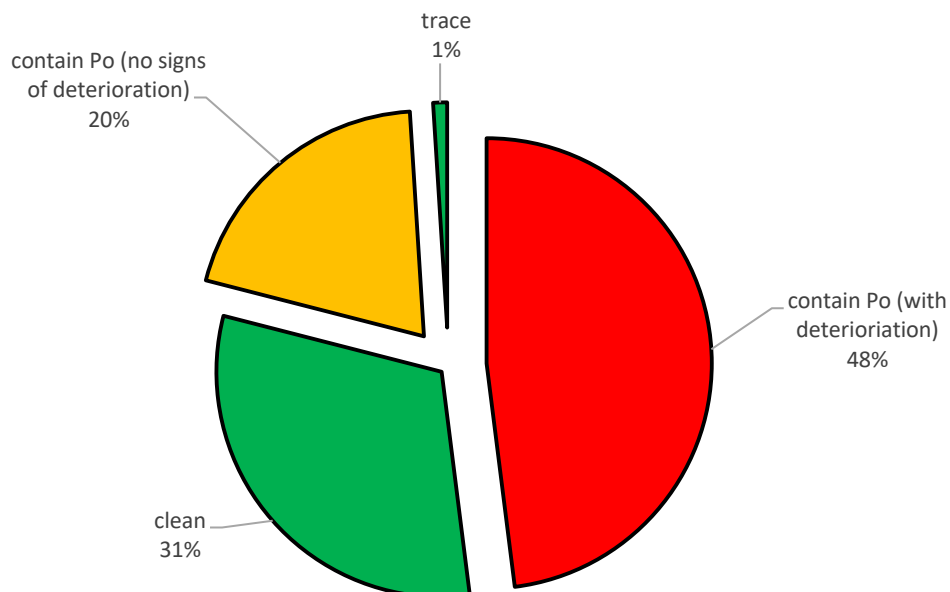


Trinity Concrete Analysis – testing lab for pyrrhotite -

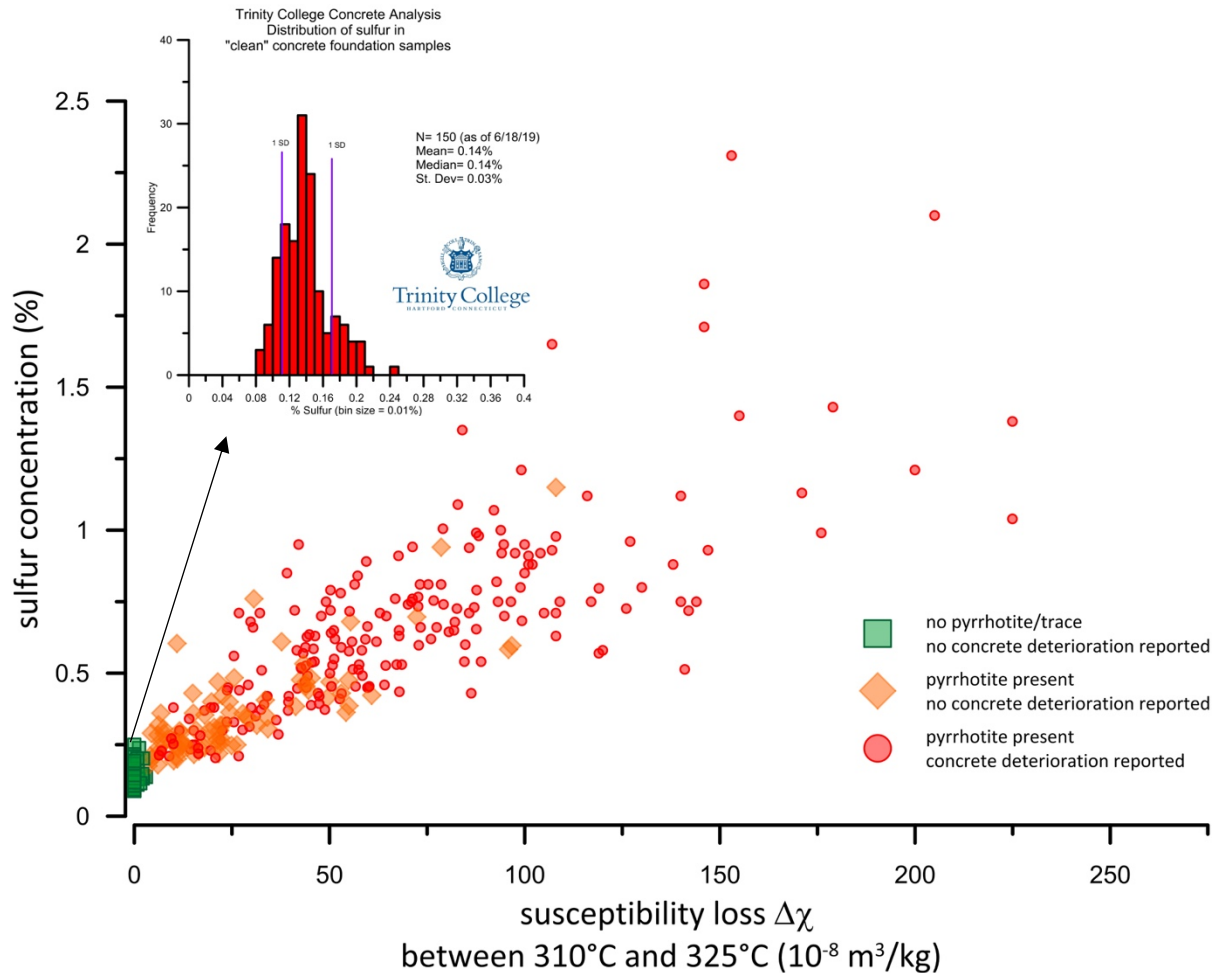
Update for CRCOG's Ad-hoc working committee on crumbling foundations - June 19, 2019
prepared by Jonathan R. Gourley Ph.D. – Trinity College Environmental Science Program

