



GILES & FLYTHE
ENGINEERS

Inspection

Raleigh Office:
7334 Chapel Hill Road
Suite 200
Raleigh, NC 27607
919.465.3801

Charlotte Office:
8819 University East Drive
Suite 200
Charlotte, NC 28213
704.810.1808

January 5, 2023

Marty Nusbaum

Re: Limited Structural Inspection
104 Bergeron Way
Cary, NC

Dear Mr. Nusbaum:

At your request, a limited structural inspection of the above property was performed on January 3, 2023. The report that follows has been prepared based on that inspection. The inspection was performed by Sam Umstot, EI of Giles Flythe Engineers.

The scope of this project was limited to the inspection and evaluation of reported improperly closing doors and drywall cracks. The report is intended to cover only those premises that may be examined visually without excavation, removing surface materials, and disassembling components.

No tests, measurements, or calculations have been made except as described in this report. We have not investigated for toxic materials or wastes, or examined public records regarding this property. The scope of the inspection does not assure that the property conforms to any regulations, restrictions, or building codes that may be in effect at its location.

DESCRIPTION

The 2-story wood-framed home (with a crawlspace) is constructed on concrete masonry unit (CMU) perimeter foundation walls with CMU block piers supporting the floor girders. The house was built in 1994 according to Wake County Real Estate Tax Records. For purposes of this report, all directions (left, right, rear, etc.) are taken from the viewpoint of an observer standing outside and facing the front door of the home.

Upon our arrival, access to the interior was provided by the current homeowner. The items detailed above in the scope were subsequently inspected.

Note that the original builder was not interviewed and no plans for the construction of this home were provided. The information presented in this report is gathered from the conditions visible at the site, as they existed at the time of the inspection. A limited photo log is included with this report.

OBSERVATIONS

Interior:

1. Multiple cracks (less than 1/16" wide) were noted in the drywall finish materials adjacent to the access door along the reentrant wall of the rear perimeter wall, approximately 13'-5" from the left perimeter wall and approximately 4'-0" from the rear perimeter wall.
2. A vertical crack (less than 1/16" wide) was noted in the drywall finish materials of the rear living room wall, approximately 11'-8" from the rear perimeter wall and approximately 11'-4" from the left perimeter wall.
3. A diagonal crack (less than 1/16" wide) was noted in the drywall finish materials of the rear master bedroom wall on the second floor, approximately 11'-8" from the rear perimeter wall and approximately 10'-0" from the left perimeter wall. The closet door along this wall was noted improperly close (stick at the top).
4. Minor floor slope was measured at approximately 1/4" vertical over 3' horizontal spanning front to rear along the rear perimeter wall, adjacent to the rear access door. The door at this location was noted to improperly close (stick at the top).

Exterior:

5. Gutters and downspouts (with and without leaders) were noted installed on the home. The grade was noted with a relatively positive slope away from the front and right perimeter walls and a relatively neutral slope adjacent to the left and rear perimeter walls of the home.

Crawl space:

6. Limited blocking was noted at multiple piers supporting the left central girder spanning front to rear, located approximately 12'-9" from the left foundation wall. Minor compression of blocking was also noted at the masonry pier at the reentrant corner of the rear foundation wall.
7. Girder ply flaring/separation (up to 1/4") was noted in the front span of the left central girder spanning front to rear, approximately 12'-9" from the left foundation wall.
8. Joist ply flaring/separation (up to 3/8") was noted at the double joist in the left joist bay, approximately 11'-2" from the rear foundation wall.
9. A vertical crack (approximately 1/16" wide) was noted in the front foundation wall, approximately 9'-3" from the left corner.
10. Evidence of moisture intrusion in the form of efflorescence and water staining was noted on the perimeter foundation walls. Multiple moisture readings were taken in the floor framing with an Amprobe MT-10 moisture meter and measured lumber moisture contents of up to 10.3%. A vapor barrier was noted installed throughout.

