SPECTON CONSTRUCTION PRODUCTS LTD.

SPEC-IT

SPEC*ton* **I***njection* **T***echnique*

TYPICAL SPECIFICATION PRECAST MANHOLE JOINT SEALING

1 GENERAL

1.1 Description of Work

a) Furnish all labour, materials, tools and equipment and perform all operations necessary for the sealing of leaking joints using polyurethane injection resins.

b) Clean existing manhole to remove any debris or other foreign materials prior to undertaking the manhole joint sealing operation.

c) Drill 11/16" holes or diameter suited to the injection header in order to intersect the precast joints or leaking area. Drill a sufficient number of holes to ensure complete resin penetration into the joints.

d) Inject polyurethane resin to fill cracks, voids and honeycombed areas until a water-tight seal has been constructed.

e) Upon completion of the work, remove all injection-related materials from the work area, and remove all debris from the site.

1.2 Quality Control

a) Polyurethane injection resins shall be installed in accordance with supplier's Instructions and as indicated on the Contract Drawings.

b) The applicator shall have a minimum of 3 years experience performing similar work and be authorized by the supplier for performing polyurethane resin injection of the nature specified.

2 PRODUCTS

2.1 Manhole Repairs

Polyurethane injection resins for sealing leaking manhole joints shall conform with the following specification:

- one-component, water-activated type, polyurethane prepolymer
- optional accelerator to provide for faster cure times as required
- allows water:resin mix ratios from 1:1 to 8:1 to be utilized
- cure times <60 seconds at 0˚C and <30 seconds at 20˚C at 8:1 mix ratio
- creates a flexible, hydrophilic, gel-like end product when cured
- cured product to be chemically stable and non-biodegradable
- 100% solids content, solvent-free and non-flammable
- MDI-based polyurethane resin with flash point above 150˚C
- suitable for cold temperature use above 0˚C
- viscosity – 1100 cps at 20°C.

Acceptable product meeting this specification is:
SPECTON ELASTOGEL *GT1100* **RESIN**

2.2 Other Requirements

a) All materials shall be delivered to the site in undamaged, unopened containers bearing the supplier's original labels.

b) WHMIS labels on all containers shall conform with Canadian regulations, including English and French risk phrases.

c) MSDS for all materials shall conform with Canadian regulations.

d) No materials shall be used which are manufactured from or contain toluene diisocyanate (TDI), toluene, acetone or acrylamide.

e) No materials shall be used which are flammable or which display shipping Class 3 red warning labels.

3 EXECUTION

3.1 Workplace safety

Supply workmen with appropriate safety equipment for performing high-pressure injection of polyurethane resins and associated tasks. Supply safety devices, traffic control barriers and other items to protect the site and other personnel from contact with the contractor's materials or equipment.

3.2 Site Services

Except as otherwise specified, supply electric power, compressed-air and water required for the purposes of undertaking the work. All construction debris and empty containers shall be removed from the site by the contractor and disposed of in accordance with applicable regulations.

3.3 Drilling Injection Holes

Drill 11/16" injection holes as required through the manhole wall to intersect cracks and joints. All drill holes shall be flushed with copious quantities of water to remove all dust and drilling debris from the hole prior to polyurethane injection.

3.4 Flushing Cracks Prior to Injection

Flush cracks and joints with water prior to proceeding with injection of polyurethane resin.

3.5 Installation of Sealing Materials

Install appropriate sealing materials along the crack or joint to be injected, where required, to minimize the loss of polyurethane injection resin. Suitable sealing materials may include hydraulic cement, epoxy bonders, polyester bonders, wooden shims, grout pads, tundra foam or oakum depending on site conditions.

3.6 Injection Equipment

Use air or electrically operated piston pumps, modified specifically for polyurethane resin injection. Pumps shall be equipped with gravity feed suction containers and shall feature an adjustable pressure limit switch to control the maximum pump output pressure and to provide automatic on/off pump operation. An Elastogel grout header shall be used to control the flow and ratio of polyurethane resin and water.

3.7 Handling of Injection Resins

Store polyurethane injection resins in an appropriate location prior to use to maintain the injection resin temperature between 15-25˚C.

3.8 Injection of Polyurethane Resins

Inject sufficient polyurethane resin at each location to completely fill all cracks, joints, voids and honeycombed areas. Avoid the use of excessive injection pressures. Continue injection until a permanent watertight barrier has been created.

3.9 Residual Joint Sealng Materials

Residual sealing materials and cured polyurethane shall be removed from the manholes. Upon completion of the work, manholes shall be left reasonably clean and all residual sealing materials and debris shall be removed from the site.

3.10 Records

Complete records shall be maintained of all manhole-sealing operations. Records shall identify the manhole section in which the joint sealing was done, the location of each joint sealed and the joint sealing verification results.

3.11 Supplier's Technical Specialist

A technical specialist representing the product supplier shall visit the site as required to examine site specific conditions and to make recommendations regarding material selection, injection equipment and application techniques.

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