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Greg Vambell
Tarheel Basement Systems
3333 Air Park Rd.
Fuquay-Varina, NC 27526

Re: Structural Observation — 489 Lenoir Drive, Spring Lake, NC 28390

Mr. Vambell,

At your request, on July 1, 2022, we performed a review of the structural plan proposed by *Tarheel Basement Systems* for the foundation stabilization work at the Spring Lake residence noted above. The structure is a conventionally framed, detached, single family residence with a slab-on-fill foundation system (*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.

FOUNDATION MOVEMENT

- Minor perimeter foundation cracks were noted on the back of the house, to the left of the back steps (*see picture 2 for example*).
 - Measurement by laser level indicated that the back-right corner of the main portion of the home was down as much as approximately $\frac{1}{4}$ " relative to the crack on the back of the home.
 - Roof gutter downspouts were noted to be installed for discharge at the foundation (*see picture 3 for example*).

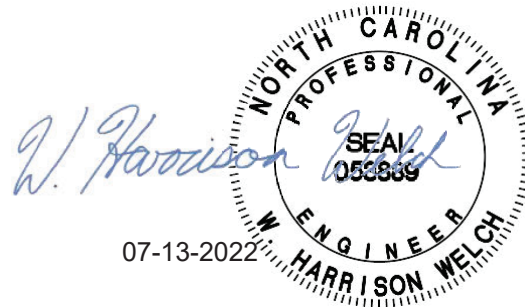
We recommend the following work be performed by a qualified general contractor (*see repair schematic*):

- Install a series of (3) galvanized steel push piers to stabilize the structure against additional differential settlement.
 - Push piers should be driven until engagement of the structure with lift indicating adequate depth/frictional resistance along the shafts of the piers.
 - The contractor should locate and avoid utilities prior to work.
 - Where the foundation wall is less than 4' tall, avoid installing piers beneath windows or doors. **Piers should not be installed on the bay window at the back right of the home.**
 - Install piers at approximately 6' on center and at the approximate locations shown in the attached repair schematic.
- 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.
- Extend roof gutter downspouts and any HVAC condensation drains for discharge at least 5' from the perimeter of the structure onto soils adequately graded away from the home.

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,
W. Harrison Welch, PE
Stonewall Structural Engineering, PLLC
Lic. #P-0951



PICTURE ADDENDUM



Picture 1 – 489 Lenoir Drive, Spring Lake, NC



Picture 2 – Foundation crack

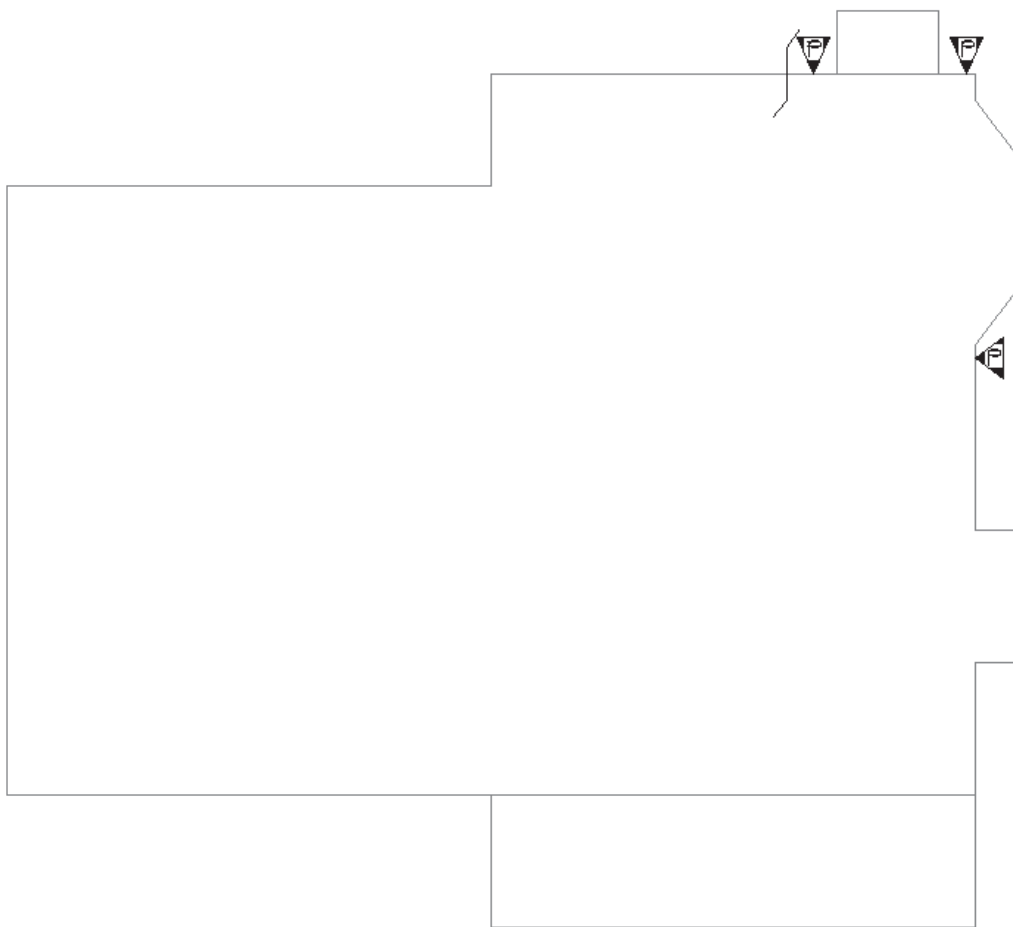


Picture 3 – Roof gutter downspouts installed for discharge at the foundation

SCHEMATIC ADDENDUM

▼ APPROXIMATE PUSH PIER LOCATIONS

— APPROXIMATE LOCATION OF CRACK



FRONT