April 26, 2023

Patrick Nolan
Gary Robinson Homes

Re: Undermined Footing – Foundation Support
156 Heatherspring Way
Spring Lake, North Carolina

Mr. Nolan,

OTG Consulting, LLC (OTG) visited the site on April 24, 2023 to determine stability of the footings after support soils were eroded for a second time.

Our previous report (dated November 25, 2022) detailed that the soils have eroded away after several rain events at the Southeast corner of the home. Based on our previous evaluation of the onsite conditions, we had recommended the cavity beneath the foundation be filled with flowable fill and that drainage swales be constructed to divert water away from the building foundation.

During our most recent site visit (April 24, 2023), we observed significant foundation support erosion at the Southeast corner of the home. Currently, the home is framed and under roof. A 2-story deck has also been constructed at the rear of the property, above the eroded soils at the SE corner.

As noted from our previous site visit, it appears that while the overall grading of the lot has positive drainage away from the building, areas directly adjacent to the foundation walls (within approximately 2 to 3 feet) are trenched to allow construction of the foundation walls and veneer (Pictures 1 to 3). While this trenching is standard practice and not typically detrimental, it can result in undermining of the footings when the site is sloped.

Recommendations

To provide support for the undermined footing, we recommend that the cavity be backfilled with non-shrink grout (not dry packed). The non-shrink grout can be mixed onsite or ordered from a ready-mix concrete company. Prior to placement, we recommend that the undermined area be cleared of loose soil and debris and the bottom of the excavation probed to verify stability. The area should be bulkheaded and the non-shrink grout pumped into the cavity. The grout should extend/make full contact with the bottom of the existing footing. The area of grout placement should extend up to the sanitary line cleanout (approximately shown in Figure 1).

The remaining areas of erosion should be properly backfilled and compacted in 8-inch loose lifts using a soil with a minimum fines content (material passing #200 sieve) of 15%. The soils should have a USCS classification of SC, SM, or CL.

