

LIGHTHOUSE ENGINEERING, L.L.C.

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National Home Builder - Name
Regional Customer Care Manager
1234 Main Street
Houston, Texas 77067

Wednesday, August 20, 2014

RE: Engineering Evaluation – Foundation Performance
Home Owner Name, 6789 ANYSTREET LANE., IRVING, TEXAS 75063
Job No. 4229511A38; Original Closing Date: 12-16-2005

The following report constitutes the engineering opinion requested on the foundation of the subject residence. This report has been prepared in general accordance with the requirements of a “Level B” survey as defined by the Texas Chapter of the American Society of Civil Engineers (ASCE) and the Texas Board of Professional Engineers (<http://texasce.org/associations/10803/files/RepairGuidelines.pdf>). This report is provided for the exclusive use of the person or persons this report was prepared for as shown above. We have no contractual relationship with, or obligation to, any party other than the party for whom this report was prepared. The purpose of this inspection was to evaluate the foundation and determine what, if any, foundation repairs are necessary. The foundation was visually inspected and a floor elevation survey was performed. The opinions contained herein are based on the experience and judgment of the writer, as well as conditions observed without taking soil samples, performing plumbing leak tests, removing floor or wall coverings, or performing invasive tests or procedures. The opinions offered herein are based solely on the observations made at the time of the inspection, and do not take into consideration any changes in the condition of the foundation after that date. This report does not predict or warrant the future performance of the subject foundation. You are encouraged to review the “Agreements and Limitations” attached to the end of this report for other important limitations and standard recommendations.

Observations

This structure is a two - story wood framed structure with brick veneer and siding on the exterior. The home has a hip roof and composition shingles. The interior walls are drywall with various finishes over the drywall including texture, paint and wallpaper. The foundation is a post-tension slab-on-ground. The home was constructed in 2005 per the Dallas County Appraisal District Records. All directions in this report are annotated by left, right, front and rear as if looking at the front door.

Observations and Discussions

1. Michael Gandy, PE physically inspected the above referenced residence to make an evaluation of the current performance of the foundation and to offer recommendations for repair, if needed. I performed a Level "B" engineering analysis as defined by the Texas Chapter of the ASCE. I made careful observations of the interior and exterior for signs of structural distress and evaluated the drainage surrounding the structure. I performed an interior elevation survey as shown on Drawing 1001. I had casual conversations with the current homeowner to obtain a brief history of the foundation and to better understand expectations for performance.
2. **Exterior Observations:** Indications of minor settlement at the front left corner.
 - a. Left rear brick expansion joint separation (0.0"@0' to 1.0"@20').
 - b. Left front brick expansion joint separation (0.0"@0' to ¼"@20').
 - c. Left front frieze board separation (separation ¾").
 - d. Sightdown the brickline along the left side shows minor brickline deflection.
 - e. Brick/mortar and stone cracking above front entry (0.0"@10' to ¾"@20').
 - f. Right front frieze board showed no separation (separation 0.0").
 - g. Right middle brick expansion joint separation (0.0"@0' to 1.0"@20').
 - h. Right rear brick expansion joint no separation (separation 0.0").
 - i. Two (2) large trees in the front yard (see pictures 4 and 5 below).
 - j. The topography of the lot is gently sloping downward from right to left. There appears to be some amount of fill dirt along the left side that was used to level the lot during construction. The exact preparation of this (apparent) fill dirt is not known.
3. **Interior Observations:** Indications of minor settlement at the front left corner.
 - a. There are hairline tile crackings in the front entry, kitchen and master bathroom. These types of crackings are caused from the normal drying process of the concrete foundation. As the concrete dries, it develops hairline "resistance to shrinkage" (RTS) crackings on the surface. When brittle tiles are laid over these RTS crackings, the normal structural vibrations and seasonal movements of the foundation translate into the tile causing the tiles to crack. These types of hairline tile crackings are not indicative of a structural deficiency.
 - b. The door to the front office is slightly out of square and would not close.
 - c. There are minor and typical sheetrock crackings in various locations.
 - d. The sheetrock cracking at the ceiling in the foyer is caused from normal seasonal movement and framing acclimation of the structure. The ceiling sheetrock cracking is not indicative of a structural deficiency.
 - e. There were no (significant) interior indications of settlement at the front left corner.
 - f. Slopes were minorly noticeable when walking the front left bedroom (study).

