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Dallas, TX 75201
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Texas Registered Engineering Firm 20170

Project No. 27120

November 18, 2020

Re: Foundation Evaluation
5505 Mesquite Grove Road
Austin, TX 78744

Dear Katelynn Essig,

As requested, personnel of GreenWorks Engineering and Consulting have completed an observation of the foundation at the address referenced above on November 15, 2020. The purpose of the observation was to collect information necessary to assess the performance of the existing foundation. This evaluation was a Level B evaluation as described in the "Guidelines for the Evaluation and Repair of Residential Foundations" by the Texas Section of the American Society of Civil Engineers (ASCE). For the purpose of this report the house faces north.

Introduction:

The house is a single-story wood framed structure with an attached two car garage built in 1994. The house is covered with brick veneer and wood siding, and the roof is covered with asphalt shingles. The foundation system of the house is a concrete slab on grade. All the information gathered was from the visual evaluation and no destructive or invasive testing was performed.

Observations:

The interior and exterior of the house appeared to be in relatively good condition. However, there were minor signs of distress.

The interior distress included:

- Cracks in the walls and ceiling drywall in the garage
- Separation of the cornerbead from the drywall in the garage
- Separation of the baseboard from the floor tiles
- Cracked floor tiles

The exterior distress included:

- Separation of the brick and the mortar
- Cracked and broken parge covering the foundation

- Cracks in the rear concrete steps
- Cracks in the concrete flatwork driveway

Note, the exposed areas of the foundation were covered with a parge, a cementitious mortar on the perimeter foundation wall, which limited our ability to visually evaluate the foundation. It should be noted that the ground surface adjacent to the foundation appears to slope toward the house.

Interior Elevation Survey:

An interior floor elevation survey was performed on the living area of the house, with the elevations recorded to the nearest 10th of an inch (0.1”). Adjustments were made to account for the thickness of the floor coverings. The elevations within the garage were recorded from the ceiling, as the slab slopes to the garage door. A benchmark elevation of 0.0 inches was established near the south wall of the living room, as shown in Figure 1 of this report.

Drainage:

The drainage of water is an important issue that affects the shrink/swell properties of the expansive soil the house is built upon. The purpose of proper drainage is to remove excess water from around the house to keep the soil around and under the perimeter foundation at a stable moisture content and the soil under the slab dry. Gutters and down spouts are an effective method of draining rainwater away from the house but must be used correctly. Downspouts should discharge rainwater a minimum of 5 feet away from the foundation. In addition, the soil around the house should have a positive 5% slope, 3 inches in 5 feet, away from the house.

Foundation History:

The existing house has no known existing repairs that can be seen, and GreenWorks Engineering and Consulting have not received any existing foundation report. It is our belief that the current foundation evaluation is the only evaluation on record.

Conclusions:

Based on our observations of the interior and exterior cosmetic distress, the floor elevations and calculations, it is our opinion that the house has undergone a permissible amount of movement. The maximum differential deflection is 0.5 inches and occurred over an approximate distance of 19.8 feet. This amount of deflection is within the standard allowable deflection of 0.7 inches for a distance of 19.8 feet. The standard allowable differential deflection is based on 1.0 inch of vertical movement, up or down, over a horizontal distance of 30 feet; expressed as Length (in inches)/ 360.

The foundation has also experienced an excessive amount of tilt. The maximum tilt measured across the foundation is 6.0 inches over an approximate distance of 41.0 feet. This amount of tilt exceeds the standard allowable tilt of 4.9 inches for a distance of 41.0 feet. The standard allowable tilt is based on 1% slope over the entire length, width, or diagonal of the foundation.

Furthermore, it is our opinion that remedial measures are required to bring the foundation to a more level condition. There are also a few foundation maintenance recommendations that could be beneficial to the future performance of the foundation.

