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Professional Engineering Services
Structural Engineering Inspections

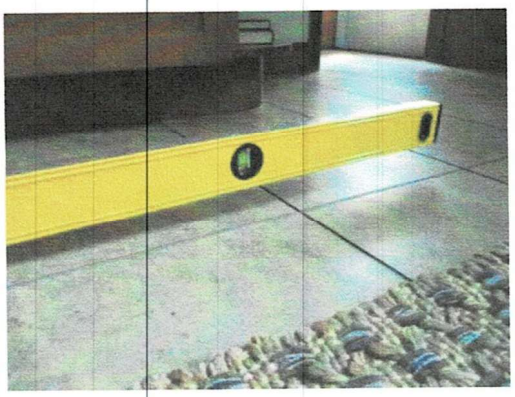
Structural Inspection Report

Report Submitted to: Sarah Doran, 414-858-6992, sarah@homemattersrealty.com

Property Inspected
Address: 2237 N. Lefeber Avenue, Wauwatosa, WI 53213
Age Info: built in: 1950 according to online information
Problem Description: ☐ Water ☒ Foundation Structural ☒ Other Structural
Inspection Date: 8/31/2020 Report Date: 9/3/2020

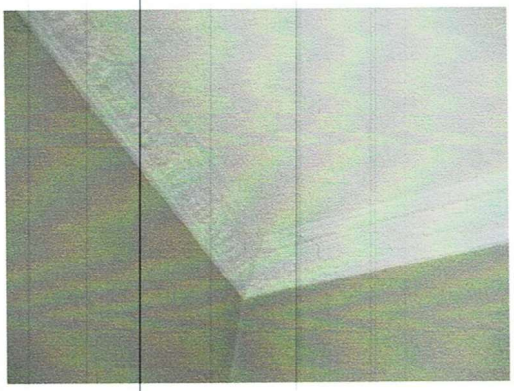
Observations
Type of Foundation: Block
• Height of Foundation Wall: 89 in. Floor to Sill • 11 Course of block • ≈ 81 in. Floor to Ground Level
Interior Drainage: ☒ Sump pump ☒ Utility drainage ☐Palmer valve ☒Positive slope to drains
Roof Drainage System: ☒ Downspouts ☐ Connection to sewer ☐ Downspouts extended
Other Observations:
(Description): The noted concerns are some sloping of the kitchen floor and a leaning brick façade (south side). Both wall and settlement measurements were taken with a BOSCH GL3 Laser level.

Settlement measurements were taken in the basement. The total settlement measured varied based on location taken. Under the kitchen, the maximum settlement measured is 5" from the north end to the south end, with the south end being lower. This results in a noticeable slope in the kitchen. About two inches was measured in the kitchen using a level (photo below).



Additional settlement measurements were taken east of the staircase. From the north end of the staircase to the south wall, a total difference of 2 3/4" was measured. Again, the south wall was the lower measurement.

There is minimal cracking of the finishes that would be indicative of continuing settlement. The windows (which appear original) operate without binding. The kitchen door did bind on the floor but it appears that this door has been replaced.





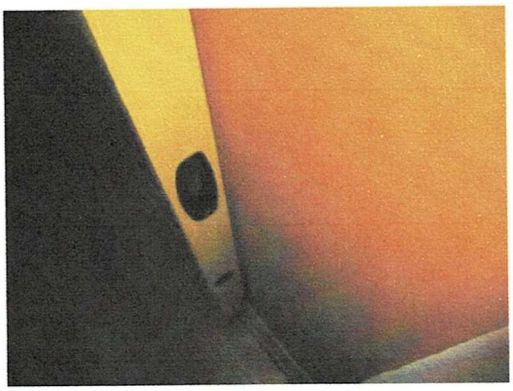
Basement wall displacement measurements were also taken of the north and south walls. The south wall is found to be tipped out 1 3/8", while the north wall is found to be tipped in 1 3/16". Some cracks are present on the south wall.

