Type F, pavement markings shall be arranged and spaced on their installation so as to be completely covered by the application of permanent pavement markings. Failure to place Type F, temporary markings at the application rate and spacing specified herein may result in the non-payment for such markings. No eradication of such modified Type F, temporary markings will be required when the Contractor installs such temporary pavement markings as detailed herein and such markings have been in place for no less than 3 days prior to the application of permanent pavement markings.

Temporary pavement markings for plant mix shall also include:

- Type D pavement markings in accordance with the requirements of Section 704 of the Specifications.

Premarking (or layout marking) is NOT acceptable for use as a temporary pavement marking.

MAINTENANCE OF TEMPORARY PAVEMENT MARKINGS AND FLEXIBLE TEMPORARY PAVEMENT MARKERS (FTPMS)

Maintenance of Temporary pavement markings applied to paved surfaces shall be in accordance with the following requirements:

While in place, temporary pavement markings sizes, shapes and retroreflectivity shall be maintained at adequate visibility and retroreflectivity, as defined in Section 512 of the Specifications. If temporary pavement markings meet these requirements, no additional application (refreshing) is required. If temporary pavement markings are Type F and these markings do not meet these requirements prior to the time limit for the application of permanent markings, such temporary markings shall be refreshed by the application of a lighter application (applied so as to enhance visibility but not as to require eradication before application of permanent markings) of Type F marking at the Contractor's expense when required by the Engineer. Under such circumstances no payment for the eradication of temporary pavement markings will be permitted if required before the application of permanent markings. If other types of permitted temporary pavement markings are used and these fail the visual evaluation or in any other respect are deficient prior to the time for the installation of permanent markings, these types shall be reapplied at the Contractor's expense when required by the Engineer. These requirements will apply until permanent pavement markings are installed in accordance with the time restrictions herein.

FTPMS shall be installed and maintained in accordance with the manufacturer's recommendations and the following requirements:

The Contractor shall maintain FTPMS for the time period specified herein or until permanent pavement markings are installed in accordance with Section 704 of the Specifications. Damaged or missing FTPMS shall be replaced with new FTPMS of the same manufacturing type, color and model. No more than one FTPM may be damaged or missing out of every broken line simulated segment. No two consecutive FTPMS may be damaged or missing on a simulated solid line application, and no more than 30 percent of the FTPMS may be damaged or missing on any measured 100-foot segment of simulated solid line.

The acceptable ambient air temperature, ambient moisture condition and pavement surface condition prior to the installation of the appropriate FTPMS shall be in

accordance with the manufacturer's recommendations, a copy of which shall be provided to the Engineer prior to installation.

Once applied, FTPMs will be considered for a single use. If a FTPM is lost before permanent markings are installed, it shall be replaced with a new FTPM. FTPMs may remain in place, undamaged, after installation for up to 30 consecutive days. When FTPMs are applied prior to pavement placement, such as with surface treatment, slurry seal and latex emulsion treatment, this 30 consecutive-day time limit shall begin at the time of actual installation of the FTPMs, not at the time of pavement placement completion. In no case shall any installed FTPMs be permitted to remain once time limits require permanent pavement marking installation.

FTPMS used for surface treatment, slurry seal or latex emulsion treatment operations shall include a removable material covering the reflective lens to protect the lens from being obscured or damaged by the paving operation.

PERMANENT PAVEMENT MARKINGS, TEMPORARY PAVEMENT MARKINGS AND FLEXIBLE TEMPORARY PAVEMENT MARKERS (FTPMS) INSTALLATION TIME LIMITS ON ROADWAYS OPEN TO TRAFFIC:

Surface Treatment Operations

The Contractor shall maintain temporary pavement markings until the permanent pavement markings are installed. The Contractor shall sweep surface treated roadways prior to installation of permanent pavement markings as directed by the Engineer but no earlier than 7 days after completion of surface treatment placement. Permanent pavement marking installation shall be completed after sweeping but within 30 calendar days after the end of the workday when the surface treatment pavement surface to be marked was placed.

The following governs the installation time limits for temporary markings or FTPMS:

- **Non-interstate roads having traffic volumes of 10,000 ADT or more:** Temporary pavement markings shall be installed within 24 hours after the end of the workday the new surface treatment is placed and maintained until the permanent pavement markings are installed. If FTPMS are used they shall be installed prior to placement of surface treatment.
- **Roads having traffic volumes between 3,000 and 10,000 ADT:** Temporary pavement markings shall be installed within 48 hours after the end of the workday the new surface treatment is placed and maintained until the permanent pavement markings are installed. If FTPMS are used they shall be installed prior to placement of surface treatment.
- **Roads having traffic volumes of 3,000 ADT or less:** Temporary pavement markings or FTPMS will not be required unless determined and authorized by the Engineer to be necessary to ensure the safety of the traveling public. If the Engineer requires FTPMS, such markers shall be installed prior to placement of surface treatment.

Slurry Seal or Latex Emulsion Treatment Operations

Permanent pavement marking installation shall be completed within 30 calendar days after the end of the workday when the slurry seal or latex emulsion treatment pavement surface to be marked was placed.

