

**PART 1 - GENERAL****1.1 DESCRIPTION**

- .1 Provide all the expertise, labour, materials, products, equipment and services needed to supply and deploy all the accessories specified and detailed on the drawings for all the disciplines, regardless of whether or not they are described in this section of the Specifications.

**1.2 RELATED SECTIONS**

- .1 The specialized Contractor is responsible for obtaining a copy of all the sections of these specifications even if they do not appear to pertain to his speciality. If he does not, it shall be understood that he agrees to the clauses and requirements of all sections in these specifications. The specialized Contractor must consult the table of contents of these specifications to have knowledge of the complete list of the specifications sections.
- .2 Comply with the general requirements and the requirements of all documents to which reference is made.

**1.3 MANUFACTURED PRODUCTS**

- .1 The brand of each of the manufactured products described in this section of the specifications shall be approved by the Departmental Representative. At the Departmental Representative's request, provide him with the technical description and/or samples of these products as well as certified copies of the results of analyses and trials conducted by independent laboratories attesting that these products comply with the manufacturing standards that apply to them. All documents shall be submitted in triplicate. A single (1) annotated copy shall be returned to the Contractor. The Contractor shall be responsible for making additional copies and distributing them.

**1.4 FASTENERS**

- .1 In all cases where fasteners not indicated on the drawings are required in concrete components to provide vertical and/or lateral support for architectural elements, pre-fabricated concrete components, parts for mechanical, electrical or other equipment, the structural design and engineering of these fasteners are the full and sole responsibility of the manufacturer who shall provide them, and shall in no way confer liability on the Departmental Representative or his representatives.
- .2 The fasteners to which Sub-article .1 above refers to includes plates, angle irons and all other hardware in direct contact with the concrete of components identified on the drawings, including rods, bolts, dowels and various anchoring devices wholly or partially embedded in this concrete.
- .3 The specialized Contractor shall nevertheless provide the Departmental Representative with a reproducible copy and a copy of the shop drawings, for information purposes, clearly indicating the location of all fasteners required as well as the intensity and direction of the stresses that each of the fasteners exert on the concrete components. These drawings shall have been approved for construction beforehand by an Engineer in good standing with the Ordre des Ingénieurs du Québec.

**PART 2 - PRODUCTS**

**Note to the specification writer:** the reader must verify the concordance between the plans and this section and if the products are suitable for the project.

**2.1 MATERIALS**

- .1 **Pre-moulded joint fillers:** pre-moulded resilient bitumen impregnated fibreboards in compliance with the ASTM D1751 standard. The dimensions required match the joints to be put in place on the drawings.
- .2 **Vapour barrier membrane under slabs-on-grade:** 0.15 mm thick polyethylene sheets in compliance with the CAN/CGSB-51.33 standard.
- .3 **Auxiliary backer rod for joints:** closed cell polyethylene foam, diameters required based on the dimensions shown on the drawings.
- .4 **Sealant for horizontal joints:** two-component, polyurethane-based product with a chemical cure, in compliance with the CAN/CGSB-19.24 standard, such as the “Sikaflex 2C SL” sealer. Distributed by Sika Canada or an equivalent approved by the Departmental Representative
- .5 **Sealant for vertical joints:** two-component, polyurethane-based product with a chemical cure, in compliance with the CAN/CGSB-19.24 standard, such as the “Sikaflex 2C NFEZ” sealer. Distributed by Sika Canada or an equivalent approved by the Departmental Representative.
- .6 **Primer for use with joint sealer:** “Sikaflex Primer 202” distributed by Sika Canada or an equivalent approved by the Departmental Representative. The primer and sealer must be compatible.
- .7 **Reinforcing steel:** according to Section 03 20 00.
- .8 **Embedded steel components:** in compliance with the requirements of the CSA-G40.21 standard, 300 MPa grade.
- .9 **Bonding agent:** three-component cement based and water-based modified epoxy product in compliance with the CAN/CSA-A23.1/A23.2 standard such as “SikaTop Armatec 110 EpoCem” from Sika Canada or an equivalent approved by the Departmental Representative.
- .10 **Rustproof coating:** three-component cement based and water-based modified epoxy product in compliance with the CAN/CSA A23.1/A23.2 standard such as “SikaTop Armatec 110 EpoCem” from Sika Canada or an equivalent approved by the Departmental Representative.
- .11 **Sealant for pressure injection of cracks:** two-component (2) epoxy resin, 100% solid, moisture tolerant. Use “Flexocrete Gel” from KRYTEX or “Sikadur 31 Hi-Mod Gel” distributed by Sika Canada or an equivalent approved by the Departmental Representative.
- .12 **Epoxy for pressure injection of cracks:** two-component (2) structural epoxy resin, 100% solids, moisture tolerant, low viscosity. Use “EPOXY-SCEL-80” from KRYTEX or “Sikadur 52” from Sika Canada or an equivalent approved by the Departmental Representative.

