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Stonewall Structural Engineering, PLLC
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Raleigh, NC 27609
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David Moriarty
Tarheel Basement Systems
3333 Air Park Rd.
Fuquay-Varina, NC 27526

Re: Structural Observation — 293 Mallard Road, Sanford, NC 27332

Mr. Moriarty,

At your request, on March 11, 2022 we performed a review of the structural plan proposed by *Tarheel Basement Systems* for the chimney stabilization work at the Sanford residence noted above (*see picture 1*).

Our observations are listed below. Indicators such as “left,” “right,” “front,” and “back” are referenced as viewing the front of the home.

CHIMNEY MOVEMENT

- The chimney was noted to be visibly leaning (*see picture 2*).
 - Measurement by laser plumb indicated that the chimney was leaning by as much as approximately 1” over a height of 8’.
 - No gutters were installed on the home. Additionally, the grade was noted to slope toward the chimney (*see picture 1*).

We recommend the following work be performed by a qualified general contractor:

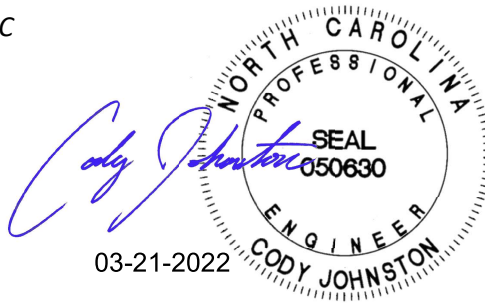
- Install (2) galvanized steel helical pier deep foundation supports to the footing beneath the outer face of the chimney to stabilize it against further movement. Piers should be located approximately 16” from corners of the chimney and should each be installed to a torque capable of developing at least 25 kips of axial load, or to refusal.
- Provide drainage improvements around the perimeter of the structure such that rainwater runoff is adequately diverted from the perimeter of the home. Drainage improvements are intended to help avoid the need for extensive foundation repair/stabilization work in the future.
 - Current building standards require 6” of fall within the first 10’ from a structure or use of drains and swales. A system of exterior perimeter “French” drains and/or catch basins installed at low points in the grade may be necessary to achieve adequate drainage. Any low spots in the grade adjacent to the home should be filled for positive drainage away from the structure.
 - Install roof gutters and extend roof gutter downspouts and any HVAC condensation drains at least 5’ from the perimeter of the structure onto soils adequately graded away from the home.

March 21, 2022

Project No. 22-1219

The above-listed determinations were made in accordance with common engineering principles and the intent of the 2018 edition of the *North Carolina Residential Building Code*. Sequencing, and means and methods of construction are considered to be beyond the scope of this report. Contractor is to provide adequate temporary shoring prior to cutting or removing any structural load-bearing elements. All work is to conform to applicable provisions of current building standards. Please feel free to contact us, should you have any questions or concerns regarding this matter.

Sincerely,
Cody Johnston, PE
Stonewall Structural Engineering, PLLC
Lic. #P-0951



PICTURE ADDENDUM

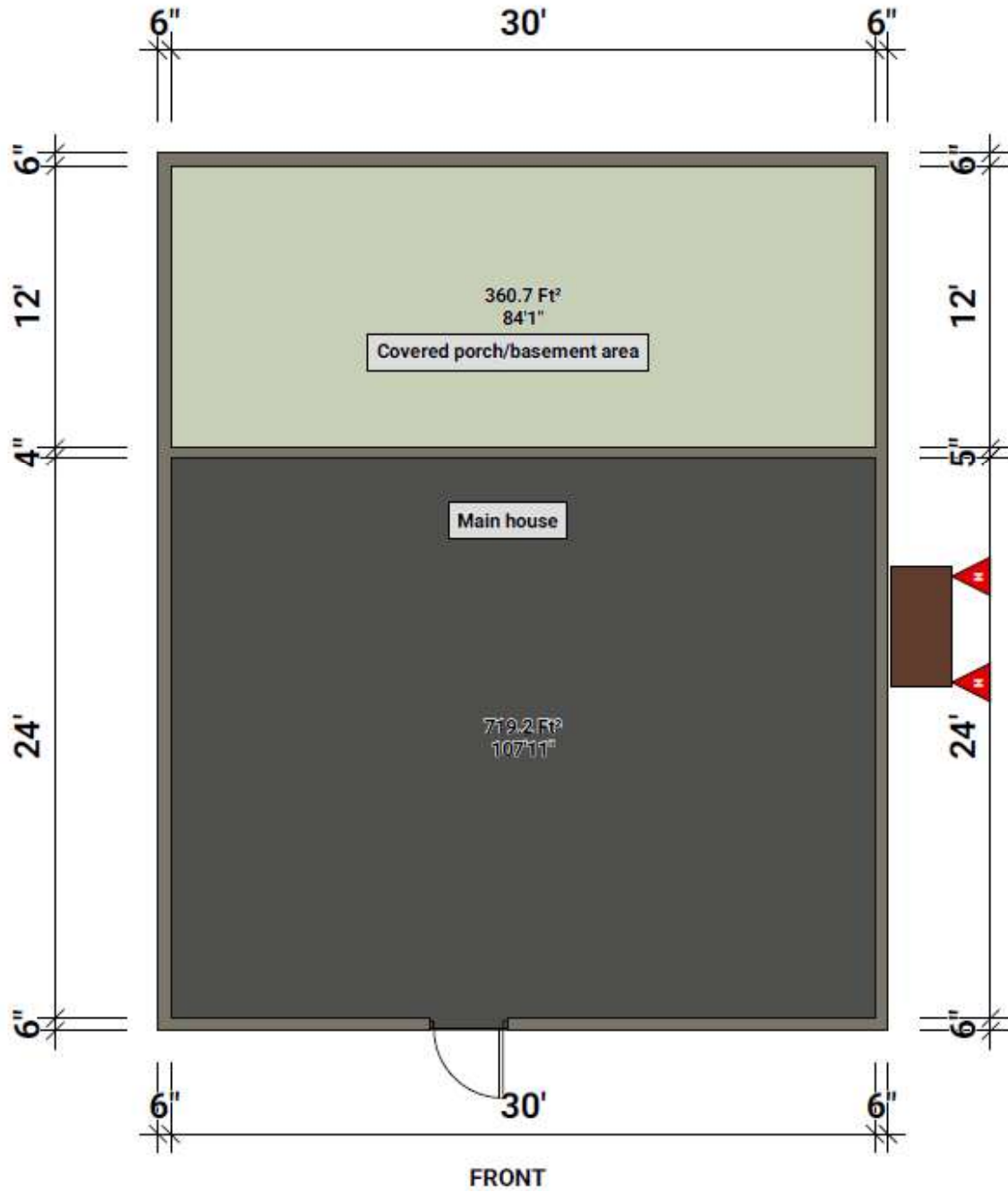


Picture 1 – 293 Mallard Road, Sanford, NC



Picture 2 – Leaning chimney

SCHEMATIC ADDENDUM



Repair Schematic