



CRACKING IN CONCRETE SURFACES

Like other construction materials, concrete expands and contracts with changes in temperature, moisture, and load and support conditions. When any of these factors are not handled in an optimum fashion, cracks may occur in the concrete. Cracks usually do not diminish the structural integrity of concrete or lead to progressive deterioration, but are an unsightly blemish on the finished product.

Why Surface Cracks Appear

- Improper jointing practices or failure to use control joints
- Poor sub-grade preparation
- Use of high slump concrete
- Improper finishing
- Inadequate curing

What to Do About It

While all concrete has a tendency to crack, following a few basic safeguards can minimize the problem:

- **Preparation of sub-grades and forms.** Make sure the soil beneath the slab is well compacted by rolling, vibrating or tamping to eliminate the risk of settlement cracks appearing while the concrete is still in a plastic state and has yet to gain strength. All forms should be constructed and braced so they can withstand the pressure of freshly poured concrete without moving.
- **Joints.** Expansion and contraction cracks occur when inadequate provisions have been made for the impact that temperature and/or moisture changes can have on concrete. To accommodate this normal expansion and contraction phenomenon, use control joints that are about one-quarter the thickness of the slab and placed no further apart than 30 times its thickness. Isolation joints should be used in areas where either horizontal or vertical movement will be restricted, such as where floors meet walls, columns or footings.
- **Concrete.** Generally use concrete with a moderate slump of up to 5". (Slump is a measurement of consistency, or the ability of freshly mixed concrete to flow.) The higher a concrete's slump, the more water it contains. An excessive slump will produce weaker concrete and contribute to cracking unless the mix is modified accordingly. It's also important to avoid segregation of concrete's basic materials by placing it as close to its final destination as possible. Instead of moving concrete over long horizontal distances during the pouring process, use wheelbarrows, chutes or concrete pumps to minimize segregation.
- **Curing.** Once the concrete has been poured, satisfactory moisture content and temperature (ideally between 50 and 75 degrees Fahrenheit) must be maintained during the curing process. Rapid loss of moisture during the curing process may result in shrinkage cracks. Protect freshly poured concrete with windbreaks, sun screening and water misting if necessary. An additional safeguard is the use of chemical admixtures to control evaporation during the curing process.
- **Finishing.** Do not perform finishing operations such as trowel finishing while bleed water still covers the concrete's surface.
- **Cover steel reinforcement.** Cracking can result when moisture is allowed to come in direct contact with reinforcing steel, causing it to rust and, consequently, expand. Steel reinforcement should be covered by at least two inches of concrete.

Products Used: Tamms Curing and Sealing Compounds; Master Builders Confilm (1 gallon and 5 gallon); Dural LV/ Gel Epoxy Repair; Duralflex Fast Patch.