

Austin 8/15/19

To: Oam Parkash

Re: Existing Residential Foundation and Superstructure Assessment

1707 Newning Ave.
Austin, TX 78704

INTRODUCTION

I have inspected the existing structure at the above referenced address on behalf of *Mike Elhaj*. The inspection was part of a Level B investigation of the foundation structure. The investigation was triggered by concerns about ongoing foundation issues and overall framing issues and to determine the extent of structural repairs needed to retrofit the structure to current building codes. According to the Texas Section of the American Society of Civil Engineers (Guidelines for the Evaluation and Repair of Residential Foundations, 2009), a Level B investigation consists of:

- Interview with homeowner/homeowner's representative or developer to inquire about possible distress signs around the building and the history of the property;
- Visual inspections on the Interior and exterior of the property to search for any visible signs of excessive foundation movement.
- Request from the client and review the provided documents regarding the foundation, such as construction drawings, geotechnical reports, previous testing and inspection reports, and previous repair information.
- Floor levelness: Relative floor elevations were taken to assess flatness of floor structure.
- Make visual observations during a physical walk-through
- Observe factors influencing the performance of the foundation.

The property is located in Austin, Travis County. At the time of preparation of this report, there are no engineering or architectural plans available for review. Additionally, there is no known history of foundation stabilization or retrofitting (e.g. pier stabilization) for this house. Per builder comments, the intent for this property is to assess the feasibility of using the existing structure as part of a new, one or two-story, single family residence.

PROPERTY DESCRIPTION

Available records indicate that the structure was built in 1941. It consists of a single-story residential structure. The *original house* is supported by a pier-and-beam foundation structure with a limited access crawl space under the wood framed floor. Subsequent additions to the house were built on similar foundation type with more accessible crawl space.

Interior and exterior walls are made of conventional wood framing elements. Lack of access to attic space prevented further investigation.

INSPECTION FINDINGS

During my visual assessment, the following items were observed. Photographic evidence is also presented.

- Lack of proper connection between the original portions of the house foundation/framing and subsequent additions. Seams and cracks, as well as floor displacements can be readily observed throughout the house.
- *Several* stair-stepped and vertical cracks on interior walls. These cracks are common indicators of foundation movement (Figure 1).



Figure 1. Cracks in walls

- Inadequate surface drainage appears in some sections around the property (Figure 2). Proper surface drainage (typically 5% or 6 inches per 10ft of positive drainage) will prevent water accumulation against the foundation structure, aggravating swelling of clays and consequent heaving. The presence of yard masonry walls also makes drainage even more difficult.



Figure 2. Site Drainage. Inadequate drainage and walls limiting water runoff

- Dissimilar foundation types: portions of the subsequent additions have “slab on grade/flatwork” foundation in contrast with the “pier-and-beam” of the original structure. The multiple foundation types, when not properly engineered, *are not a good construction practice and most likely contributed to the extensive signs of distress observed*. Flatwork construction is not an engineered slab and has no structural value to support residential structures. Large separations were noticed between slab on grade/pier-and-beam and flatwork areas, Figure 3.



Figure 3. *Dissimilar foundation types*

- Proximity of the house to large trees. The presence of trees near the foundation will change moisture content of the clay soils underneath the foundation and may cause damage to the structure, Figure 4.



Figure 4. Proximity of large trees.

- Interior Floor elevations indicate that the floor is approximately 3.0" out of level (*pier-and-beam*). This may indicate a high degree of foundation shifting/settlement. Most variations in elevation measurements inside particular rooms are equal or over 1.5", pointing to excessive movement.
- Signs of excessive deflection of ceiling elements were noticed on the sheetrock, Figure 5.



Figure 5. Multiple cracks in ceiling.

- Mold and framing deterioration were observed in more than a few rooms. The extent of damage could not be determined. Figures 3 and 6.



Figure 6. *Mold and framing deterioration*

- Several cosmetic repairs still visible throughout the house. These repairs were likely necessary to cover extensive cracking on interior walls and ceiling. This reinforces the previous observation about out-of-tolerance foundation movement.

CONCLUSIONS AND RECOMMENDATIONS

Based on my visual observation, the numerous signs of distress throughout the building are evidence of underlying serious structural issues related to lack of proper engineering and substandard construction. The extent and nature of the distress will not allow for the strengthening/retrofitting without extensive damage to and/or demolition of large portions of the main house construction.

The multiple foundation types (pier-and beam; concrete flatwork) and wall construction (wood framing) will not allow a proper retrofitting strategy (e.g., drilled piers) without *permanently compromising* the structural integrity of the entire building. In addition, the flatwork and most of the

original portions of the pier-and-beam foundation are not structurally “sound”¹ and must be completely removed and replaced with properly engineered foundation.

In addition to these factors, the lack of information on the existing pier-and-beam “footings” or “piers” (reinforcement, overall depth, material properties) will significantly hinder any attempts to level the structure adequately. Destructive methods can be employed to assess all these items, however the costs involved are appreciably high. Issues involving the superstructure must also be addressed (mold/excessive deflection, etc), with the potential need to replace portions of the wall/ceiling/roof framing structure.

With respect to the economic feasibility of this project, it is anticipated that the total cost of demolition, retrofit and renovation of the existing structure will exceed the cost of a new, “up to Code”, construction (foundation elements and adequate drainage). The anticipated PVR of over 3” (based on visual observation of foundation distress) indicates the high degree of movement experienced by this residential structure *that was not engineered* to sustain it with an acceptable performance level. This conclusion is based on my experience with similar buildings and new residential construction. Therefore, it is my professional opinion that the existing structures should give way to a new construction in order to make the development financially viable.

Limitations

This is exclusively a visual inspection. This report is not intended to offer any warranty on the future performance of this foundation or framing structure. If you have any questions, please contact us at (512) 215-4364 or by e-mail: marcos@sectexas.com.

Sincerely,



Marcos V. Dequeiroga, PE
Principal
SEC Solutions LLC

¹ Not engineered for the anticipated ground movement.