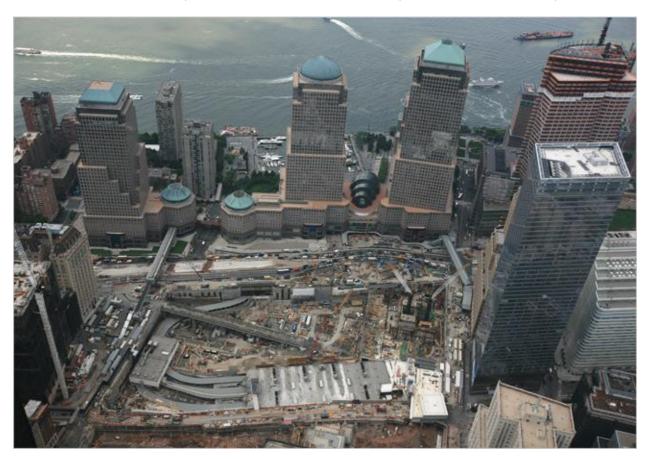# RFID Puts New World Trade Center on Solid Foundation

Thousands of active RFID tags with temperature sensors are embedded in the concrete of the new Freedom Tower, which is being built in New York City on the site of the original Twin Towers. Construction workers monitor the concrete curing process using handheld readers to get tag temperature data.

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March 20, 2008—RFID is literally helping set the foundation for the 1,776-foot Freedom Tower that is being constructed where the World Trade Center's original Twin Towers stood in New York City. Builders are embedding thousands of active RFID tags with temperature sensors in the concrete used for the foundation and throughout the structure so they can easily and accurately monitor the curing process. The RFID tags are being embedded in poured and pre-form concrete used throughout the structure, which will have more than 2.6 million square feet of office and observation space and is scheduled to open in 2011.

The Freedom Tower will have a blast-resistant steel frame, but thousands of yards of concrete will be used for the foundation, stairwells, elevator shafts, and other elements. Many grades of concrete will be used, and each cures differently. Concrete must be completely cured before it can bear a load. The process can take weeks, which necessitates frequent monitoring to keep construction schedules up-to-date.

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"There are several ways to monitor concrete maturity. One is mathematical models, which have a high margin of error. Construction tends to take longer because there's such a safety factor to make sure the concrete is really cured," said Peter Linke, president of IDENTEC SOLUTIONS, whose i-Q32 Temperature Tracking Tags and readers are being used in the project. "There are also wired sensors, but the wire has to be removed later. You can throw our tags right into the concrete and read them with a handheld."

Linke estimates the tags are usually embedded in concrete between eight and 12 feet thick. The concrete being used in the Freedom Tower is a much stronger grade than typically used in construction, and is said to be a record for a New York City facility, but has not posed a problem for getting reads from the active UHF tags.

"We didn't have to modify our product at all," said Linke.

The tags are integral to the Concrete Maturity Monitoring System (HardTrack) developed by Wake, Inc., a data collection solutions provider. Wake developed the system several years ago and has provided it for other construction projects. The company offers a good explanation of the concrete maturity process and how the RFID system works on its website.

Linke said the Freedom Tower project is not a typical application for long-range active RFID, but can help people see how the technology could be used. "When people think of RFID, they tend to think about EPC and Wal-Mart-type applications," he said. "We see RFID as an intelligent wireless product rather than a standard EPC identifier. It is like a computer you can embed in something and access wirelessly."

Once curing is complete builders have no further use for the RFID tags, which are left encased in the concrete. Linke said they will remain readable for years, as long as the battery lasts.

Last year 3M released a new line of RFID tags intended for long-term underground use to help locate

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buried pipes and cables (see *New RFID Tags Help 'Call Before You Dig'*). Ford has also targeted the construction industry with an RFID solution, offering in-dash computers linked to embedded Gen2 readers in pickup trucks and work vans to help contractors track tagged tools, equipment, and other assets carried in the vehicle (see *Ford Builds RFID into Pickups and Vans to Track Cargo*).

For more information on Wake, Inc. and the HardTrack Maturity & Temperature Monitoring Solution

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