

## **Pavement Marking Specifications**

# Pavement Marking Specifications – General

## Abbreviations

When the following abbreviations are used in the Pavement Marking Specifications, they shall mean the following:

BPN	British Pendulum Number
DSM	Designated Sources for Materials
MMA	Methyl Methacrylate
MTO	Ontario Ministry of Transportation
OPSS	Ontario Provincial Standard Specification

## General Requirements for Pavement Markings

*These general requirements apply to Items PM001 to PM012, as applicable, and shall be read in conjunction with OPSS 710 (Nov 2010), OPSS 1712 (Feb 1991), OPSS 1713 (Feb 1991), OPSS 1714 (Feb 1991) and OPSS 1750 (Dec 1983).*

*The following Standard Drawing is applicable to Items PM001 to PM012, as applicable: DS-400.*

### Scope of Work

The Contractor shall:

- supply and apply:
  - reflectorized, non-coning, permanent durable pavement markings; and/or
  - traffic paint pavement markings;
- provide pre-marking to establish the position of all pavement markings in accordance with OPSS 710; and
- use appropriate traffic control measures to protect freshly painted lines from being tracked or smeared by the travelling public.

### Equipment Requirements

The Contractor shall use a self-propelled pavement marking unit to perform the pavement marking work. The unit shall:

- be capable of producing top quality markings, with true edges, free from waviness or variations;
- have a large sign with a checkerboard border mounted on its rear to advise motorists that line painting operations are in progress;

- be equipped with a full complement of lights for safety; and
- a mobile radio equipped for direct truck to truck communication.

The Contractor shall also supply and operate at least two (2) safety warning trucks during the performance of the pavement marking work. Each safety warning truck must be equipped with the following, at a minimum:

- a full complement of lights for safety;
- rotating amber lights, clearly visible from the front and the rear of the truck;
- four (4) way flashers;
- A rear mounted bi-directional arrow board sign (TC 12), in accordance with the Ontario Traffic Manual, Book 7; and
- a mobile radio equipped for direct truck to truck communication.

The pavement marking unit and safety warning trucks shall be subject to inspection and approval by the Region.

### **Materials**

All non-coning permanent durable markings and reflectorizing glass beads shall be from sources indicated in MTO's DSM.

Non-coning permanent durable markings being laid on freshly laid asphalt shall meet the requirements of OPSS 1713.

Non-coning permanent durable markings being laid on existing asphalt shall meet the requirements of OPSS 1714.

Traffic paint pavement markings shall meet the requirements of OPSS 1712.

Reflectorizing glass beads shall meet the requirements of OPSS 1750.

The Contractor shall provide the Region with proof that the materials are from an approved source under MTO's DSM and meet the requirements of the applicable OPSS referenced above.

### **Operations**

All pavement marking work shall be carried out in accordance with OPSS 710 and the following:

1. Traffic control shall be maintained in accordance with the requirements of the Ontario Traffic Manual, Book 7. The Contractor shall ensure that freshly painted lines are not tracked or smeared by motorists.

2. All work shall be carried out in compliance with the *Occupational Health and Safety Act*, the *Highway Traffic Act*, the *Environmental Protection Act* and all applicable regulations of these statutes.
3. Pavement marking work shall be conducted by qualified operators who have all of the necessary licensing requirements to carry out the work.
4. Paint application shall have a wet film thickness of 0.40 mm and a dry film thickness of 0.30 mm, plus or minus 10%. Paint thinners shall not be used. The rate of paint application shall be a minimum of 20 metres per litre and a maximum of 18 metres per litre.
5. Glass beads shall be applied at the rate of 0.7 kg/litre of raw paint applied. Beads that do not become embedded in the pavement markings must be swept up and properly disposed of.
6. The minimum width of line applied shall be 100 mm. Where double line is applied, the space between the two (2) lines shall not be less than 100 mm. The maximum width of the above described line or space shall be 115 mm.
7. Centre line markings shall be yellow, 10 cm wide line(s).
8. Pavement markings shall be applied when the temperature is above 10 degrees Celsius and the pavement is completely dry, as determined by the Region.
9. Any workmanship that does not conform to the requirements of OPSS 710, as amended herein, shall be corrected at the Contractor's expense.
10. The Contractor shall correct any severe tracking situation which was created by the Contractor, or as a result of poor traffic control operations or other errors/omissions on the part of the Contractor.

