October 24, 2024 Project No. 24-2225

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Stonewall Structural Engineering, PLLC
9203 Baileywick Rd. #200
Raleigh, NC 27615
(919)407-8663

Brandon Dyer
Tar Heel Basement Systems
3333 Air Park Rd.
Fuquay-Varina, NC 27526

Re: Review of Proposed Foundation Repairs — *380 Senter Lane, Bunnlevel, NC 28323*

Mr. Dyer,

At your request, Stonewall Structural Engineering (SSE) was consulted to review and provide recommendations for foundation repairs proposed by Tar Heel Basement Systems at the above referenced address. The purpose of the proposed foundation repair(s) is to address issues observed by Tar Heel Basement Systems while on-site October 9, 2024.

Conditions Evaluated

Based on the information provided by Tar Heel Basement Systems, we understand the subject structure to be a conventionally framed, detached, single-family residence with raised first-floor framing over a pier/curtain-wall foundation system. A closed crawlspace system was observed in photographs provided, and the first-floor framing was noted to consist of nominally sized dimensional lumber *(see pictures 1-4)*. Indicators such as “left,” “right,” “front,” and “back” are referenced as viewing the front of the home.

Picture 1 – Front of Home
(380 Senter Lane, Bunnlevel, NC 28323)

Picture 2 – Rear of Home

Picture 3 – Existing Foundation System and Typical First Floor Framing

Picture 4 – Existing Crawlspace (Closed Crawlspace System)

The following foundation issues were observed by Tar Heel Basement Systems during a routine maintenance inspection associated with the recent installation of the closed crawlspace system:

1. One (1) cracked Cement Masonry Unit (CMU) block was reported near the middle of the back girder line *(see picture 5).*
2. One (1) masonry pier was reported to be out of contact with its supported girder *(see picture 6).*

In order to address the foundation issues noted above, Tar Heel Basement Systems has proposed the following foundation repair(s):

1. Install two (2) SettleStop IntelliJack supports.
2. Shim the out-of-contact pier.

Picture 5 – Cracked CMU Block Supporting Girder

Picture 6 – Out-of-Contact Pier

Engineering Assessment and Recommendations

The cracked solid cap of the pier (item #1) is possibly the result of eccentric loading of the CMU pier from the girder above. Additionally, the out-of-contact pier (item #2) is possibly the result of minor interior settlement and is potentially related to the recent installation of the closed crawlspace system. Site drainage improvements and/or moisture control efforts, commonly included with the installation of closed crawlspace systems, can lead to initial structural movement as the moisture levels in the soils supporting a home change, and a relative state of structural equilibrium is reached.

Based on our review of the information provided, the proposed foundation repairs are recommended to be installed as follows:

1. Reinforce each girder span adjacent to the cracked CMU pier using an IntelliJack support on a well-compacted 18"x18"x18" gravel footing. Two (2) IntelliJacks required. Jacks should be located within 18" of the cracked pier (*see Drawings 1-2 for details*).
   - Each new gravel footing should be located such that the edge of the new footing abuts the existing footing for the cracked pier.
   - If the existing footing projection is found to be larger than 8", then the IntelliJack should be anchored directly to the existing footing and the gravel footing omitted.
2. Install tight-fit treated or steel shim material at the out-of-contact pier such that the pier is in contact with the girder.
   - To lessen the likelihood of future differential settlement of the pier, one additional IntelliJack support may be installed at the mid-span of the girder to the left of the out-of-contact pier. The new support should be centered on a well-compacted 18"x18"x18" gravel footing (*see Drawings 1-2 for details*).

General Comments and Limitations

The determinations above were made in accordance with common engineering principles and the intent of the 2018 edition of the *North Carolina Residential Building Code.* Our review and assessment of the proposed foundation repair(s) was limited to the information provided by Tar Heel Basement Systems, and SSE was not consulted to visit the subject project site. As such, SSE is not liable for any issues arising beyond the scope of information provided to SSE. Should additional information become available, or if site conditions are found to vary from those reported, SSE is to be notified and consulted regarding possible impacts to the structure's integrity and/or the effectiveness of the recommendations presented.

