



March 6, 2024

RJ Crawlspace Repairs
c/o Dago Berto

Re: Limited Structural Inspection
270 Wiggins Road
Louisburg, NC

Dear Mr. Dago,

At your request, a limited structural inspection of the above property was performed on March 4, 2024. The report that follows has been prepared based on that inspection. The inspection was performed by Evan Rimer, EI of Giles Flythe Engineers, Inc.

The scope of this project was limited to inspection and evaluation of damaged floor framing. 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). The house was built in 1980 according to Franklin 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 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

Crawlspace:

1. The framing in the crawlspace generally consisted of 2x10 floor joists spaced up to 16" O.C. The floor joists were supported by the perimeter foundation walls and floor girders.
2. Damaged floor framing was noted at the following locations in the left crawlspace area:
 - a. Damage was noted to the floor girder spanning left to right approximately 10'-0" from the front foundation wall. The damage was noted to be in both spans of the floor girder.
 - b. Damage was noted to nearly all floor joists spanning front to rear at the rear of the crawlspace.
 - c. Damage was noted to a section of floor joists spanning front to rear at the front of the crawlspace. The damage was noted to start at the left foundation wall and extend towards the right approximately 13'-6".
 - d. Damaged subfloor was noted to the front of the floor girder approximately 6'-0" from the front foundation wall. The damage was noted to start at the left foundation wall and extend towards the right approximately 4'-0".
3. Damaged floor framing was noted at the following locations in the main crawlspace:
 - a. Damage was noted to the floor girder spanning left to right in all spans approximately 13'-6" from the front foundation wall.
 - b. Damage was noted to the floor girder spanning left to right approximately 5'-0" from the front foundation wall. The damage was noted to be in both spans of the floor girder.
 - c. Damage was noted to a double floor joist at the front of the crawlspace approximately 20'-0" from the right foundation wall. Additionally, the floor joist was noted to have a pipe penetration near the rear bearing end.
 - d. Damage was noted to a floor joist at the front of the crawlspace approximately 21'-8" from the right foundation wall.
 - e. Damage was noted to a floor joist at the front of the crawlspace approximately 24'-6" from the right foundation wall.
 - f. Damage was noted to a floor joist at the front of the crawlspace approximately 22'-0" from the left intermediate foundation wall.
 - g. Damage was noted to a floor joist at the front of the crawlspace approximately 17'-6" from the left intermediate foundation wall.
 - h. Damage was noted to a floor joist at the front of the crawlspace approximately 7'-6" from the left intermediate foundation wall.
 - i. Damage was noted to a floor joist at the front of the crawlspace approximately 4'-0" from the left intermediate foundation wall.
 - j. Damage was noted to a 4-ply floor joist at the front of the crawlspace approximately 20'-0" from the left intermediate foundation wall.
 - k. Damage was noted to subfloor approximately 6'-6" from the front foundation wall. The damage was noted to start approximately 1'-4" from the right foundation wall and extend towards the left approximately 5'-6".
4. Cracked/split floor joists were noted in the main crawlspace at the following locations:
 - a. A cracked/split floor joist was noted at the front of the crawlspace approximately 11'-6" from the left intermediate foundation wall.
 - b. A cracked/split floor joist was noted at the front of the crawlspace approximately 14'-0" from the left intermediate foundation wall.
 - c. A cracked/split bearing end of a floor joist was noted at the front of the crawlspace 14'-2" from the left intermediate foundation wall.

- d. A cracked/split floor joist was noted at the rear of the crawlspace approximately 20'-3" from the left intermediate foundation wall.
5. A cut floor joist was noted at the front of the crawlspace approximately 11'-6" from the left intermediate foundation wall.
6. In the main crawlspace, separation (up to 1/4" wide) was noted of a box-out header approximately 9'-0" from the front foundation wall and 4'-0" from the right foundation wall.
7. In the main crawlspace, separation (up to 1/4" wide) was noted of a box-out header approximately 12'-0" from the rear foundation wall and 5'-0" from the right foundation wall.

DISCUSSION

The damaged floor framing noted above (Observations #2-3) is likely the result of moisture intrusion into the building envelope in combination with prolonged elevated moisture levels in the crawlspace and wood-damaging insect infestation. Excess water intrusion in the building envelope over time can deteriorate the integrity of the wood framing members and cause rot. The damaged floor framing is considered to be a structural concern. We have provided recommendations below to address these issues.

The cracked/split floor joists noted above (Observation #4) are likely due to natural defects in the lumber causing the members to split. The condition of the floor joists is considered to be structural concerns. We have provided a recommendation below to address this issue.

The inadequately supported box-out framing is likely due to construction methods at the time of original construction of the home. If left in this condition, vertical displacement and finish material damages are likely. We have provided a recommendation below to address this issue.