## Pavement Marking Specifications – Items

### Item PM001 Permanent Durable Pavement Markings

*This Specification shall be read in conjunction with the General Requirements for Pavement Markings.*

This item is for:

- white dashed and solid lane lines, including markings for left and right turn lanes
- white dashed and solid bike lane lines
- white edge lines
- yellow directional dividing lines

The pavement markings shall be applied to the final surface course in the location(s) shown on the Drawings.

#### Measurement for Payment

Measurement for payment shall be by the horizontal length in metres (m) of 10 cm wide lines, excluding gaps. Wider lines shall be measured in 10 cm equivalents.

#### Basis of Payment

Payment shall be made at the unit price and shall be full compensation for all labour, equipment and materials necessary to complete the work as specified.

### Item PM002 Permanent Durable Pavement Markings – Crosswalk Lines

*This Specification shall be read in conjunction with the General Requirements for Pavement Markings.*

*The following Standard Drawing is applicable to this item: DS-408.*

This item is for white crosswalks lines.

Crosswalk lines shall be 15 cm wide and shall be applied to the final surface course in the location(s) shown on the Drawings and in accordance with Standard Drawing DS-408.

Crosswalk lines shall be applied within 24 hours of the new ramp construction. In the event that the permanent crosswalk lines cannot be applied within 24 hours of the new ramp construction, the Contractor shall apply temporary crosswalk lines under Item PM012 within 24 hours of the new ramp construction.

**Measurement for Payment**

Measurement for payment shall be by the horizontal length in metres (m) of 15 cm wide lines, excluding gaps.

**Basis of Payment**

Payment shall be made at the unit price and shall be full compensation for all labour, equipment and materials necessary to complete the work as specified.

**Item PM003 Permanent Durable Pavement Markings – Intersection Stop Lines**

*This Specification shall be read in conjunction with the General Requirements for Pavement Markings.*

This item is for white intersection stop lines.

Intersection stop lines shall be 45 cm wide and shall be applied to the final surface course in the location(s) shown on the Drawings.

Intersection stop lines shall be applied within 24 hours of the new ramp construction. In the event that the permanent intersection stop lines cannot be applied within 24 hours of the new ramp construction, the Contractor shall apply temporary intersection stop lines under Item PM012 within 24 hours of the new ramp construction.

**Measurement for Payment**

Measurement for payment shall be by the horizontal length in metres (m) of 45 cm wide lines, excluding gaps.

**Basis of Payment**

Payment shall be made at the unit price and shall be full compensation for all labour, equipment and materials necessary to complete the work as specified.

**Item PM006 Permanent Durable Pavement Markings – Zebra Markings**

*This Specification shall be read in conjunction with the General Requirements for Pavement Markings.*

*The following Standard Drawings are applicable to this item: DS-412 (zebra markings within crosswalk lines) and DS-413 (zebra markings within crossrides).*

This item is for white zebra markings within white crosswalk lines or crossrides.

Zebra markings shall be applied to the final surface course in the location(s) shown on the Drawings and in accordance with Standard Drawing DS-412 or DS-413, as applicable.

Zebra markings shall be comprised of alternating 60 cm wide bars and 60 cm spaces and shall be laid out parallel to the through lane. The first zebra marking bar at each end of the crosswalk shall be a full 60 cm wide bar, placed a minimum of 60 cm from the edge of pavement in order to prevent pedestrian from contacting the zebra marking when taking their first step in the crosswalk.

The crosswalk lines shall be installed and paid for under Items PM002 and PM004, as applicable.

Elephant feet markings shall be installed and paid for under Item PM008.

### **Measurement for Payment**

Measurement for payment shall be by the horizontal length in metres (m) of 60 cm wide lines, excluding gaps.

### **Basis of Payment**

Payment shall be made at the unit price and shall be full compensation for all labour, equipment and materials necessary to complete the work as specified.

### **Item PM007      Permanent Durable Pavement Markings – Symbols**

*This Specification shall be read in conjunction with the General Requirements for Pavement Markings.*

This item is for symbols (i.e. arrows, crosses, bicycle, sharrows, etc.).

Symbols shall be white and shall be applied to the final surface course in the location(s) shown on the Drawings.

### **Measurement for Payment**

Measurement for payment shall be a count of each symbol applied.

### **Basis of Payment**

Payment shall be made at the unit price and shall be full compensation for all labour, equipment and materials necessary to complete the work as specified.