Sequencing, and means and methods of construction are considered to be beyond the scope of this report. A qualified 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

10/24/2024

DETAIL ADDENDUM

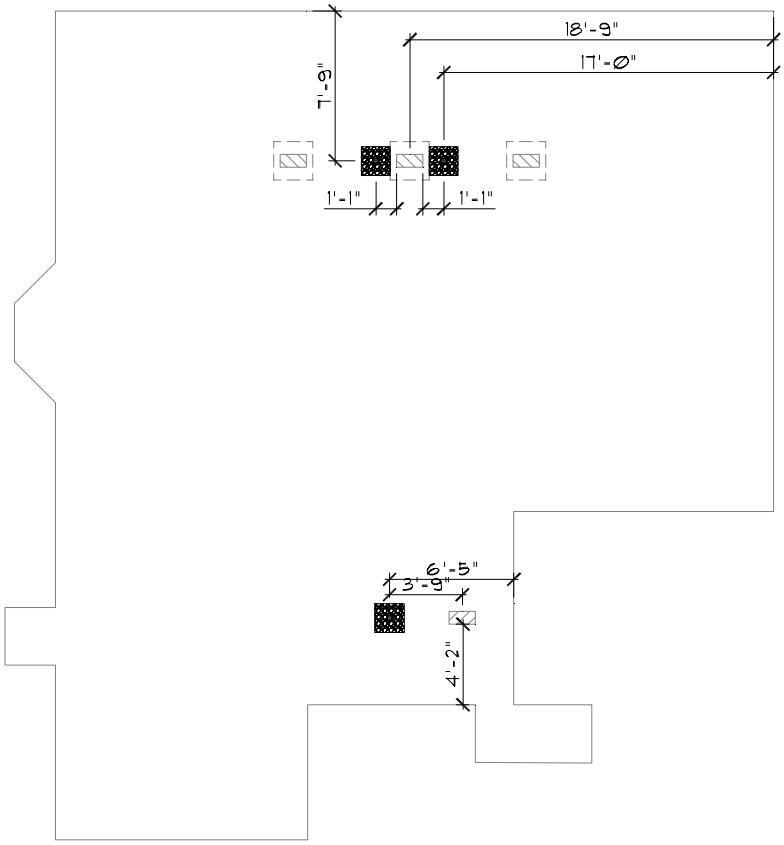
NOTES

1. ASSUMED SOIL BEARING CAPACITY IS 2,000 PSF. CONTRACTOR MUST CONTACT A SOILS ENGINEER IF UNSUITABLE SOILS ARE ENCOUNTERED.
2. CONTRACTOR TO VERIFY DIMENSIONS PRIOR TO WORK.

