

C. Christian Berg, PE
Structural Engineer

1126 Boxcar Way, Apex, NC 27502
919-623-7300

July 9, 2020

Jacquelyn Spears
Coldwell Banker Howard Perry and Walston
9051 Strickland Road, Suite 200
Raleigh, NC 27615

Re: Structural Issues - 107 North Elm, Louisburg, NC

Dear Ms. Spears:

The home in question is an approximately 100-year-old historic home, which has been renovated by the seller and is currently under contract. As part of this renovation, the majority of the floor framing was replaced with new framing. At your request, I originally visited the subject home on 7/1/20. The purpose of my visit was to review several items of structural concern which were raised by the home inspector in a previous review. During that visit, I reviewed the concerns, and made several recommendations, which were then repaired by the contractor. I then revisited the home today to confirm the completion of all requested work. The items which were reviewed, along with their resolutions, include the following:

- Floor joist connections – concerns were raised that the new floor joists had been connected to the girder by means of toe nailing. While this is a normal practice for years, most modern homes are constructed using engineered joist hangers. At my request, engineered joist hangers have been installed at all new floor joists in the crawlspace
- Floor Insulation – it was noted that the new insulation under the floor in the crawlspace had been installed upside-down (with the paper side facing the crawlspace). This is now been corrected and all the insulation reversed
- Floor Girder – It was noted that the central floor girder (down the center of the house) was not replaced but had been supported with 4x4 wood posts below it at a close spacing. This original girder, which appears to have past termite damage, appears to have been left in place due it being located under the main central bearing wall of the home. New 2x plates have been added to both sides of the girder to connect the new floor joists, as well as below the girder.

I recommended that the “temporary” posts supports be removed, and that a new 3-2x12 floor girder be installed below the existing girder, tight to the new 2x plate on the bottom of the original girder. Additionally, I recommended a new concrete footing supported post should be installed at midspan of these new 2x girders. This work has been completed as requested, and even more support than requested was installed.

- Sag in main roof – It was noted the visible sag can be seen from the ground on the main roof slopes. I went into the attic to review the existing attic framing and found the framing over the main home to be very solid old-growth timber with no signs of structural deterioration. It is my opinion that the sag seen is a result of “creep” in the joists, which is very common in framing of more the 60-70 years old. This is simply a result of the fibers in the wood elongating over time, causing the structural members to deflect. I see no structural concerns with this condition, and it appears normal for a home of this age. (Please note this does NOT apply to the rear added shed roof, which is addressed below)

It was also noted that several addition support posts had been added in the attic eave space. The joists supported by these posts didn't not appear to have any damage or diminished capacity, and I speculate they were added because of the creep sag noted above.

- Sag in non-standard framing over rear addition – The rear addition, enclosing the attic stair, appears to have been added at a later time and features a very odd 2x4 roof framing, with the 2x4 roof joists being supported at midspan with a 1x main girder. This inadequate framing was causing a pronounced sag in the rear shed roof. I recommended that the roof be jacked back to level, and additional support be added to this roof by converting the existing 1x “girder” to an actual girder by adding additional 2x6's and support posts. At my re-visit today, this work had been completed and the roof was leveled.
- Mortar at front piers – It was noted that the mortar joints at several of the front porch piers were exhibiting loss of mortar. This is not unusual in an older home, and these front piers are subject to weathering. I recommended that these piers have all of their joints re-pointed. This work was in progress and nearly completed during my re-visit.

After reviewing all of the above items, along with the corrective work noted, and the general condition of the home, It is my professional opinion that this home will continue to safely support all required loads as it has for the last 100+ years.

Please let me know if you have any questions or require additional information.

Regards,

Chris Berg, PE

