07020 Hot Applied Plastic Pavement Markings

Index

07020-1 General

This specification covers plastic pavement marking requirements. The field installation locations have been defined based on the frequency of vehicle trips over the marking, typically longitudinal markings and transverse markings, hereafter named *longitudinal* and *intersection* markings for easy reference. The longitudinal lead line and first 2 broken lines past the intersection are included in the *intersection* section as they have a higher frequency of vehicle crossings and therefore are subject to more wear than typical longitudinal lines. All markings covered in this section are long term markings that are not expected to require any maintenance under normal traffic wear for a period exceeding three (3) years.

07020-2 Types of Markings

2.1 Longitudinal Markings

2.1.1 Directional Dividing Lines

Directional Dividing Lines shall be 100 mm wide, yellow in colour, solid or broken and may be a single line or two parallel lines separated by a distance of 100 mm. When broken, the directional dividing line shall consist of a line 5 metres long with an 8 metre skip distance between lines in a consecutive pattern.

2.1.2 Lane Lines

Lane Lines shall be single line, 100 mm wide, white in colour and may be broken or solid. When broken, the lane line shall consist of a line 5 metres long with an 8 metre skip distance between lines in a consecutive pattern.

2.1.3 Pavement Edge Lines

Pavement Edge Lines shall be single, solid line, 100 mm wide and may be yellow or white in colour.

2.1.4 Continuity Lines

Continuity Lines shall be a single line, 200 mm wide, white or yellow in colour and may be broken or solid. When broken, the continuity line shall consist of a line 5 metres long with a 5 metre skip distance between lines in a consecutive pattern.

2.1.5 Chevrons

Chevrons shall be white or yellow 600mm wide, bordered by a 200mm solid line, and installed as per the Required Permanent Markings at Chevrons Plan No. 102-0028-009r001.

2.2 Intersection Markings

Intersection markings shall be installed as per the Required Permanent Markings at Intersection Plan No. 102-0028-008r001.

2.2.1 Stop Lines

Stop Lines shall be a single solid line, 600 mm wide and white in colour.

2.2.2 Crosswalk Lines

Crosswalk Lines shall be two, parallel, solid lines, 150 mm wide and white in colour. The lines shall be 3.0m apart. Crosswalk markings shall be installed as per Crosswalk Pavement Markings Plan No. 102-0028-001r002.

2.2.3 'Zebra' Crosswalk

'Zebra' Crosswalk Shall be two, parallel, solid lines, 100 mm wide and white in colour, with alternating longitudinal lines 1000mm wide and 3.0m long, separated by 1000mm spaces across the roadway. The longitudinal lines shall be located transversely to minimize application in the established vehicle wheel path. Zebra crosswalk markings shall be installed as per Crosswalk Pavement Markings Plan No. 102-0028-001r002.

2.2.4 Arrows/Symbols

Arrows/Symbols shall be white and designed according to the Uniform Traffic Control Device Manual for Canada or City Standard.

2.2.5 Guide Lines

Guide Lines shall be white, 100 mm wide and shall be placed through intersections as extensions of lane lines 0.5 metres long spaced at 0.5 metres.

07020-3 Material

3.1 General

The material shall be applied to the road surface while in the liquid form and shall sufficiently set to allow traffic to drive over the material with no adverse effects to the material or vehicle. In the solid (dried) state, the material shall not give off fumes which are toxic or otherwise injurious to persons or property.

3.2 Durability

The dried material shall not deteriorate, crack, or decay during air temperature changes within -50 C to +50 C and with exposure to UV light. The material shall not deteriorate by contact with sodium chloride, calcium chloride, or other chemicals used against formation of ice on roadways; oil content of pavement materials; or motor vehicle oil or other fluids.

3.3 Colour

After setting, the colour of the white material shall be similar to standard number 37875 of the standard U.S. Federal Standard 595B, and yellow shall be similar to standard number 33538. The material shall not discolour when exposed to UV light. The material shall maintain its relative colour over the duration of the warranty period (the white marking shall not ‘grey’, nor shall the yellow material ‘fade’).

3.4 Drying Time

The material will be considered dried when a vehicle can drive over the material with no adverse effect to the material or vehicle. The drying time shall not exceed 20 minutes during average summer temperatures and humidity and shall be completely dry after one hour.

