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PART 1 - GENERAL

- 1.1 Work Included .1 This section specifies the requirements for the application of pavement markings. The Work consists of the furnishing of all materials, tools, equipment and labour to lay down pavement markings for the delineation and control of traffic.
- .2 Those materials which are not specified and/or indicated but are necessary for the complete installation of the work shall be deemed the responsibility of the Contractor and shall be included at no extra cost to the Contract.
- 1.2 Related Sections .1 S-1 Specification for Hot Mix Asphaltic Concrete.
- .2 S-2 Specification for Performance Graded Asphalt Binder.
- 1.3 Reference Standards .1 Manual of Uniform Traffic Control Devices for Canada (MUTCD), (5th Edition), latest revision.
- 1.4 Shop Drawings .1 Submit shop drawings in accordance with Section 01 10 00 for items listed in Supplementary Specifications.
- 1.5 Codes, Bylaws, Ordinances and Regulations .1 All work covered by this section shall be performed according to applicable Halifax Regional Municipality Codes, bylaws, Ordinances, and Regulations.
- .2 Nova Scotia Department of Transportation and Infrastructure Renewal "Temporary Work Place Traffic Control Manual" (latest revision).
- .3 HRM Traffic Control Manual Supplement.

PART 2 - PRODUCTS

- 2.1 General .1 All material supplied shall be new.
- 2.2 Temporary Pavement Markings .1 Paint: to CGSB 1-GP-71. Color to conform to CGSB 1-GP-12C, 505-308 for yellow and 513-301 for white.
- .2 Reflectorized self adhesive marking tape.
- .3 Milled surfaces shall have reflective temporary pavement marking "tabs".
- .4 Temporary markings shall be removed within 24 hours once permanent markings have been applied.

2.3 Permanent
Pavement Markings

- .1 Yellow paint: to CGSB 1-GP-71. Color to conform to CGSB 1-GP-12C, 505-308. Add 75 g/L titanium dioxide and 100 g/L lead chromate.
- .2 White paint: to CGSB 1-GP-71. Color to conform to CGSB 1-GP-12C, 513-301. Add 150 g/L titanium dioxide
- .3 Glass beads: overlay type and to CGSB 1-GP-74M, premix type to CGSB 1-GP-149M.
- .4 Marking tape: 3M Stamark 380IES or equivalent

2.4 Contact Cement

- .1 3M Stamark Surface Preparation Adhesive P-50 or equivalent.

PART 3 - EXECUTION

3.1 General

- .1 Clean pavement surface of all dirt, dust, oil, surface water and pavement markings that have been previously or poorly applied.
- .2 Thoroughly clean distributor tank before refilling with materials of different colour.
- .3 Pavement markings which are partially impacted at any intersection shall have the complete marking painted.
- .4 All incorrectly painted pavement markings are to be removed by grinding, resulting in minimal scarring and removal of at least 95% of existing markings. Markings shall be removed in such a way that the pavement surface is not damaged below a depth of 3 mm ($\frac{1}{8}$ "). Grooving, rutting or other significant damage is not acceptable. Removal equipment used for pavement marking removal shall be capable of vacuuming the debris they generate simultaneously with the grinding operation.

3.2 Pavement Marking Drawings

Where a pavement marking drawing is provided, the Contractor is required to paint markings as indicated on the drawing. Where a pavement marking drawing is not provided, the Contractor is to accurately inventory existing markings. HRM approval of the Contractor's inventory drawing is required prior to the removal of the existing pavement markings. In locations where a pavement marking drawing is not provided, the following shall apply to assist the Contractor in establishing uniformity in the development of pavement marking drawings/descriptions. This checklist should be used as a guide to ensure that all of the basic elements are covered.

For locations which require a scaled and surveyed drawing:

The contractor shall submit a pavement marking drawing that is to a 1:250 scale for signalized intersections and approaches, and a 1:500 scale on all other streets unless otherwise approved by the Engineer. Drawings shall be submitted in PDF form and printed to either an 11 x 17 or A-1 size. The pavement marking drawing shall be produced from a survey and shall inventory the existing pavement markings. The contractor shall be responsible for including any revisions as directed by HRM Traffic Management. The inventory shall include pavement markings at all intersections crossed or at the limit of streets in the contract, except for continuous center or lane lines.

The pavement marking drawing shall be submitted no later than 10 business days before scheduled removal of pavement markings and/or asphalt.