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Picture 1 and 2: Indications of minor settlement at the front left corner. Minor expansion joint separation at top and frieze board separation at front left corner.



Picture 3: Hairline tile cracking in the front entry, kitchen and master bathroom. These are not indicative of a structural deficiency.



Picture 4 and 5: View of the left and right front of the home. It is hypothesized that there may be fill dirt compaction at the front left corner. This fill dirt compaction, and the large trees, may be contributing to the minor settlement at this corner.

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4. **Overall Drainage:** The drainage around the property appears to be adequate to direct surface water away from the foundation.
5. **Available Documentation:**
 - a. A building packet was provided by Lennar Homes. This packet contained the structural layout of the foundation including grade beam locations and post-tension cable layout.
 - b. The homeowner provided an engineering report from Mr. Gary Osborne, PE dated September 20, 2013. I made a casual review of this report while on site at the time of my analysis. This report concluded that the foundation was experiencing settlement at the front left corner. Mr. Osborne hypothesized that the large tree at the front left yard was contributing to the settlement. Mr. Osborne recommended foundation lifting piers to be installed around the front and left side perimeter.
6. **Elevation Analysis:** Industry standard tolerance for foundation performance (as defined by the Texas Chapter of the ASCE) is less than L/360 overall or local deflection and 1.0% tilt. This criteria, and my experience and judgment, was used to evaluate the performance of the foundation. Figure 1 below shows a graphical depiction of the actual deflection and tilt across the profile section A-A as shown on Drawing 1001.
 - a. The maximum allowable deflection is $L/360'' = 576''/360'' = 1.6''$ and the actual deflection was measured to be $\approx 1.0''$. This is less than the maximum allowable tolerance for deflection.
 - b. The actual (overall) tilt was measured to be $\approx 0.45\%$. This is less than the maximum allowable tolerance for tilt.