3.5 Reflectorization

During placement, glass spheres shall be mixed into the material to the extent required to achieve high levels of retroreflectivity. The pavement marking material shall bond with the beads sufficiently to ensure retention of the beads throughout the life cycle of the pavement marking. The retroreflectivity of the pavement marking shall be measured

using a retroreflectometer and shall maintain a minimum reflectance value of 75 mcd/sqm/lux at the end of the warranty period for both colours.

The glass beads shall be manufactured from glass of a composition designed to be highly resistant to traffic wear and to the effects of weathering. The beads shall be transparent and colourless to prevent their imparting of any noticeable hue to the paint. Glass beads shall also be applied to surface of extruded material before it has set, at a rate of 140 to 250 g/m².

07020-4 Installation

4.1 General

The pavement marking shall be installed on new asphalt, micro surfacing, old asphalt, old lane lines, and on concrete. Installation of the product shall be performed by hand or using mechanical equipment in a process to minimize traffic restriction delay, and to ensure no damage to public or private property during installation or drying time of the material (no spray or tracking).

4.2 Surface Preparation

All material must be installed on a clean dry road surface. The contractor may choose to use abrasive surface preparation methods for the roadway to maximize surface bonding. The existing pavement damage shall be minimal. No grooving of the roadway will be permitted. Where the location of the new pavement markings conflict with existing pavement markings the new marking shall be installed in the same line as the existing marking. The contractor shall be responsible for removal of any existing marking material at his cost. The owner will only pay for removal of existing markings where relocation is required.

07020-5 Traffic Control and Work Area

5.1 General

Work zone traffic controls shall be set up in accordance with the City of Saskatoon Traffic Control Manual 2004.

The Contractor shall at all times keep traffic congestion to a minimum. The work zone shall be limited to maintain one lane of traffic in all directions at all times. The work shall

be carried out as quickly as possible to prevent excessive delay and inconvenience to traffic.

07020-6 Workmanship and Warranty

6.1 Adhesion to Pavement

The Contractor shall make all tests and take all samples necessary to assure adequate adhesion between the pavement marking material and the roadway surfaces used by the City. Surface preparation is at the discretion of the Contractor and any markings installed over existing markings is covered by the warranty period even if the old marking bond is deemed to be the failed portion of the application.

6.2 Rejected Work

Poor workmanship such as insufficient material, wrong location, wavy lines, too much overflow, non-uniform lengths, shall be removed by the Contractor and replaced within seven calendar days. Surplus material shall be trimmed to give clean straight edges. The Engineer will give the Contractor written notice of any markings that have been rejected.

6.3 Warranty Period

The Engineer will issue a Completion Certificate for each month the Contractor performs work. The Contractor shall remedy all defects in the work due to faulty material, workmanship or everyday wear for a period of three (3) years from the date of installation. Locations known to have excessive shear forces such as curves or lane lines on entrance ramps/roadways shall not be exempt from the warranty period. The Contractor shall be responsible for placing sufficient product thickness to accommodate these conditions.

The maintenance of the markings during the warranty period shall be the Contractors responsibility and shall be carried on until expiration of the warranty period of which time the Contractor's responsibility shall cease, unless there is an outstanding order from the Engineer requiring the Contractor to correct some of the maintenance that has not been completed.

The Contractor shall supply the Owner with a written three (3) year warranty for retention of at least eighty-five (85) percent of the markings (including wheel path wear

areas on transverse lines) with minimum retroreflectivity of 75 mcd/sqm/lux at the end of the product warranty.

The Engineer shall give the Contractor written notice of all defects observed within the warranty period.

In the event that the above minimum retention is not met, the Contractor will, at the option of the Engineer, either:

1. Replace the missing sections to the satisfaction of the Engineer at no expense to the City or;
2. Reimburse the City at the same rate the Contract was awarded, for the quantity of line failing to meet the minimum criteria.

07020-7 Payment

Payment is to be made on the basis of the number of lineal metres of material installed as measured by the Engineer in the field for lines, and per unit for arrows/symbols as counted. Chevrons shall consist of a combination of 200mm solid line and 600mm chevron line; zebra markings shall consist of 100mm solid line and 1000mm zebra bar, each measured per unit for each marking type. Crosswalks shall consist of two 150mm lines measured per lineal meter of crossing width measure at the midpoint of the crosswalk (i.e. a 12m wide roadway would result in a 12 units of crosswalk markings, not 24 units).

The unit prices are to include the complete cost of supplying and installing the material, surface preparation, and traffic accommodation (except traffic control on freeways). All costs associated with travel to and from the worksite shall be included in the unit prices.

End of Specification 07020