COLD WEATHER CONCRETE TIPS

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WHAT IS COLD WEATHER?

Cold weather is described as a period when the average daily temperature falls below 40°F [4°C] for more than three successive days, and the air temperature is less than 10°C for half day of any the days. These conditions warrant special precautions when placing, finishing, curing and protecting concrete against the effects of cold weather.

40°F **4°C**

Average temperature below 40°F/4°C for more than three successive days warrants special precautions.

WHY CONSIDER COLD WEATHER PROTECTION?

Concrete at a low temperature has a slower rate of set and strength gain. A rule of thumb is that "a drop in concrete temperature of 10°C will approximately double the set time".

In its fresh state if temperature goes below 4°C, the potential strength of frozen concrete can be reduced by more than 50% and will not be durable.

According to CSA 23.1; During cold weather, adequate protection of the concrete shall be provided that will maintain the concrete temperature at a minimum of 10°C for the duration of required curing period as defined by table 2 & 19 (Basic, additional and extended wet curing).

Protection shall be provided by means of heated enclosures, covering, insulation or a suitable combination of these methods.

HOW TO PLACE CONCRETE IN COLD WEATHER?

In Cold weather, slower setting and rate of strength gain of concrete can delay finishing operations. Chemical admixtures and other materials can be used to help offset these effects but depends on weather, productivity, protection...etc.

1 EXTRA PRECAUTIONS

When ambient temperature is 5°C or lower, extra precautions should be followed.

2 ADDITIONAL HEAT

During cold weather, additional heat is often required to maintain favorable concrete curing temperatures of 10°C - 20°C

3 INSULATE & PROTECT

Upon concrete finishing, it's important to cover 100% of the surface by using insulated blankets and tarping. Leaving formwork in place for vertical elements (walls, columns) and their top surface shall be protected as well.

4 SEALING COMPOUND

Sealing compounds (Sealers) when applied to hardened concrete can help reduce the penetrations of liquids such as water, de-icing solutions that cause freeze-thaw damage and chemical attack. Application of sealing compound is highly recommended.

NOTE: *Accelerating Admixtures can aid in preventing concrete from freezing but their use does not preclude the requirements for appropriate curing and protection from freezing. Addition of water to achieve higher slump can delay setting time and impacting finishing operations.*

For comprehensive concreting guidelines, please refer to the Canadian Standard Association (CSA), A23.1 Curing of Protection or American Concrete Institute (ACI) 305, 306, & 308.

For further assistance contact RMC Quality Control
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