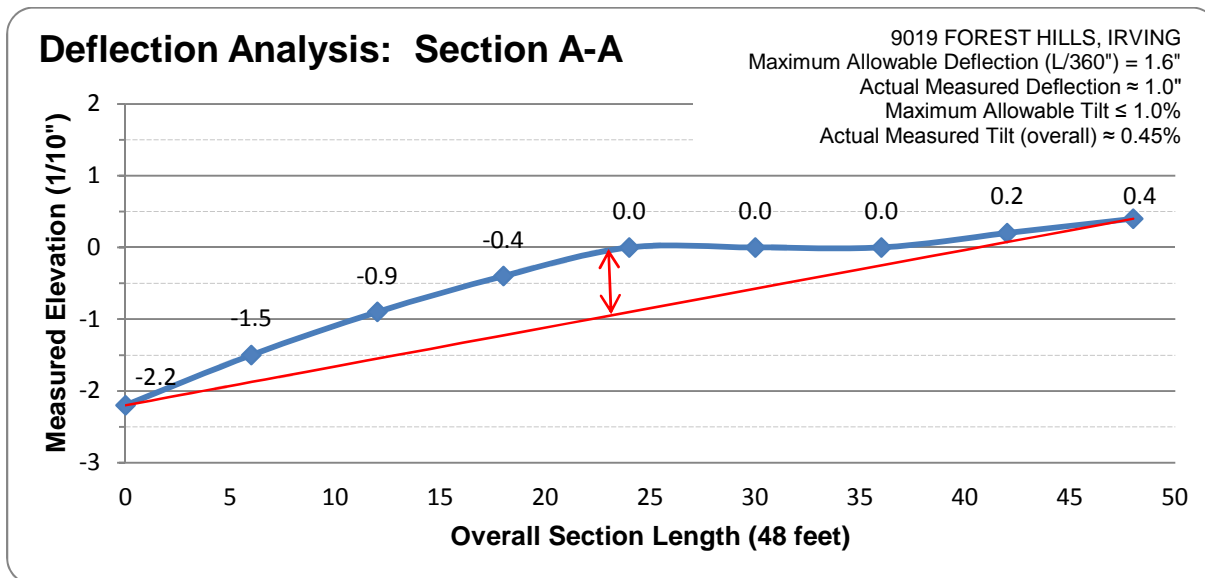


Figure 1: Deflection Analysis Cross Section A-A

7. **Conclusion:** The actual deflection and tilt of the foundation is **LESS THAN the maximum allowable limits**. Based on this analysis, the magnitude and severity of the deflection, tilt and cosmetic indicators of movement do not warrant the need for structural foundation repairs at this time. Some minor movement of

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the foundation has occurred since the home was built. The amount of movement is within acceptable tolerance as foundations are designed to allow for minor movement. The magnitude and severity of the deflections in the foundation are not causing any load bearing component to be unsafe, unsanitary, or otherwise unlivable.

8. Recommendations:

- a. It is recommended to check ALL sprinkler heads for leaks. There may be a sprinkler leak located along the right side (see Drawing 1001). Repair ALL sprinkler head leaks if they are discovered.
- b. Maintain a watering program in the dry months of the year to prevent the soil around the home from drying and cracking. If soaker hoses are used, place the soaker hoses 1' – 2' away from the foundation and run for 30 – 60 minutes every other day as needed.
- c. It is recommended to make cosmetic adjustments to all interior doors to allow for proper door operation. Make cosmetic repairs to sheetrock, as desired.
- d. If the homeowner desires to reduce these minor slopes, foundation lifting piers could be installed as recommended by Mr. Osborne, PE. However, these would be considered a cosmetic adjustment, not a structural necessity.

Interior Elevation Survey

Interior floor elevations were taken with a Technidea Pro-2000 Zipllevel. Elevations were recorded to the nearest .1-inch throughout the home. A benchmark of 0.0 was established in the middle floor plan and is shown on drawing no. 1001 with a star. An adjustment was made for floor coverings if they were a different elevation than the floor covering at the benchmark location. Elevation differentials varied by a maximum of -3.2 vertical inches in 67 horizontal feet. It should be noted that the elevation measurements include effects of elevation variation in the original construction which normally are 0.6 inches to 1.0 inches. A sketch of the house with the elevations is attached as Drawing 1001.

Agreements and Limitations

Use of this report for any reason implies consent to all agreements and limitations of this report. This report is the professional opinion of Lighthouse Engineering, LLC and is based upon a limited evaluation of the property. This report is provided for the exclusive use of the addressee. We have no contractual relationship with, or obligation to, any party other than the addressee of this report.

This report does not constitute a structural warranty or performance contract with the purchaser of this report to or with any other party. It only states conditions observed at the time of the inspection. The evaluation of the property included a visual examination

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of the exposed interior and exterior finishes of the structure and the ground surfaces adjacent to the structure and to the taking of relative floor elevations. The taking and testing of soil samples was not included. Unless written in the report, the original design drawings and any design conditions were not known. Determination of construction to Building Code is best done during the original construction and is not a part of this evaluation. Testing for plumbing leaks was not performed but is recommended after foundation work is performed.

It is possible that future repairs could be required for the subject foundation. This evaluation only addresses the current condition of the foundation. Lighthouse Engineering, LLC does not offer or imply any warranty for the repairs or for the repair company's acts or omissions or for any other person conducting the repairs.

