

**Part 1 General**

**1.1 SUMMARY**

- .1 This Section covers the restoration of cracks and fissures in structural wood members by in various methods.

**1.2 REFERENCES**

- .1 CSA International
  - .1 CAN/CSA-O141-05(R2009), Softwood Lumber.
- .2 American Society for Testing and Materials (ASTM)
  - .1 ASTM C881/C881M-15 Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete.

**1.3 MEASUREMENT PROCEDURES**

- .1 The areas of repair will be identified and quantified via visual inspection by the Contract Administrator in the presence of and with the assistance of the Contractor. The areas will then be measured and agreed upon by the Contractor and Contract Administrator prior to commencement of work.
- .2 Unit prices must include all supervision, labour and materials, and equipment.
- .3 The Contractor is to note that if the area of the repair is increased over that originally measured without consultation with the Contract Administrator, then the Contractor will not be paid for the increased area.
- .4 The following unit prices have been requested:
  - .1 Crack injection will be paid for on a lineal meter basis for varying crack widths in 1/8 in increments of their average width and for depths up to half the member thickness. The minimum length of payment is 1 lineal foot.
    - .1 Less than 1/8 in.
    - .2 1/8 in to 1/4 in.
      - 1/4 in to 3/8 in.
    - .3 3/8 in to 1/2 in.
  - .2 Routing and filling of cracks will be paid for on a lineal meter basis for varying cracks widths in 1 in increments of their average width. The minimum length of payment is 1 lineal foot.
    - .1 1/2 in to 1 in width.
    - .2 1 in to 2 in width.
    - .3 2 to 3 in width.
    - .4 Greater than 3 in width.

**1.4 QUALITY ASSURANCE**

- .1 Field Mock-up:
  - .1 A preconstruction field mock-up sample shall be made for each type of repair using equipment, materials, and procedures planned for the actual construction.
    - .1 Use same personnel, including supervisors, which will perform work.
    - .2 Install products and materials according to specified requirements.
    - .3 Work shall be representative of those to be expected for work.

- .4 Finish various components to show maximum variation that will exist in work.
- .2 Install field mock-up at Project site in a pre-selected area of building or location approved by Contract Administrator. Install material in accordance with this Section.
- .3 Maintain field mock-ups during construction in an undisturbed condition as a standard for judging completed work.
- .2 Contractor Qualifications:
  - .1 Have proven experience in application of specified (or similar) products on projects of similar size and scope.
  - .2 Successful completion of a minimum of 2 projects of similar size and complexity to specified Work within the last 5 years.

### 1.5 DELIVERY, STORAGE AND HANDLING

- .1 Comply with Section 01 61 00.
- .2 Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- .3 Store tightly sealed materials off ground and away from moisture, direct sunlight, extreme heat, and freezing temperatures.
- .4 Keep materials in manufacturer's original, unopened containers and packaging until installation.
- .5 Protect materials during storage, handling, and application to prevent contamination or damage.

### Part 2 Products

#### 2.1 MATERIALS

- .1 Crack/Fissure Injection Resin: Two-component, thixotropic epoxy. Approved product:
  - .1 Rotafix Structural Adhesive by Rotafix.

#### 2.2 ACCESSORIES

- .1 Wood fillets of various sizes and dimensions to match species and moisture content (MC) of existing wood.

### Part 3 Execution

#### 3.1 PREPARATION

- .1 Remove dirt, dust, and other materials which will prohibit adhesion of the epoxy resin.
- .2 Remove loose dust, obstructions, and other materials which will prohibit adequate performance from the areas to be injected by vacuum, oil-free compressed air or other approved means.

#### 3.2 INJECTION PROCEDURE

- .1 Entry ports shall be provided along the crack at intervals of not less than the thickness of the member at that location.

- .2 Surface seal material shall be applied to the face of the crack between the entry ports. The surface seal **must** be non-marring and non-staining. For through cracks, surface seal shall be applied to both faces as necessary to prevent leakage of the injection resin.
- .3 Allow enough time for the surface seal material to gain adequate strength before proceeding with the injection.
- .4 For vertical and inclined orientations, start injection process on port of lowest elevation. When injection resin shows at port above, cap lower entry port and continue injection process on the second port. Continue process until all ports have been injected and pressure is maintained.
- .5 For horizontal orientations, inject from one end of the crack to the other using same port-to-port procedures. When possible, inject from bottom side of structure.
- .6 Perform epoxy adhesive injection continuously until cracks are completely filled.
- .7 If port to port travel of epoxy adhesive is not indicated, the work shall immediately be stopped and the Contract Administrator notified.
- .8 When cracks are completely filled, epoxy adhesive shall be cured for sufficient time to allow removal of surface seal without any draining or runback of epoxy material from cracks.

### 3.3 ROUTING AND FILLING OF CRACKS

- .1 Cracks larger than 12.5 mm in width will be repaired by widening the crack with a router and/or parallel cutter to the depth of a crack but not greater than 1/4 of the member thickness in that direction.
- .2 The width of the reglet must be sufficient to straighten the crack and allow insertion of a new wood fillet.
- .3 Thoroughly clean reglet by insert air nozzle to bottom of hole and blow out using an air pump or oil-free compressed air. Clean hole with wire brush. Repeat procedure until reglet is clean and free of dust.
- .4 Pre-condition wood fillets to within  $\pm 1\%$  of in situ timber MC.
- .5 Cut wood slips slightly oversize (approximately 1 or 2 mm) and slightly tapered towards the inside.
- .6 Thoroughly coat the reglet and fillet with adhesive. The adhesive will act as a lubricant and allow the fillet to be inserted with a wooden mallet.
- .7 Allow to cure for 3 days then plane and level to match surrounding surface.

### 3.4 CLEANING

- .1 Finish the face of the crack approximately flush to the adjacent surface showing no indentations or protrusions caused by the placement of entry ports. Ports must be removed flush.

**END OF SECTION**