



LEADING THE WAY
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Laura Richardson

April 22, 2024

E-mail: laura.richardson@relevate.life

Subject: Residential Structural Evaluation
134 Dogwood Lane
Wake Forest, North Carolina

Project No.: DM-24323

Dear Laura:

RB Engineering, Inc. is pleased to provide the following summary engineering letter concerning our site observations at the subject residence. We performed our site visit and were asked to inspect for potential structural issues, evaluate the general structural condition and to provide any necessary general repair recommendations.

FINDINGS

For the purpose of this report, all directions are given from the perspective of an individual standing in front of and facing the residence. No material testing, soil testing or destructive inspection techniques were performed for the purpose of this report. Construction plans were not available for our review. During our site inspection, we observed the following relevant information:

- During our inspection of the home's interior, we observed minor to moderate drywall cracks at isolated locations of upper corners of doorways. Extensive drywall cracks and separations were most noticeable on the third floor, finished attic. Isolated doors were misaligned in their openings. Using a rotary laser level, we recorded minor to moderate vertical floor misalignments up to 1.25- to 1.5-inches with the largest misalignment recorded at the doorway leading from the foyer hall to the kitchen.

Structural Evaluation – The vertical floor misalignments, the cracks observed in upper corners of doorways and the misaligned doors are due to gradual, long term, differential settlement of slab/footing support of the basement support walls. The garage area of the slab, which was the only visible area of slab due to carpet covering the finished areas of the basement, showed no signs of cracking or structural failure. We recommend patching all drywall cracks and then monitoring annually for any changes in condition. We do not feel a structural repair is needed at this time. The extensive drywall cracks and separations we observed in the attic are due more to poor installation methods of the drywall with wood backing not being provided along edges of the drywall so that it could be properly secured. We do not feel a structural issue is actively occurring that needs to be addressed.

- A large bulge in the drywall was observed on the right-side wall of the stairwell from the first to second floor. The bulge could be pushed inwards in some areas.

Structural Evaluation – It is not uncommon for a slight bulge to be present when drywall spans the framing from the first floor to the second floor if the framing is even slightly misaligned. The bulging drywall we observed is more excessive than what is commonly found but the only way to verify if misaligned framing is what is occurring at the stairwell bulge is by removal of a section of drywall to visibly inspect the framing. We believe that misaligned framing and improperly secured drywall is what is occurring and not a structural failure issue, but destructive techniques would need to be performed to provide a definitive structural assessment.

- During our inspection of the home's exterior, we observed cracks, with some displacement, in the brick rowlock of the front porch near the support column by the steps. Other areas of the brick rowlock appeared to have settled slightly creating gaps between the rowlock and some of the support columns. The trim that wraps the support columns had some wood decay present at their base.

Structural Evaluation – The crack with displacement in the brick rowlock at the support column near the steps is due to differential settlement and slight rotation of the rowlock off to the side of the support column and not directly below the column. While there is evidence that minor settlement has occurred at isolated areas of the rowlock, resulting in gaps between the rowlock and base of the column, we do not feel a structural repair is needed at this time and instead recommend shimming beneath the columns to eliminate the gaps and then monitoring the brick rowlock support for changes in condition. The decayed trim wrapping at the base of the columns does not create a structural concern as the trim is only cosmetic but it is recommend that the lower trim is removed and the post wrapping cut back so that the base of the actual interior support post could be inspected at its bottom to verify that it does not have wood decay present.

- The rear decks, upper and lower levels were in poor condition with decayed wood present in the decking and handrails. Additionally, the framework does not meet current, or prior structural standards for deck framing.

Structural Evaluation – We recommend the complete removal and rebuild of the rear decks given the safety concern of their current condition.

- The brick retaining wall along the left side of the driveway was covered in ivy but in pulling some of it back near the steps a crack was observed in the wall near the bush/tree that's growing in the corner.

