**PART 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, drop sheets and other items to protect the site, other contents 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 are to be removed from the site by the contractor and disposed of in accordance with applicable regulations.

3.3 **DRILLING INJECTION HOLES**

Drill 3/8” injection holes at an angle of 60° to intersect cracks and joints beyond the mid-point of the wall or slab being injected. Drill hole spacing shall not exceed wall or slab thickness, and shall not exceed 300 mm under any condition. All drill holes shall be flushed with copious quantities of water to remove all dust and drilling debris from the hole prior to installing the injection packers.

3.4 **INSTALLING INJECTION PACKERS**

Install 3/8” plastic injection packers, complete with metal fittings, in accordance with supplier’s instructions.

3.5 **FLUSHING CRACKS PRIOR TO INJECTION**

Flush cracks with water prior to proceeding with injection of polyurethane resin. If acid flushing is required, use only MULTIURETHANES crack flushing agent diluted to a 5% solution in water and flush with copious quantities of water following acid injection.

3.6 **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 or backer rod, depending on site conditions.

3.7 **INJECTION EQUIPMENT**

Use an electrically-operated airless piston pump, modified specifically for polyurethane resin injection. The pump shall be equipped with gravity feed suction containers. It shall feature an adjustable pressure limit switch to control the maximum pump output pressure and to provide automatic on/off pump operation. A multiple grout header shall be used to control the flow of polyurethane resin and shall include a 0 - 3000 psi pressure gauge, flow control valves and a bypass - pressure relief valve.

3.8 **MIXING AND HANDLING OF INJECTION RESINS**

Follow recommended guidelines as per supplier’s product data sheets. Measure all materials using graduated containers and in appropriate quantities to suit site requirements.

3.9 **INJECTION OF POLYURETHANE RESINS**

Follow recommended guidelines as per supplier’s product data sheets and technical literature. 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 water-tight barrier has been created.

3.10 **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.
1.1 DESCRIPTION OF WORK

a) Furnish all labour, materials, tools and equipment, and perform all operations necessary for the repair of leaking concrete expansion joints using hydrophobic, water-activated polyurethane injection resin.

b) Remove all foreign material from expansion joint to expose interior concrete surfaces and flush with water to remove any debris.

c) Drill and flush 3/8" injection holes, install 3/8" plastic packers and prepare for subsequent injection of polyurethane resin.

d) Soak appropriate lengths and diameters of open-cell backer rod in liquid polyurethane resin and install to provide barriers at top and bottom of expansion joint, while creating a cavity along the interior of the expansion joint.

e) Apply temporary fabric strips and wooden formwork along top and bottom of expansion joint to confine polyurethane resin during installation.

f) Inject hydrophobic, water-activated polyurethane resin to fill remaining portion of concrete expansion joint until a water-tight seal has been constructed.

g) Upon completion of the work, remove all temporary formwork and 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 of experience performing similar work and be authorized by the supplier for performing polyurethane resin injection of the nature specified.

2.1 POLYURETHANE INJECTION RESIN

Polyurethane injection resins for repairing concrete expansion joints shall conform with the following specification:

- one-component, water-activated type
- flexible foam end product
- hydrophobic
- solvent-free and non-flammable
- fast-acting with variable curing rate
- cured product shall not shrink
- MDI-based polyurethane prepolymer with accelerator
- suitable for cold temperature use above 0°C
- viscosity - 600 cps at 20°C

Acceptable product meeting this specification is:

MULTIURETHANES FLEXIBLE RESIN

2.2 OPEN CELL BACKER ROD

Open cell backer rod for repairing concrete expansion joints shall conform with the following specification:

- fabricated, round, open cell polyurethane foam
- uncompressed density: 2 - 3 lbs/ft³
- compression deflection: 1 psi @ 25%
- elongation: 130%
- tensile strength: 15 lbs minimum

Acceptable product meeting this specification is:

INDUSTRIAL THERMO POLYMERS LIMITED - TUNDRA FOAM