

Section 14 – Signing, Pavement Marking, Signalization, and Lighting Infrastructure

SIGNING, PAVEMENT MARKING, SIGNALIZATION, AND LIGHTING INFRASTRUCTURE

The Contractor shall provide permanent pavement markings for all affected areas within the Project.

The Contractor shall be responsible for the design and installation of the Project pavement marking within the limits of the Project and comply with the requirements of this Section 14.

Design Requirements

The Contractor shall prepare pavement marking, designs and plans for all areas on the Project in accordance with the requirements of the following sections. These plans shall be a component of all Released for Construction Documents where any pavement marking or is required for the Work. No material, part, or attachment of any equipment shall be substituted or applied contrary to the manufacturer’s recommendations and standard practices.

The Contractor shall provide permanent pavement marking, delineation, and other traffic control devices that facilitate safe flow of traffic through the completed Project elements.

The Contractor shall design and construct pavement marking elements in accordance with the requirements of the standards listed in Table 14.1-1 as appropriate for the jurisdictional ownership, oversight and approval of the Work.

Table 14.1-1 PAVEMENT MARKING STANDARDS		
	Author	Title
1	CDOT	Special Provisions included in Section 14
2	CDOT	<i>Standard Specifications for Road and Bridge Construction Section 627</i>
3	FHWA	<i>Manual on Uniform Traffic Control Devices (Current Edition)</i>

Permanent Pavement Marking

Pavement Marking Design

The Contractor shall prepare pavement marking designs and plans for any roads affected by the construction of the Project. These plans shall include, all striping required for center lines, edge lines, lane lines, gore areas, lane drops, merging lanes, transition lanes, bike lanes, arrows, legends, symbols, object markings, delineation, and any other striping.

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Pavement marking design CDOT facilities shall comply with the requirements of the most current publications of the CDOT *Standard Specifications for Road and Bridge Construction and M & S Standard Plans*; and the FHWA MUTCD. The requirements of the MUTCD shall include both the standard requirements and the guidance recommendations of the manual.

Materials

The Contractor shall use the pavement-marking materials on I-70 specified in Table 14.1-2.

Table 14.1-2 PAVEMENT MARKING MATERIALS	
Location	Pavement Marking Type
Edge lines, Channelizing Lines	Modified Epoxy Pavement Marking
Skip Lines	Preformed Plastic Pavement Marking (Type II) (Inlaid)