Recommendations:

- 1) To stabilize and lift the perimeter foundation wall, install (8) perimeter and (12) interior piles or drilled piers as shown on Figure 1 of this report. The piles can be concrete cylinders, steel pipe, or helical screws. Refer to Figures 2, 3, 4, and 5 of this report. Space the piles or drilled piers along the perimeter foundation at a maximum of 7 feet on-center and within the interior at a maximum of 5 feet on-center. The number of interior piers may be reduced if the interior grade beams are located prior to pier installation. The interior piers may be placed at the interior grade beam intersections and along the grade beam at a maximum of 8-feet on center. Note, any foundation movement, even corrective movement, can cause additional cosmetic distress.
- 2) With the completion of the foundation repair, the interior cracks can be repaired, and the exterior separations can be sealed. Exterior brick cracks can be filled with mortar.
- 3) A leak detection test by a licensed plumber is recommended after the foundation has been repaired to verify the condition of the plumbing. If any discrepancies are determined they should be repaired immediately to preserve the foundation repair.
- 4) With the completion of the foundation underpinning, a final elevation survey must be performed to provide a final elevation baseline. It is recommended to review the performance of the foundation every 6 to 12 months. Compare all future foundation evaluations to this baseline.

Foundation Maintenance Recommendations:

- 1) It is recommended to review the performance of the foundation as a proactive foundation maintenance program every 6 to 12 months. Retain this report as an elevation baseline for the foundation. Compare all future foundation evaluations to this baseline.
- 2) To better control the rainwater, add gutters, downspouts and extensions to all the downsloped areas of the roof. The downspouts should discharge the water a minimum of 5 feet from the foundation or into a drainage system.
- 3) To assist in the drainage of free water the soil around the house should be sloped away from the house. The slope should drop a minimum of 3 inches in 5 feet, a 5% slope. If this cannot be done a French Drain may be required.
- 4) Establish a watering program for the foundation soil to keep the soil moisture content constant during the dry months. The lawn should be kept healthy. This will help by reducing evaporation. Water the lawn and other vegetation consistently and evenly. If the soil is cracking at the surface this is a sign that the soil is drying out.

Limitations:

The opinions and recommendations contained in this report are based on the visual observation of the then current conditions of the house and the knowledge and experience of the engineer. The evaluation was limited to visual observations and areas not visible, accessible or hidden behind furniture and appliances were not included in the evaluation. There has been no structural inspection of the existing framing of the house and no verification of the framing has been done. The evaluation did not include any soil sampling or testing.

The evaluation did not include any assessment of the existing framing, plumbing or soil and no implication is made on the compliance or non-compliance of the house with old or current building codes. The evaluation does not constitute a design of the foundation. No verification was made of the existing concrete strength, thickness, reinforcement nor capacity to support any load.

Foundation movement is a prevalent phenomenon in the Austin metroplex area. Future foundation movement is likely to varying degrees due to the shrink/swell characteristics of the soil. The foundation is prone to movement due to the moisture variation in the existing soil and total prevention of future movement is unlikely.

No guarantee or warranty as to the future performance or need for repair of the foundation is intended or implied. Limits of liability for any claims with respect to this report is limited to the fees paid for services and anyone relying on the content of this report agrees to indemnify GreenWorks Service Company for all costs exceeding this fee.