- 1) To date, since May of 2018 we have tested 212 homes (451 individual cores)
- 2) Of the 451 cores:
 - a. 215 cores (48%) contain measurable pyrrhotite (Po) above a trace level in foundations that show signs of deterioration
 - b. 140 core (31%) contain no Po
 - c. *91 cores (20%) contain measureable Po above a trace level in foundations that did not show signs of deterioration at time of testing
 - d. 5 cores (1%) contain a trace of Po



- 3) The majority of tested homes were from towns that have reported foundation deteriorations. However, we have tested several homes in towns throughout the state (outside towns that have reported problems), all of which have returned pyrrhotite-free results to date.
- 4) *IMPORTANT: There is a growing number of homes that fall into category c. above (Po is present but do not show signs of deterioration. These homes range across the spectrum in terms of age and concentration of Po, although they tend to return lower results (see diamonds on graph on reverse side). These homes are probably going to be a major issue in the future. Some may start showing deterioration soon, others not for years or decades. Prediction isn't currently possible but some degree of risk assessment may help these homeowners as their homes are

becoming unsellable with pyrrhotite. IF some sort of insurance (e.g. rider similar to flood insurance) could be established, it may provide a way for these homes to maintain their value.



Trinity Concrete Analysis data as of 6/18/19 (from 212 homes, 451 cores). Results are based on two independent, objective tests 1) total sulfur concentration (y-axis) and 2) magnetic susceptibility of pyrrhotite (x-axis).

Of note: red circles are cores from homes that contain pyrrhotite and show signs of deterioration. These values go very low, almost to clean/trace values, indicating deterioration is possible for some of the lowest measurable concentration of pyrrhotite. Also significant- overlap of homes that contain pyrrhotite but do not show signs of deterioration (orange diamonds). Most of these plot at the low end of the spectrum.

Inset graph: distribution of sulfur for clean concrete (average concentration 0.14% for 150 cores). When pyrrhotite is present, samples are consistently above 0.2% sulfur with a few exceptions.

For questions or comments, please contact Jonathan Gourley at Trinity College: jonathan.gourley@trincoll.edu; 860-297-4128. These data are for informational purposes only and should not be published without the express written consent of Trinity College. June 19, 2019