The 1st floor exterior walls were also checked for plumb using a 6-foot level. Similar measurements were observed on the first floor as what was found in the basement. The south wall is tipped out, and the north wall is tipped in.

South



North

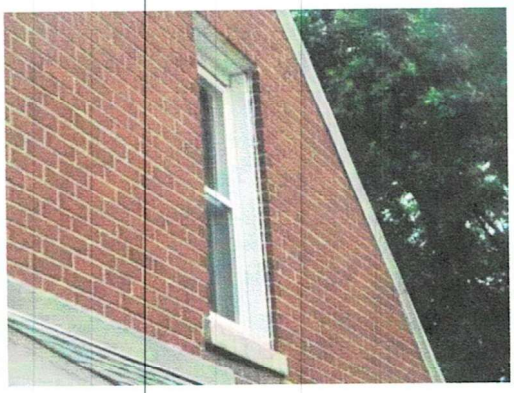


Some moisture staining was observed in the SE corner, where the sump pump is located. There is a rain barrel located in the same corner on the exterior. When the rain barrel overflows, the water is discharged next to the foundation.



Brick Façade

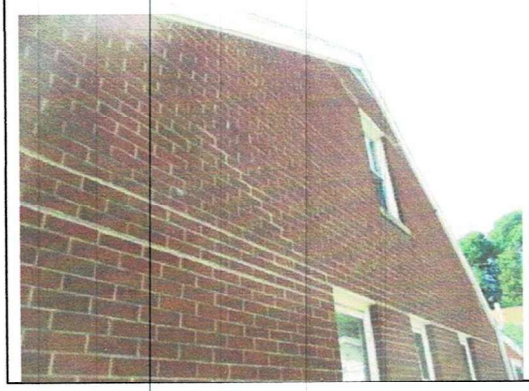
The brick façade on the south side was also inspected. From the second-floor window on the south side, one can see the gap between the house and the brick. There are indications of movement as evidenced by gaps in the caulk as well as displaced siding along the roof edge. The façade is visibly off plumb.







There is some patched cracking of the brick on the north side. The age of this patching is unknown.





Opinion/Recommendations

My opinion is that:

1. The south end of the foundation has settled on the order of 5" since the time of construction, a movement of about 1/14" per year on average. The fundamental cause of this problem is that the footings were not adequately sized for the actual soil conditions, or none exist. The soil conditions very likely included un-compacted fill material, or of an organic material which has poor bearing capacity. The rate of the settlement was likely greater for a decade or two after construction. The lack of cracking in the finishes upstairs as well as the proper operation of the windows and doors indicates the movement has slowed greatly and most likely has stopped. The kitchen door binding is not related to any building movement.

2. The brick façade on the south wall does appear to be actively moving. There is caulking around the windows that has stretched and pulled away in some areas. The most likely cause for this is a lack of the ties that connect the brick to the wooden structure, or even a failure of the ties that are in place. The problem has been exacerbated as the wall has been off plumb since construction, allowing a small force (gravity) to continually place a small pulling force on the bricks.

3. To repair the brick on the south wall, the existing façade will need to be pulled down in its entirety and rebuilt using the proper amount of ties. The brick on the north side is to be in good condition, with minimal cracking and what appears to be older tuck-pointing. This wall should be monitored moving forward.

4. No repairs are required to the foundation walls. I would recommend tuck pointing the vertical crack on the west wall in the small bump out area.

5. Moving forward, attention should be paid to surface drainage so that shrubs, leaf blockage, minor soil settling, disconnected downspouts, and other factors do not inhibit the flow of water away from the house. Included in this is to ensure that the rain barrels discharge water away from the house. These are maintenance issues but are important to watch.

This report is limited to an independent, impartial opinion, and is rendered to a reasonable degree of engineering certainty. This report is intended to help you understand the risks associated with these specific building components. It is not a warranty. My opinion is based on what was visible, and therefore what was visible, at the particular point in time that I was there.

Submitted by:
Zerrecon, Inc.

Matthew E. Soiney, PE
President
WI Professional Engineer 39452-6