Prepared by,

Wayne Leake III

H. Wayne Leake III, P.E.
Professional Engineer



GreenWorks Service Company
Texas Registered Engineering Firm 20170

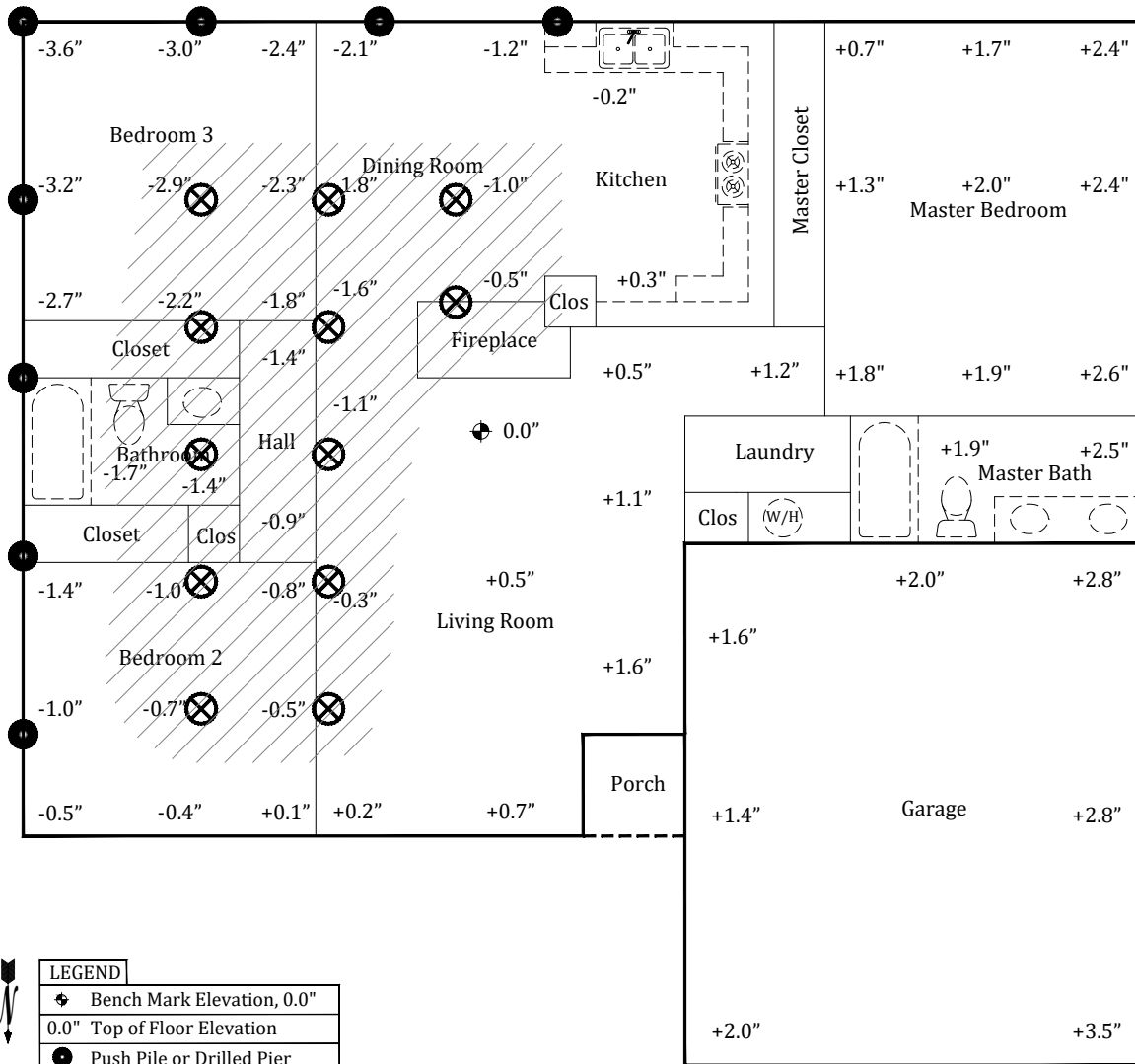


FIGURE 1

NOT TO SCALE

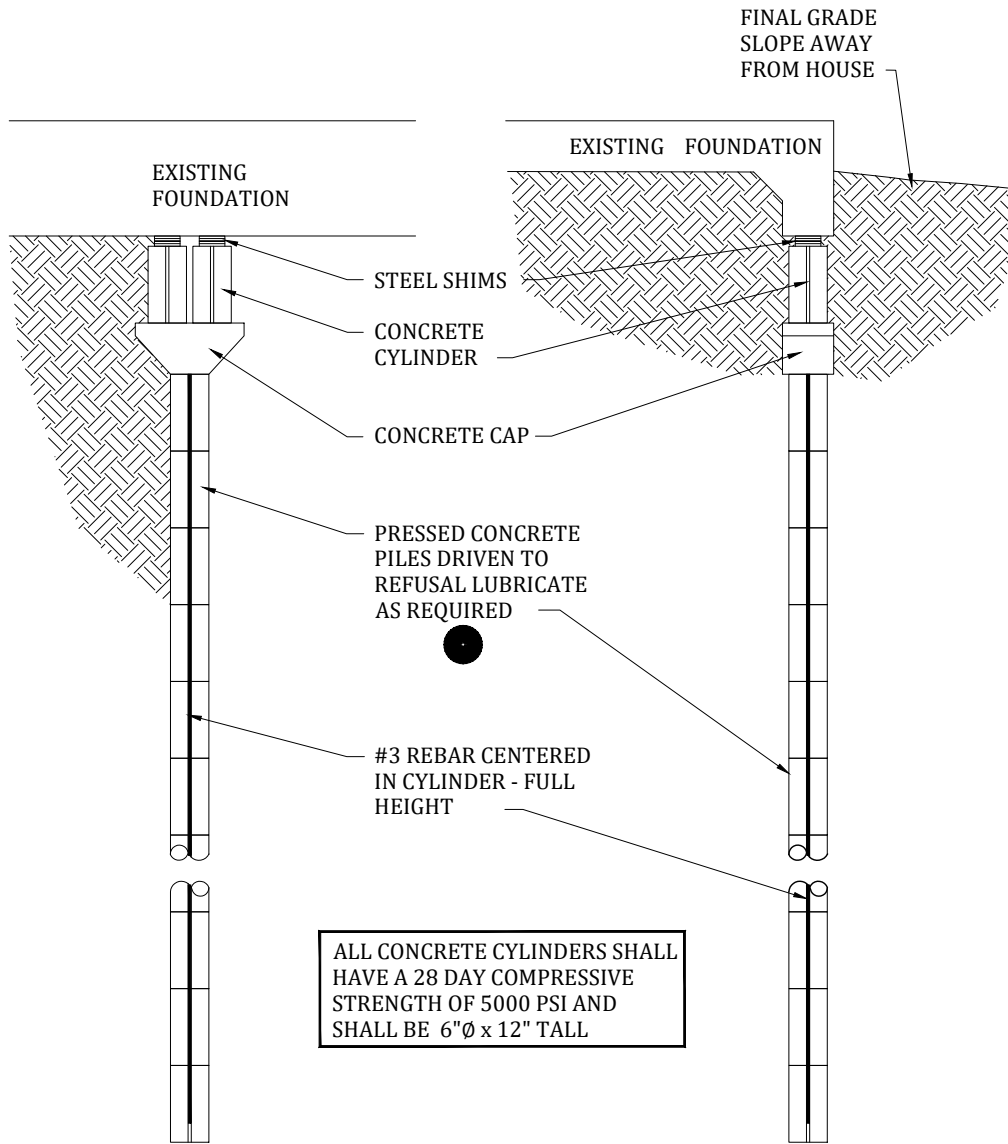


FIGURE 2

NOT TO SCALE

