



600 N Pearl Street
Suite S1900
Dallas, TX 75201
(855) 349-6757
Texas Registered Engineering Firm 20170

Project No. 17715

March 13, 2020

Re: Foundation Evaluation
[REDACTED]

Dear [REDACTED]

As requested, personnel of GreenWorks Engineering and Consulting have completed an observation of the foundation at the address referenced above on March 5, 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 south.

Introduction:

The house is a single-story wood framed structure built in 1946. The foundation system of the house is a pier and beam with a partial perimeter concrete foundation wall. 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 showed typical signs of distress for a house that has incurred differential foundation movement.

The interior distress included:

- Cracks in the walls and ceiling drywall
- Cracked bead boards on wall
- Separation of the drywall at interior corners
- Separation of the drywall at the ceiling and wall intersection
- Separation of the drywall tape from the drywall
- Separation of the corner bead from the drywall
- Compressed drywall cracks
- Interior doors do not operate properly and/or are out of square
- Separation of door trim at corners

- Separation of window trim at corners
- Separation of dry wall from the tiled fireplace that varies in width
- Separation of crown molding joints
- Cracked and missing grout in floor tile
- Separation of grout and floor tiles
- Cracked floor tiles
- Cracked wall tiles
- Cracks in the garage slab

The exterior distress included:

- Cracks in the brick veneer
- Separation of the brick and the mortar
- Shifted sections of the brick veneer
- Slight separation of the veneer from the window and door trim
- Separation of the fascia from the brick veneer
- Separation of the frieze board joints
- Separation of the lap siding joints
- Horizontal, vertical and diagonal cracks in the perimeter foundation wall
- Cracked foundation corners
- Patched foundation corner at front porch
- Chipped concrete porch near the front entry
- Shifted bricks at the front entry
- Cracked driveway
- Rotted lap siding at bottom of wall
- Cracked rear sidewalk

The areas of concern as viewed from the crawlspace included:

- Cracked floor beam
- Leaning piers
- 2x lumber shims
- Stacked 2x lumber shims
- Piers not centered under floor beam they support
- Vertical 2x lumber piers bearing directly on soil
- Misaligned floor beams, the elevation along the tops of the beam do not match
- Leaning piers
- Inadequately supported ends of floor beams at piers
- Misaligned pier with a cantilevered brick to support floor beam

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. A benchmark elevation of 0.0 inches was established near south east corner of the kitchen 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 an excessive amount of movement. The maximum differential deflection is 1.5 inches and occurred over an approximate distance of 30.0 feet. This amount of deflection exceeds the standard allowable deflection of 1.0 inches for a distance of 30.0 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.

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 (25) perimeter piles or drilled piers as show on Figure 1 of this report. The piles can be concrete cylinders, steel pipe, or helical screws. Refer to Figures 3, 4, 5 and 6 of this report. Space the piles or drilled piers along the perimeter foundation at a maximum of 6 feet on-center. Note, any foundation movement, even corrective movement, can cause additional cosmetic distress.
- 2) Replace cracked floor beam with same size beam using pressure treated SP #2 lumber.
- 3) Re-plumb the leaning piers.
- 4) Adjust the crawlspace piers as required, using metal shims, to achieve a more level condition between Bedrooms 2 and 3 and in the Kitchen. It is recommended that all wood shims be replaced with metal shims due to the wood shims can be damaged over the years.

- 5) With the completion of the foundation repair the interior cracks can be repaired, and the exterior separations can be sealed. Exterior separations around doors and windows should be caulked with an elastic silicone caulk and stone veneer cracks can be filled with mortar. The foundation cracks 1/4 inch and wider should be sealed with an injected epoxy such as Simpson Strong-Tie Crack-Pac or similar product.
- 6) Have the doors that remain poorly functioning adjusted or rehung.
- 7) It is recommended to review the performance of the foundation every 6 to 12 months. Retain this report as an elevation baseline for the foundation. Compare all future foundation evaluations to this baseline.

