



**ONTARIO
PROVINCIAL
STANDARD
SPECIFICATION**

**METRIC
OPSS 1215
MARCH 1998**

MATERIAL SPECIFICATION FOR PROTECTION BOARD

TABLE OF CONTENTS

1215.01	SCOPE
1215.02	REFERENCES
1215.03	Not Used
1215.04	Not Used
1215.05	MATERIAL
1215.05.01	Composition
.02	Properties
.03	Indentation/Puncture
.04	Compatibility
.05	Weather Simulation and Bond
.06	Water Absorption
1215.06	Not Used
1215.07	PRODUCTION
1215.07.01	General
.02	Size
.03	Shipment and Delivery
1215.08	QUALITY ASSURANCE
1215.08.01	Size Measurements
.02	Indentation/Puncture Test
1215.08.02.01	Apparatus
.02	Specimen Preparation
.03	Procedure
1215.08.03	Compatibility
1215.08.03.01	Specimen Preparation
.02	Procedure

1215.08.04 Weather Simulation and Bond Tests

**1215.08.04.01 Sample Preparation
.02 Procedure**

1215.08.05 Water Absorption Test

**1215.08.05.01 Sample Preparation
.02 Procedure**

1215.09 Not Used

1215.10 Not Used

1215.01 SCOPE

This specification covers the material requirements for protection board for use with hot applied rubberized asphalt bridge deck waterproofing membranes.

1215.02 REFERENCES

This specification refers to the following standards, specifications or publications:

Ontario Provincial Standards Specifications, Construction:

OPSS 904 Concrete Structures
OPSS 914 Waterproofing Bridge Decks with Hot Applied Asphalt Membrane

Ontario Provincial Standards Specifications, Material:

OPSS 1103 Emulsified Asphalt
OPSS 1149 Hot Mix and Hot Laid Asphaltic Concrete, Including Recycled and Specialty Mixes
OPSS 1213 Hot Applied Rubberized Asphalt Waterproofing Membrane

American Society for Testing and Materials, Standards:

ASTM C 403-95 - The Test Method for Time of Setting of Concrete Mixtures by Penetration Resistance

ASTM D 3202-94 - Practice for Preparation of Bituminous Mixture Beam Specimens by Means of the California Kneading Compactor

1215.05 MATERIAL

1215.05.01 Composition

Protection board shall be formed of asphalt and fillers between two sheet materials.

1215.05.02 Properties

The board shall remain stable and free from perforations when placed according to OPSS 914.

1215.05.03 Indentation/Puncture

When tested according to the Quality Assurance section, the boards shall show no punctures. Indentations shall be local at least 0.25 mm and no greater than 0.9 mm deep.

1215.05.04 Compatibility

When tested according to the Quality Assurance section, the board shall show no evidence of puncture, delamination, pumping, stripping of the aggregates, or any signs of incompatibility between the boards and the asphaltic concrete or the waterproofing membrane.

1215.05.05 Weather Simulation and Bond

When tested according to the Quality Assurance section, the edge of the upper board shall not curl up more than 5 mm from the original horizontal position, and shall not delaminate within itself or debond from the waterproofing membrane.

1215.05.06 Water Absorption

When tested according to the Quality Assurance section, the specimens shall have a water absorption of no greater than 5% and shall show no deterioration such as stripping emulsification or loss of mass.

1215.07 PRODUCTION

1215.07.01 General

Under no circumstances shall the protection board or the board separating material placed on the top surface of the board, be changed, without the prior approval of the Owner.

1215.07.02 Size

The thickness shall be 3.6 mm \pm 0.4 mm. The width of the board shall be 1100 mm \pm 200 mm and the length of the board shall be 1500 mm \pm 200 mm. The board shall have straight edges, square corners, and edges free of burrs and breakaways.

Notwithstanding the size tolerance above, all sheets in a shipment shall be of the same length and width within a tolerance of \pm 5 mm and of uniform thickness within a tolerance of \pm 0.25 mm.

1215.07.03 Shipment and Delivery

The following information shall be clearly shown on each bundle of protection board:

- a. Brand Name
- b. Name of Manufacturer
- c. Date of Manufacture
- d. Instructions on handling, storage and application.

The material shall be so packaged as to permit shipping, handling, and storage without damage to the contents.

1215.08 QUALITY ASSURANCE

1215.08.01 Size Measurements

Thickness measurements will be made at ten locations on the board and these locations will be determined by the Owner.

1215.08.02 Indentation/Puncture Test

1215.08.02.01 Apparatus

Apparatus will be according to ASTM C 403.

The needle used in the test will be flat ended and 9.1 mm in diameter. A steel base plate with a circular hole 5 mm larger than the diameter of the needle will be positioned in the testing apparatus so that the hole is centred under the needle.