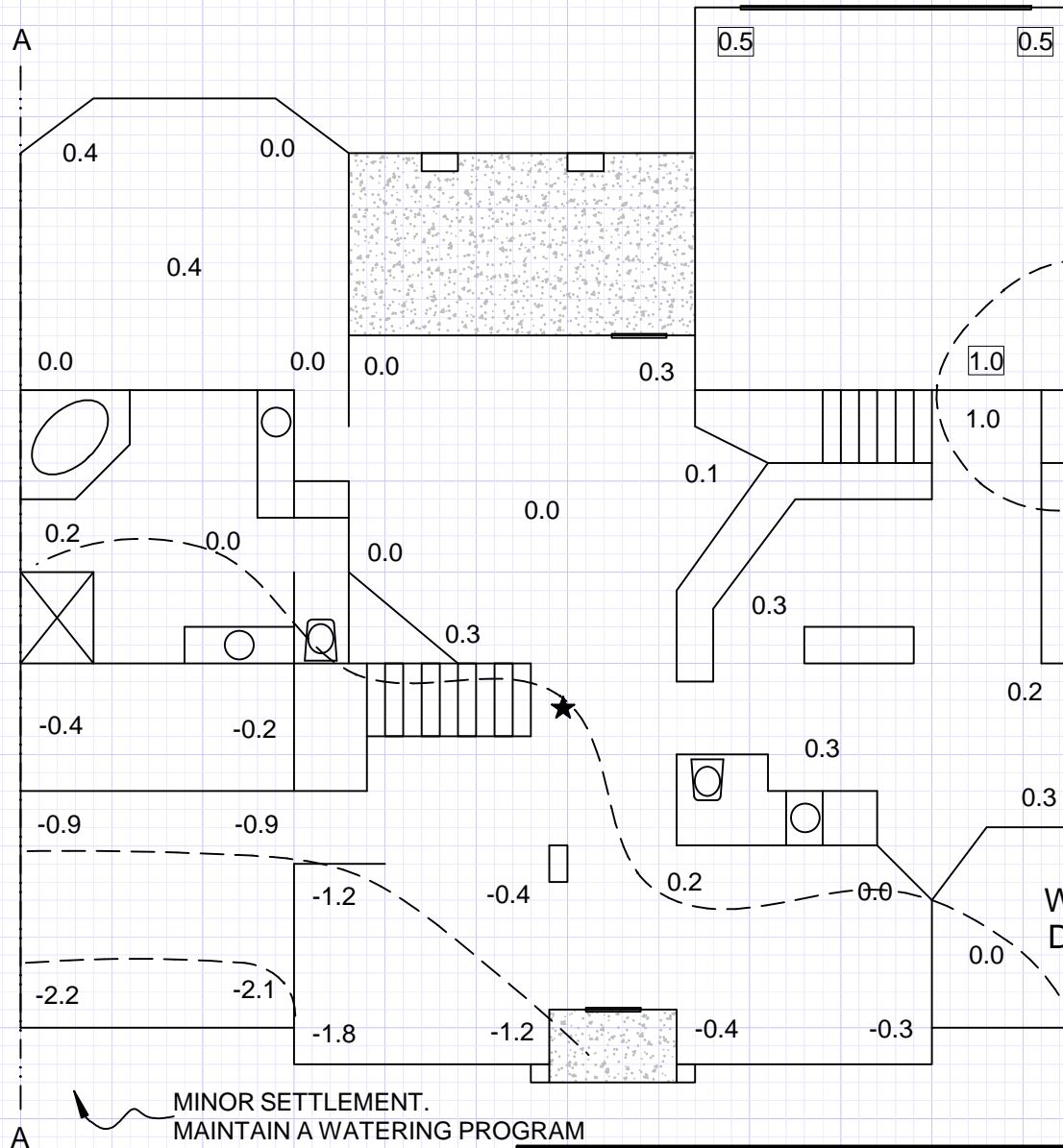
The fee collected is for this inspection only. Additional engineering services are available at an additional cost. Requests for these services must be made in a timely manner before commencement of work. Please contact this office for additional inspection scheduling and fee arrangements.

Sincerely,



Michael Gandy, P.E.
8/20/2014
Registered Engineering Firm F-9334

THIS REPORT DOES NOT PREDICT OR WARRANT
THE FUTURE PERFORMANCE OF THE FOUNDATION

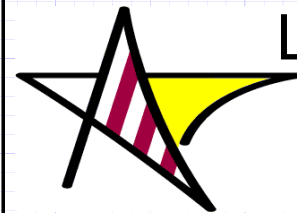


Michael Gandy

SEPTEMBER 23, 2013

APPROX. SCALE 1" = 10'

★ BENCHMARK ELEVATION 0 INCHES
ELEVATIONS ARE SHOWN IN TENTHS OF AN INCH
ELEVATION SURVEY DRAWING



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