Foundation Maintenance Recommendations:

- 1) To better control the rainwater, add downspout extensions to all the downspouts that do not currently have them. The extensions should discharge the water a minimum of 5 feet from the foundation or into a drainage system.
- 2) 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 maybe required.
- 3) 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 Dallas/Fort Worth 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.

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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,



Todd E. Alexander, P.E.
Vice President of Engineering



GreenWorks Service Company
Texas Registered Engineering Firm 20170

LEGEND
 ● Bench Mark Elevation, 0.0"
 0.0" Top of Floor Elevation

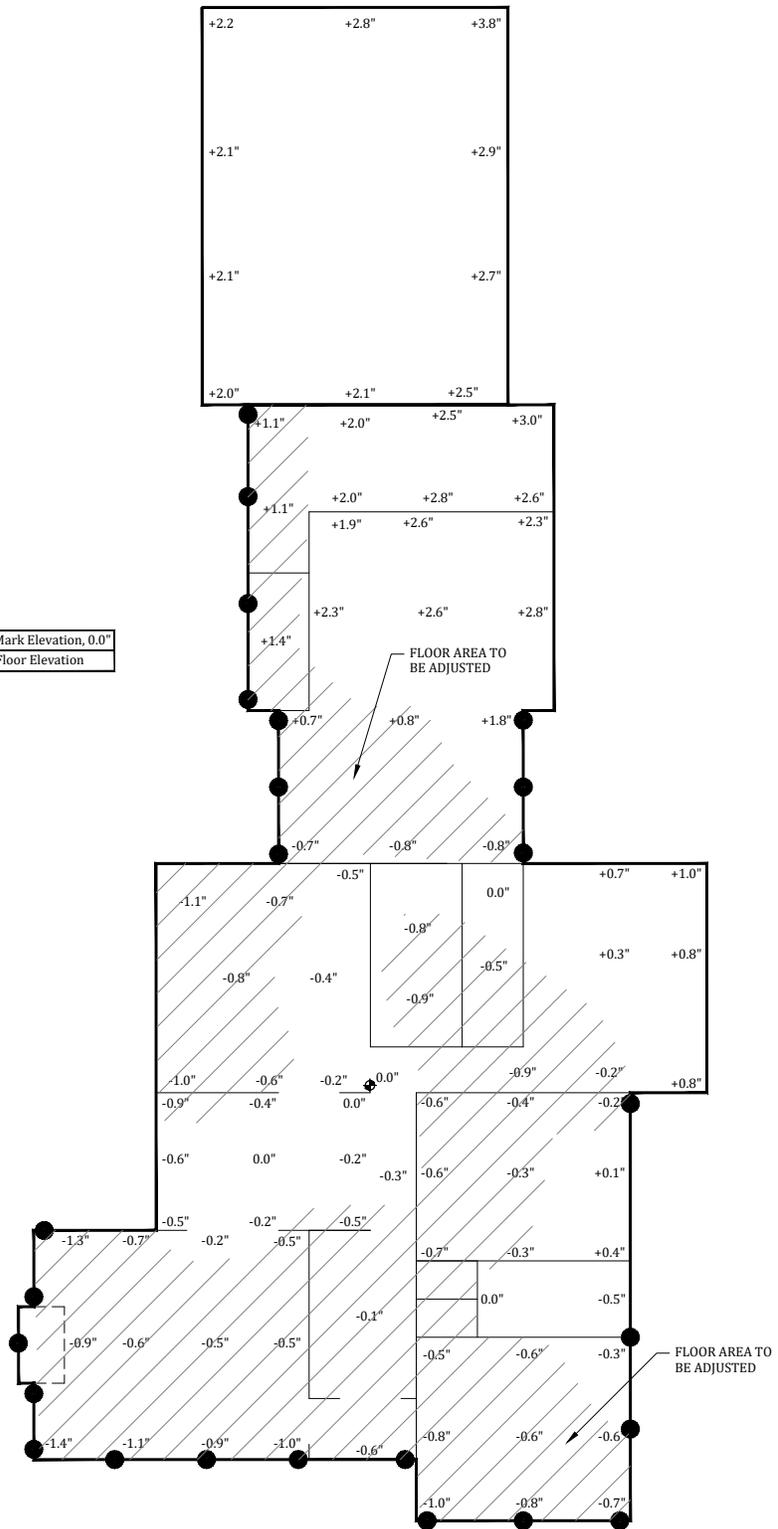
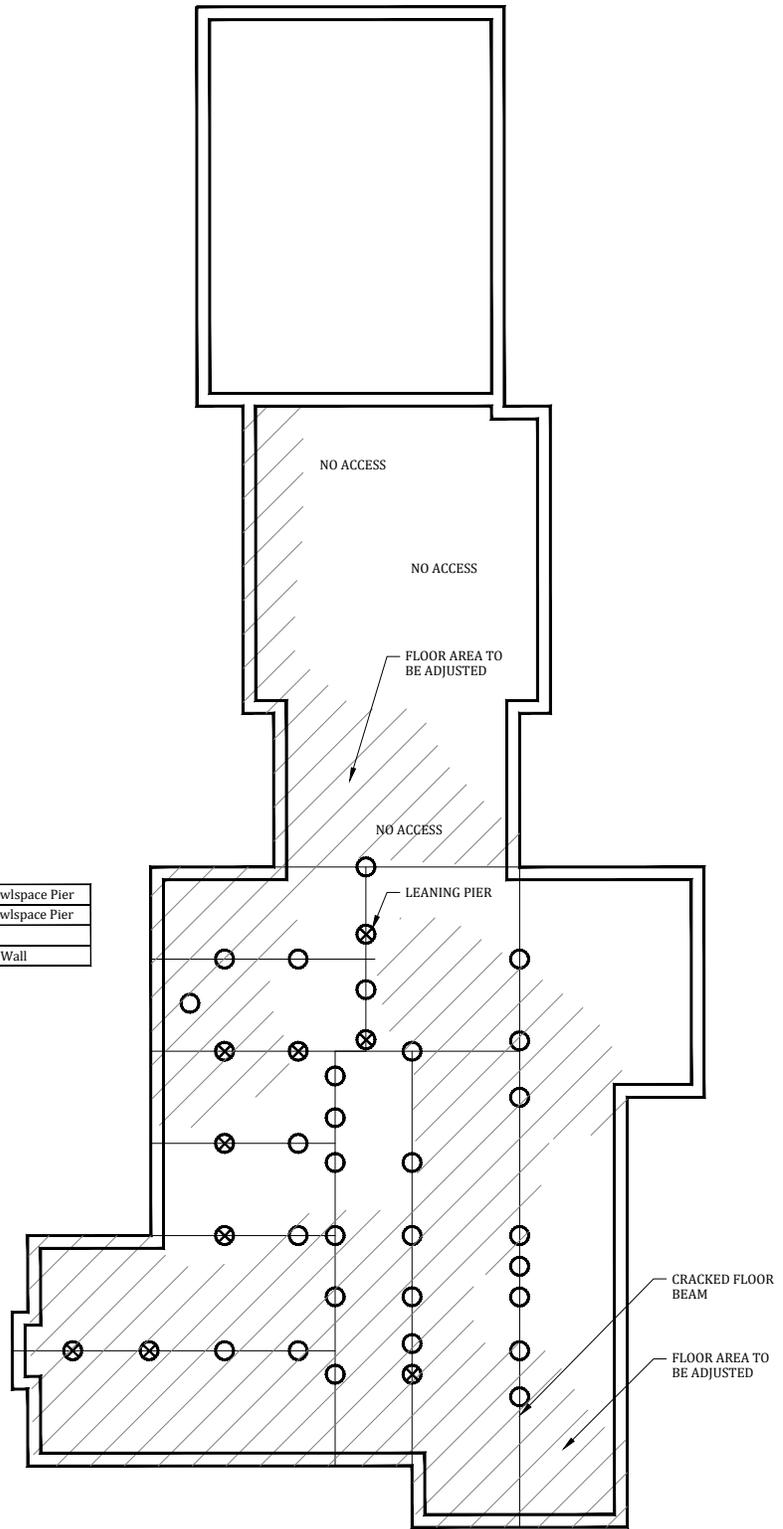