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	Material Specification	Removal/Inlay Specification	Bid Items	Notes
Stencils	<p>*Standard Specifications* 627.09 Preformed Thermoplastic Pavement Marking 713.14 Preformed Thermoplastic Material</p> <ul style="list-style-type: none"> 125 mils (Note J) <p>*Project Special Required* [A] ROS 627 Preformed Thermoplastic Material (Special) Heat indicator system Contractor training or proof of prior experience Bevel leading edge at 45°</p> <p>*Standard Specifications* 627.05 Modified Epoxy Pavement Marking (Note 3) Application rate 85-90 sf/gal (18 mils thickness) 35° air and pavement temperature Water blast new concrete Air blast existing concrete and new/existing asphalt 713.08 Glass Beads 713.17 Modified Epoxy Pavement Marking Material</p> <p>*Project Special Required for I-70 MM 180-195 & 207-EJMT* [C] ROS 627 Modified Epoxy Pavement Marking Application rate 64-67.5 sf/gal (24 mils thickness)</p> <p>*Standard Specification for I-70 MM 180-195 and 207-EJMT* 627.05 Modified Epoxy Pavement Marking 35° air and pavement temperature Water blast new concrete Air blast existing concrete and new/existing asphalt 713.08 Glass Beads 713.17 Modified Epoxy Pavement Marking Material</p> <p>*Standard Specification for All Other Areas* 627.08 Preformed Plastic Pavement Marking 713.13 Preformed Plastic Material Class 2 for skip lines Type I - Standard (Note 7); Type II - Contrast (on concrete)</p> <p>*Project Special Required for I-70 MM 180-195 & 207-EJMT* [C] ROS 627 Modified Epoxy Pavement Marking Application rate 64-67.5 sf/gal (24 mils thickness)</p> <p>*Standard Specifications* 627.04 Pavement Marking with Low Temperature Acrylic Paints and High Build Acrylic Paint (Note 8) High Build application rate 67-70 sf/gal (24 mils thickness) High Build 45° air and pavement temperature for 24 hours Low Temp application rate 89-93 sf/gal (18 mils thickness) Low Temp 35° air and pavement temperature for 24 hours 708.05 Pavement Marking Materials 713.08 Glass Beads</p>	<p>*Standard Specification* 202.05 Pavement Markings</p> <p>*Project Special Required* [B or E] ROS 202 Removal of Pavement Marking (Grinding) Grinding depth of 90 mils +/- 10 mils Grinding width no more than 1" larger than stencil, rectangular pattern</p> <p>*Standard Specification* 202.05 Pavement Markings (Notes 4,5)</p> <p>*Project Special Required for I-70 MM 180-195 & 207-EJMT* [D or E] ROS 202 Removal of Pavement Marking (Grinding) Grinding depth of 130 mils +/- 5 mils</p> <p>*Project Special Required for All Other Areas* [D or E] ROS 202 Removal of Pavement Marking (Grinding) Grinding depth of 40 mils +/- 5 mils</p> <p>*Standard Specification for I-70 MM 180-195 and 207-EJMT* 202.05 Pavement Markings</p> <p>*Standard Specification for All Other Areas* 627.08(a) Preformed Plastic Pavement Marking Inlay depth of 130 mils +/- 5 mils Groove width shall be pavement marking width plus 1", +/- 1/8 inch</p> <p>*Project Special Required for I-70 MM 180-195 & 207-EJMT* [D or E] ROS 202 Removal of Pavement Marking (Grinding) Grinding depth of 130 mils +/- 5 mils</p> <p>*Standard Specification* 202.05 Pavement Markings Final alignment - grind width of final stripe Transition alignments - grind 12"/15" wide</p>	<p>*Bid Items Required* 627-30407 Preformed Thermoplastic Pavement Marking (Word Symbol)(Special)(SF) -or- 627-30411 Preformed Thermoplastic Pavement Marking (Crosswalk-Stop Line)(Special)(SF) Payment is for square foot of line/symbol (reference S-627-1 or obtain from Traffic)</p> <p>202-00250 Removal of Pavement Marking (SF) Payment is for nominal area of new stencil (Note 2)</p> <p>*Bid Items Required* 627-00008 Modified Epoxy Pavement Marking (GAL) (Note 6) 202-00250 Removal of Pavement Marking (SF) Payment is for length of line x nominal width (i.e. 4" or 8")</p> <p>*Bid Items Required for I-70 MM 180-195 and 207-EJMT* 627-00008 Modified Epoxy Pavement Marking (GAL) (Note 6)</p> <p>202-00250 Removal of Pavement Marking (SF) Payment is for length of line x nominal width (i.e. 4" or 8")</p> <p>*Bid Items Required for I-70 MM 180-195 and 207-EJMT* 627-00008 Modified Epoxy Pavement Marking (GAL) (Note 6)</p> <p>202-00250 Removal of Pavement Marking (SF) Payment is for length of line x nominal width (i.e. 4" or 8")</p> <p>*Bid Items Required for All Other Areas* 627-01010 (Type I)(Inlay) -or- 627-02010 (Type II)(Inlay) Payment is for length of line x nominal width (i.e. 4" or 8")</p> <p>*Bid Items Required* 627-00013 Pavement Marking Paint (High Build) 627-00014 Pavement Marking Paint (Low Temperature)</p> <p>202-00250 Removal of Pavement Marking (SF) Payment is nominal width of stripe removed for final alignment and full width of grind for transition alignment</p>	<p>[1] 90 mils thickness is available, but not allowed by CDOT.</p> <p>[2] Note that payment is not for the area of actual grinding, but area of stencil.</p> <p>[3] For chip seals, two passes are required for the centerline stripe with one in each direction of travel (to coat each side of the chip). For edge lines, only one pass is required in the direction of travel.</p> <p>[4] Chip seals less than 3 years old should not be ground. Chip seals 3-5 years old should be assessed before grinding. Chip seals more than 5 years old may be ground.</p> <p>[5] It is highly recommended that existing stripes be removed prior to a chip seal.</p> <p>[6] Note that the total quantity includes volume of both A and B components (color and catalyst).</p> <p>[7] Type II Preformed Plastic Pavement Marking is not used on State Highways.</p> <p>[8] If the temporary striping will be in place for 2 weeks or less, application rate can be reduced to 100-110 sf/gal w/ 25 lb of beads. This requires another project special provision.</p> <p>[A,B,C,D,E] Refers to PROJECT PROVISIONS</p> <p>EJMT: Eisenhower-Johnson Memorial Tunnel (MM 213.65)</p>
Center, Edge and Channelizing Lines				
Skip Lines				
Temporary Striping				

Project: I-70 Vail Pass Various Wall Repairs
Project Sub Acct. No: 21897
Date: October 16, 2018
Technical Requirements

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Lighting

Permanent Lighting Design

Not Applicable

Permanent Lighting Materials

Not Applicable

Temporary Lighting

Not Applicable

Construction Requirements

Permanent Pavement Marking

New or existing asphalt shall be air-blasted prior to placement of any primer or pavement-marking material.

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Project Special Provisions

The following specifications modify and take precedence over the Standard Specifications.

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REVISION OF SECTION 627 MODIFIED EPOXY PAVEMENT MARKING

Section 627 of the Standard Specifications is hereby revised for this project as follows:

Section 627.05 shall include the following:

Application Rate or Coverage Per Gallon of Modified Epoxy Pavement Marking

	<u>Minimum</u>	<u>Maximum</u>
24 mil Marking	64 sq. ft.	67.5 sq. ft.
Beads:	31 lbs.	

Modified Epoxy Paint Thickness shall be 24 mils instead of the standard 18 mils.

All modified epoxy pavement marking on I-70 shall be inlaid. The grooved width shall be the pavement marking width plus 1 inch, with a tolerance of $\pm \frac{1}{4}$ inch. The depth of the grooves shall be 130 mils \pm 5 mils. Groove position shall be a minimum of 2 inches from the edge of the pavement marking to the longitudinal pavement joint.

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Deliverables

At a minimum, the Contractor shall submit the following to CDOT for review, Approval, and/or Acceptance:

Deliverable	Review, Acceptance, or Approval	Schedule
Pavement Marking Plans	Approval	60 Days prior to issuance of Released for Construction Documents