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SAI Global



TECHNICAL BULLETIN #26

SAMifilla BRIDGE JOINT SYSTEM

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Description

SAMifilla Bridge Joint System is a flexible bridge joint system used to seal bridge expansion joints in both bituminous and Portland cement concrete pavements. The system consists of a combination of a specially formulated rubberised sealant, and selected aggregate. A high aggregate content is essential as it is the mechanical strength derived from the confined interlocking stones that provide the load bearing characteristics of the joint system.

Benefits

SAMifilla Bridge Joint System has high elasticity, is tough, and can be overlaid with asphalt or spray seal. The system provides a flexible and watertight seal of movement and construction joints on bridges and elevated structures.

Ingredients

The SAMifilla Bridge Joint System is a combination of SAMifilla HM and graded spray sealing aggregate. The aggregate should be of good quality, clean and dry (preferably pre-coated), and typically of 14mm size. If the depth of the joint is less than 40mm then a smaller sized aggregate may be more appropriate. A blend of aggregate sizes is recommended for joints 70mm – 175mm in depth. This blend will reduce the possibility of “depressions” forming in the wheel tracks of the deeper joints. The recommended aggregate blend is 40%-14mm, 30%-10mm and 30%-7mm aggregate. Other aggregate blends may also be suitable.

Generally the volume of the joint being filled will be about 65-70% aggregate and 30%-35% SAMifilla HM, however this will vary depending on the aggregate size and compaction.

Primer used for the preparation of the joint is SAMIprime QDP.

Caulking needs to be able to withstand 200°C.

Application

The movement capability of the system is dependent on both width and depth dimensions. The ideal depth of the joint should be 70mm - 100mm to ensure that adequate adhesion to the sides of the joint is obtained, however 40mm is considered minimum. The ideal width of the joint is between 200mm – 350mm, and up to a maximum width of 500mm. Lesser width joints can also be suitably constructed in a similar way.

The Bridge Joint System is installed by forming a rebate in the bridge surfacing at the joint either by saw cutting and removing the existing overlay (or by removing an existing defective joint). Saw cut through the full depth of existing asphalt. Break out this material and clean the joint, the gap between the concrete members, and surrounding area using compressed air, ensuring a clean dry surface.

Caulk the gap below the base of the joint to be filled with a suitable caulking material, caulked 60-80mm below the surface. Prime the entire joint with SAMIprime QDP (brush or spray on). When the SAMifilla HM is heated to between 170-185°C, fill the gap above the caulking to the base of the joint with SAMifilla HM and “over-fill”. To prevent the punching action of traffic and to act as a bond breaker it is recommended to cover the filled gap with a plate (see guide on page 2) fixed it to the bridge deck along one side of the joint to hold it in place (central locating pins attached to the plate could be used as an alternative). If the gap is less than 30mm then an aluminium flashing strip may be used and does not necessarily need to be fixed in place provided the flashing width is sufficient to cover the gap when allowing for bridge expansion movement.

If repairing existing joints and there is a steel plate covering the gap then this plate should be re-used. Either remove the plate completely to enable re-sealing of the gap, or the plate may be left in place (check with the Engineer).

Once the plate is installed, apply a liberal coating of hot SAMIfilla HM to the bottom of the joint (about 5mm thick) then immediately apply the first layer of aggregate (20mm depth). Hand tamp the aggregate in to place. Continue filling the joint in layers using this process and when each layer of SAMIfilla HM is poured (or sprayed), ensure about 2-5mm of the aggregate is left above the SAMIfilla HM layer as this provides a good interlocking surface for the next layer of aggregate.

The final surface layer of aggregate should be similar in appearance to a spray sealed surface. A smaller sized aggregate may be used to give the finished surface of the joint a texture that may better suit the wearing course either side of the joint. Slightly overfill the joint, as the SAMIfilla HM will shrink on cooling to ambient temperature. Allow the SAMIfilla HM to cool down to ambient temperature prior to trafficking.

If the surface level of the joint does drop once the joint system has cooled, then another layer of SAMIfilla HM and finish surface aggregate can be easily applied at any time using the same process as filling the joint. If this is done, ensure all loose aggregate is removed and the surface is clean and dry prior to adding another layer.

