

 <b>Winnipeg</b> PUBLIC WORKS DEPARTMENT • SERVICE DES TRAVAUX PUBLICS Engineering Division • Division de l'ingénierie	<b>Effective Date: November 15, 2022</b>
	<b>DIVISION 4</b>
<b>CW 3140 – R1</b>	<b>SUPPLY AND INSTALLATION OF PAVEMENT REPAIR FABRIC</b>

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## 1. DESCRIPTION

### 1.1 General

1.1.1 This specification covers the supply and installation of pavement repair fabrics for reinforcement of asphalt layers, distribution of loads, and reducing reflective cracking distresses.

### 1.2 Definitions

1.2.1 Pavement Repair Fabric composed of fiberglass strands coated with an elastomeric polymer and formed into a grid structure.

1.2.2 Minimum Average Roll Value (MARV) is Property value calculated as typical minus two standard deviations. It shall yield a 97.7 percent degree of confidence that any sample taken during quality assurance testing will exceed the value reported.

1.2.3 Apertures are the open spaces formed between the interconnected network of longitudinal and transverse ribs of a fabric.

1.2.4 Type A Pavement Repair Fabric is composed of fiberglass strands coated with an elastomeric polymer and formed into a grid structure. It will be used for either localized repair reinforcement (*i.e.* at joints and cracks) or full-width asphalt reinforcement to minimize both thermal and stress-related reflective cracking.

1.2.5 Type B Pavement Repair Fabric is high-strength fabric in the cross-machine direction and will be used for localized repair reinforcement (*i.e.* at joints and cracks) where severe cracking conditions and heavy loadings are expected.

### 1.3 Referenced Standard Construction Specifications

1.3.1. CW 3110 – Sub-Grade, Sub-Base and Base Course Construction.

1.3.2. CW 3410 – Asphaltic Concrete Pavement Works

1.3.3. Approved Products for Surface Works.

## 2. MATERIALS

### 2.1 Approved Products

1.1.1 Use only those materials listed as Approved Products for Surface Works. The Approved Products are available at the City of Winnipeg, Corporate Finance, Material Management Internet site at:  
[https://www.winnipeg.ca/finance/findata/matmgt/std\\_const\\_spec/current/Docs/Approved\\_Products\\_Surface\\_Works.pdf](https://www.winnipeg.ca/finance/findata/matmgt/std_const_spec/current/Docs/Approved_Products_Surface_Works.pdf)

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## **2.2 Material Identification**

2.2.1. Pavement Repair Fabric shall be labelled in accordance with ASTM D4873/D4873M, and must clearly show the manufacturer name, product style number and roll number. Products without proper identification or labelling, mislabelling, or misrepresentation of materials shall be rejected.

## **2.3 Storage and Handling**

1.3.1 Pavement Repair Fabric rolls shall be elevated off the ground and adequately covered to protect them from site construction damage, precipitation, any contamination of dirt or dust and any other deleterious materials.

1.3.2 Pavement Repair Fabric rolls shall be protected from extended ultraviolet radiation including sunlight, chemicals that are strong acids or strong bases, flames including welding sparks, excess temperatures, and any other environmental conditions that may damage the physical properties of the fabric.

1.3.3 Store and handle the Pavement Repair Fabric in accordance with the manufacturer's recommendations. Manufacturer's data sheets shall include preparation instructions and recommendations as well as storage and handling requirements and recommendations.

## **2.4 Certification**

1.4.1 The Contractor shall provide Manufacturer's Mill Certificate and MARV Roll Data to the Contract Administrator prior to installation. The Certification shall state that the Pavement Repair Fabric meets MARV requirements as evaluated under the Manufacturer's quality control program. The Certification shall be attested to by a person having legal authority to bind the Manufacturer. The Pavement Repair Fabric shall be annually tested by accredited a third-party testing facility.

1.4.2 The Contractor shall provide a letter to the Contract Administrator stating the product name, manufacturer, style number, and other pertinent information to fully describe the Pavement Repair Fabric.