1215.08.02.02 Specimen Preparation

Three 100 mm x 100 mm specimens will be cut from the board and conditioned along with the base plate for two hours at $94^{\circ}\text{C} \pm 2^{\circ}\text{C}$.

1215.08.02.03 Procedure

Immediately after conditioning, the base plate will be placed into the apparatus and the specimen will be centred on the plate and a load of 89 N will be applied for five seconds with the needle. This procedure will be repeated for three specimens.

1215.08.03 Compatibility

1215.08.03.01 Specimen Preparation

Two specimens will be prepared. A 5 ± 1 mm, layer of waterproofing membrane, according to OPSS 1213, will be applied to one of the larger faces of each of two 381 mm x 83 mm x 50 mm concrete bases cured according to OPSS 904.

Immediately after the application of the membrane, two pieces of protection board 196 mm x 83 mm will be applied to each base to provide a 12 mm overlap at the centre of the base.

A coating layer of SS-1 emulsion according to OPSS 1103 will be applied to the surface of the board and allowed to set according to OPSS 914.

40 mm of loose hot mix HL4 mm according to OPSS 1149 will be compacted in one lift over each specimen by applying 180 tamps to each from a California Kneading Compactor according to ASTM D 3202.

The temperature of the asphalt during compaction will be $120^{\circ} \pm 5^{\circ}\text{C}$. The foot pressures shall be as follows:

- 40 tamps @ 517 kPa
- 40 tamps @ 689 kPa
- 40 tamps @ 1380 kPa
- 60 tamps @ 2070 kPa

Immediately after compaction a static load will be applied to each specimen by a compression machine. The load will be applied at a rate of 6.4 mm per minute until the maximum applied load of 2760 kPa is reached. The load will be maintained at that level for one minute, then slowly released.

When the specimens are cooled to room temperature and removed from their moulds, they will be placed, concrete face down, on a smooth flat surface.

Both specimens will be cured for seven days at room temperature. One specimen will be oven aged for an additional 24 hours at $60^{\circ} \pm 2^{\circ}\text{C}$ and then cooled to $23^{\circ} \pm 2^{\circ}\text{C}$.

1215.08.03.02 Procedure

After the conditioning period the composite samples will be examined for compatibility requirements specified in the Materials section.

1215.08.04 Weather Simulation and Bond Tests

1215.08.04.01 Sample Preparation

A layer of hot poured rubberized asphalt waterproofing membrane 5 ± 1 mm thick will be applied to a 300 x 300 x 75 mm concrete base according to OPSS 914.

Two pieces of protection board cut 159 mm x 300 mm to provide an 18 mm overlap at the centre of the concrete base will be applied immediately after the application of the membrane and allowed to condition at $23^{\circ} \pm 2^{\circ}\text{C}$ for a minimum of 30 minutes.

1215.08.04.02 Procedure

The board will be ponded with water to a depth of 6 mm above the top surface for 30 minutes then drained and dried under a 250 watt heat lamp centrally located above the specimen at a height of 400 ± 5 mm for 2 hours.

The procedure will be repeated a second time on the same day and an additional time the following day.

Following the third cycle, two parallel cuts 100 ± 5 mm long will be made near the centre of the sample, 25 mm apart through the upper protection board from the overlapped edge with a sharp knife. The cuts will be perpendicular to the edge and down to the concrete surface. The parallel cuts shall be made no sooner than 4 h nor later than 24 h after removal of the heat lamp. The sample shall be maintained at a temperature of $23^{\circ} \pm 2^{\circ}\text{C}$ during the test.

The board shall not separate from the waterproofing when a peeling force of 0.6 N/mm is applied to the exposed edge of the overlap of the 25 mm wide strip.

1215.08.05 Water Absorption Test

1215.08.05.01 Sample Preparation

Two specimens of protection board 150 mm x 50 mm will be cut.

1215.08.05.02 Procedure

The specimens will be oven dried to a constant mass at $60^{\circ} \pm 1.1^{\circ}\text{C}$. The mass of the specimens before and after drying will be recorded. The specimens will then be submerged horizontally under 25 mm of water three times as follows:

First Immersion:

The water temperature will be $23^{\circ} \pm 2^{\circ}\text{C}$ and the duration of the immersion will be 4 hours.

Second Immersion:

The water temperature will be $23^{\circ} \pm 2^{\circ}\text{C}$ and the duration of the immersion will be 20 hours.

Third Immersion:

The water temperature will be $60^{\circ} \pm 2^{\circ}\text{C}$ and the duration of the immersion will be 80 hours.

After each immersion the specimens will be towel dried and the mass recorded.

The percent mass loss or gain from the original oven dry mass will be recorded.