As noted in the report, the Engineer has identified numerous structural-related concerns throughout the crawl space. The structural components have redundancies that help to provide rigidity and safety for the occupants. Over time, settlement and deflections may cause loads to be transferred to other components which are not readily apparent to the Engineer. While we have identified what are believed to be the primary structural deficiencies, the homeowner should monitor the structure for additional concerns after the initial repairs are made. As the loads are redistributed to the newly installed repairs, cracking of drywall and other finish materials are likely. Contact the Engineer for further evaluation should additional concerns appear.

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 location or method of repair contact the engineer prior to construction.

1. We recommend removing and replacing the damaged sections of floor girder noted above (Observations #2a) for the full length (bearing point to bearing point). The new sections of floor girder should consist of 3-2x10 members and bear above the existing support piers in the crawlspace. Install pressure-treated wood blocking and/or metal shims to ensure full-width uniform bearing contact of the girder onto the support piers below.
2. We recommend removing and replacing the damaged sections of floor girder noted above (Observations #3a-3b) for the full length (bearing point to bearing point). The new sections of floor girder should consist of 4-2x10 members and bear above the existing support piers in the crawlspace. The plies should be positively attached with (3) 5.5" FastenMaster HeadLok screws at 16" O.C. staggered on each side OR 1/2" diameter through bolts at 16" O.C., staggered top and bottom. Ensure a minimum of 2" edge distance for all through bolts. Install pressure-treated wood blocking and/or metal shims to ensure full-width uniform bearing contact of the girder onto the support piers below.
3. We recommend fully sistering both sides of the second and third girder spans from the right for the full length (bearing point to bearing point). The sistered member should match the size of the existing and bear above the existing support piers in the crawlspace. Attach all plies with (3) 7" FastenMaster HeadLok screws at 16" O.C. staggered on each side OR 1/2" diameter through bolts at 16" O.C., staggered top and bottom. Ensure a minimum of 2" edge distance for all through bolts.
4. In regards to the damaged 4-ply joist/girder noted above (Observation #3j), we recommend removing and replacing the damaged members with a new 4-2x10 members. The new members should be supported by the foundation wall and new floor girder at the bearing ends. Positively attach the plies together with (3) 5.5" FastenMaster HeadLok screws at 16" O.C., staggered on each side.
 - a) Additionally, we recommend positively re-attaching the subfloor from above with 8d nails spaced up to 12" O.C.
5. We recommend fully sistering the damaged, split, and cut floor joists noted above (Observations #2b-2c, 3c-3i, and #4-5) for the full length (bearing point to bearing point). All double joists should be sistered on each side. The sistered member should match the size of the existing and be attached with (3) 10d nails at 16" O.C.
6. In regards to the damaged subfloor noted above (Observation #2d and #3k), we recommend the installation of 3/4" plywood/OSB sheathing between each of the floor joists where the existing subfloor is damaged. The new sheathing should be pushed tight to the underside of the in-place subfloor and should extend minimum 6" beyond the limits of the damaged/deteriorated area. The sheathing is to be supported on all four sides with continuous 2x4 blocking. The new blocking is to be fastened to the face of each in-place floor joist with minimum (2) rows of 12d nails spaced 12" on center (parallel orientation), or each end of the new blocking is to be toenailed into the face of the in-place floor joists with minimum (2) 16d nails (perpendicular orientation).
7. In regards to the inadequately supported framing ends noted above (Observations #6-7), we recommend installing new pressure-treated 6x6 posts at the left ends of the box-out header to the front and rear of the chimney. The new posts should bear on minimum 12"x12"x8"-thick

concrete footings. Positively attach the post to the footing with a Simpson Post Base (or equivalent).

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 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 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.

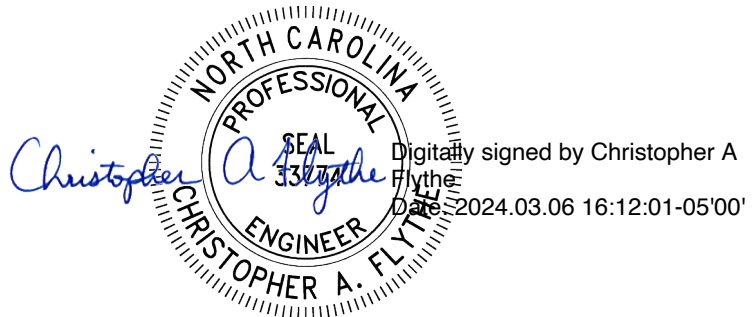
CONCLUSION

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,



Evan L. Rimer, EI
Project Engineer
Giles Flythe Engineers Inc.
NC Lic. No. C-2871



Christopher A. Flythe, PE
Engineering Manager
Giles Flythe Engineers Inc.
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Enclosed: Location Sketch
 Limited Photo Log