1.4.3 All testing and data shall be in accordance with approved ASTM standards. Data reported in accordance with other standards will not be accepted.

## **2.5 Pavement Repair Fabric Properties**

2.5.1. Pavement Repair Fabric shall consist of a high strength, fiberglass grid custom knitted and coated with an elastomeric polymer and self-adhesive glue with square or rectangular opening configurations.

2.5.2. The axis with the least strength will be taken as the ultimate strength of the fabric for any given property.

2.5.3. Type A Pavement Repair Fabric shall meet the requirements in Table CW 3140.1.

**Table CW 3140.1 – Type A Pavement Repair Fabric Property Requirements**

Physical Property	Machine Direction	Cross-Machine Direction	Test Method
Tensile Strength, Minimum	100 kN/m	100 kN/m	ASTM D 6637
Tensile Strength @ 2% Strain, Minimum	80 kN/m	80 kN/m	ASTM D 6637
Secant Stiffness EA at 2% Strain	4,000 kN/m	4,000 kN/m	ASTM D 6637
Elongation at Break, Maximum	3%		ASTM D 6637
Coating Softening Point, Minimum	150 °C		ASTM D 36
Coating Melting Point, Minimum	350 °C		ASTM D 276
Glass Melting Point, Minimum	820 °C		ASTM D 338
Mass/Unit Area, Minimum	420 g/m <sup>2</sup>		ASTM D 5261

2.5.4. Type B Pavement Repair Fabric shall meet the requirements in Table CW 3140.2.

**Table CW 3140.2 – Type B Pavement Repair Fabric Property Requirements**

Physical Property	Machine Direction	Cross-Machine Direction	Test Method
Tensile Strength, Minimum	100 kN/m	200 kN/m	ASTM D 6637
Tensile Strength @ 2% Strain, Minimum	80 kN/m	160 kN/m	ASTM D 6637
Secant Stiffness EA at 2% Strain	4,000 kN/m	8,000 kN/m	ASTM D 6637
Elongation at Break, Maximum	3%		ASTM D 6637
Coating Softening Point, Minimum	150 °C		ASTM D 36
Coating Melting Point, Minimum	350 °C		ASTM D 276
Glass Melting Point, Minimum	820 °C		ASTM D 338
Mass/Unit Area, Minimum	420 g/m <sup>2</sup>		ASTM D 5261

2.5.5. All physical property requirements are Minimum Average Roll Values (MARV) determined in accordance with ASTM 4759. Values not labelled as MARV will not be accepted.

2.5.6. Aperture Sizes shall be as follows:

2.5.6.1. Between 10 mm and 14 mm for pavement repair fabric immediately below or within Type 1A asphalt layer.

2.5.6.2. Between 19 mm and 25.4 mm for pavement repair fabric immediately below or within Type III asphalt layer.

2.5.7. If the fabric has a rectangular aperture size, the smaller dimension shall be used to establish the suitable Pavement Repair Fabric.

