May 12, 2016

REVISION OF SECTIONS 202, 627 AND 708
PAVEMENT MARKING PAINT

**NOTICE**

This is a standard special provision that revises or modifies CDOT’s *Standard Specifications for Road and Bridge Construction*. It has gone through a formal review and approval process and has been issued by CDOT’s Project Development Branch with formal instructions for its use on CDOT construction projects. It is to be used as written without change. Do not use modified versions of this special provision on CDOT construction projects, and do not use this special provision on CDOT projects in a manner other than that specified in the instructions unless such use is first approved by CDOT’s Standards and Specifications Unit. The instructions for use on CDOT construction projects appear below.

Other agencies which use the *Standard Specifications for Road and Bridge Construction* to administer construction projects may use this special provision as appropriate and at their own risk.

**Instructions for use on CDOT construction projects:**

Use in all projects having pavement marking paint, except for chip seal projects.

Sections 202, 627 and 708 of the Standard Specifications are hereby revised for this project as follows:

In subsection 202.05, delete the third paragraph and replace with the following:

1. *Removal of temporary pavement marking on final alignment.* Temporary pavement marking paint on the approved final alignment shall be removed completely from the roadway surface at locations of permanent pavement markings as shown on the plans. The ground location shall be clean, dry and free of laitance, oil, dirt, grease, paint or other foreign contaminants prior to application of final pavement marking. The Contractor shall not remove more pavement marking paint than what can be replaced with permanent pavement marking during the same working day or working period. If an event occurs that precludes the contractor from completing the work during the placement of permanent marking, the Contractor shall halt the removal operation and raised flexible pavement markers shall be placed at locations that have been removed but not marked while the pavement is drying prior to the marking application. Marking application shall resume when pavement is dry and has had no moisture for a minimum of 24 hours. Raised flexible pavement markers shall be installed with one marker at 40-foot centers.
2. *Removal of temporary pavement marking on transitions.* Removal of pavement marking paint on temporary transitional alignments shall be performed by grinding or water-blasting. The removal shall result in 100 percent removal of the paint and a wide swath of ground pavement surrounding the former location of the temporary paint. The width of the swath shall be as follows; the center of the swath shall be the location of the paint line:

|  |  |
| --- | --- |
| Width of Pavement Marking to be removed | Width of Swath |
| < 8 inches | 12 inches |
| > 8 inches | 15 inches |

Subsection 202.11 shall include the following:

Removal of temporary pavement marking on transitions will be measured as the actual square feet of the swath constructed for the required width. Removal of pavement marking for the permanent alignment will be measured as the actual number of square feet removed.

Subsection 202.12 shall include the following:

Payment will be made under:

**Pay Item** **Pay Unit**

Removal of Pavement Marking Square Foot
Removal of Pavement Marking (12 Inch) Square Foot
Removal of Pavement Marking (15 Inch) Square Foot

Raised pavement markings shall be at the Contractor’s expense.

In subsection 627.04, delete the first paragraph and replace with the following:

**627.04 Pavement Marking with Low Temperature Acrylic Paint and High Build Acrylic Paint.** Striping shall be applied when the air and pavement temperatures are no less than 45 °F for waterborne and high-build paint, and 35°F for low temperature waterborne paint on asphalt or portland cement concrete pavements. The pavement surface shall be dry and clean, and free of all latent materials, in accordance with manufacturer recommendations. Weather conditions shall be conducive to satisfactory results.

Glass beads shall be applied into the paint by means of a low pressure, gravity drop bead applicator.

