

Development and Application of a Model to Estimate Costs to Replace Failing Residential Foundations in Connecticut

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Connecticut Coalition Against Crumbling Basements Meeting

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Disclaimer:

- ▶ The author has a foundation that is failing.
- ▶ All work on this white paper was performed on personal time.
- ▶ The contents of this presentation reflect the views of the author who is responsible for the facts and the accuracy of the data presented herein. The contents do not represent the views of the author's employer.

Acknowledgements

- ▶ Without the tireless efforts of the Coalition, this project would not have been possible.
- ▶ Many people were involved in the writing of this white paper.
- ▶ Countless suggestions were received and incorporated.
- ▶ Many thanks to all involved.

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Who, Why, What and How

Who the heck is Jim Mahoney and why is he standing on the stage?

- ▶ Civil Engineer
 - ▶ Education
 - ▶ Training
 - ▶ Occupation
 - ▶ I'm not a licensed professional engineer (PE)
- ▶ Conduct research on transportation construction materials including:
 - ▶ Asphalt
 - ▶ Concrete
 - ▶ Soils
 - ▶ De-icing chemicals
- ▶ Conduct education and training on testing these materials

Why?

“It comes down to a simple choice, really. Get busy living or get busy dying.” - Shawshank Redemption

- ▶ I decided it was time to get busy living.
- ▶ I wanted to shed the feeling of being a victim and become empowered by working toward a solution.
 - ▶ This is a scary, potentially life-altering situation, and while I'm still angry, I want to use that energy to help work toward a solution.
- ▶ We all have skills to contribute to finding a resolution to this problem.

Why did I write this?

- ▶ Scope of this problem is enormous
 - ▶ New cases of this problem will be found for decades.
 - ▶ Without a proactive screening program, it will be decades before the entire scope of this problem is known.
 - ▶ Many of the records needed to fully understand the scale of this problem no longer exist.
- ▶ You cannot begin to solve a problem until you have an understanding of the size of the problem.
- ▶ Nobody can predict exactly which foundations will fail
 - ▶ The goal was to put forth a reasonable and conservative estimate on a region-wide basis.
 - ▶ This is intended to be an estimate which can be further refined as more data is collected.
 - ▶ When more data is available, more powerful modeling techniques can be employed.

What did I find?

- ▶ At least 20 CT municipalities are impacted (~11% of Connecticut's population).
 - ▶ Capital Region Council of Governments (CRCOG) indicates at least 22 municipalities are reportedly impacted with 2 additional municipalities possibly impacted (9/16/16).
- ▶ As indicated in publicly available data, an estimated 35,593 residences were constructed in the 20 municipalities from 1983 - 2015. This includes single family houses and condominiums.
 - ▶ Insurance Commission Estimates 34,130 homes built in that period
- ▶ Using a relatively straight forward mathematical model, it is estimated that 10,300 of these residences contain concrete from JJ Mottes.

Cost Estimate

- ▶ Assumed a cost of replacing the foundation to be \$150,000 with other costs (landscaping, hardscaping, temporary relocation costs, etc.) of \$65,000 for a total average cost of \$215,000 per residence.
- ▶ If 50% of the estimated number of JJ Mottes foundations (5,000 foundations) need to be replaced, the cost is approximately \$1.1 billion dollars (2016 dollars).
- ▶ Not all of this funding has to be secured at once, as it will take decades for the full extent of this “slow motion disaster” to be known.
- ▶ This disaster does not translate well to photographs or video as compared to other disasters such as Hurricane Sandy or wildfires out west. It is no less devastating though.

Affects on the Region

- ▶ All residents will be impacted - directly or indirectly.
- ▶ All property values will be adversely affected.
 - ▶ Residences built from 1983 - 2015 will be stigmatized if the source of the foundation concrete is not known, documented or tested.
 - ▶ The number of abandoned residences will increase, with little or no chance of reselling them.
- ▶ Property taxes for all property owners will be impacted.
- ▶ Municipalities may have to reduce services because of the reduction in tax revenue.
- ▶ Uncertainty will affect the number of people looking to purchase houses in the region.
- ▶ The drop in property values combined with an increase in taxes will far outweigh any potential increases in insurance rates for everyone.

How Do We Proceed from Here?

*“It is amazing what you can accomplish if you do not care
who gets credit for it.”*

Harry S. Truman

Job #1

- ▶ We must build a partnership with our elected officials on a local, state and federal level as well as regional planning organizations.
 - ▶ There is not a single person on the planet who knows how to resolve this problem; it will take many people to figure it out.
 - ▶ There is no “quick fix” for this.
 - ▶ Working together will move things forward faster.
- ▶ We have to lose the “us vs them” attitude, as this problem affects everyone.
- ▶ We must carry ourselves in a professional and respectful manner to build this partnership.

*“Action Speaks Louder
than Words but Not
Nearly as Often.”*

Mark Twain

In order for a partnership to succeed, both sides must be engaged and working together.

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White Paper Recommendations

State of Connecticut Should Obtain Records of Where This Material Was Placed

- ▶ Apparently, many of the records of where this concrete was placed have been lost.
 - ▶ Official documentation of which records don't exist or has not been made publicly available.
- ▶ Where records do exist, the State should obtain these records and notify the property owners of the possibility of this problem.
 - ▶ Applies to ready-mixed concrete as well as precast septic system components.
- ▶ This could be a joint effort between the State and municipalities on the notifications as well as developing local databases of potentially impacted properties.

