

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 45 00 – Quality Control.
- .3 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .4 Section 03 30 00 - Cast-In-Place Concrete.
- .5 Section 03 30 51 – Concrete Bridge Decks.

1.2 MEASUREMENT FOR PAYMENT

- .1 See Section 01 29 00 – Payment Procedures.

1.3 REFERENCES

- .1 ASTM C719-14, Standard Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement (Hockman Cycle).
- .2 ASTM C793-05 (2010), Standard Test Method for Effects of Laboratory Accelerated Weathering on Elastomeric Joint Sealants.
- .3 ASTM C1193-13, Standard Guide for Use of Joint Sealants.
- .4 ASTM C1330-02 (2013), Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.
- .5 ASTM D412-06a (2013), Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers – Tension.
- .6 ASTM D2240-05 (2010), Standard Test Method for Rubber Property – Durometer Hardness.
- .7 ASTM D5893/D5893M-10, Standard Specification for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements.

1.4 SUBMITTALS

- .1 Submit product data including printed product literature and data sheets in accordance with Section 01 33 00 – Submittal Procedures. Data to include product characteristics, performance criteria, physical size, finish and limitations.
- .2 Submit samples in accordance with Section 01 33 00 – Submittal Procedures.
 - .1 Submit sample for color selection.
 - .2 Submit sample for verification. Provide samples in color offered with joint sealants formed between two 150 mm long strip of material matching appearance of surfaces adjacent to joint sealants.

- .3 Submit manufacturer's instructions in accordance with Section 01 33 00 – Submittal Procedures.
 - .1 Include preparation and installation instructions for each product used.
- .4 Submit standard drawings illustrating manufacturer's recommended sealant joint profiles and dimensions applicable to Grande Anse Bridge Rehabilitation. Indicate width, width-to-depth ratio, thickness of joint sealant, and depth of recess limitations recommended by manufacturer.
- .5 Preconstruction field-adhesion test reports.
- .6 Field quality control adhesion test reports.

1.5 QUALITY ASSURANCE

- .1 Preconstruction Field-Adhesion Testing: Prior to installing pavement sealants, field test adhesion to joint substrates using ASTM C1193 method A. Verify adhesion is adequate. Modify joint preparation recommendations for failed joints and re-test. Submit written report to Departmental Representative.

1.6 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, handle, store and protect materials to prevent damage to packaging.
- .2 Deliver and store materials in original wrappings and containers with manufacturer's seals and labels, intact. Protect from freezing, moisture, water and contact with ground or floor.
- .3 Replace defective or damaged materials with new.

1.7 WASTE MANAGEMENT

- .1 Separate waste materials for disposal in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facility.
- .3 Unused sealer material must not be disposed of into the river, on to the ground or in other locations where it will pose health or environmental hazard.
- .4 Divert unused sealer material from landfill to official hazardous material collections site approved by Departmental Representative.
- .5 Empty plastic joint sealer containers are not recyclable. Do not dispose of empty containers with plastic material destined for recycling.
- .6 Fold up metal banding, flatten, and place in designated area for recycling.

1.8 PROJECT CONDITIONS

- .1 Environmental Limitations: conform to manufacturer's written instructions.
 - .1 Do not install sealant during inclement weather or when such conditions are expected. Allow wet surfaces to dry.
 - .2 Do not install sealants when temperature is above 50°C or below 4.4°C.

- .3 Do not install sealant when temperature is at or below dew point (the temperature at which the air is saturated with moisture vapor and liquid water (dew) begins to form).
- .2 Substrate Conditions:
 - .1 Do not proceed with installation of materials until contaminants capable of interfering with adhesion are removed from substrates.

1.9 ENVIRONMENTAL REQUIREMENTS

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of Material Safety Data Sheets (MSDS) acceptable to Labour Canada.
- .2 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.

Part 2 Products

2.1 MATERIALS

- .1 Two component, 100% silicone rubber sealant designed to seal joints and accommodate typical thermal movements to the following requirements:

<u>Test Method as Supplied</u>	<u>Test</u>	<u>Value</u>
MIL-2-8802	Extrusion Rate, g/min	200-550
ASTM D1475	Specific Gravity	1.25-1.35
As Installed - at 25°C (77°F) and 50 percent RH		
CTM2 0093	Skin-Over Time, minutes, maximum	20
CTM 0208	Non-Volatile Content, percent minimum	93
ASTM D3585	Joint Elongation, percent minimum	600
ASTM D3583	Joint Modulus at 100 percent, psi (kPa)	3-12 (21-83)
Performance ASTM C719	Movement, 10 cycles at +100/-50 percent, joints 1-3" (25.4-76.2mm) wide Accelerated	Pass
ASTM D793	Weathering at 5,000 hours	No cracks, blisters or bond loss
<u>Joint Cure Rate, percent of total cure</u>	<u>Hours</u>	
50 percent	4-6	
75 percent	24	
100 percent	48-160	

Part 3 Execution

3.1 JOINT SEALANT APPLICATION

- .1 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil, grease, and other matter which may impair Work using materials and methods recommended by sealant manufacturer.
- .2 Ensure joint surfaces are dry and frost free.
- .3 Prepare surfaces in accordance with manufacturer's directions.
 - .1 Remove laitance, form-release agents, dust, and other contaminants.
- .4 Mask adjacent surfaces to prevent staining or damage by contact with sealant or primer.
- .5 Prime joint substrates when recommended by sealant manufacturer or when indicated by preconstruction testing. Apply recommended primer using sealant manufacturer's recommended application techniques. Allow to dry according to manufacturer's recommendations prior to sealant application.
- .6 Select joint backing materials recommended by sealant manufacturer to be compatible with sealant material. Install backing material at depth required to produce profile of paving sealant allowing optimal sealant movement. Install continuously without gaps, twisting, stretching, or puncturing backing material. Use gauge to ensure uniform depth to achieve correct profile, coverage, and performance.
- .7 Apply sealant to manufacturer's instructions. Comply with recommendations in ASTM C1193.
 - .1 Tool non-sag type sealants immediately with appropriately shaped tool to force sealants against joint backing and joint substrates, eliminating voids and ensuring full contact.
 - .1 Provide concave, smooth, uniform, sealant finish. Eliminate air pockets and ensure complete contact on both sides of joint opening.
 - .2 Tool joints with one continuous stroke.
 - .3 Use tooling agents recommended by sealant manufacturer for application.
- .8 Curing: to manufacturer's recommendations.
- .9 Cleanup.
 - .1 Clean adjacent surfaces immediately and leave work neat and clean.
 - .2 Remove excess and droppings, using recommended cleaners as work progresses.
 - .3 Remove masking tape after initial set of sealants without disturbing seal.
- .10 Apply sealant to the following:
 - .1 Between bridge deck curb and curb on approach slab, including curb joints.
- .11 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter which may impair Work.
- .12 Ensure joint surfaces are dry and frost free.

- .13 Prepare surfaces in accordance with manufacturer's directions.
- .14 Apply sealant to manufacturer's instructions.
- .15 Curing: to manufacturer's recommendations.
- .16 Cleanup:
 - .1 Clean adjacent surfaces immediately and leave Work neat and clean.
 - .2 Remove excess and droppings, using recommended cleaners as work progresses.
 - .3 Remove masking tape after initial set of sealant.

3.2 WARRANTY

- .1 Products applied under this Section shall include a three-year performance warranty beyond the manufacturer's normal one-year warranty.

END OF SECTION