

WINTER CONCRETE

No concrete with possible exposure to road salt may be placed from November 1st through April 1st.

Based on Building Code Requirements ACI 318 (5.11 Curing) the following winter guidelines need to be followed:

- Concrete (other than high-early-strength) shall be maintained above **50 degrees F and in a moist condition for at least the first 7 days** after placement, except when cured in accordance with 5.11.3.
- High Early-Strength concrete (*at least 7 bag mix with a plasticizer*) shall be maintained above 50 degrees F and in moist condition for at least the first 3 days, except when cured in accordance with 5.11.3.

COLD WEATHER CONCRETING

As the cold weather season approaches, a few timely recommendations and precautions are in order for the placement of concrete. Cold weather, as defined by the American Concrete Institute Committee 306, is when:

1. The average daily air temperature is less than forty (40) degrees for three (3) consecutive days.
2. The air temperature is not greater than fifty (50) degrees for more than half of any twenty-four (24) hour period.

Using A.C.I.'s definition, cold weather concreting usually starts around the first of November in the Chicago area.

Cold weather concreting presents many challenges in mixing, placing, setting time, and curing. Cold weather has adverse effects on properties and service life of concrete.

Setting time of concrete for each ten (10) degree drop increases by about one-third. For example, concrete placed at 11:00 a.m. in seventy (70) degree weather will be set at 5:00 p.m. That same concrete placed in forty (40) degree weather will not set until 1:00 a.m. the following day. Concrete in the plastic state will freeze at about twenty-nine (29) degrees. Once ice has formed in plastic concrete, normal cement hydration will not occur and a drop of up to fifty (50) percent in compressive strength can be expected. Concrete should not be exposed to freeze-thaw cycle prior to achieving 3500 PSI. If it is, surface deterioration is most likely to occur.

Curing is one of the most important aspects of producing a durable product at low temperatures. To ensure cement hydration in freshly placed concrete, it must be protected and covered. Concrete not properly protected only reaches fifty-five (55) percent of its potential.

To summarize, we recommend:

1. Not placing concrete on frozen sub grade.
2. Protecting fresh concrete from freezing.
3. Curing concrete for a minimum of twenty-eight (28) days after placement.
4. Keeping all vehicular traffic off unprotected concrete for twenty-eight (28) days.
5. Not using salts or other corrosives on concrete flat work, use sand if needed.
6. Use accelerating admixtures to obtain accelerated set times and increased early strengths.