It Is Imperative that Connecticut Develop a Specification Limit for Pyrrhotite

- ▶ The specification for concrete should be amended to include a maximum allowable pyrrhotite content.
- ▶ Quarries should be required to have petrographic analysis of their aggregates to ensure compliance with the pyrrhotite limits used for concrete be tested at least every other year and these results should be filed with the State.
- ▶ Uniform set of standards for measuring this should be developed

Instilling Confidence in the Real Estate Market

- ▶ For houses built within the region during the period in question, there should be a requirement for a foundation core to be taken for petrographic analysis as part of a property transfer.
- ▶ These results should be filed with the building department within the municipality.
- ▶ Should be considered as part of the home inspection process
- ▶ Will help to reduce secondary lawsuits on property transactions as well as understanding the scope of this problem
- ▶ Could be waived if the builder will sign an affidavit confirming the source of the concrete used in the foundation and filing that with the municipality

Reaching out to *Municipalities* in Massachusetts

- ▶ This concrete was supplied for construction in Massachusetts as well as in Connecticut.
- ▶ Problems with crumbling concrete have been reported in Massachusetts.
- ▶ Being that more than one state is affected, it may bolster the argument to seek Federal assistance.

Obtaining Concrete Core Data from Insurance Companies

- ▶ The State of Connecticut should request the data collected by insurance companies cutting cores and having them analyzed petrographically.
- ▶ The data could be “blinded” so that it is only identifiable by town.
- ▶ This data will be invaluable for understanding the problem and developing a specification for a pyrrhotite limit going forward.
- ▶ There may be other mineralogical factors that influence the damage done by pyrrhotite and the data contained in these results may help to sort that out.

White Paper URL

- ▶ The entire white paper can be found at:

<https://ccacbdotorg.files.wordpress.com/2016/01/crumbling-concrete-estimated-cost-for-replacing-foundations-9-5-2016-final.pdf>

Emergency Funding for Houses that are Structurally Unsafe

- ▶ Funds need to be identified immediately that can be used for the houses that are structurally unsafe and cannot be lived in at this time.

Coring Houses Less Than 10 Years Old

- ▶ The State of Connecticut should conduct research on foundations less than 10 years old.
- ▶ Cores should be cut from both affected concrete and concrete from other suppliers of a similar age
- ▶ Initially cracking is a Symptom not the problem
- ▶ Internal damage can be seen microscopically long before external damage can be seen
- ▶ Determine the amount of pyrrhotite present
- ▶ Relatively straightforward process to establish the finish line year
- ▶ Will help to protect consumers buying houses outside of the “affected years”

Making a Standard for Foundation Replacements

- ▶ To protect the public, there is an urgent need to set a standard for foundation replacements
- ▶ This would include methods for replacements as well as what gets replaced
- ▶ When money starts to flow, it will be the wild west with contractors of all skill levels coming to Connecticut to do this work
- ▶ Building inspectors will need a standard set of practices to ensure compliance
- ▶ We don't want to be doing this again in 20 years!

Engaging an Outside Organization to Review Potential Alternative Mitigation Options and Warranties

- ▶ There are many people pushing alternatives to full foundation replacements - especially for foundations that are not yet structurally compromised.
- ▶ There MAY be options for minimally-impacted foundations, but there is a need to vet these options to ensure these alternatives will be successful.
- ▶ IF any of these options were deemed to be viable, there is a need to have an iron-clad warranty.
 - ▶ May require a performance-type bond or a large entity such as the State of Connecticut to back the warranty
 - ▶ Any warranty needs to have the financial means to back it up
- ▶ The Connecticut Academy of Science and Engineering is well placed to conduct this type of study

What Can You Do To Move Things Forward

- ▶ We will petition each of the affected municipalities to drop their building permit fees associated with replacing foundations.
 - ▶ The Governor has stated that the State would waive their portion of the building permit fee.
- ▶ There is a need to educate the public on this problem as many people still do not know about it, are choosing to ignore it or believe this is simply someone else's problem.
- ▶ Reach out to your insurance company urging them to join the insurance pool announced by the Attorney General.
 - ▶ A sample letter has been posted on the CCACB website
- ▶ Volunteer - the form is on the CCACB website.
 - ▶ This will be a ramping up later in October in preparation for the upcoming Legislative Session.
- ▶ Donations are always welcome

Urging People to Register with DCP

- ▶ There are approximately 330 people who have registered with DCP.
- ▶ The actual number of affected people is much higher than 330.
- ▶ The information collected by DCP is protected for seven years and can't be made public.
- ▶ Insurance companies cannot drop you for filing a claim for foundation issues.
 - ▶ They won't know about your filing with DCP unless you tell them.
- ▶ The amount of funding that is made available will be proportional to the number of complaints filed.
- ▶ There is no stigma associated with filing a complaint.
 - ▶ This is not a negative reflection on your decision-making skills.
- ▶ This is only delaying the resolutions for everyone

Every Flood Begins with a Single Raindrop

These may all seem like small steps, but we need to set goals that can be achieved and provide the groundwork for future victories.

The way I see it the Coalition has 2 goals

- ▶ #1 - the obvious one - working towards finding solutions for the crumbling basement problem
- ▶ #2 - leaving a trail of bread crumbs for others to follow when the next situation like this occurs
 - ▶ The Canadian Coalition is doing this by being here!
 - ▶ Thank You for traveling here to help us

*“Hope is a good thing,
maybe the best of
things, and no good
thing ever dies.”*

Shawshank Redemption

This is an enormous problem, but
if we all work together, we will
get through it.