TECHNICAL BULLETIN # 3

Curing Concrete

CSA A23.1 mandates some form of curing of all concrete under the standard, regardless of exposure class. “Curing shall begin immediately following the placing and finishing operations and shall provide the temperature and moisture conditions for the period of time necessary for the concrete to develop its strength, durability and other properties.”
“The concrete shall be maintained at no less than 10 ^{o} C throughout the curing period.”
Curing retains moisture in the concrete for the continued hydration of the cementing materials.
CSA stipulates different types (see below) and periods (3-7 days) of curing depending on the exposure class of the hardened finished product.

Curing can be achieved by a number of means:

1) Curing Compounds
2) Ponding or continuous sprinkling with water
3) Applying water and covering with polyethylene sheets
4) Applying water and covering with absorptive burlap fabric
5) Leaving forms in contact with the concrete surface
6) Other moisture-retaining methods as approved by the owner

Curing Compound Types and Application

Curing Compounds form a membrane on the concrete surface to maintain moisture needed for hydration. They can be clear or pigmented. White pigmented curing compounds are most often used for concrete flatwork placed during warm ambient conditions. The white colour acts as a reflector of solar heat to help maintain proper curing temperatures and too reduce evaporation. Coloured curing compounds give visual confirmation of adequate coverage in a variety of conditions. Clear and pigmented curing compounds are also used for decorative concrete applications.

Curing compounds should always be applied according to their manufacturer’s recommendations. Typically they are applied by sprayer or by roller. Manufacturers will indicate whether a given curing compound is for interior or exterior flatwork. However, no curing compound should be applied if there is any chance that the concrete will freeze during the curing period. If the concrete is left uncured after final finishing (i.e. if the concrete is just left to dry out), the concrete may achieve only slightly better than 50% of its potential design strength and its durability may be substantially compromised.

Sealers are applied after the curing period to protect the concrete from any further ingress of moisture or contaminants and in some instances to lend a sheen or mat finish. They should be applied in accordance with their manufacturer’s recommendations. For exterior flatwork exposed to cycles of freeze and thaw, CSA recommends a drying period of one month following the prescribed curing period, before exposure of the slab to such conditions. Under these circumstances it may be necessary to delay sealing until after this recommended drying period following curing.