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### 3. CONSTRUCTION METHODS

- 3.1. Pavement Repair Fabric shall not be placed when weather conditions, in the opinion of the Contract Administrator, are not suitable for installation including heavy rainfall, extreme cold or frost conditions, or extreme heat.
- 3.2. Make all repairs as required prior to placement of Pavement Repair Fabric. Seal cracks and fill holes using a method that provides a proper level surface. Receiving surface shall be smooth, with the existing cracks pretreated.
- 3.3. Surfaces shall be mechanically cleaned by sweeping and vacuuming and be free of oil, vegetation, sand, dirt, water, gravel, and other contaminants prior to placement of Pavement Repair Fabric.
- 3.4. Pavement Repair Fabric placement should not be undertaken if rain is likely to fall prior to covering the fabric with an asphalt mat overlay. Pavement Repair Fabric that is placed and will not adhere due to moisture shall be removed and replaced at the Contractor's expense.
- 3.5. Pavement Repair Fabric shall be laid out by mechanical means or by hand using sufficient pressure to eliminate ripples. Remove any ripples by pulling the fabric tight. Cutting of the fabric may be permitted on tight radii to prevent ripples.
- 3.6. Transverse joints shall be overlapped 75 mm or as recommended by the manufacturer, whichever is greater. Longitudinal joints shall be overlapped 37.5 mm or as recommended by the manufacturer, whichever is greater.
- 3.7. Prior to the asphalt topping placement, the fabric shall be inspected by the Contract Administrator for damage during installation. Damaged fabric shall be removed and replaced at the Contractor's expense.
- 3.8. Activate self-adhesive glue by rolling with a rubber coated drum roller or a pneumatic tire roller. In no instance shall steel-wheeled or vibratory rollers be used. Rolling shall continue until the adhesive is activated and the fabric is bonded to the leveling course.
- 3.9. Roller tires shall be kept clean to the satisfaction of the Contract Administrator.
- 3.10. If bonding of the fabric is not readily achieved, it shall be removed and replaced at the Contractor's expense.
- 3.11. Pavement Repair Fabric shall be laid and rolled over ironworks (e.g., manhole covers). Once the fabric has been rolled, those portions covering the ironworks shall be removed by cutting the fabric with a utility knife or other methods approved by the Contract Administrator.
- 3.12. Protect the Pavement Repair Fabric until placement of the finished asphalt topping.
- 3.13. Where a tack coat or emulsified asphalt is specified, the approved tack coat/emulsion and dose should be used as recommended by the manufacturer in conjunction with the Pavement Repair Fabric. Tack coat or emulsified asphalts shall not be diluted. Unless otherwise recommended by the manufacturer, apply tack coat or emulsified asphalt at the rate of 0.35 liters per square meter of surface area.

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- 3.14. Where tack coat or emulsified asphalt is placed prior to the fabric, it must fully cure prior to placement of the fabric. Where tack coat or emulsified asphalt is placed after the fabric, it must fully cure prior to construction traffic, including paving, travelling on the surface.
- 3.15. Prevent spattering of tack coat or emulsified asphalt when placed adjacent to curbs, gutters, structures and other adjacent surfaces. Clean any surfaces where it has been contaminated by the tack coat or emulsified asphalt.
- 3.16. Leveling course or overlay layer shall be a minimum thickness of 40 mm. Place and compact asphalt over the Pavement Repair Fabric in accordance with CW 3410.

#### **4. QUALITY ASSURANCE TESTING**

- 4.1. The Contract Administrator shall test the adhesion for pavement repair fabric in field during construction is as follows:
  - 4.1.1 Place approximately 1 m<sup>2</sup> of fabric on a prepared surface that is representative of the project conditions.
  - 4.1.2 Activate self-adhesive glue by rolling with a rubber-tired roller or by applying adequate pressure to fully activate the pressure-sensitive adhesive.
  - 4.1.3 Use a calibrated spring balance by inserting the hook of the balance under the centre of the fabric and pulling upward until the fabric starts to pull away from the surface.
  - 4.1.4 A 9 kg pull is required without pulling the grid free or creating ripples in the fabric.
- 4.2. The minimum frequency shall be one test, then test every 2000 square meters.

#### **5. MEASUREMENT AND PAYMENT**

- 5.1. Supply and installation of Pavement Repair Fabric will be measured on an area basis and paid for at the Contract Unit Price per square metre for "Supply and Install Pavement Repair Fabric". The area to be paid for will be the total number of square metres of Pavement Repair Fabric, supplied and installed in accordance with this specification, accepted and measured by the Contract Administrator.
- 5.2. Only material placed within the designated limits will be included in the payment for "Supply and Install Pavement Repair Fabric".
- 5.3. No measurement or payment will be made for Pavement Repair Fabric removed and replaced due to improper installation or damaged materials.
- 5.4. No measurement or payment will be made for transverse and longitudinal overlap.