LEGEND

INDICATES INTELLIJACK ON WELL
COMPACTED 18"x18"x18" GRAVEL FTG

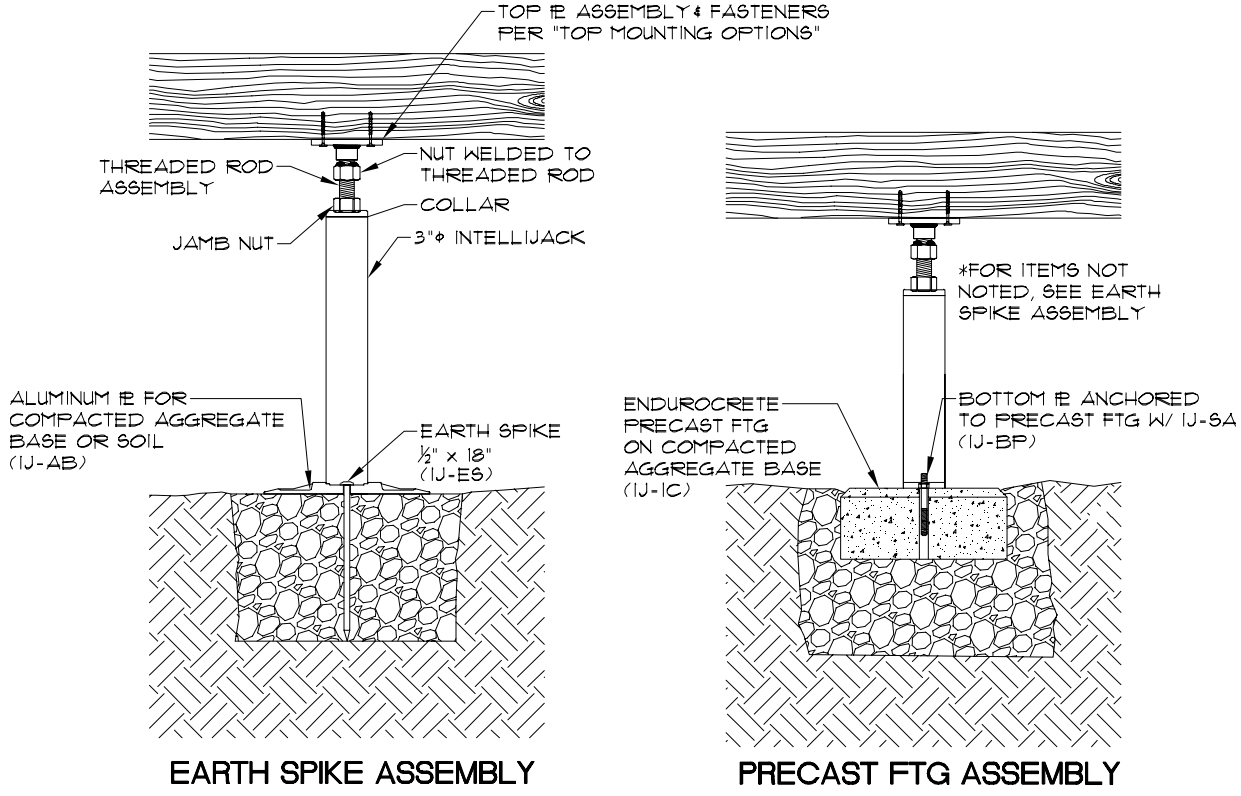
INDICATES (E) CMU BLOCK
PIER

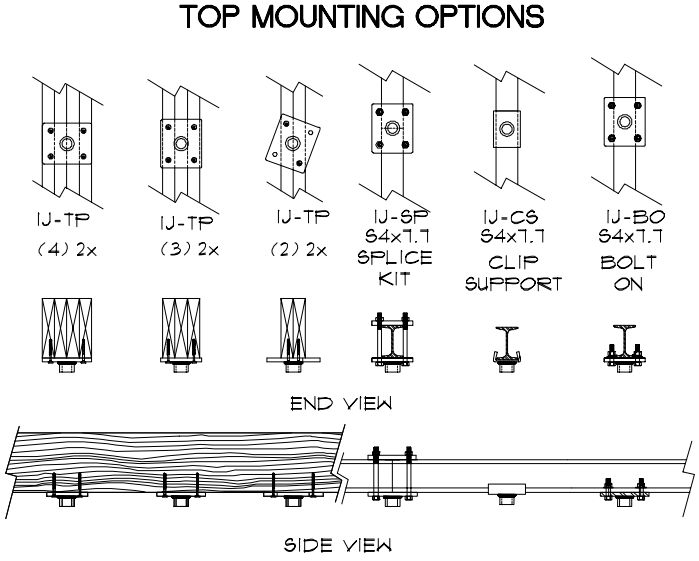


INTERIOR PIER STABILIZATION SCHEMATIC

SCALE: N.T.S.

Detail 1 – Interior Pier Stabilization





Detail 2 – Standard IntelliJack Installation