

# **Keyhole Technology**

## **“Cold Weather Coring & Reinstatement”**

***GTI Keyhole Technology Meeting***

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# Cold Weather Reinstatement

- In northern climates, most of the done between **April and November** when the ambient temperature is above 40°F 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 50°F – 60°F 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



# 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





# 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 Reinststate:



# The Components



# Monitoring Temperature with Heat Gun



**Core Temperature: 72°F**



# 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



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