In subsection 627.04 delete the table and replace it with the following:

|  |  |
| --- | --- |
| **Description** | **Pavement Marking Paint** |
| Low Temp | High Build |
| Alignment  | Lateral Deviation | 2.0 inch per 200 foot Max |
| Coverage Rate | Sq. Ft. per Gallon | 89-93 | 67-70 |
| Thickness | Mil | 17-18 | 23-24 |
| Width | Inches | Per Plans +/- 0.25 | Per Plans +/- 0.25 |
| Dry Time | Minutes | 5-10 | 7-12 |
| Beads | Application Rate, lbs./gal | 7-8 | 9-10 |

Subsection 627.13 shall include the following:

**Pay Item Pay Unit**

Pavement Marking Paint (High Build) Gallon
Pavement Marking Paint (Low Temperature) Gallon

Delete subsection 708.05 and replace with the following:

**708.05 Pavement Marking Materials**. All pavement marking materials shall be selected from the Department’s Approved Products List (APL). Prior to start of work, a Certificate of Compliance (COC) for all pavement marking materials shall be submitted in accordance with subsection 106.13.

1. *Color.* The pavement marking paint, without drop-on beads, shall correspond following requirements:

White – Federal Standard No. 595B-17925. The Yellowness Index (YI) of white shall not exceed 8.0 per ASTM E-313-10 initially. The color after drying shall be a flat-white, free from tint, and shall provide the maximum amount of opacity and visibility under both daylight and artificial light.

Yellow – Materials for pavement markings shall meet the initial daytime chromaticity that fall within the box created by the following corner points:

Initial Daytime Chromaticity Coordinates (Corner Points)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **1** | **2** | **3** | **4** |
| x | 0.530 | 0.510 | 0.455 | 0.472 |
| y | 0.456 | 0.485 | 0.444 | 0.400 |

1. *Low Temperature Acrylic Waterborne Paint.* Low Temperature Acrylic Waterborne Paint binder (nonvolatile portion of vehicle) shall be 100 percent XSR acrylic polymer, by weight, as determined by infrared analysis or other chemical analysis available to the Department.
2. *High Build Acrylic Waterborne Paint.* High build acrylic waterborne paint binder (nonvolatile portion of vehicle) shall be 100 percent HD 21 acrylic cross linking polymer, by weight, as determined by infrared analysis or other chemical analysis available to the Department.

Low Temperature Acrylic Waterborne Paint, and High Build Acrylic Waterborne paint shall meet the following requirements:

**Performance Requirements**: The paint shall be water resistant and shall show no softening or blistering.

**Table 708-1
LOW TEMPERATURE WATERBORNE AND HIGH BUILD ACRYLIC WATERBORNE PAINT**

|  |  |  |  |
| --- | --- | --- | --- |
| **Property** | **White** | **Yellow** | **Test Method** |
| Nonvolatile portion of vehicle (white and yellow), % | 43.0 (min) | 43.0 (min) | ASTM D 2205 |
| **Pigment Composition**  |  |  |  |
| Percent by weight♦ | 60.0 | 60.0 | ASTM D 4451ASTM D 3723 |
| Paint  |  |  |  |
| Titanium Dioxide Content, lb./gal | 1.0 (min) |  | ASTM D 5381 |
|  |  |  |  |
| **Properties of the Finished Paint** |  |  |  |
| Total Non-volatiles, (solids) % by weight | 77.0 (min) | 77.0 (min) | FTMS 141C - Method 4053.1, ASTM D 2369, or ASTM D 4758 |
| Density, lbs./gal  | 14.0-14.6 | 13.7-14.3 | ASTM D 2205 |
| Consistency (Viscosity) White and Yellow, Krebs-Stormer Units | 85-95 | 85-95 | ASTM D 562 |
| Freeze Thaw Stability | Shall complete 5 or more test cycles successfully | ASTM D 2243 |
| Fineness of Grind, Cleanliness Rating B, minimum | 3 | 3 | ASTM D 1210 |
|  Scrub Resistance | 800 | 800 | ASTM D2486 |
| Directional Reflectance: [15 mil Wet Film] | 88 (min) | 50 (min) | ASTM E 1347 |
| Dry Opacity (Contrast Ratio): [5 mil Wet Film] | 0.95 (min) | 0.95 (min) | ASTM D 2805 |
| ♦Percent by weight shall include percent of organic yellow pigment.  |