

CRACKING CONCRETE SURFACE

WHAT are Some Forms of Cracks?

Concrete, like other construction materials, contracts and expands with changes in moisture and temperature, and deflects depending on load and support conditions. Cracks can occur when provisions to accommodate these movements are not made in design and construction. Some forms of common cracks are:

Figure A: Plastic shrinkage cracks (See CIP 5)

Figure B: Cracks due to improper jointing (See CIP 6)

Figure C: Cracks due to continuous external restraint
(Example: Cast-in-place wall restrained along bottom edge of footing)

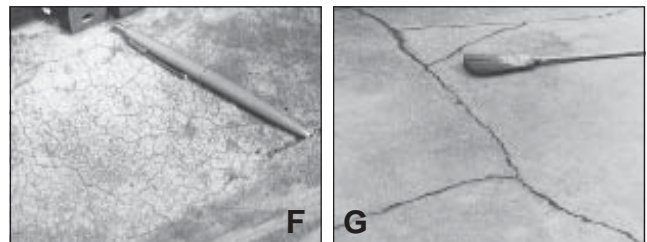
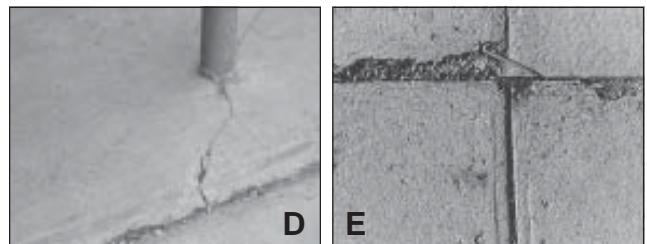
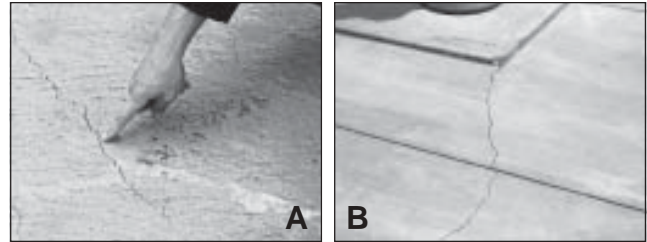
Figure D: Cracks due to lack of an isolation joint (See CIP 6)

Figure E: D-Cracks from freezing and thawing

Figure F: Craze Cracks (See CIP 3)

Figure G: Settlement cracks

Most random cracks that appear at an early age, although unsightly, rarely affect the structural integrity or the service life of concrete. Closely spaced pattern cracks or D-cracks due to freezing and thawing, that typically appear at later ages, are an exception and may lead to ultimate deterioration.



WHY Do Concrete Surfaces Crack?

The majority of concrete cracks usually occur due to improper design and construction practices, such as:

- Omission of isolation and contraction joints and improper jointing practices.
- Improper subgrade preparation.
- The use of high slump concrete or excessive addition of water on the job.
- Improper finishing.
- Inadequate or no curing.

HOW to Prevent or Minimize Cracking

All concrete has a tendency to crack, and it is not possible to produce completely crack-free concrete. However, cracking can be reduced and controlled if the following basic concreting practices are observed.

- Subgrade and Formwork.* All topsoil and soft spots should be removed. The soil beneath the slab should be compacted soil or granular fill, well compacted by rolling, vibrating or tamping. The slab, and there