

# Development of a Risk Assessment Framework for Crumbling Concrete Foundations

---



**PI: Kay Wille**

Associate Professor, Director of ACMC lab  
Department of Civil & Environmental Engineering

**Co-PI: Marisa Chrysochoou**

Professor and Department Head  
Department of Civil & Environmental Engineering



**Co-PI: Jim Mahoney**

Director, Connecticut Advanced Pavement Laboratory  
Assoc. Director, Connecticut Transportation Institute

- **Sampled approximately 85 houses using our drilling technique**
  - ❖ No cost to homeowners
  - ❖ Sampling is usually completed in 60-90 minutes
  - ❖ Does not disturb waterproofing as we only drill 5 inches
    - ❖ Dry process – minimizes mess in the basement
  - ❖ Demand for testing has dropped off considerably in the last 6 months
    - ❖ We need more houses to sample to expedite our research
  
- **Collected concrete from more than 40 foundation replacements**
  - ❖ Looking for chunks of concrete from foundation replacements
  - ❖ We will come and pick it up
  - ❖ [james.mahoney@uconn.edu](mailto:james.mahoney@uconn.edu) or 860.486.9299



- ❑ **Pyrrhotite content is one metric that can be used to assess the likelihood of premature failure of concrete**
  - ❖ Higher pyrrhotite concentrations – more likely to fail
  - ❖ Little to no pyrrhotite – low probability of failure
  - ❖ Moderate levels of pyrrhotite – other factors such as permeability, other minerals present in the aggregate may drive the likelihood of failure
  
- ❑ **Ideally, running a test on cores from the existing concrete foundation that will expedite any potential oxidation of the pyrrhotite would be really helpful**
  
- ❑ **Working on methods to accelerate the oxidation of the pyrrhotite in the concrete**
  
- ❑ **We are trying different techniques to see if this can be done and some very preliminary work looks promising – we have a long way to go with this, but could be a really big tool assessing risk for existing foundations with pyrrhotite exhibiting little to no visible damage**

# One More Plea – We Need to Get Samples

---

- **We need more foundations to drill**
  - ❖ <https://crumblingconcrete.engr.uconn.edu>
- **We need more chunks of concrete from replacements**
  - ❖ We usually can get out a site within 24 hours of being notified that a foundation is being removed to pick up samples
  - ❖ People can contact me:
    - ❖ [james.mahoney@uconn.edu](mailto:james.mahoney@uconn.edu)
    - ❖ 860.486.9299 (office)
- **Thank you for letting me give this update!**