The following governs the installation time limits for temporary markings or FTPMs. The Contractor shall maintain temporary pavement markings until the permanent pavement markings are installed:

- **Interstate roads:** Temporary pavement markings shall be installed prior to opening to traffic, and maintained by the Contractor until the permanent markings are installed.
- **Non-interstate roads having traffic volumes of 10,000 ADT or more:** Temporary pavement markings shall be installed within 24 hours after the end of the workday the new slurry seal or latex emulsion is placed and maintained until the permanent pavement markings are installed. If FTPMs are used they shall be installed prior to placement of slurry seal or latex emulsion treatment.
- **Roads having traffic volumes between 3,000 and 10,000 ADT:** Temporary pavement markings shall be installed within 48 hours after the end of the workday the new slurry seal or latex emulsion is placed and maintained until the permanent pavement markings are installed. If FTPMs are used they shall be installed prior to placement of slurry seal or latex emulsion treatment.
- **Roads having traffic volumes of 3,000 ADT or less:** Temporary pavement markings shall be installed within 72 hours after the end of the workday the new slurry seal or latex emulsion is placed and maintained until the permanent pavement markings are installed. If FTPMs are used they shall be installed prior to placement of slurry seal or latex emulsion treatment.

Plant Mix Operations

Prior to the end of the workday the Contractor shall determine whether permanent pavement markings can be installed within 24 hours after the end of the workday. If the Contractor determines that permanent pavement markings can be installed within such time limits, the permanent pavement markings shall be installed. If the Contractor determines that permanent pavement markings cannot be installed within such time limits he shall install and maintain temporary pavement markings or FTPMs until the permanent pavement markings are installed. **Permanent pavement marking installation shall be completed within 30 calendar days after the end of the workday when the plant mix pavement surface to be marked was placed, unless otherwise noted below.**

- **Interstate Roads:** Temporary pavement markings shall be installed prior to opening to traffic, and maintained by the Contractor until the permanent markings are installed.
- **Non-interstate roads having traffic volumes of 10,000 ADT or more:** Permanent pavement markings, temporary pavement markings or FTPMs shall be installed within 24 hours after the end of the workday the plant mix is placed.
- **Roads having traffic volumes between 3,000 and 10,000 ADT:** Permanent pavement markings, temporary pavement markings or FTPMs shall be installed within 48 hours after the end of the workday the plant mix is placed.
- **Roads having traffic volumes of 3,000 ADT or less:** Permanent pavement markings, temporary pavement markings or FTPMs shall be installed within 72 hours after the end of the workday the plant mix is placed.

TABLE VII-1 PAVEMENT MARKINGS is replaced with the following:

**TABLE VII-1
Pavement Markings**

Type	Class	Name	Temp/ Perm	Surface Temp. at Time of Application	Film Thickness (mils)	Pavement Surface	Application Limitations
A		Traffic paint	Permanent	50°F+	15 ± 1 when wet	AC HCC	May be applied directly after paving operations
B	I	Thermoplastic Alkyd	Permanent	50°F+	90 ± 5 when set	AC	May be applied directly after paving operations
	I	Thermoplastic Hydrocarbon	Permanent	50°F+	90 ± 5 when set	AC	Do not apply less than 30 days after paving operations
	II	Preformed Thermoplastic	Permanent	50°F+	120-130	AC HCC	Manufacturer's recommendations
	III	Epoxy resin	Permanent	50°F+	20 ± 1 when wet	AC HCC	Pavement surface needs to be at least 1 day old
	IV	Plastic-backed preformed Tape	Permanent	(Note 1)	60 - 90	AC HCC	Manufacturer's recommendations
	VI	Profiled preformed Tape	Permanent	(Note 1)	(Note 1)	AC HCC	Manufacturer's recommendations
	VII	Polyurea	Permanent	(Note 1)	20 ± 1 when wet	AC HCC	Manufacturer's recommendations
D	I & II	Removable tape	Temporary	(Note 1)	(Note 1)	AC HCC	Construction zone pavement marking
E		Removable Black tape (Non-Reflective)	Temporary	(Note 1)	(Note 1)	AC	Construction zone pavement marking for covering existing markings
F	I & II	Temporary markings	Temporary	(Note 1)	15 max	AC HCC	May be applied directly after paving operations
FTPM		Temporary markings	Temporary	(Note 1)		AC HCC	Manufacturer's recommendations

Note 1: In accordance with manufacturer's recommendation.

Section 704.04—Measurement and Payment is amended to add the following:

Permanent pavement markings will be measured and paid for as the appropriate pavement line marking or pavement message marking pay items and pay units specified in the Contract. For roadways that are surface treated, the cost of sweeping the roadway prior to installing permanent pavement markings shall be included in the price bid for such pavement line or message marking items.

Temporary pavement markings, including **flexible temporary pavement markers (FTPMS)** used in substitution of temporary pavement markings, will be measured and paid for at the contract unit price per linear foot for the appropriate pavement line marking pay items and pay units specified in the Contract. Where FTPMs are used to simulate skip-line and solid-line centerline markings and skip-line and solid-line lane-division markings, the linear foot pay unit shall represent all FTPMs required in accordance **TYPICAL PLAN FOR FTPM PLACEMENT** and the requirements herein to simulate that solid or skip line temporary line marking. This cost shall include furnishing and application of the temporary pavement markings or FTPMs, surface preparation, furnishing, installing and maintaining temporary pavement markings (or FTPMs) for the entire 30 calendar day time limit.

Please note: Quantities for temporary markings listed in the contract are based on one cycle of marking for the 30 day time limitation before permanent markings must be installed. If temporary markings require refreshing or reapplication before the expiration of the 30 day time limit for the application of permanent markings, refreshing or reapplication shall be at the Contractor's expense. Such prices shall also include quality control daily logs, all materials, labor, equipment and incidentals.

Payment will be made under:

Pay Item	Pay Unit
Temporary pavement markings and (FTPMS)	Linear Foot
Temporary pavement markings	Square Foot

TYPICAL PLAN FOR FTPM PLACEMENT