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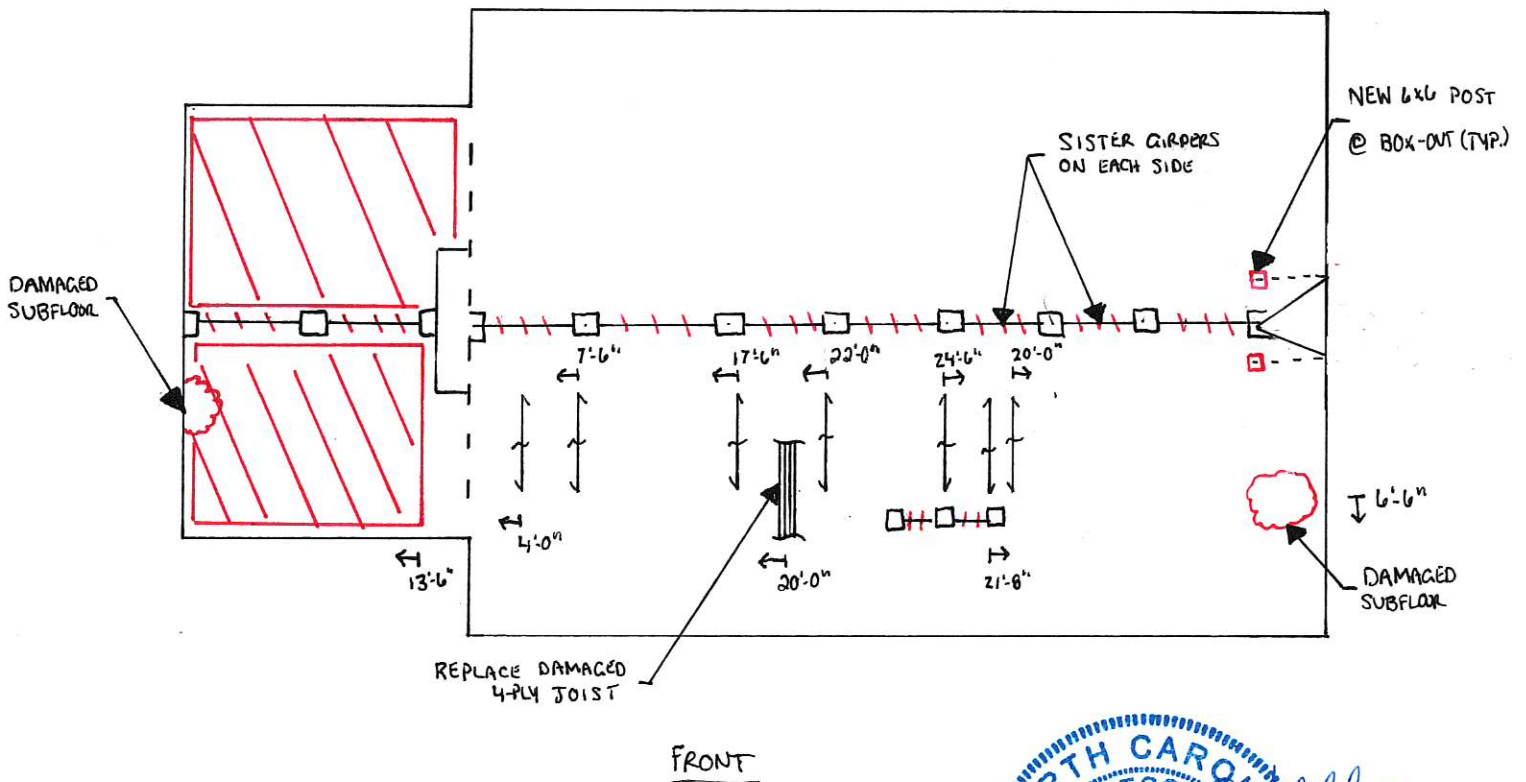
270 WIGGINS ROAD
LOUISBURG, NC

LOCATION SKETCH
(NOT TO SCALE)

* REPAIRS TO BE MADE PER ATTACHED REPORT.
SKETCH IS FOR LOCATION ONLY.

- H: DAMAGED GIRDER
- ▣: SECTION OF DAMAGED FLOOR JOISTS
- ↑: DAMAGED FLOOR JOIST

* NOTE: LOCATIONS OF CUT/SPLIT
FLOOR JOISTS NOT SHOWN FOR
CLARITY



Description

Front elevation of
the home.



Photo No.
1

Description

Typical view of a
damaged floor
girder.



Photo No.
2

Description

Typical view of a
damaged floor joist.

Photo No.
3



Description

Typical view of
cracked/split floor
joists.

Photo No.
4



Description

View of the
damaged 4-ply joist.

Photo No.
5



Description

Typical view of
inadequately
supported box-out
header.

Photo No.
6

