crazing concrete

Definition

Crazing is the development of fine random cracks on the surface of the concrete caused by shrinkage of the surface layer. These cracks are rarely more than 1/8 inch deep and are more noticeable on steel troweled surfaces. The cracks are shaped like irregular hexagon and are typically no more than 1 1/2 inch across. Generally craze cracks develop at an early age and are apparent the day after placement. The crazing is more prevalent when the surface is wet.

Crazing cracks are sometimes referred to as shallow map or pattern cracking. **They do not affect the structural integrity of the concrete.**

Contributing Factors

- Poor or inadequate curing (see curing).

- Too wet a mix, excessive floating, the use of a jitterbug or any other procedure which depresses the coarse aggregate and produces an excessive concentration of cement paste and fines at the surface.

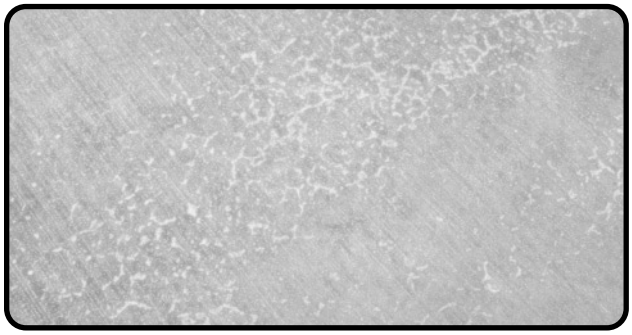
- Finishing while there is bleed water present on the surface or the use of steel trowel at a time when the smooth surface brings up too much water and cement fines. The use of a darby or bullfloat while bleed water is present will produce a high water-cement ratio at the surface, which makes the slab more susceptible to crazing (see finishing).

- Sprinkling cement on the surface to dry up bleed water. This concentrates fines on the surface.

- Occasionally carbonation of the surface can cause crazing. (Carbonation is a chemical reaction between the cement and carbon dioxide or carbon monoxide from unvented heaters or power trowels.

How to Prevent Crazing

- Start curing the concrete as soon as possible. The surface should be kept wet by either flooding with water or covering with wet burlap and keeping moist for a minimum of 3 days. (see curing).



- Use of moderate slump (3 to 5 inches), air-entrained concrete. Higher slump (up to 6 or 7 inches) can be used, provided the mixture is designed to produce the required strength without excessive bleeding and segregation. (Please consult your local ready mix producer for help with mix designs.) Air entrainment helps to reduce the rate of bleeding of fresh concrete and thereby reduces the chance of crazing.

- Never sprinkle or trowel dry cement or a mixture of cement and fine sand into the surface of the plastic concrete to absorb bleed water. Remove bleed water by dragging a garden hose across the surface. DO NOT perform any finishing operation while bleed water is present on the surface.

- Dampen the subgrade prior to concrete placement to prevent it from absorbing too much water from the concrete. If an impervious membrane, such as a polyethylene, is required on the sub grade, cover it with 2 to 3 inches of damp sand to reduce bleeding.

References

NRMCA CIP 3 (1998). *What, Why and How? Crazing Concrete Surfaces*
National Ready Mixed Concrete Association