WHAT ARE COLD WEATHER CONCRETE OPERATIONS?

The American Concrete Institute (ACI 306) defines cold weather concrete operations as:

- Three successive days with mean temperature (average of the high and the low) below 40° F (5° C) and the air temperature not greater than 50° F for more than half of any 24-hour period.

Ice Lenses in Concrete

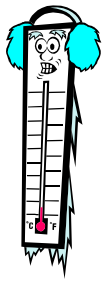
AIR ENTRAINMENT

Helps cured concrete resist freeze thaw cycles in harsh environments. Does not prevent freezing of plastic concrete.

HOW DOES COLD WEATHER AFFECT CONCRETE?

- Delayed strength gain
- Increased finishing time
- Cracking due to rapid cooling or large differential temperatures
- Damaged concrete if frozen before strength achieves 500 psi (at 50° F about two days of curing for normal weight concrete)

Call your GEM Engineering representative for help with cold weather concrete planning at (502) 493-7100.



WHAT CAN BE DONE TO PROTECT CONCRETE?

- Necessary protection increases as temperatures decrease.
- Remove frozen subgrade and ice or snow from forms.
- Heat surfaces above 32° F where concrete will be placed.
- Use insulated forms.
- Have concrete supplier use heated water or aggregates.
- Use low slump concrete on flatwork to reduce bleed water and set time.
- Use wind breaks, enclosures and heaters (vented to outside).
- Monitor placement temperatures and change operations if concrete drops below 55° F (varies with section dimensions - ACI 306).
- Have concrete supplier increase cement content, use high early Type III cement or use project specified concrete accelerator.
- Use insulation blankets, insulation batts, straw, etc. on exposed surfaces, especially edges/corners.
- Do not allow ice to form.
- Do not begin final finishing with bleed water present.
- Delay sealing surface.
- Gradually remove protective measures (do not exceed 40° F change in concrete temperatures in 24-hours.)