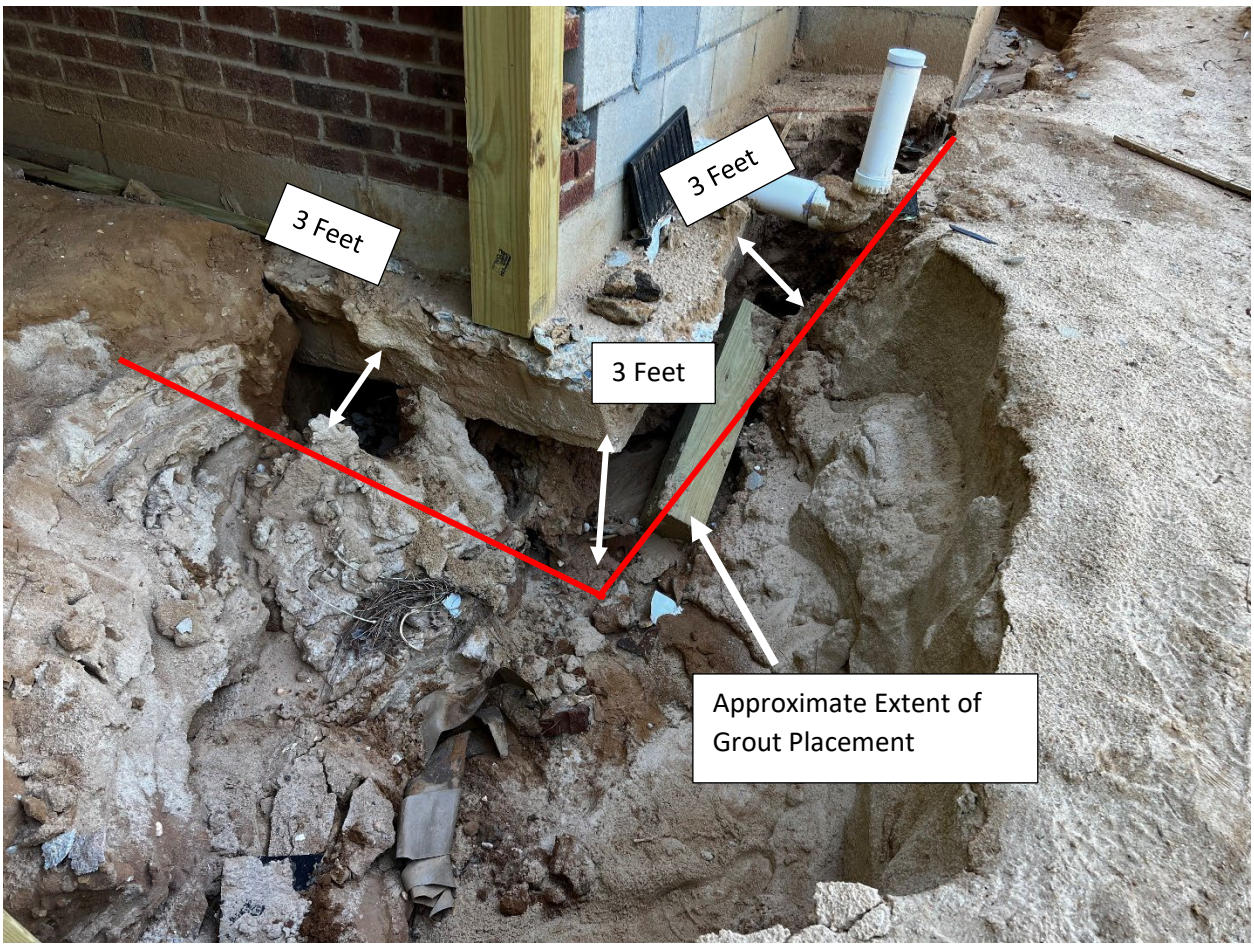


Figure 1: Approximate Extents of Repair (Not to Scale)

In addition, we recommend that a diversion berm be constructed along the side of the home starting at the North end of the front porch, extending along the East side of the home and terminating past the Southern-most deck supports (See Figures 2 and 3 for Approximate Location). The berm should consist of SC, SM or CL soils and be sufficiently compacted to minimize erosion.

The areas directly adjacent to the foundation, where they were trenched to allow for foundation and veneer construction, should be temporarily backfilled and compacted with SC, SM, or CL soils until veneer construction begins. In addition, once veneer construction is completed, we recommend that the areas be permanently backfilled as promptly as possible and covered with erosion control matting to minimize erosion.

For the long term stability of the slope in that area we recommend that gutters and downspouts (with a minimum 10-foot extension) be installed, positive drainage away from the foundation walls be achieved (per 2018 NCRC) and permanent grasses be installed. A deeper drainage swale may need to be installed along the North and East sides of the home to capture surface water runoff from the roadway and driveway.