The pavement marking drawing shall include:

- Project name, street name, limits, tender number and date
- Indicate north arrow and scale
- Use a legend to define all symbols (as per HRM Red Book detail DS 13)
- Show colours, sizes and configurations of existing pavement markings (crosswalks, arrows, solid/dashed lines, hatching, bicycle symbols, etc.)
- Dimension individual lane widths, bike lane widths, length/width of hatching, stop bar setbacks, etc.
- Layout pavement markings in accordance with the HRM Red Book and the Manual of Uniform Traffic Control Devices for Canada, unless otherwise indicated.
- Pre-marking for permanent pavement markings shall be laid out by survey based on the reviewed pavement markings plan.

For locations which require a non-scaled drawing:

The contractor shall submit a pavement marking drawing, not to scale for the identified street. Drawings shall be submitted in PDF form and printed to either an 11 x 17 or A-1 size. The pavement marking drawing shall inventory the existing pavement markings and the contractor shall be responsible for including any revisions as directed by HRM Traffic Management. The inventory shall include pavement markings at all intersections crossed or at the limit of streets in the contract, except for continuous center or lane lines.

The pavement marking drawing shall be submitted no later than 10 business days before scheduled removal of pavement markings and/or asphalt.

The pavement marking drawing shall include:

- Project name, street name, limits, tender number and date
- Indicate north arrow and scale or NOT TO SCALE (N.T.S.)
- Use a legend to define all symbols (as per HRM Red Book detail DS 13)
- Show colours, sizes and configurations of existing pavement markings (crosswalks, arrows, solid/dashed lines, hatching, bicycle symbols, etc.)
- Dimension individual lane widths, bike lane widths, length/width of hatching, stop bar setbacks, etc.
- Layout pavement markings in accordance with the HRM Red Book and the Manual of Uniform Traffic Control Devices for Canada, unless otherwise indicated.

For locations which require a description:

The contractor shall submit a pavement marking description for the identified street. This pavement marking description shall inventory the existing pavement markings and the contractor shall be responsible for including any revisions as directed by HRM Traffic Management. The inventory shall include pavement markings at all intersections crossed or at the limit of streets in the contract, except for continuous center or lane lines. The pavement marking description shall include:

- Project name, street name, limits, tender number and date.
- Indicate colours, sizes and configurations of existing pavement markings (crosswalks, arrows, solid/dashed lines, hatching, bicycle symbols, etc.).
- Indicate individual lane widths, bike lane widths, length/width of hatching, stop bar setbacks, etc.

3.3 Paint

- .1 Apply paint only when air temperature is above 12 degrees Celsius and in dry weather.
- .2 Apply markings to within a tolerance of 12 mm of the dimensions indicated with a 5 mm maximum deviation in any 3.0 metre of length.
- .3 Apply paint under pressure at a rate to achieve a paint thickness of not less than 0.253 mm (10 mils) when sprayed on the surface.
- .4 Apply glass beads to all pavement markings. Apply glass beads at a rate of 300 g/m²

- .5 Protect newly painted markings from traffic by barricades or cones or other suitable method until paint has dried sufficient so as to not be damaged by traffic.
- 3.4 Marking Tape
- .1 Apply marking tape only when the air temperature, pavement temperature, and weather conditions meets or exceeds manufacturer's recommendations.
- .2 Apply markings to within a tolerance of 12 mm of the dimensions indicated with a 5 mm maximum deviation in any 3.0 metre of length.
- .3 Apply marking film into the surface of newly laid asphalt and in accordance with manufacturer's recommendations. Roll marking tape into the asphalt surface using a two-wheel or three-axle tandem roller.
- .4 Protect newly laid markings from traffic by barricades or cones or other suitable method until asphalt has cooled or markings have set sufficiently so as to not be damaged by traffic.
- 3.5 Temporary Pavement Markings
- .1 Apply temporary lane markings (tabs on milled surface, temporary tape on micro and pavement) to Arterials immediately after the placement of each lift of asphaltic concrete. Permanent markings shall be applied within 48 hours. For all other streets, apply temporary lane markings to base course of asphalt if the placement of the surface course of asphalt will not be proceeding within one week of the completion of the base course. All other streets shall have the permanent markings applied within one week after the placement of the final lift of asphaltic concrete. Pavement markings on speed humps shall be applied within 48 hours.
- .2 Apply temporary pavement markings to section 3.3 and 3.4.
- 3.6 Arrows, Symbols and Letters
- .1 Prepare templates to match patterns supplied by Owner. Obtain approval of all templates prior to use.
- Arrows to be $\frac{3}{4}$ size of Transportation Association of Canada standards listed in the Uniform Traffic Control Devices for Canada.
- .2 Apply painted arrows, symbols, and letters in accordance with section 3.3.
- .3 Arrows, symbols, and letters applied with marking tape to section 3.4.