DEPARTMENT *of* INFRASTRUCTURE, ENERGY *and* RESOURCES, TASMANIA

BRIDGEWORKS SPECIFICATION

B23-PENETRATING SEALERS AND COATINGS FOR CONCRETE OCTOBER 2006

Previously MB13

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B23.1 SCOPE

This Specification sets out the requirements for the preparation, supply and application of penetrating sealers and coatings to concrete surfaces for the purpose of controlling the ingress of water, chlorides, sulphates or carbon dioxide.

B23.2 EXTENT OF WORKS

The extent of works shall be as detailed on the drawings or in the Specification.

B23.3 MATERIALS

B23.3.1 Silanes

Silanes shall be methyl or butyl silanes suitable for application to concrete surfaces.

Butyl silanes shall comply with the following requirements:

- the material shall be monomeric isobutyl triethoxy silane
- the material shall be 100% active, with no diluting by solvent or other fluid
- the material shall posses the following properties:
  - specific gravity 0.88
  - refractive index 1.40
  - active component content 98-100%
  - flashpoint 60^{o}C
- the material shall remain in its original sealed containers until use
- the storage area shall be cool, dry and protected from direct sunlight. Relevant warning signs shall be displayed
- each consignment of materials shall be accompanied by a manufacturer's certificate confirming specified composition properties and date of manufacture
- any material which has been stored beyond the manufacturer's recommended shelf life shall not be used.

B23.3.2 Silane-Siloxane Mixtures

Silane-siloxane mixtures including organic carriers shall be suitable for application to concrete surfaces.

B23.3.3 Top Coats

Top coats shall be compatible with the silane or silane-siloxane base coat and shall comply with Australian Paint Approval Scheme specification 0117/3 Medium build latex long life low profile texture coating for exterior concrete and masonry.

B23.3.4 Xypex ♦

Xypex crystal growth waterproofing may be used as an alternative to silane.

Treatment shall consist of a coating of Xypex concentrate followed by a coating of Xypex modified.

B23.4 PREPARATION ♦

Defects in the concrete surface shall be repaired in accordance with specifications B15 and B16.

Oil, grease, loose particles, decayed matter, moss, algal growth, curing components and laitance shall be removed from all surfaces to be coated by the use of high pressure water jetting using potable water. Abrasive blasting may be required with tightly adhering materials.

After cleaning, the surfaces shall be allowed to stand to dry for not less than 72 hours before silane impregnation commences. Areas to be treated shall be, where necessary, protected from adverse weather conditions and shall be surface dry for a minimum of 24 hours before application commences. Artificial drying of the surface shall not be permitted. Requirements for tidal and splash zones are detailed as part of application requirements.

For Xypex application the areas shall be thoroughly wetted prior to product application.

B23.5 PRE-APPLICATION TESTING

If directed by the Superintendent the Contractor shall undertake pre-application testing of silane or siloxane materials.

Two areas of the structure, each of minimum area of one square metre, will be designated by the Superintendent prior to work commencing and impregnated with material in accordance with this specification at the Contractor's cost.

On completion of the trial, a core 50 mm in diameter and not less than 25 mm deep, using a dry method of coring, shall be taken from each area. The samples will be tested by the supplier, or other approved laboratory, to confirm the depth of penetration. The average depth of penetration is to be the standard and control for future works.

Treated and untreated areas may also be tested to measure the rate of absorption. The percentage decrease in absorption will then become a standard and control for the works.

B23.6 APPLICATION

B23.6.1 Silanes and Siloxanes

Silanes and siloxanes shall be applied by an airless spray pump system with a nozzle pressure not exceeding 70 kPa. Water shall be prevented from entering any part of the system.

Impregnation shall be carried out in a series of continuous operations. The material shall be applied by a continuous spray technique giving saturation flooding, working from the lowest level upwards. There shall be a minimum run down of 150 mm and the treated area shall have a "wet look" for 5 seconds.

Two applications shall be made each at a coverage rate of 300 ml per sq. m with a minimum interval between coats of at least 6 hours.

On soffits the material is to be applied to give a "mirror wet look" for at least 5 seconds per coat.

In a tidal or splash zone, application of the first coat shall not commence until the tide has reached its lowest level as the tide recedes, and the surface has no visual surface water. The Contractor shall allow a "drying out" time of at least 14 days before applying the second coat using the same technique as above.

The outdoor temperature and the temperature of the substrate shall be within the range of 0 to 45^{o}C. Where the atmospheric humidity is extremely low in conjunction with a very dry substrate and a high outdoor temperature a light mist spray of fresh water shall be applied over the treated surface after the material has been absorbed.

Impregnation shall not be carried out in rain or strong winds.

Bearings, painted steel surfaces, plastic, exposed bituminous materials and joint sealants adjacent to members to be impregnated shall be masked-off before impregnation. Members shall be protected from rain and other contamination during application and for at least six hours after completion. Plants in the vicinity shall be protected against contact with the material.

Although etching will not result, any residue formed by the material on glass, wood or metal by contact shall be removed immediately by an alcohol based cleaning agent.

Additional visual monitoring of the application of the material shall be made, as determined by the Superintendent, by mixing a spirit based fugitive dye such as “Elbasol Blue 2B” (by Hodgson Dye Agencies Pty Ltd telephone (02) 211 4633) at a rate of 0.2% i.e. 400 grams per 200 litres of the silane material.

B23.6.2 Xypex ♦

Xypex shall be applied in accordance with the manufacturers recommendations by brush, trowel or spray.

B23.6.3 Top Coats ♦

Top coats shall be applied to achieve a pinhole free coating with a minimum dry film thickness of 150 microns.

Xypex shall not be top coated.

B23.7 TESTING DURING AND AFTER IMPREGNATION

The Superintendent may undertake audit tests during and after impregnation.

B23.8 SAFETY ASPECTS

The silane material is a combustible liquid. The Materials Safety Data Sheet and recommended handling procedures from the manufacturer shall be supplied with the Tender.

B23.9 PAYMENT

Payment for the supply and application of concrete coatings shall be at the items as listed in the Schedule of Rates.

Payment shall include the provision of all plant, labour and materials required for access, surface preparation, application of coatings, protection from weather and shielding of traffic, pedestrians and vegetation, all testing and the disposal of any debris.