

Suggested Specification Language for the Injection of Cracks and Similar Voids in Concrete (updated 04/01)

SCOPE OF WORK

All cracks exhibiting a surface width measurement of .008" or greater are to be injected.

[OR: Those cracks designated on drawings Numbers _____ are to be injected.]

[OR: Those cracks field identified with blue paint are to be injected.]

Unless otherwise stated, it is the intent of the specification to include the injection of designated cracks for their full length, although some segments may be narrower than specified.

PERFORMANCE

Voids in excess of .007" shall be filled minimum depth of 6".

The owner imposes no procedural requirements or restrictions, and will therefore not be influenced by their inclusion or absence in appraisal of unsatisfactory results. The exact procedures and equipment selected to obtain the specified results are the contractor's option and the contractor's responsibility.

Following injection, all porting adapters and protruding capping material shall be removed, leaving the surface of the concrete smooth.

QUALITY ASSURANCE

Prior to commencing work, the contractor shall submit to the owner written instructions from the manufacturer of the proportioning dispenser as to the procedures recommended to monitor and assure its proportioning accuracy of the unit. . These recommendations are to be diligently carried out by the contractor, and the owner shall be kept advised as to when and where, so that the owner's representative can observe the procedures.

The contractor shall provide the owner with dispensed samples, not exceeding 2 fluid ounces, whenever requested. The samples are to be taken undisturbed at the outlet following in-line mixing. These samples are to be provided in addition to any sampling or other procedures recommended by the manufacturer of the proportioning dispenser.

Cores shall be removed periodically at the sole discretion of the owner. The results evident by core examination shall be the sole criteria in determining whether the requirements of the specification have been met. The cores shall be at least 2" in diameter and 6" in depth. Core locations shall be selected by the owner, and shall be removed only in the presence of the owner's representative unless otherwise instructed. Cores and core holes shall be carefully indexed as to location.

Injection will not proceed beyond the initial 50 feet until three cores have been submitted to, and approved by, the owner. In the meantime however, additional preparation of cracks for injection may proceed with the understanding that there will be no compensation for such preparation if the initial effort is not approved.

One core is to be furnished from each additional 100 feet. Cores shall be taken within one working day following the owner's request. If the cores are delayed, work shall be delayed without cost to the owner until the cores are provided. No cores will be required within 3" of the extremity of the crack seal.

Following their removal, the cores will be examined for penetration. If requirements are met, the cores will be demolished. If no major fracture occurs on a glue line, the core is acceptable. If the core breaks on a glue line, the fragments shall be inspected and/or tested to determine if the failure is attributable to improper metering or mixing of the epoxy. If so, the core shall be considered unsatisfactory and additional cores will be required of the contractor at his own expense from the same vicinity to determine the scope of defective work.

PAYMENT

MOBILIZATION, INCLUDING 2 CORES (LUMP SUM)	\$
PER LINEAR FOOT OF CRACK [#3]	\$

The lump sum mobilization item shall obviate any claims for additional compensation in the event actual quantities fall short of those estimated by the owner, or anticipated by the contractor. Likewise, the owner shall make no claim upon the contractor for reduced unit pricing in the event quantities exceeds those reckoned.

The contractor shall include in his unit prices, the furnishing of one core from each 150 linear feet of crack measured for payment. Two additional cores required from the initial 100' are to be included in MOBILIZATION.

Mobilization shall be considered earned following the successful injection of the first 100 linear feet. If the contractor is unable to promptly and consistently satisfy the specification during the injection of this initial footage, he will be deemed unqualified for the project and dismissed without mobilization or other cost to the owner.

Cracks shall be measured for payment along the cap-seal. However, if cores taken 3" from the extremity of the cap seal reveal no crack, 3¢ of measurement will be deducted for each instance of same, and the contractor shall furnish an additional core from a similar location as directed by the owner at the contractor's expense.

If cracks radiating from specified cracks must be capped or injected to assure penetration of designated footage, they shall be included for payment. However, radiating cracks will be cored and expected to contain resin. If not, no payment will be made for the footage. For each instance where such cores reveal no penetration, an additional core will be required in a similar location at the contractor's expense.

[#1] Samples of dispensed resin should monitor the performance of the mixer as well as the dispenser, for if product builds up within a mixer, it will lose efficiency. The retained samples should be examined and/or tested in compliance with the resin manufacturer's recommendations

[#2] Here the specification must be specific as to what penalty the contractor shall suffer, or what action he will be obliged to take in the event of defective footage. Re-injection of areas lacking penetration is a reasonable requirement, followed by payment if the results are satisfactory. If the protection of reinforcement is the purpose of the injection, gummy, partially catalyzed resin may serve the purpose nearly as well as a hard product, greatly reducing the gravity of the flawed work.

In most such cases it is not feasible to re-inject with much success. However, routing and sealing of the injected crack with an epoxy gel should be considered to prevent uncured resin from subsequently leaching; thus disfiguring the structure.

If a structural contribution is essential, it may be advisable to utilize a monetary penalty to motivate the contractor to take extraordinary precautions in maintaining and monitoring the performance of his equipment. Once a lubricant (partially catalyzed resin) has been injected into a structural fault, the cost to an owner may be substantial.

The injection of a mockup prior to commencing injection of critical members may also be considered to fully qualify the contractor. If a location is not available on site, damaged members suitable for such testing are often available in pre-stressed yards.

[#3] It is important to be specific as to how the footage is to be measured. Normally a wall or slab is measured for payment on one side only, though there may be work required on the opposite side as well. There is no overwhelming precedent or logic in support of one approach or another. What is important is that all bidders understand exactly how the cracks are to be measured for payment. Presume nothing. It must be spelled out.