

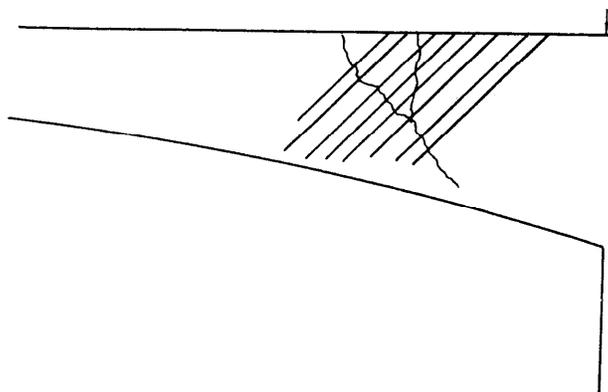


REMR TECHNICAL NOTE CS-MR-3.6

CRACK REPAIR METHOD: CONVENTIONAL REINFORCEMENT

PURPOSE: To provide guidance on use of conventional reinforcement to repair cracks in concrete. (NOTE: Before selecting any method for repair of cracks, REMR Technical Note CS-MR-3.1, "Selection of a Crack Repair Method," should be reviewed.)

DESCRIPTION: This method consists of sealing the crack, drilling holes $3/4$ in. in diameter at 45-degree angles to the deck surface and crossing the crack plane at approximately 90 deg, filling the hole and crack plane with epoxy pumped under low pressure (50 to 80 psi), and placing a reinforcing



bar into the drilled hole. Typically No. 4 or 5 bars are used, extending at least 18 in. on each side of the crack. The epoxy bonds the bar to the walls of the hole, fills the crack plane, bonds the cracked concrete surfaces back together in one monolithic form, and thus reinforces the section.

EQUIPMENT, TOOLS, AND PERSONNEL REQUIREMENTS: A concrete drill, an epoxy injection system, a means of cleaning holes and cracks, and normal hand tools are required. One man can repair cracks using this method, but a two- or three-man operation is more efficient.

APPLICATIONS AND LIMITATIONS: Cracked reinforced concrete bridge girders have been successfully repaired using epoxy injection and reinforcing bar insertion.

STEP-BY-STEP-PROCEDURE: Holes $3/4$ in. in diameter should be drilled at 45 degrees to the deck surface and crossing the crack plane at approximately 90 degrees. The holes should extend at least 18 in. on each side of the crack

when possible. The holes can be spaced to suit the needs of the repair. They can be placed in any desired pattern, depending on the design criteria and the location of the in-place reinforcement.

The holes and the cracks should be cleaned as described in the epoxy injection method (REMR Technical Note CS-MR-3.9). The reinforcing bars should then be placed in the drilled holes. Sealing of the surfaces, installation of entry ports, mixing of epoxy, injection of epoxy, and removal of the surface seals should also be accomplished as described in REMR Technical Note CS-MR-3.9.

REFERENCES: a. Causes, evaluation, and repair of cracks. ACI Committee 224.
In: Journal of the American Concrete Institute, Vol 81,
No. 3, American Concrete Institute, Detroit, MI, 1984, ACI
224.1R-84.