DISCUSSION

The crack in the foundation wall noted above is likely due to limited differential foundation settlement. The clay soils in this area are considered "expansive" type soils and will typically expand and contract with fluctuations in the moisture content. This expansion and contraction of load-bearing soil materials can lead to soil consolidation and foundation cracking/movement. If conditions around the foundation remain relatively dry, the likelihood of future significant settlement will be reduced, but we cannot predict the extent of future settlement. The condition of the foundation wall does not appear to be a significant structural deficiency and improving exterior drainage and monitoring cracks for additional propagation is an acceptable approach at this time.



A positive grade away from the foundation should be created and maintained to reduce moisture infiltration under the foundation. Additional soil consolidation and settlement can occur due to water infiltration into soils and subsequent drought conditions which dry out the soils below foundations. Creating and maintaining positive drainage away from the perimeter foundation wall(s) is vital to the long-term structural integrity of the foundation.

Blocking is a necessary component of framing to allow full contact bearing across the width of the pier for the above floor framing, in this case, the supported girder. The installed blocking does not appear to be providing full uniform bearing of the supported girder onto the pier. If left in the existing condition, vertical displacement resulting in interior floor slope and interior finish material damages may occur. We have provided a recommendation below to address this issue.

The flaring noted is likely due to the vertical loads on the beam causing slight rotation in the plies of the member. This effect can lead to increased vertical deflection and improper bearing at the load-bearing supports. The flaring is considered significant and is a structural concern. We have provided a recommendation below to address this issue.

The floor slope noted above is likely the result of limited deflection in the framing below. Deflection of supporting members can occur with sustained loads. The floor framing supports the weight of non-load bearing walls, kitchen island, granite countertops, heavy furniture, etc. Deflection of the floor framing will be greater in areas with sustained loads than in areas with movable (live) loads. The floor slope is not a structural concern at this time. Monitoring for additional movement is an acceptable approach at this time.

The moisture content of the floor framing noted in the home at the time of the inspection is considered normal for this time of year. Compression observed may be an indication of previous high moisture levels. Moisture levels of the framing can fluctuate based on weather conditions and seasonal changes in humidity. Prolonged elevated moisture content of the framing can lead to excessive deflection and structural damage.

The minor interior drywall cracks and improperly closing doors noted above are likely the result of a combination of the supporting members contracting/deflecting and the limited foundation settlement discussed above. Minor drywall cracking and finish carpentry separations are typically associated with changes in weather, temperature, and humidity causing the wood to shrink and swell with the seasons. When moisture is taken away from wood it has a tendency to contract thus resulting in deflection (or sagging). Any walls, windows, or doors bearing on the deflected members will also move. We do not consider contracting and deflecting wood members and the cracking/separation noted in the interior finish materials to be a significant structural concern at this time.

The recommendations presented in this report are based on our experience and understanding of the concerns to provide a reasonable solution based on the conditions that were visible and/or known to us on the date of inspection. As this report is based on the circumstances at one point in time, conditions may change which may result in additional repair recommendations. Further, the recommendations are the opinion of the Engineer to address significant structural-related concerns and may not rectify cosmetic issues.



RECOMMENDATIONS

If there are any questions or concerns regarding the location or method of repair contact the engineer prior to construction.

1. We recommend installing flat, pressure-treated blocking and metal shims between the masonry piers and girders span noted in Observation #6 to provide tight, full contact bearing across the width of the pier for the above floor framing. Care should be taken while installing the shims so as to minimize damage to interior finishes.
2. The flaring girder (Observation #7) and joist (Observation #8) spans noted above should be temporarily clamped to bring the plies into full contact, and the plies should be reattached with (3) Simpson SDS Screws (or equivalent) spaced at 16" on center alternating sides.
3. If desired and to help stiffen the floor framing in the area, we recommend installing a pressure-treated 4x4 post at the midspan of the two-ply joist noted in Observation #8. The new post is to bear on a 12"x12"x10"-thick concrete footing and be positively attached at the top and bottom. Provide a Simpson post cap and base (or equivalent).
4. Monitor the crack in the foundation wall. If the crack widens significantly (expands by an additional 1/8") or additional significant cracks (greater than 1/4" wide) propagate, then further evaluation by a structural engineer may be needed at that time. We recommend sealing the foundation crack with a construction-grade epoxy or exterior sealant in order to prevent moisture intrusion into the foundation and more accurately monitor the cracks for widening.
5. We also recommend ensuring that stormwater drains positively away from the home to minimize the risk of future water infiltration. This can be accomplished by installing leaders on downspouts that do not have them and ensuring gutters, downspouts, and leaders remain clear of debris and properly functioning to direct the drainage away from the home. Also, creating and maintaining a positive grade around the perimeter of the home will aid in stormwater evacuation. Water infiltration can cause further undermining of the soil and foundation settlement.