Figure 2: Approximate Start Location of Temporary Diversion Berm

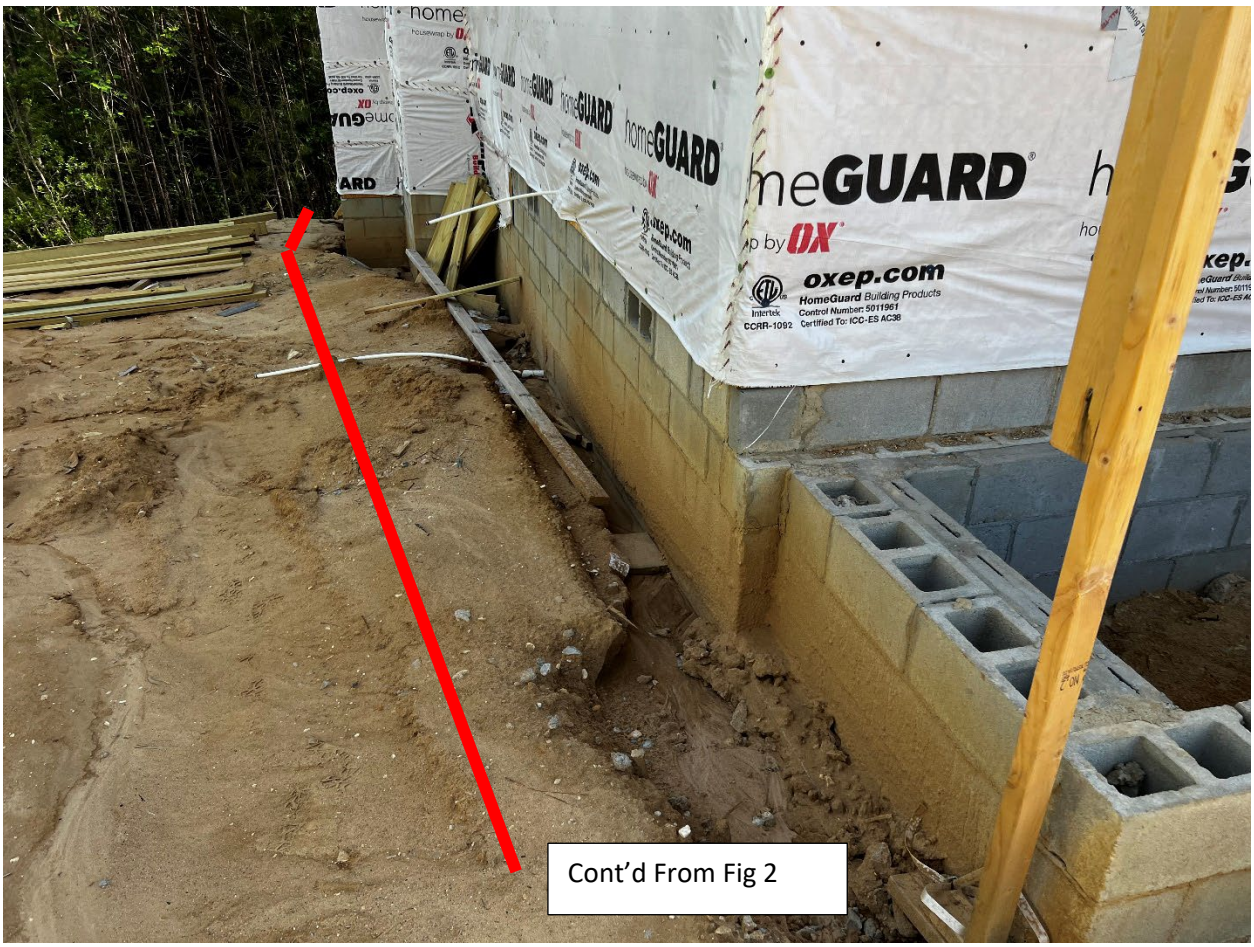


Figure 3: Approximate Extents of Diversion Berm

Photographs

Picture 1: Foundation Support Eroded, Trench/Slope Along Foundation

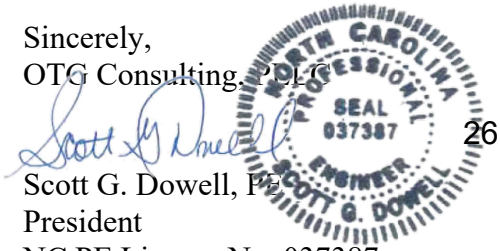
Picture 2: Foundation Support Eroded, Trench/Slope Along Foundation

Picture 3: Negative Slope/Trench

Picture 4: Footing Undermine

We appreciate the opportunity to help you with this. Should you have any questions or need additional information, please contact me at your earliest convenience. We can be reached at 336-414-1179 or at otgconsulting@protonmail.com.

Sincerely,
OTG Consulting, PLLC



26 Apr 2023

Scott G. Dowell, PE
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