Cold Weather Concrete Tips

JOBSITE SUPPLY

CONSTRUCTION IDEAS AT WORK

Only Pour on a Thawed Sub-grade

Never place concrete on frozen ground because the concrete will settle as the subgrade thaws. **Jobsite Supply** rents and sells concrete blankets and the **Heat King** to thaw the ground. Likewise, placing and compacting fill material on a frozen subgrade doesn't solve the basic issue of the expanded soil underneath. Make sure the base is completely thawed out before compacting, grading and placing. Cover the subgrade before the pour to raise the ground temperature. Use insulated blankets, sandwiched between two layers of 6 mil poly. The poly alone will suffice if the temperatures don't drop below the mid 20s overnight, but frost can penetrate several inches overnight with temperatures in the teens or lower. Our friends way up north - where frost depths may reach 5 and 6 feet - have to build heated enclosures and wait days before they are able to get the frost out. Make sure the exhaust is vented to the outside as the fumes can blister the top layer of the fresh concrete, not to mention harming your personnel.

Mix Design:

Making adjustments in the mix design are necessary to compensate for cold weather conditions. Ask your ready mix provider for mix design recommendations. Here are several options for accelerating the mix:
Ask your ready mix producer to use hot water; increase the cement content half a bag or more; use a non chloride accelerator; and even place the concrete at a lower slump. Ask if high early Type III cement is available to be used in place of regular Type I. Make sure you have the right air content, usually between 5 - 6 percent. Place concrete at 55 degrees or warmer and maintain at least 50 degrees for two days if possible. **Do Not Use Calcium Chloride Accelerators.** Use **Fritz Pak NCA (non-chloride accelerator)** bags to speed up the set time. These are very easy to use at the jobsite. Simply throw the inner water soluble bags into the ready mix truck and allow to mix for a few minutes. 1- 3 bags can be added per yard, depending on conditions. Follow dosage instructions on the side of the bag.

Protecting the Slab:

After placement, it is important to maintain the heat generated by the hydrating concrete so the curing process can continue. Hydration slows drastically when the concrete temperature drops below 50 degrees. Concrete must reach at least 500 psi before being subjected to freezing temperatures. Heat coming off the fresh pour may ward off temperatures dropping slightly below freezing the first night, but why take the risk?

Cover with concrete blankets as soon as you can walk out onto the slab. Putting the fuzzy side of the insulation on the fresh surface prevents any staining that might occur when the poly contacts the fresh surface. Keep the plastic as tight as possible over the slab. Wrinkles will promote discoloration because these areas cure at a different rate than the rest of the slab surface. Remove the plastic and blankets as soon as possible, hopefully the next morning when the sun is out. Try to let the slab air out as much as possible to avoid surface discoloration. Pay special attention to the edges where less heat is generated by the concrete.

The protection you have placed can be removed long enough for saw cutting, but recover and leave covered until you are confident that the strengths are up. One way to tell if you have at least 500 psi is when the saw blade doesn't cause the edges to ravel when you are cutting the control joints.

It is not recommended to apply sealer when the temperature is below 50 degrees. Try to seal when the temperature will be a constant 50 degrees or higher, and no rain or snow for a few consecutive days.