General Notes:

- All new lumber should be SYP No.2 or equivalent. All lumber exposed to concrete/masonry or weather must be pressure treated. All metal components exposed to weather or pressure-treated lumber shall be galvanized.
- Install pressure-treated blocking to provide full uniform bearing of the above floor framing onto the new/existing block piers.
- All new concrete is to have a minimum 28-day compressive strength of 3000 psi.
- New concrete footings are to be installed a minimum of 12" below grade (to the bottom of the footing) and in no case less than frost depth.
- Soils below new foundation components to be contractor verified to be a minimum 2000 psf bearing capacity.
- All new metal hangers/ties/clips are to be installed per manufacturer specifications.
- All fastening shall conform to R602.3(1) in the 2018 NC Building Code: Residential Code.
- Installation of the above-recommended repairs may require temporary shoring of the in-place structural components. Shoring methods are the responsibility of the contractor.
- With any structural changes, finish material cracks and minor movements are typical and expected. These are associated with settlement and allowable deflection generally observed after construction of an addition, significant remodel, or repair.



CONCLUSION

We trust that this report provides the information you require. Please contact us at 919-465-3801 if you have any questions. Thank you for the opportunity to be of assistance to you.

Sincerely,



Sam Umstot, EI
Project Engineer
Giles Flythe Engineers Inc.
NC Lic. No. C-2871



Digitally signed by
Christopher Flythe
Date: 2023.01.05
11:51:36 -05'00'

Christopher A. Flythe, PE
Principal Engineer
Giles Flythe Engineers Inc.
NC Lic. No. C-2871

Enclosed: Limited Photo Log



Description

General view of the home.

Photo No.
1



Description

General view of the area along the rear perimeter wall with cracks in the drywall finish materials and an improperly closing door.

Photo No.
2



Description

Typical crack noted in the drywall finish materials.

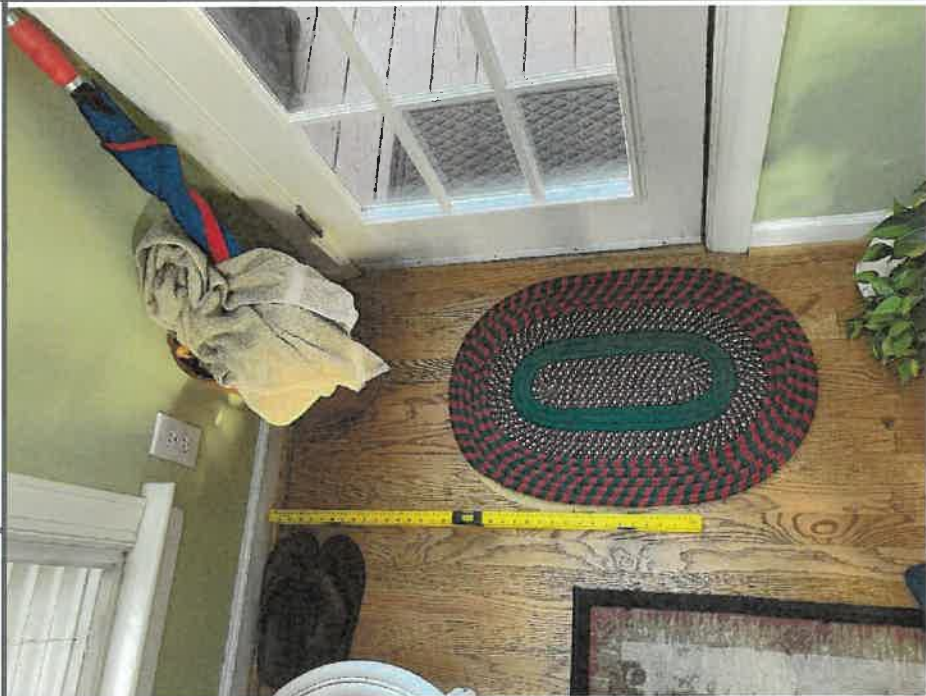
Photo No.
3



Description

General area of floor slope noted along the rear perimeter wall.

