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TOP STORY

# Concrete testing to improve; UConn develops new method to test foundations, assess risk of failure

By Eric Bedner  
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Oct 16, 2020



James Mahoney, executive director of the Connecticut Transportation Institute, takes foundation samples from a Ryefield cc  
Eric Bedner / Journal Inquirer

A quest to determine how vulnerable crumbling foundations are to deterioration is a step closer to being reached as the University of Connecticut has quickly developed a less expensive and less invasive testing program supported by federal dollars.

In August, the university was awarded \$768,000 out of \$1.5 million in federal funding for the National Institute of Standards and Technology, or NIST, to research how pyrrhotite deteriorates foundations and to establish a risk assessment to determine potential ways to minimize deterioration.

As compared to core testing that has been used in the past, UConn has developed a less intrusive, less expensive, more accurate, and quicker method that examines samples crushed into a powder that officials say provides a better representation of potential deterioration within a foundation.

Marisa Chrysochoou, a professor and department head of civil and environmental engineering at UConn, said the new method is extremely reliable in detecting the presence of pyrrhotite and can cost much less than the roughly \$2,000 bill for traditional core testing.

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### Just The Facts

**NEW TESTING METHOD:** UConn has developed a quicker, less expensive, less evasive, more accurate method for testing foundations for the presence of pyrrhotite.

**ASSESSING RISK:** The goal is to help establish a risk assessment scale to better understand at which point a foundation will deteriorate and how quickly.

**FEDERAL SUPPORT:** The testing program is supported by \$768,000 in federal funding.

**PROBLEM HAS SPREAD:** A home in Darien has been determined to have a crumbling foundation, potentially meaning the issue is more widespread than previously thought.

The goal of the new testing strategy is to determine how vulnerable a foundation is to deterioration, potentially giving homeowners some confidence that their foundation is not in imminent danger and could be lived with for years, perhaps decades, if mitigation efforts are taken.

Over time, UConn will use test results to build a database that will monitor how pyrrhotite reactions change and determine at how much risk a foundation is of widespread deterioration, Kay Wille, associate professor of civil and environmental engineering, said.

Tests were conducted Thursday at Ryefield Condominiums in Vernon, where UConn officials were joined by U.S. Rep. Joseph D. Courtney, D-2nd District, and state Sen. Daniel Champagne, R-Vernon, who also serves as Vernon's mayor.

Debra MacCoy, a relentless advocate for condominium owners with crumbling foundations, said the cheaper tests are a welcome development and testing the number of foundations affected at the Ryefield condominiums would cost about \$64,000 through traditional methods.

Chrysochoou said the university intends to provide "at least" 100 free tests throughout the state using federal dollars.

The exact cost of each UConn test and how many will be done with the \$768,000 allocation is difficult to determine and is dependent on how many samples are taken and analysis methods, Wille said.

Courtney noted that officials from NIST already have visited the state to begin laying out long-term goals and deploying resources to enable UConn to get its testing program started so quickly since being awarded funding in August.

"NIST is a partner in this," Courtney said. "That's some pretty heavy firepower in terms of support and in terms of the science."

The collaboration with NIST has enabled UConn to move "at Mach speed" when deploying the federal dollars, and "we're already seeing good results," he said.

By establishing a risk assessment scale, Courtney said homeowners would have more certainty about the structural integrity of their foundations, which would help stabilize the housing market in the affected region.

Chrysochoou said she hopes a risk scale will be developed within two years, but added it could take longer.

Meanwhile, the crumbling foundation crisis could be more widespread than previously known, as a home in Darien has been found to be affected, Champagne said, citing data from the Connecticut Foundation Solutions Indemnity Co.

“We’re trying to figure out how it got there,” he said, noting that concrete containing pyrrhotite could’ve been mixed on site.

Champagne said the details are being investigated, but that the foundation “definitely has spider webbing and all the signs” of crumbling foundations that have plagued the northeastern part of the state.

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Eric covers the state legislature and elected state leaders. Eric joined the JI in June 2014. He graduated from CCSU, and his hobbies include speaking truth to power and exposing hypocrisy. He is a fan of the New York Giants and Metallica.