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Design and Engineering
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Small/Minority Business Enterprise

June 20, 2023

Lacey Allain and Alex Turcotte
Project Address:
101 Riverside Drive
Vernon, CT 06066

Subject: Structural Examination of Concrete Foundation Walls
Attachments: Photographs

Dear Lacey and Alex,

I visited the home located at 101 Riverside Drive, Vernon, CT on June 16, 2023. The purpose of this visit was to examine the concrete foundation walls and provide an opinion on their condition and if there are any signs of the effects of pyrrhotite oxidation reaction. According to town assessor records, the home is a 1532 square foot colonial style house built in 2005.

Observations

The evaluation of the home, as seen in photograph 1, began with a visual examination of the interior foundation walls. Only a small portion of the foundation walls were visible from the interior of the basement area, as most of the basement was finished. There was no cracking worth noting seen from the interior side of the foundation walls.

The evaluation concluded with a visual examination of the exposed foundation walls on the exterior of the home. There was one crack at the rear of the garage that had been previously filled and repaired. This crack, which can be seen in photograph 2, was found to be in good condition. There were also several vertical shrinkage cracks seen in the garage foundation walls as seen in photograph 3.

Conclusion

Based on our visual examination, no indication of deleterious pyrrhotite-bearing aggregate is present in the foundation walls of this home. Pyrrhotite is a mineral sometimes found in the aggregate used in concrete and is currently a major problem affecting homes in the State of Connecticut and Massachusetts. If pyrrhotite is present in large enough quantities in a foundation, it can lead to swelling of the concrete which can cause indiscriminate map cracking in all directions. The more moisture exposure a concrete wall containing pyrrhotite has the more rapidly the concrete deteriorates. Generally, foundation walls in areas susceptible to moisture exposure are the first to see the signs of this problem. The time frame for the appearance of the first visual evidence of this problem varies greatly by the amount of pyrrhotite present in the concrete and by the amount of moisture exposure the foundation has. Generally, the first signs present themselves in 10-25 years after the concrete is placed. This home, being 18 years old, does fall within this time frame.

Due to the nature of pyrrhotite reaction, in that it can remain hidden for many years with no signs, a visual examination cannot state with absolute certainty whether the entire foundation contains pyrrhotite or not. In this case, the cracking that is generally associated with this issue was not found.

If you have any questions or concerns, please call us at (860) 653-4432.

Thank you,

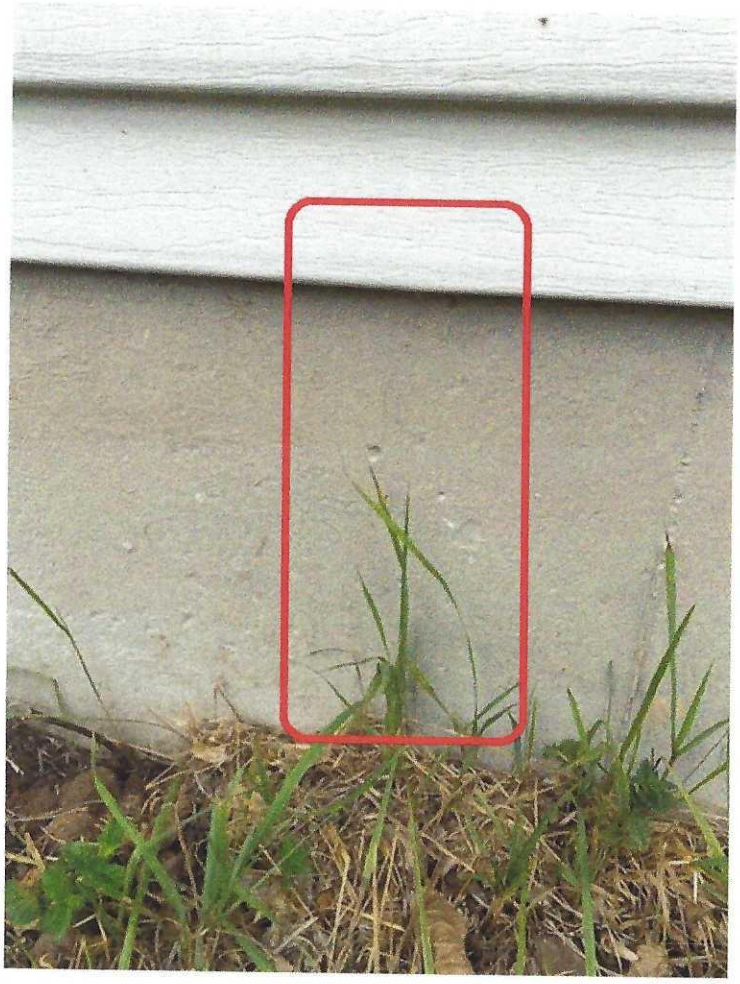
Ryan Baer, EIT

Lorri DiBattisto, PE. 23530

STATE OF CONNECTICUT
LORRI A. DIBATTISTO
LICENSED
PROFESSIONAL ENGINEER

Photograph 1: Exterior of Home

Photograph 2: Crack at Rear of Garage Previously Filled



Photograph 3: Shrinkage Crack at Garage Wall