

# CONCRETE CONSTRUCTION

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The World of Concrete



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## Cold weather concreting tips

For successful cold weather concrete placement, consider these tips:

### General:

- Schedule/plan a pre-construction meeting.
- The recommended minimum concrete temperature at the time of placement is a function of the minimum dimension of section size and ambient temperature. See Table 3.1 of ACI 306R-88 for guidance.
- Make sure that the concrete has been proportioned for cold weather placements including the appropriate accelerating admixtures.
- Accelerators are not antifreeze agents, they just shorten the set time and accelerate strength-gain of protected concrete.

### Batching & Mixing:

- Aggregate temperature will affect the concrete temperature more than any other constituent since aggregate occupies the most volume in a concrete mix. Hot water can also be used to heat the mix.
- Sequence batches to avoid contact between hot water and cement.

### Placing & Curing:

- Plan ahead – make sure you have all the equipment necessary for placement, including plenty of blankets and heaters if necessary. Consider having backup equipment for critical items like vibrators and heaters.
- Do not place concrete on frozen ground. Remove all snow, ice, and frost from areas to be concreted.
- The temperature of embedded items (including reinforcement) should be above freezing, when coming in contact with concrete.
- Cure concrete after placement and protect it from freezing. Edges and corners of placements are more susceptible to freezing, so give them extra protection. Do not allow concrete to dry out during the curing and protection period.
- If combustion heaters are used, make sure the exhaust is vented properly to reduce risk of carbonation that can lead to dusting of concrete surfaces.
- Maintain in-place temperature at 500 F, or greater, until required strength has been attained. Consider nondestructive methods of determining in-place strength such as the maturity method.
- At the end of the protection period, concrete should be cooled gradually to reduce the potential of cracking due to thermal stresses.

These are general tips for cold weather concreting. For specific recommendations refer to ACI 306R-88.