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Cold-weather concrete parking slab demonstration brings groups together



Warm air rises from the cold-weather concrete poured on frozen ground March 26. The process requires no tenting or preheating of the ground, making it a method that works well for typical winter construction projects in Alaska.

Rollo Pool For Juneau Economic Development Council/SpringBoard

Pouring concrete in winter without the usual tents and heating may be commonplace in the future thanks to demonstrations March 26 and 27 at Fort Wainwright.

This was the second year groups met in Fairbanks to demonstrate cold-weather concrete, which uses technology developed by the Cold Regions Research and Engineering Laboratory (CRREL), one of several labs working for the US Army Corps of Engineers.

"We know this technology works. This year, we wanted to show the Army and others that cold-weather concrete is a suitable alternative to other cold-weather methods that, by the way, consume considerable time, energy and money," said Dr. Charles Korhonen, retired CRREL engineer hired by SpringBoard, who has been working on this technology for 15 years.

"We don't need to preheat the ground, nor do we need to build enclosures and pipe in heat for days or weeks. We pour this mix on frozen ground. We don't need to heat the water that goes in the concrete-mixing truck. This concrete is a significant step forward for military and commercial uses," Korhonen said.

Basically, off-the-shelf, cold-weather admixtures replace some of the water in the concrete mix (gravel, sand, cement). These chemicals depress the freezing point of the water in the mix and accelerate the curing time – without the loss of strength, he said. Water freezing in normal concrete mixtures decreases strength, one of the key traits of concrete.

At Fort Wainwright, contractors and subcontractors poured five 25-by-15 foot sections, each with a different dosage of the four admixture chemicals. The slabs will be used as parking for communications and Stryker vehicles. Monitoring of slab temperatures and breaking of cylinder cores provides scientific data needed to prove this, he added.

This was a true collaborative effort, with federal agencies and the U.S. Army working hand-in-hand with academia, private industry and non-profits. Alaska Department Transportation Department officials and University of Alaska engineering professors also attended the pours, test runs and debriefing meetings.

In March 2007, cold-weather concrete was poured for two slabs at the Cold Climate Housing Research Center in Fairbanks. An earlier pour occurred in Juneau.

Both 2007 and 2008 demonstrations were funded primarily by CRREL and SpringBoard, which is a statewide program of the Juneau Economic Development Council and a partnership intermediary with the U.S. Department of Defense.



Jody McConnel of HC RediMix, Fairbanks, moves the chute to direct the flow of cold-weather concrete to create a concrete slab for communication and Stryker vehicle parking during a demonstration at Fort Wainwright March 26 and 27.



Finishers work a trowel over the solidifying concrete. This was the second year for such a project at Fort Wainwright, which incorporates cold-weather concrete, a technology developed by the U.S. Army Corps of Engineers' Cold Regions Research and Engineering Laboratory.

photos by Rollo Pool