FIGURE 1

NOT TO SCALE



LEGEND	
○	Existing Crawlspace Pier
⊗	Leaning Crawlspace Pier
—	Floor Beam
▨	Foundation Wall

FIGURE 2

NOT TO SCALE

CRAWLSPACE LAYOUT

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Figure No: 2 of 6

Date: 03/13/2020

Revision Date:

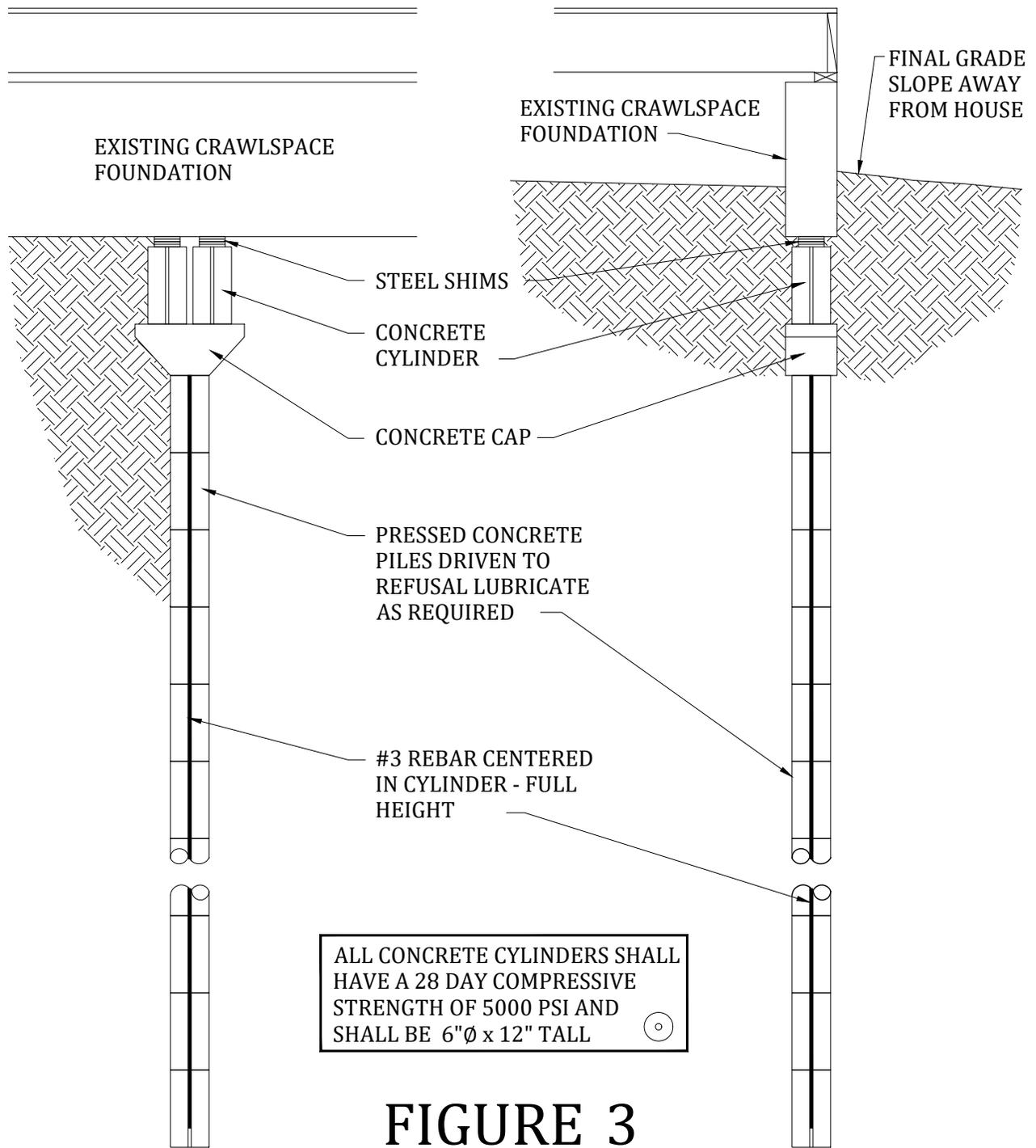


FIGURE 3

SCALE: 1/2" = 1'-0"

