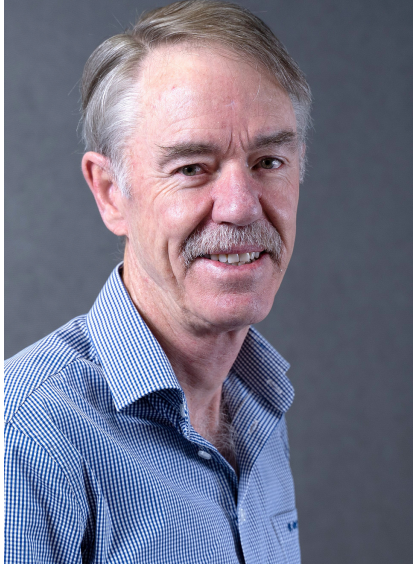

CARELESS CURING CAN RUIN THE BEST CONCRETE, CCSA WARNS

Concrete that has been correctly specified, batched, mixed, placed, and finished can still fail without adequate curing. "Curing is usually the last step in a concrete project and, unfortunately, is often neglected - even by professionals," says Bryan Perrie, CEO of Cement & Concrete SA (CCSA).

Perrie says it is not generally realised that all newly-cast concrete must be cured appropriately to ensure that hydration continues until the full potential strength of the hardened concrete is achieved and to minimise the tendency to crack.
"This means ensuring that the concrete is kept damp and at a temperature that allows cementing reaction to proceed—the more extender in the mix, the slower the strength development, calling for longer curing operations. Curing has the greatest effect on the surface, and near-surface zone, of concrete and is critical in reinforced concrete and concrete subject to abrasion," Perrie adds.

He says for proper concrete curing, and the following steps should be followed:
·Covering the surface with a water-retaining material such as sand, earth, straw or hessian that is kept continuously damp;
·Sprinkling or spraying with water often enough to keep the concrete continuously moist;
·Ponding water on the concrete surface (commonly used for flat surfaces such as slabs or roads). Berms can be used to contain water on sloping slabs;
·Covering the concrete with plastic sheeting of waterproof paper. The covering must be held in place at its edges in a way that does not damage the concrete and be sufficiently overlapped at joints;
·A fine water spray can be used to apply water continuously and uniformly;
·Applying membrane-forming compounds. Such components are supplied in liquid form and applied by spray, roller or brush. On horizontal surfaces, the membrane should be protected against damage. Curing compounds must be applied as soon as possible without marring horizontal surfaces or within two hours of formwork removal on vertical surfaces;
·Leaving formwork in place and covering any exposed concrete surfaces; and
·Small precast elements (such as decorative paving stones) can be demoulded and cured by immersion in water.

"If freshly placed concrete is exposed to hot sunshine or drying winds, evaporation should be prevented by covering with plastic sheeting immediately after placing and finishing.

Suppose the plastic sheeting could damage the surface. In that case, water-filled atomiser sprays of the type used for spraying insecticides on fruit trees can provide a mist over the fresh concrete until the surface is hard enough to permit one of the curing methods. It may also be necessary to offer adequate windbreaks to the concrete during cooler parts of the day," Perrie advises.

In winter, newly placed concrete should be protected from frost by covering it with insulating material such as sacking or straw. In addition, the temperature of placed and compacted concrete should not be allowed to fall below 50C until the concrete has attained a strength of 5MPa.

"Curing must continue for at least five days after placing concrete, and longer – about a week - in cold weather. Adequate curing is essential for concrete to attain its potential compressive strength at 28 days. With adequate curing, the concrete will become stronger and durable, more impermeable, and more resistant to abrasion," he adds.

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