- .13 **Chemical anchoring system:** high-performance two-component (2) structural epoxy adhesive. Use an adhesive such as "HIT HY 150" from HILTI or "Sika Anchor Fix-3ca" from Sika Canada or an equivalent approved by the Departmental Representative.
- .14 **Mechanical rebar splicing system:** Lenton type mechanical splicing system or approved equivalent. Mechanical splices must develop 120% of the steel rebar's tension.
- .15 **Textile form liner:** Use one of the following products or an equivalent approved by the Departmental Representative at the locations indicated on the plans:
- Drainaform R from SolmaxTexel
  - Hydroform 2000 from Hydro
  - Zemdrain from Dupont
- .16 **Waterstop:**
- .1 Ribbed extruded polyvinyl chloride PVC waterstops with the following properties:
    - .1 Minimal tensile strength: 11.4 MPa
    - .2 Elongation to failure: 275%
    - .3 Minimum tear resistance: 50 kN/m (ASTM D624-00 standard, Die "B" Method).
  - .2 The waterstops shall be of the width and thickness specified on the drawings. If no other dimension is provided, the waterstops shall be at least 150 mm wide and 10 mm thick.
  - .3 At T, L or X intersections use factory pre-cut and pre-assembled components.
- .17 **Sealer for concrete surfaces:** Silane based sealer such as "Sikagard SN40" from Sika Canada or approved equivalent.
- .18 **Beam support pad:** made of 50 duro neoprene measured with a durometer according to the ASTM D2240-05 standard and with a tensile strength of at least 15.5 MPa according to the ASTM D412-06a standard; the pads shall be moulded to the appropriate dimensions or cut out of moulded sheets.
- .19 **Repair grout:** Non-shrink cementitious grout such as Sika Grout 212 from Sika mixed with 1.1 litres of Sikacem 810 and 3.5 litres of water per bag of grout, or an equivalent approved by the Departmental Representative.
- .20 **Caulking mortar:** Once the injection is completed, caulk the cracks with an epoxy mortar such as "Sikadur 31 Hi-Mod Gel" from Sika or an equivalent approved by the Departmental Representative.
- .21 **Epoxy repair grout:** Three-component (3) epoxy resin such as "Sikadur 42 Grout Pak Multi-Flo" from Sika Canada at a 6:1 ratio or an equivalent approved by the Departmental Representative.

**PART 3 - PERFORMANCE****3.1 JOINT FILLER:**

- .1 Locate and form isolation and / or expansion joints according to the indications provided. Install the joint filler.
- .2 Unless otherwise indicated on the drawings, use a 12 mm thick joint filler to separate slabs-on-grade from vertical surfaces, and a 25 mm joint filler to separate slabs-on-grade from one another at the required locations.