Photo No.
4



Description

Crack noted in the drywall finish materials of the rear master bedroom wall on the second floor.



Photo No.
5

Description

Joist ply flaring noted in the left joist bay.



Photo No.
6

Description

Girder ply flaring/separation noted in the front span of the left central girder spanning front to rear.

Photo No.
7



Description

Limited blocking noted between a masonry pier and the left central girder spanning front to rear.

Photo No.
8



Description

Crack noted in the front
foundation wall.

Photo No.
9





Josh Wingate

Re: 104 Bergeron Way inspection report

To: Marty Nusbaum

January 14, 2023 at 6:20 PM

Mr. Nusbaum,

I have read the report and everything looks fairly straightforward.

Below will be the Estimate for the recommendations from the engineering report.

Please let me know if you have any questions or concerns.

Thank you,

Josh Wingate
Wingate Construction
919-924-9478

Scope of Work as follows:

#1 Install additional treated blocking and steel shims as needed so that the girders above have proper support from the piers below.

Note: I have included a total of 4 piers to be completed, if there are more than an additional \$140.00 will be added per pier. If there are only 3 needed to be repaired then a deduction of \$140.00 will be given.

#2 Clamp together the girder and double floor joist and install Simpson SDS screws per report.

#3 Install a new concrete footing and a treated 4x4 post under the double floor joist per the report.

In repairs above we will need to use jacks to help install blocking, steel shims and new post.

We will try to reclaim loss floor deflection but only to a point of is safe to do so, Some interior finishes above may have some movement? We will strive to not have this happen but occasionally some finishes do move.

Total for labor and materials above \$2185.00

[See More from Marty Nusbaum](#)

Josh Wingate
Wingate Construction LLC
(919)-924-9478

Repairs made



GILES FLYTHE
ENGINEERS

Re-Inspection

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919.465.3801

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8819 University East Drive
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704.810.1808

March 17, 2023

Wingate Construction
c/o Josh Wingate

Re: Limited Structural Re-Inspection
104 Bergeron Way
Cary, NC

Dear Mr. Wingate:

At your request, a representative of Giles Flythe Engineers visited the subject home to inspect previously completed repairs on March 15, 2023. The purpose of the inspection was to determine if the re-shim, flaring floor framing, and post repairs (Recommendations #1-3) were installed per recommendations outlined in the previous inspection report dated January 5, 2023. The following itemizes our review of the repairs:

- 1) The girder to pier bearing locations exhibiting limited and compressed blocking were re-shimmed in general accordance with Recommendation #1 in the previous inspection report.
- 2) The flaring plies of the 4-2x10 girder and 2-2x10 floor joist at the front-left and rear-left areas of the crawlspace, respectively, were reattached in general accordance with Recommendation #2 in the previous inspection report.
- 3) A new 6x6 post on a concrete footing was installed below the midspan of the 2-ply floor joist noted above. The post was attached at the joist using a Simpson A35 clip angle and at the base using a Simpson A24 angle. The installed post repair is adequate to support the design loading conditions and satisfies Recommendation #3 in the previous inspection report; no further repairs are required.

The above-listed determinations were made in accordance with the 2018 edition of the North Carolina Residential Building Code.

We trust that this letter provides the information you require. Please contact us at (919) 465-3801 if you have any questions. Thank you for the opportunity to be of assistance to you.

Sincerely,

Sean M. McDonald, PE
Project Manager
Giles Flythe Engineers Inc.
NC Lic. No. C-2871