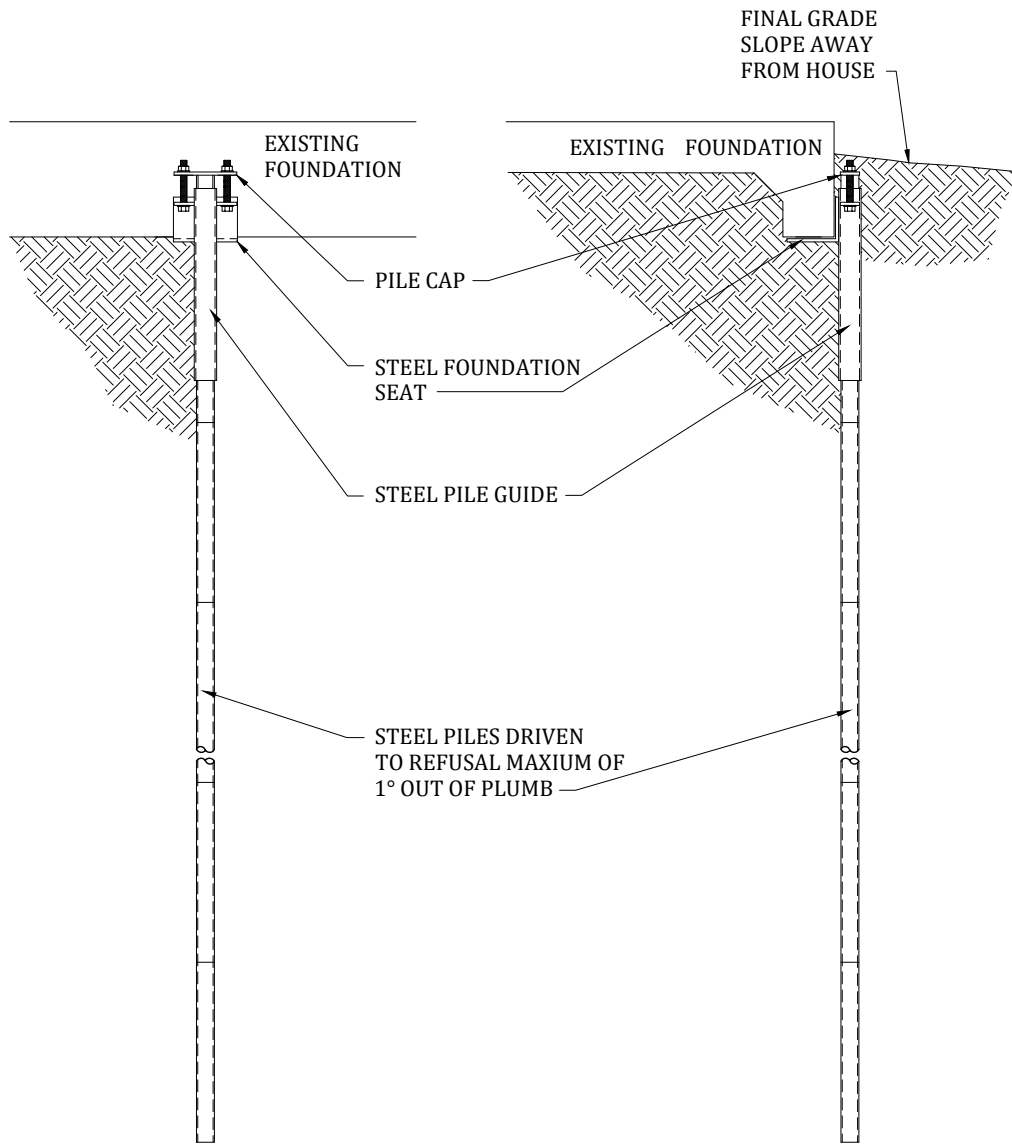


FIGURE 3

NOT TO SCALE

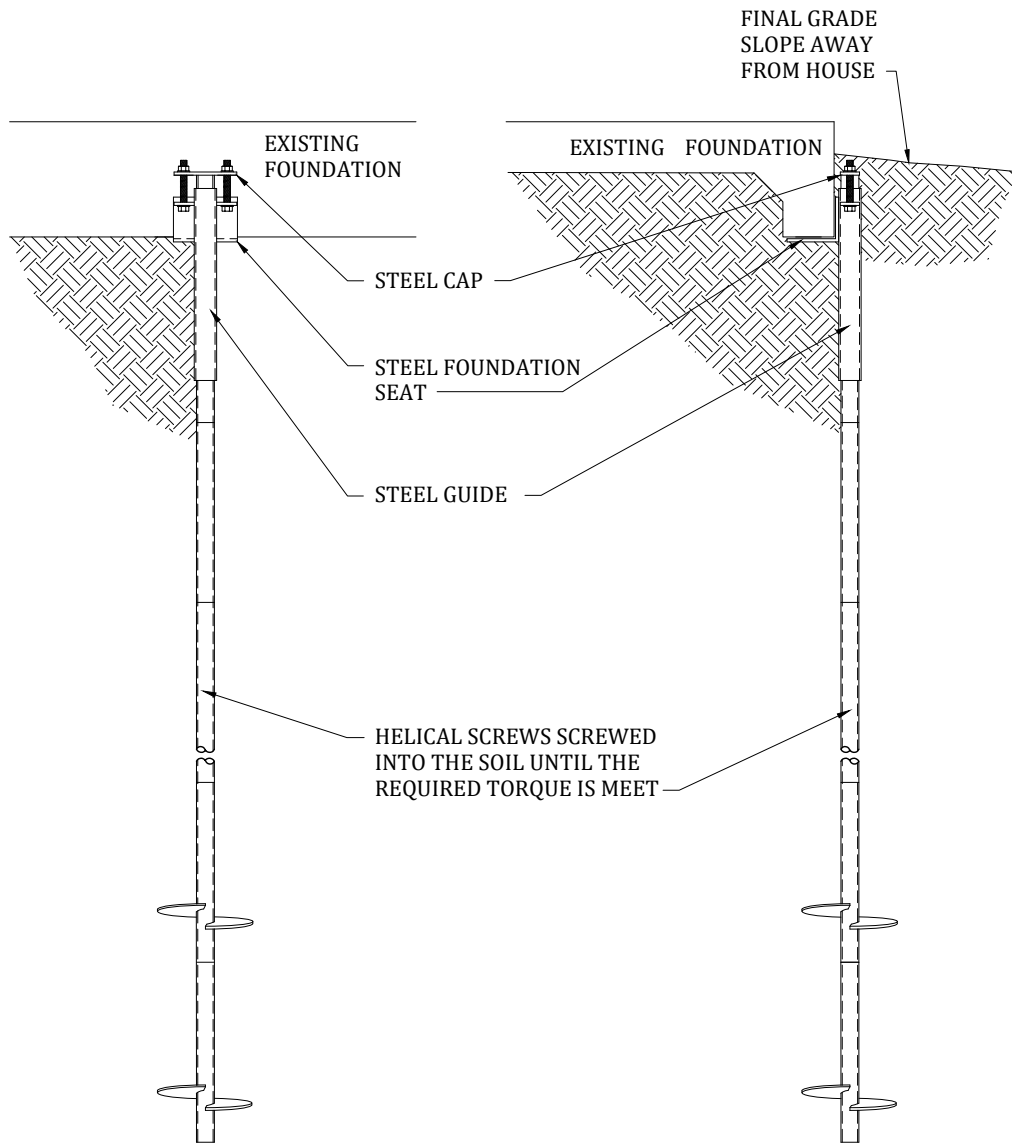
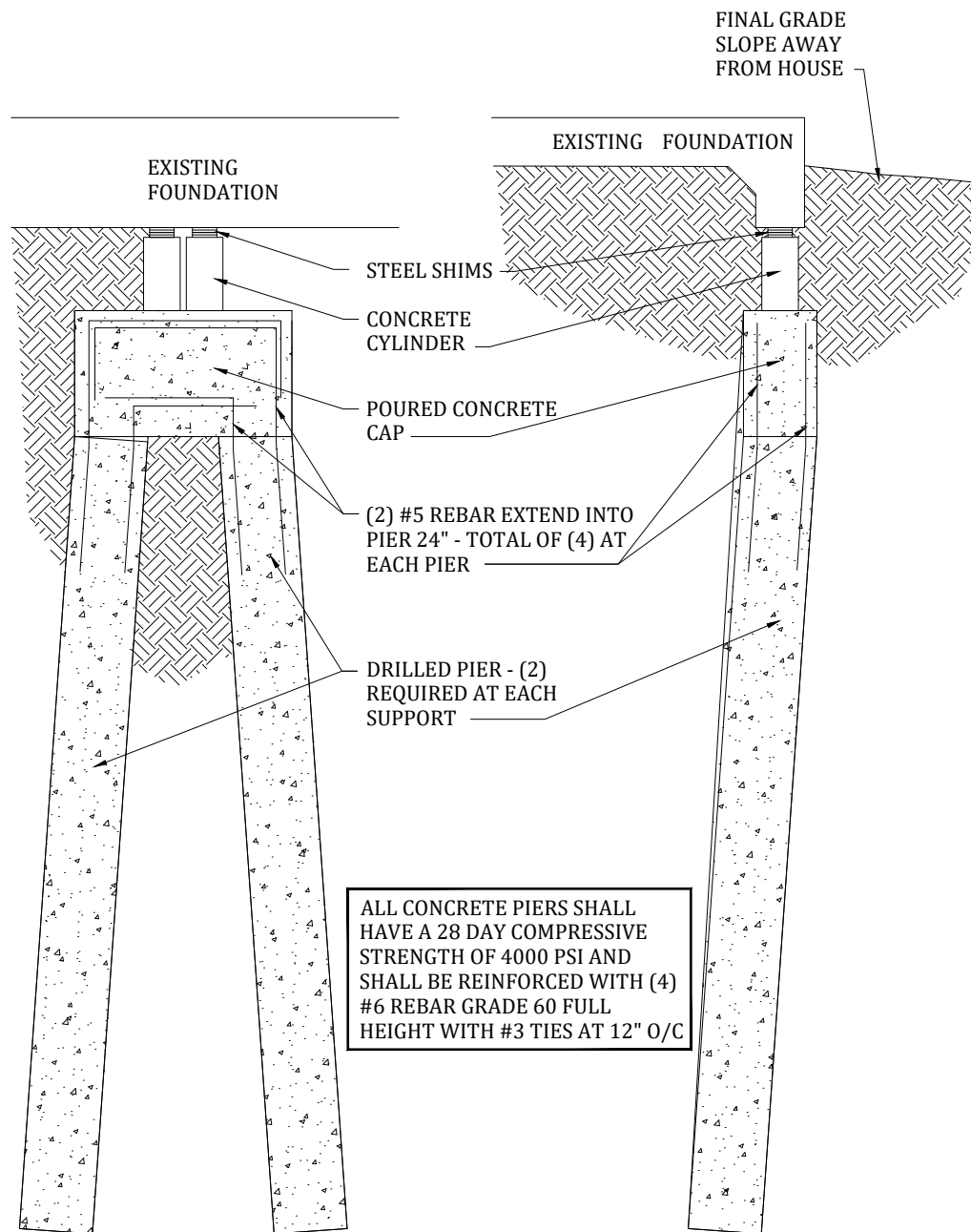


FIGURE 4

NOT TO SCALE

ALL CONCRETE CYLINDERS SHALL
HAVE A 28 DAY COMPRESSIVE
STRENGTH OF 5000 PSI AND
SHALL BE 6"Ø x 12" TALL



ALL CONCRETE PIERS SHALL
HAVE A 28 DAY COMPRESSIVE
STRENGTH OF 4000 PSI AND
SHALL BE REINFORCED WITH (4)
#6 REBAR GRADE 60 FULL
HEIGHT WITH #3 TIES AT 12" O/C

FIGURE 5

NTS