**3.2 VAPOUR BARRIER MEMBRANE**

- .1 Install a vapour barrier membrane under concrete slabs-on-grade located inside buildings.
- .2 At locations where there are joints, overlap the sides of the polyethylene sheets by at least 150 mm.
- .3 Repair any perforations in the vapour barrier membrane before pouring the concrete. Use pieces that extend at least 150 mm beyond all the edges of the perforations.

**3.3 JOINT CAULKING:**

- .1 Remove dust, loose mortar and other foreign material and dry the surfaces of the joint.
- .2 Prepare the surfaces in compliance with the caulking manufacturer's instructions.
- .3 Clear the joint to the required depth to install a backer rod. This will allow the application of a layer of caulking that complies with the manufacturer's recommendations for the width of the joint involved.
- .4 Apply the primer on the contact surfaces, and then apply the caulking following the manufacturer's recommendations. Clean adjacent surfaces immediately after application.

**3.4 WATERPROOFING THE JOINTS**

- .1 Refer to the drawings to determine which construction joints need to be sealed with waterstops. Even if there are no indications on the drawings, all joints below the grade shall be sealed with waterstops.
- .2 Take care not to deform or damage the waterstops when fastening them to the form. Avoid moving adjacent reinforcements and ensure the waterstops cannot shift or bend during the pour.
- .3 Butt weld the waterstops together, following the manufacturer's recommendations. Each weld shall be perfectly watertight. Butting waterstops together on the construction site is only permitted in the case of waterstop segments that are an extension of one another.

**3.5 EMBEDDED COMPONENTS**

- .1 All embedded component manufacturing work shall be performed in compliance with the requirements of the CAN/CSA-S16-01 standard.

**3.6 IMPLEMENTATION – CHEMICAL ANCHORING SYSTEM:**

- .1 Drill a hole 4 mm wider than the bar to be anchored.
- .2 Make sure the drill hole is clean, dry, free of clay, debris and cement dust. The holes shall be drilled with a hammer drill and cleaned with compressed air.
- .3 Prepare and apply epoxy resin according to the recommendations provided on the manufacturer's data sheet.
- .4 Where possible, partially fill the hole with epoxy and insert the bar. If not, introduce the rod and inject epoxy resin.
- .5 Anchor the rod in the concrete to a depth at least 15 times the diameter of the bar unless otherwise indicated.

**3.7 IMPLEMENTATION – RUSTPROOF COATING**

- .1 Dry or wet sandblast the rebar to clean it and remove all grease, oil or rust. It may be necessary to clean the steel rebar using a mechanical steel brush to remove the rust.
- .2 Following the manufacturer's recommendations, use a stiff brush or a roller to apply a 0.5 to 1 mm thick coat on the steel rebar.
- .3 Allow to dry for 2 to 3 hours before applying a second coat of the same thickness.
- .4 Allow to dry for 2 to 3 hours before placing the repair concrete.

**3.8 IMPLEMENTATION – BINDING AGENT**

- .1 Dry or wet sandblast the surfaces to clean them and remove all traces of grease, oil or rust, as well as loose aggregate.
- .2 Moisten the surface of the concrete to obtain a saturated, superficially dry substrate.
- .3 Following the manufacturer's recommendations, use a stiff brush or a roller to apply a 0.5 mm coat over the entire area to be bound.
- .4 Place the repair concrete within the maximum time limits prescribed by the manufacturer.

**3.9 INJECTING THE CRACKS**

- .1 Roughen the cracks and clean the surfaces with compressed air jet.

- .2 Install injection points and seal them and the surfaces of the cracks to be injected to prevent resin loss. The distance between injection points shall not exceed the thickness of the part to be injected.
- .3 When the sealer has hardened, inject epoxy at the injection points. Inject the filler until the filler begins to come out of the next injection point.
- .4 Then plug the first injection point before going on to the next one.
- .5 When the epoxy resin has hardened, grind the top of the concrete surfaces at the sealing location to remove the sealer and the excess epoxy from the surface. The repaired crack surfaces shall have a quality finish.

**END OF SECTION**