

CURING IN-PLACE CONCRETE

WHAT is Curing?

Curing is the maintaining of an adequate moisture content and temperature in concrete at early ages so that it can develop properties the mixture was designed to achieve. Curing begins immediately after placement and finishing so that the concrete may develop the desired strength and durability.

Without an adequate supply of moisture, the cementitious materials in concrete cannot react to form a quality product. Drying may remove the water needed for this chemical reaction called hydration and the concrete will not achieve its potential properties.

Temperature is an important factor in proper curing, since the rate of hydration, and therefore, strength development, is faster at higher temperatures. Generally, concrete temperature should be maintained above 50°F (10°C) for an adequate rate of strength development. Further, a uniform temperature should be maintained through the concrete section while it is gaining strength to avoid thermal cracking.

For exposed concrete, relative humidity and wind conditions are also important; they contribute to the rate of moisture loss from the concrete and could result in cracking, poor surface quality and durability. Protective measures to control evaporation of moisture from concrete surfaces before it sets are essential to prevent plastic shrinkage cracking (See CIP 5).

WHY Cure?

Several important reasons are:

- a. **Predictable strength gain.** Laboratory tests show that concrete in a dry environment can lose as much as 50 percent of its potential strength compared to similar concrete that is moist cured. Concrete placed under high temperature conditions will gain early strength quickly, but later strengths may be reduced. Concrete placed in cold weather will take longer to gain strength, delaying form removal and subsequent construction.
- b. **Improved durability.** Well-cured concrete has better surface hardness and will better withstand surface wear and abrasion. Curing also makes concrete more watertight, which prevents moisture and water-borne chemicals from entering into the concrete, thereby increasing durability and service life.
- c. **Better serviceability and appearance.** A concrete slab that has been allowed to dry



Application of liquid membrane-forming compound with hand sprayer.



Slab on grade covered with waterproof paper for curing.

out too early will have a soft surface with poor resistance to wear and abrasion. Proper curing reduces crazing, dusting and scaling.

HOW to Cure

Moisture Requirements for Curing - Concrete should be protected from losing moisture until final finishing.

Using suitable methods like wind breaks, fogger sprays or misters to avoid plastic shrinkage cracking. After final finishing the concrete