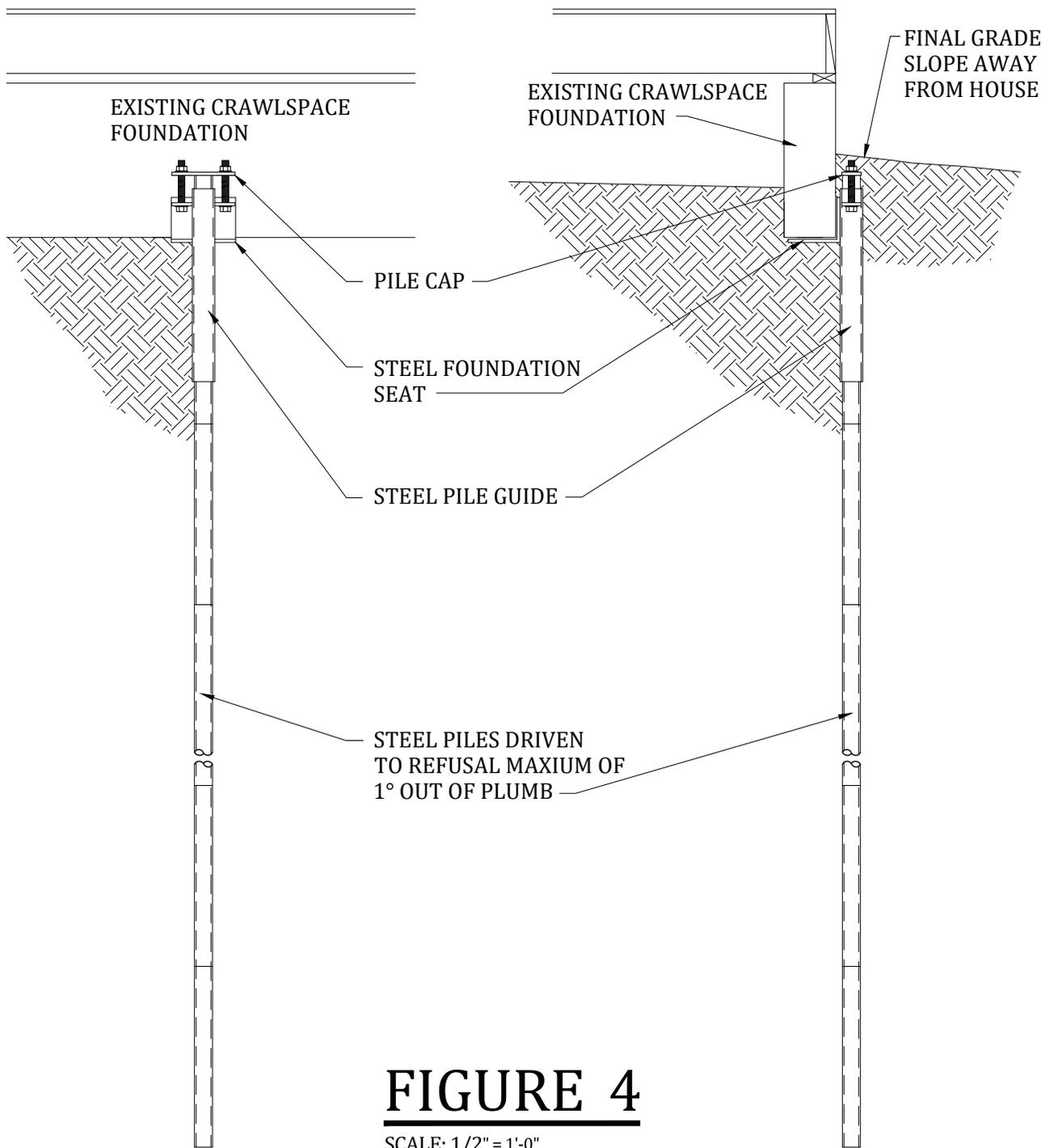
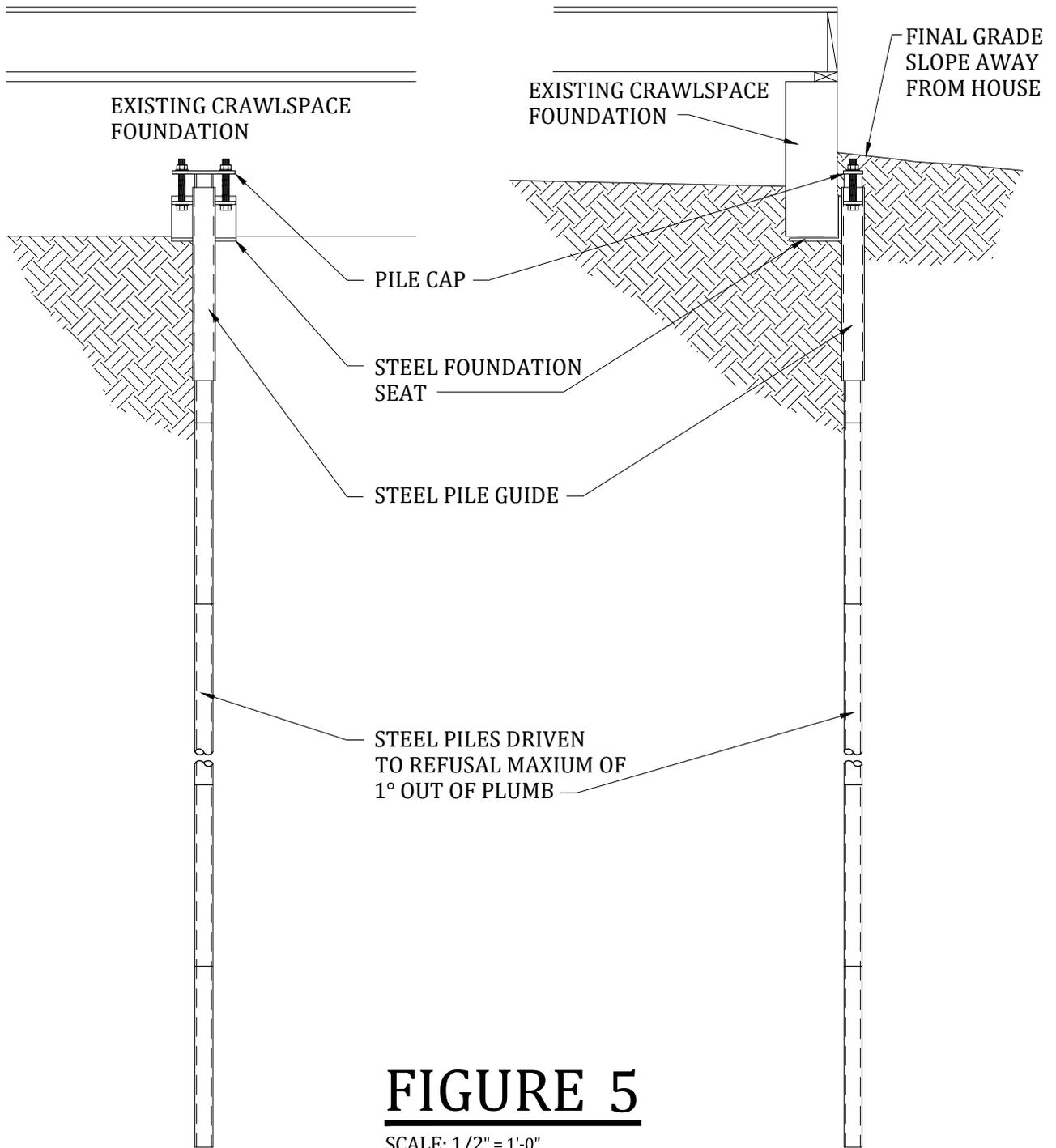
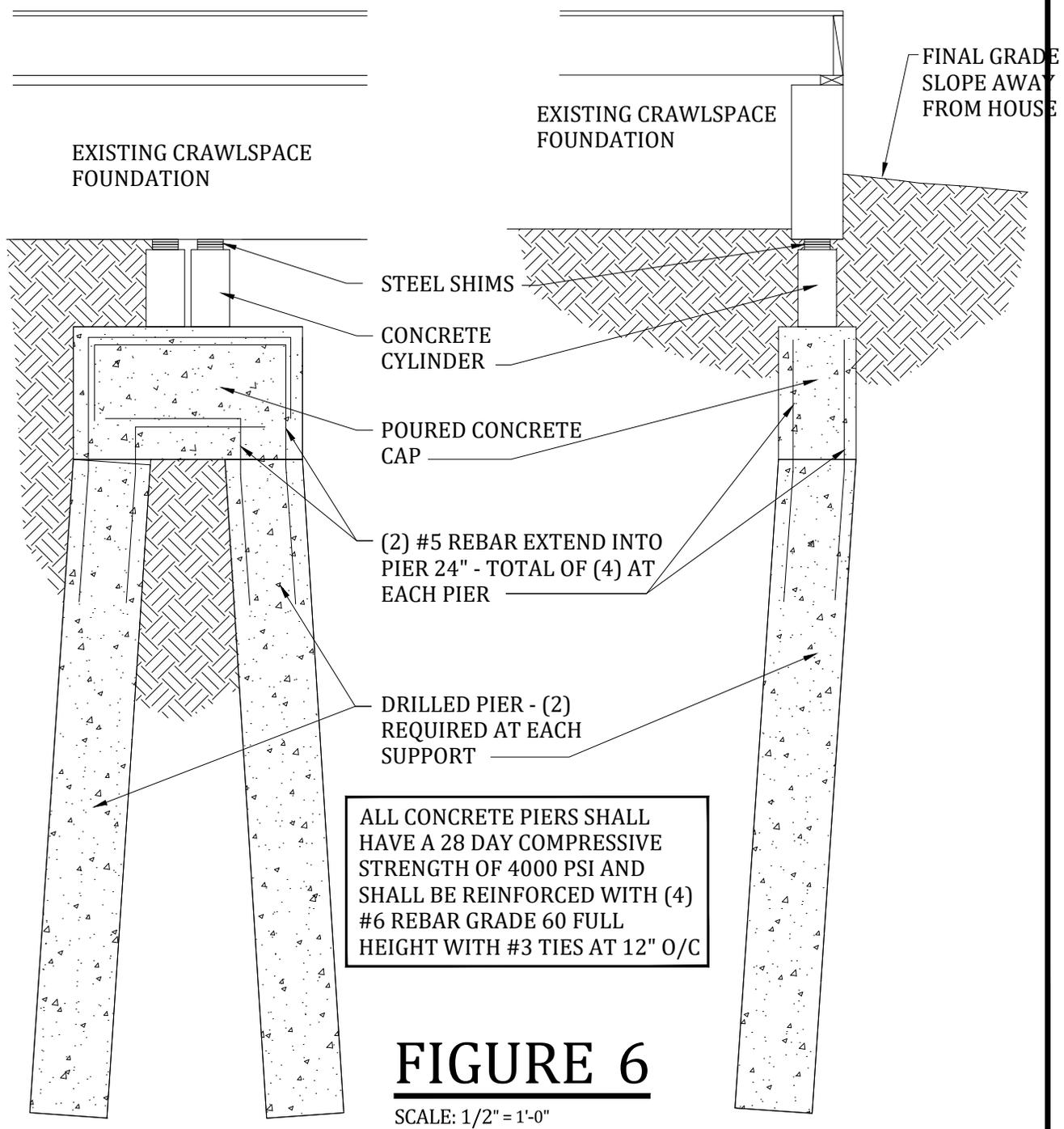


FIGURE 4

SCALE: 1/2" = 1'-0"



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 6

SCALE: 1/2" = 1'-0"

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DRILLED PIERS

5947 MARQUITA AVENUE
DALLAS, TX

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