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Project No. 17459

March 13, 2020

Re: Foundation Evaluation



Dear



As requested, personnel of GreenWorks Engineering and Consulting have completed an observation of the foundation at the address referenced above on March 6, 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 two-story wood framed structure built in 1936. The foundation system of the house is a pier and beam with a wood perimeter skirt 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 minor signs of distress. Note, the house has been recently updated.

The interior distress included:

- Minor cracking in the walls and ceiling drywall
- Slight separation of the drywall corner bead from drywall
- Slight separation of the door trim at the top corners
- Slight separation of the base board molding at corners
- Slight separation of the drywall tape from the drywall
- Cracked grout between kitchen counter and tile backsplash
- Painted / repaired drywall cracking at upper corners of door trim and above door trim
- Cracked wall tile in the master bathroom

- Separated wood floor in upstairs closet
- Interior doors do not operate properly and/or are out of square

The exterior distress included:

- Minor cracking in the stucco veneer that appear to have been painted over
- Patched areas in the stucco veneer, not yet painted
- Crack in the perimeter skirt wall at northwest corner
- Separation of the fascia from the rafter outlookers
- Separation of the fascia at the corners

The areas of concern as viewed from the crawlspace included:

- Concrete piers not in contact with the floor beams that they should support
- Single 2x lumber piers in direct contact with the soil
- Floor beams not aligned vertically with adjacent floor beams
- Log piers in direct contact with the soil
- Floor beam not in contact with the floor joist it should support
- Log pier with a 2x lumber shim
- Notched floor beam for plumbing
- 2x lumber shims
- Stacked 4x4 and 2x lumber pier

### **Interior Elevation Survey:**

An interior floor elevation survey was performed on the living area of the house, with the elevations recorded to the nearest 10<sup>th</sup> 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 the northeast 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 appears to be in relatively good condition but could be due to the recent updating of the interior and exterior. However, the house has experienced an excessive amount of movement. The maximum differential deflection is 0.7 inches and occurred over an adjusted distance of 11.0 feet. This amount of deflection exceeds the standard allowable deflection of 0.36 inches for a distance of 11.0 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  $\text{Length (in inches)} / 360$ .

Furthermore, it is our opinion that due to the recent updating of the house adjusting the areas of the house that are out of the standard deflection noted above could cause new distress on the interior and exterior and cause the existing distress to worsen. Therefore, remedial adjusts to the height of the floor are not recommended but correcting some of the crawlspace issues are. There are also a few foundation maintenance recommendations that could be beneficial to the future performance of the foundation.

### **Recommendations:**

- 1) Shim the crawlspace piers that are not in contact with the floor beams. It is recommended that all wood shims be replaced with metal shims due to the wood shims can be damaged over the years.
- 2) Shim between pier and floor beam that is not in contact with the floor joists above.
- 3) Replace log and lumber piers with solid concrete piers, shim tight to existing framing.
- 4) Have the doors that remain poorly functioning adjusted or rehung.
- 5) 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.

### **Foundation Maintenance Recommendations:**

- 1) 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.
- 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:**

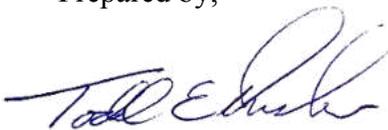
The opinions and recommendations contained in this report are based on the visual observation of the then current conditions of the house and the knowledge and experience of the engineer. The evaluation was limited to visual observations and areas not visible, accessible or hidden behind furniture and 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 San Antonio 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.