Structural Evaluation – The crack that was observed in the retaining wall is likely being caused by the root system of the nearby bush/tree and hydrostatic pressure is also likely contributing. The overgrowth of ivy made it impossible to determine if a structural repair is needed to prevent any portion of the wall from falling but the limited inspection we were able to perform did not indicate the wall is in a condition where that is a concern. We recommend cutting the ivy back so that the retaining wall could be fully inspected to determine any necessary repairs.

LIMITATIONS OF INSPECTION

The opinions and comments contained in this report are based primarily on the observations of apparent performance of the structure and the qualified knowledge and experience of this office. The conclusions reached in this report are based upon the conditions observed at the time of the evaluation. No guarantee or warranty as to future life or performance of any item evaluated is intended or implied.

Our services were provided in accordance with the standard of practice for structural engineering and within the limits imposed by scope, schedule, and budget. If you have any questions, or if I can be of further assistance to you on this project, please contact me at (919) 677-9662.

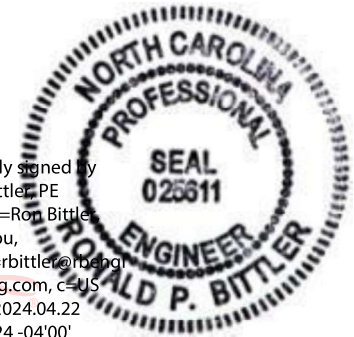
Respectfully submitted,



Ron Bittler, PE
President / Structural Engineer
RB Engineering, Inc.

Ron
Bittler,
PE

Digitally signed by
Ron Bittler, PE
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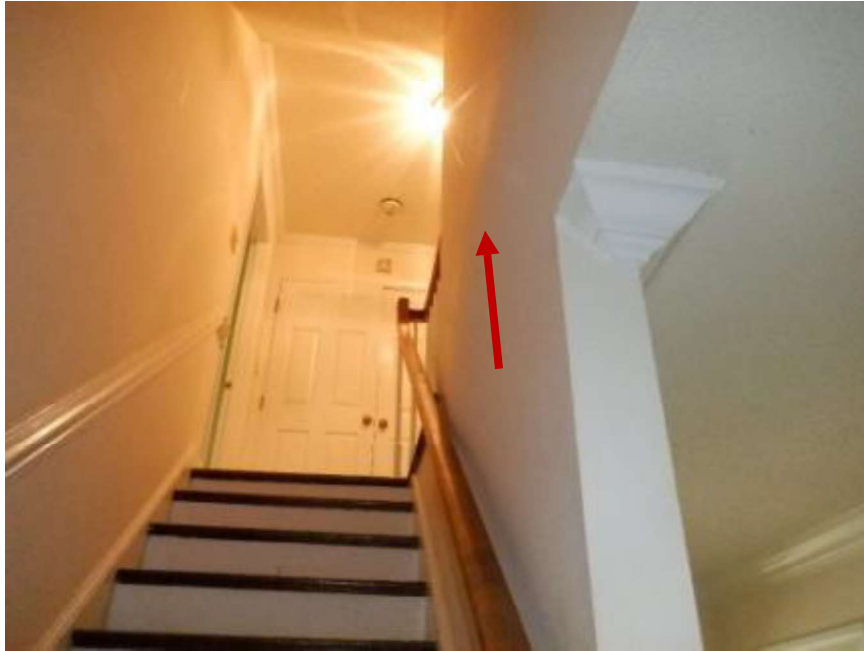
PHOTOGRAPHS



Photograph Number 1 - Example of drywall crack found in isolated areas. Patch and monitor.



Photograph Number 2 - Separation of drywall in attic. Framing was not present along edge of drywall for properly securing.



Photograph Number 3 - Bulge in drywall at stairwell.



Photograph Number 4 - Brick rowlock rotating to the side of support column.
Shim columns and monitor.



Photograph Number 5 - Rear decks are in poor condition. Remove and rebuild both levels of the deck.



Photograph Number 6 - View of undersized deck posts.



Photograph Number 7 - View of poor deck connections and support details.



Photograph Number 8 - Cracks in brick retaining wall.