### **Item PM010      Interim Traffic Paint Pavement Markings – Lines (Provisional)**

*This Specification shall be read in conjunction with the General Requirements for Pavement Markings.*

This item is for the interim painting of:

- white dashed and solid lane lines, including markings for left and right turn lanes
- white dashed and solid bike lane lines

- white edge lines
- yellow directional dividing lines

with traffic paint in the event that the permanent durable pavement markings to be applied under Item PM001 cannot be successfully applied due to unfavourable weather conditions, as determined by the Commissioner.

**Once the weather conditions are favourable, the Contractor shall replace the interim pavement markings with the permanent durable pavement markings to be applied under Item PM001.**

Interim pavement markings shall be applied in the location(s) shown on the Drawings.

Two (2) coats of paint shall be applied to new surfaces and for first time applications. One (1) coat shall be applied when painting over existing pavement markings.

#### **Measurement for Payment**

Measurement for payment shall be by the horizontal length in metres (m) of 10 cm wide lines, excluding gaps. Wider lines shall be measured in 10 cm equivalents.

#### **Basis of Payment**

Payment shall be made at the unit price and shall be full compensation for all labour, equipment and materials necessary to complete the work as specified.

#### **Item PM011 Interim Traffic Paint Pavement Markings – Symbols (Provisional)**

*The General Requirements for Pavement Markings shall apply to this item.*

This item is for the interim painting of symbols (i.e. arrows, crosses, bicycle, sharrows, etc.) with traffic paint in the event that the permanent durable pavement markings to be applied under Item PM007 cannot be successfully applied due to unfavourable weather conditions, as determined by the Commissioner.

**Once the weather conditions are favourable, the Contractor shall replace the interim pavement markings with the permanent durable pavement markings to be applied under Item PM007.**

The interim pavement markings shall be white and shall be applied in the location(s) shown on the Drawings.

#### **Measurement for Payment**

Measurement for payment shall be a count of each symbol applied.

**Basis of Payment**

Payment shall be made at the unit price and shall be full compensation for all labour, equipment and materials necessary to complete the work as specified.

**Item PM012 Interim Traffic Paint Pavement Markings – Crosswalk Lines and Stop Lines (Provisional)**

*The General Requirements for Pavement Markings shall apply to this item.*

This item is for the interim painting of:

- white crosswalk lines
- white intersection stop lines

with traffic paint in the event that the permanent durable pavement markings to be applied under Items PM002, PM003, PM004 and PM005, as applicable, cannot be successfully applied within 24 hours of the new ramp construction.

**The Contractor shall replace the interim pavement markings with the permanent durable pavement markings to be applied under Items PM002, PM003, PM004 and PM005, as applicable.**

Interim pavement markings shall be applied in the location(s) shown on the Drawings.

Two (2) coats of paint shall be applied to new surfaces and for first time applications. One (1) coat shall be applied when painting over existing pavement markings.

**Measurement for Payment**

Measurement for payment shall be by the horizontal length in metres (m) of 15 cm wide lines, excluding gaps. Wider lines shall be measured in 15 cm equivalents.

**Basis of Payment**

Payment shall be made at the unit price and shall be full compensation for all labour, equipment and materials necessary to complete the work as specified.

**Item PM014 Pavement Markings – Obliterating**

*This Specification shall be read in conjunction with OPSS 710 (Nov 2010) and OPSS 1712 (Feb 1991).*

Existing pavement markings that do not form part of the operational traffic lane arrangement for any interim stage of the Work or part of the final Contract layout shall be ground out and then blacked out using by applying two (2) coats of black paint in accordance with OPSS 710 and OPSS 1712 (Black-CGSB 1-GP-12C black 512-301).

**Measurement for Payment**

Measurement for payment shall be per metre (m) of pavement markings obliterated, based on a 10 cm width, horizontally measured.

**Basis of Payment**

Payment shall be made at the unit price and shall be full compensation for all labour, equipment and materials necessary to complete the work as specified.

**Item PM015      Inlaid Pavement Markings – Obliterating**

Existing inlaid pavement markings that do not form part of the operational traffic lane arrangement for any interim stage of the Work or part of the final Contract layout shall be ground out and then filled by applying PMi PolyMight International Anti-skid MMA grey durable cold plastic (Product code 20-8175), or Equivalent, as required to fill the void in the road surface created by grinding. The void shall be filled until flush.

**Measurement for Payment**

Measurement for payment shall be per metre (m) of pavement markings obliterated, based on a 10 cm width, horizontally measured.

**Basis of Payment**

Payment shall be made at the unit price and shall be full compensation for all labour, equipment and materials necessary to complete the work as specified.