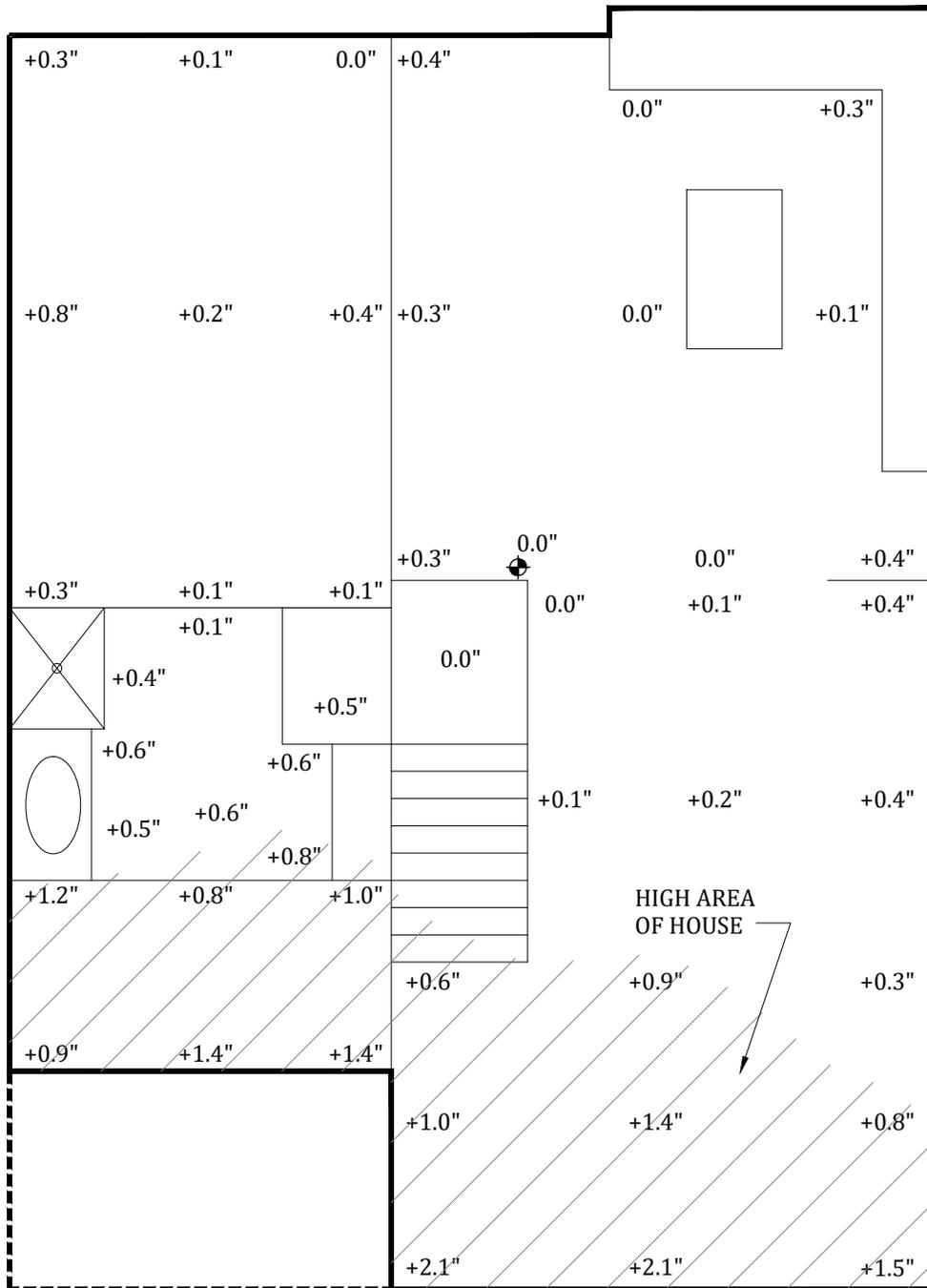
Prepared by,



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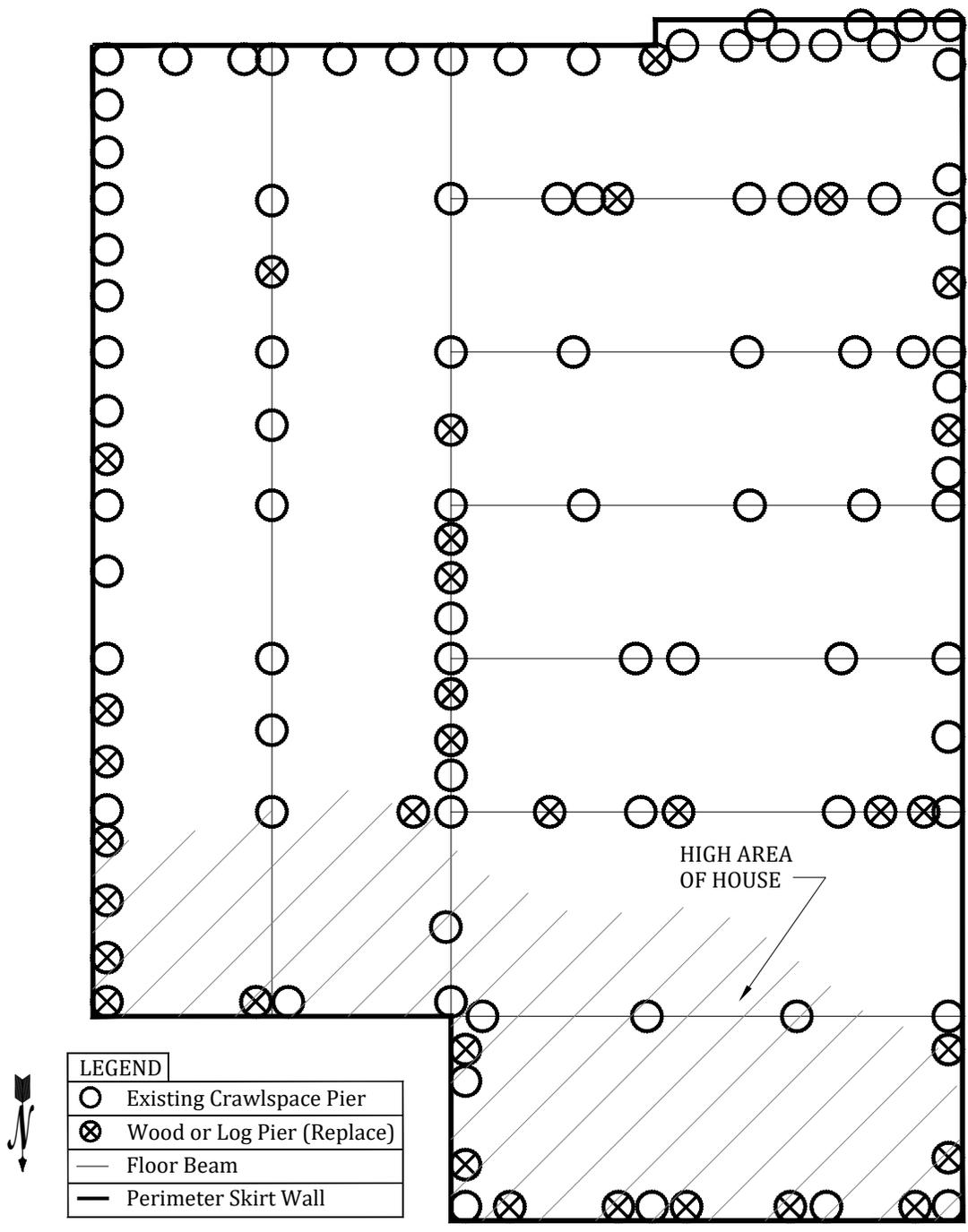


**FIGURE 1**

NOT TO SCALE

**LEGEND**

- ⊕ Bench Mark Elevation, 0.0"
- 0.0" Top of Floor Elevation



LEGEND	
○	Existing Crawlspace Pier
⊗	Wood or Log Pier (Replace)
—	Floor Beam
—	Perimeter Skirt Wall

**FIGURE 2**

NOT TO SCALE

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**CRAWLSPACE LAYOUT**  
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 [Redacted Area]

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Date:	03/13/2020
Revision Date:	---