Typical Properties of the Bridge Joint Binder (SAMIfilla HM)

| Test Reference | Test | Unit | SAMIfilla HM |
|-------------------------|--|-------|--------------|
| ASTM D5 | Penetration at 25°C | dmm | 20 - 50 |
| ASTM D5329 (12) | Resilience at 25°C recovery | % | report |
| ASTM D5329 (8) | Flow at 70°C, 72 hours | mm | report |
| RTA T505**or AS 2341.18 | Softening point | °C | 90 min. |
| MBT 11** | Brookfield viscosity at 180°C, spindle #29 | Pa.s | 3 max. |
| RTA T736 | Flow at 60°C, 5 hours | mm | 5 max. |
| SAMI-IT-09B-7 | Flow at 70°C, 5 hours | mm | report |
| AS 2341.11 | Elongation at 25°C | % | 300 min. |
| SAMI-IT-09B-15 | Relative density at 15°C | ratio | 1.05 min. |
| ASTM D5329 (18) | Low temperature flexibility over a 90° angle bend without cracking | °C | 0 max. |

** routine tests

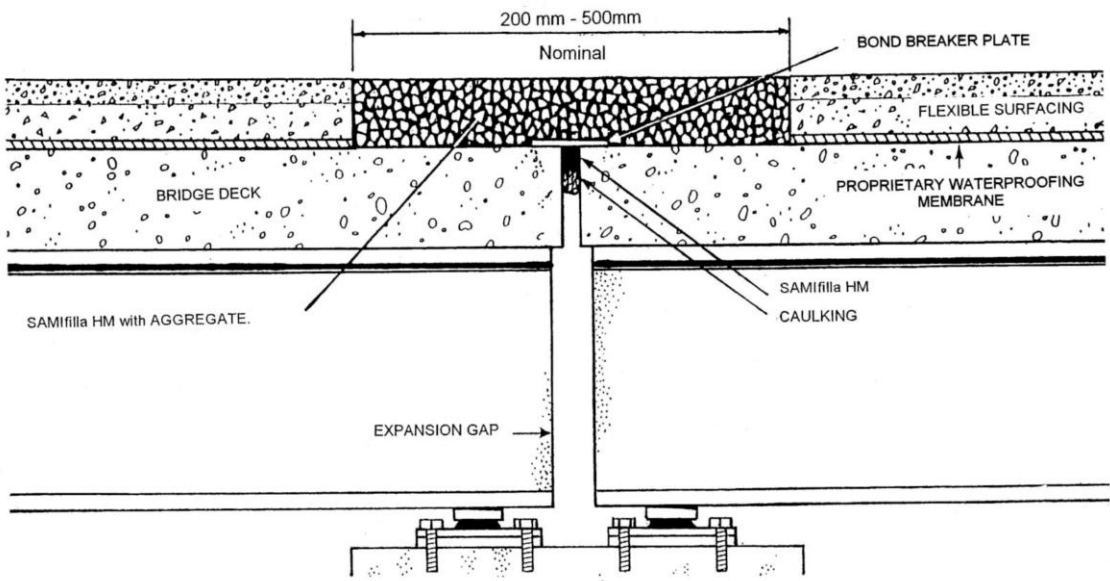
Guide for Expansion Gap Plate Sizes

| Gap Width | Plate Size | Width |
|--------------|-------------------------------|---------|
| Up to 30mm | Aluminium Flashing | nominal |
| 30mm - 50mm | 3mm thick (maximum 2.0m long) | 150mm |
| 50mm - 70mm* | 6mm thick (maximum 2.0m long) | 175mm |

*Where the gap is greater than 70mm wide, contact SAMI for recommendations on plate size.

This document should be read in conjunction with the SAMIfilla Bridge Joint System “**Typical Section Through Bridge Joint**” diagram which forms page 3 of this technical bulletin, also the technical bulletins for SAMIfilla HM (Technical Bulletin #27), SAMIprime QDP (Technical Bulletin #35) and the Material Safety Data Sheets.

NOTE: Whilst every care is taken in the preparation of this bulletin, no responsibility is accepted for the interpretation of the information contained herein, nor is any warranty expressed or implied for the suitability of the material for a particular purpose.



Typical Section Through Bridge Joint
SAMifilla Bridge Joint System