



November 25, 2019

Floyd West

Re: Inspection of Repairs  
295 Wood Rd.  
Dunn, NC

Dear Mr. West:

At your request, the undersigned visited the subject property on November 21, 2019 to inspect the home addition being constructed at the subject property. The report that follows has been prepared based on that inspection.

The scope of this inspection was limited to inspection of the structural components of the home addition at the subject property. The report is intended to cover only those premises that may be examined visually without excavation, removing surface materials and disassembling components.

## OBSERVATIONS

### Roof:

1. 2x8 rafters @ 16" on center spanning front to rear over addition structure.
2. 2x6 rafters @ 16" on center spanning left to right over the front porch addition w/ 2x4 ceiling joists and (2) 2x8 porch band.

### Ceiling:

1. 2x6 ceiling joists @ 16" on center in rear.
2. Front section vaulted with 2x8 ceiling joist and 2x4 collar ties at 16" on center.

### Walls:

1. Interior and exterior walls – 2x4 studs at 16" on center
2. Window headers (2) 2x10

### Floor Framing:

1. 2x8 floor joists @ 16" on center spanning front to rear a maximum of 10'.
2. (3) 2x8 floor girders with 2x ledgers supporting floor joists spanning approximately 10'.

### Foundation:

1. 8" CMU block walls with 24" wide concrete footing. Depth of footing was approximately 12".
2. 16"x16" CMU block piers on concrete footings supporting floor girders. CMU blocks were turned sideways with the openings visible.

## DISCUSSION

The vaulted ceiling construction doesn't allow for the rafter loading to be adequately supported. The vaulted section on the front side of the home addition does not make use of a structural ridge beam. Since there is no ridge beam supporting the load from the rafters, the loads should be carried through ceiling joists or rafter ties per the 2018 NC Building Code: Residential Code. The vaulted ceiling construction doesn't allow for the rafter loading to be adequately supported, and repairs are required. We have provided recommendations below to address this issue.

After analysis, it was determined that the 3-ply 2x8 girders supporting the floor framing are inadequate to support the anticipated loads. We have provided a recommendation below to address this issue.

The CMU block piers in the crawl space have the CMU blocks turned on their side. This orientation of the CMU blocks has placed them in their weak axis and is therefore not properly supporting the floor framing above. We have provided recommendations below to address this issue.

The remaining structural components are suitable in their current condition.

## RECOMMENDATIONS

1. We recommend installing new 2x6 rafter ties horizontally at the top of the vaulted ceiling section. The new rafter ties shall be installed at a maximum of  $1/3^{\text{rd}}$  of the vertical distance between the top of the supporting walls and bottom of the roof ridge. The ends of the new rafter ties shall be fastened to the rafters with a minimum of (9) 16d nails. Also, the end of the 2x8 ceiling joists at the rear of the vaulted section shall be fastened to the 2x6 ceiling joists in the rear section with a minimum of (9) 16d nails.
2. We recommend installing new 8"x16" CMU block piers at all midspans of the floor girders. This will total to (4) new CMU piers. The piers shall be supported by a new 12"x20"x8" thick concrete footing installed a minimum of 8" below grade. After this repair the floor girders will be structurally adequate.
3. We recommend one of the following repairs to address the CMU block piers with the blocks turned on their weak axis:
  - a. Temporarily supporting the floor framing and rebuilding the block piers with the blocks stacked along their strong axis.
  - b. Installing new 8"x16" CMU block piers directly adjacent to the existing piers, and directly under the floor girders. At the (2) existing center piers, a new 8"x16" block pier should be installed on both sides, under the girder. The new piers should be supported by a concrete footing as described in recommendation #2. If the existing footing projection is sufficient, the new piers may be placed on the same footings as the existing piers.

We trust that this report provides the information you require. Please contact us (919) 465-3801 if you have any questions. We appreciate the opportunity to provide our services to you on this important project.

Sincerely,

Zachary T. Shepherd, PE  
Project Manager  
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