Keyhole Technology

“Cold Weather Coring & Reinstatement”

GTI Keyhole Technology Meeting

Colin Donoahue
Utilicor Technologies Inc.
Cold Weather Reinstatement

- In northern climates, most of the done between April and November when the ambient temperature is above 40ºF and there is no likelihood of frost.

- **No water-soluble cementitious bonding product will set up and gain strength at temperatures below freezing.** That includes all bonding compounds like Utilibond or other cement based grouts.

- **WHY?** Ice crystals form at the surface and prevent the bond from forming between the two surfaces that are to be joined.

- **Surfaces of both the hole and the core need to be at least 50ºF – 60ºF to drive frost back.**

- Because of Utilibond’s super-fast strength gain formula, the **retained heat** in the pre-heated core and pavement eliminates the ice crystal problem and is sufficient to allow the hydration reaction to kick in -- roughly 5 to 10 minutes.

- Once the initial bonding reaction takes place, freezing temperatures will not affect the bond.

- **PROCESS:** use **hot water** to mix Utilibond and heat the surfaces of both the hole and the core with a **core heater.**
Winter Coring Demo
Lowell MA, March 5, 2005

Temperature: 6º F (-14ºC)
Wind Gusts: 36 mph (58 km/h)
The Core is Cut
Utilicor Core Heater is Put in Place
Insert Heater Base In Hole -- Place Core on Top and Replace Cover
Heat the Core and Hole to 70°F
-- 10 minutes
Heated Core
Clean up the heated core
Mix Utilibond with Warm Water
Add Pea Gravel & Pour Utilibond in Hole
Replace the Core
Press Down to Expel Excess Utilibond
Trowel Off Excess Utilibond
Finished Core Reinstatement

Because temperature of core and hole approx: 60°F at end, Utilibond strength gain time approx: 40 minutes.
Winter Works: National Grid
Albany NY, December 7, 2006

Temperature: 21°F to 32°F (-6°C to 0°C)
Preparing to Reinstate:
The Components

- Core Heater Base to Heat Hole
- Core Heater Heat Source
- AC Fan with Propane Burner
- Battery Power Pack
- Core Heater Cover
Monitoring Temperature with Heat Gun
Core Temperature: 72ºF
Filling the Hole with Warm Utilibond
Replacing the Core

NOTE: Area around core still warm and dry
Finishing Core Reinstatement
Utilibond in Pilot Hole: 78°F
Perfect Reinstatement: Reopen Road in 30 minutes.
Questions and Discussion

Colin Donoahue
Utilicor Technologies Inc.
Tel: 1.888.552.6666
Email: info@utilicor.ca