



GEOTECHNICAL
CONSULTANTS INC.

Strategies for Hot Weather Concrete Pours

Summer weather brings backyard cookouts, holiday parades and fun times at the pool. For contractors pouring concrete, the hot, dry summer weather creates unique challenges that must be properly addressed to avoid schedule delays and costly remedial actions.

The principal issues caused by accelerated drying of the surface of newly placed concrete are the development of plastic shrinkage cracking, decreased concrete strength and durability, and an undesirable appearance of the finished surface.

In hot weather, efforts should be made to keep concrete temperatures as low as practical and to control the rate of evaporation of water at the concrete surface. Below are brief explanations of the steps GCI's construction inspectors and engineers may recommend or require to ensure that the hot-weather concrete pours on your project are prepared, finished and cured properly.



1. Accurately measure moisture content of aggregates

Aggregate stockpiles have lower than normal moisture content during hot, dry weather. The moisture content of aggregates must be measured and the batch weight adjusted accordingly to avoid low strengths and over-yield.

2. Shift the Schedule

Placing and finishing concrete during the night and early morning hours can avoid the adverse effects of the midday sun.

3. Wet subgrade and formwork before pouring

When severe drying conditions exist and concrete is to be placed on a dry absorptive subgrade, lightly dampening (not to the point of freestanding water) the subgrade, formwork and reinforcement immediately prior to concrete placement will help prevent the subgrade from wicking moisture too rapidly from the fresh concrete.

4. Chill before mixing

Cooler concrete temperatures can help alleviate hot dry weather conditions. Substituting ice for some of the mixing water, using cool water from deep wells, sprinkling cool water on aggregate stockpiles, and using liquid nitrogen to lower the mixing water temperature will result in cooler concrete temperatures.

5. Have appropriate manpower and equipment on site

During extreme weather, contractors must have appropriate manpower, equipment and supplies on hand so the concrete can be placed and finished promptly. Any supplies that may be needed to prevent evaporation if delays occur such as wet burlap, polyethylene sheeting, building paper, wind breaks or fog sprays should also be onsite prior to starting the pour.



6. Keep the concrete surface moist during finishing

High temperatures and low humidity cause high evaporation rates and premature surface drying which increases the likelihood of plastic shrinkage cracks. A fog spray or monomolecular film applied to the surface between operations will slow surface water evaporation.



7. But not too wet

If excess surface water is worked back into the top surface of the concrete during finishing, a high water-cement ratio and, therefore, a low strength surface layer is produced.

8. Promptly apply curing compound

Curing maintains adequate moisture content and temperature in concrete at early ages so that it can develop the strength and durability properties it was designed to achieve. Concrete in a dry environment can lose as much as 50% of its potential strength. Properly cured concrete has better surface hardness, is more watertight and will better withstand surface wear

and abrasion. Sprayed-on curing compounds should be applied as soon as possible after finishing, especially during severe weather conditions. A second coat of curing compound may be needed.

9. Keep a continuously wet surface for proper curing

After final finishing and application of the curing compound, the concrete surface must be kept continuously wet or sealed to prevent evaporation for a period of at least several days. Systems to keep concrete wet include burlap or cotton mats used with soaker hoses or sprinklers, wet straw covered with tarps, damp earth, sand or sawdust, or continuous sprinkling. The surface cannot be allowed to dry out during this critical early stage of the curing process.

10. Keep them on ice

Concrete test specimens are extremely vulnerable and require special care during hot weather conditions since extreme heat and loss of moisture will result in lower 28-day strengths. If cylinders are the

basis for acceptance of the concrete, they must be maintained between 60° and 80° F and moisture loss prevented during their initial curing in the field. Curing boxes with refrigeration or added ice are necessary to meet this requirement of ASTM C 31 and C 94.



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