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Wednesday, December 14, 2016

Cornerstone Custom Homes
Darren Gaunt
208 Pine Crest Drive
Madisonville, LA 70447

Re: Structural Assessment – Residence at 350 Sandy Brook Circle, Madisonville,
LA

1.0 INTRODUCTION

At your request, on Wednesday, July 6th and Friday, December 9th, 2016, I visited the site of an existing residential structure. The purpose of my visit was to observe existing conditions of the structure for the preparation of this report. During my visit, I observed and took photographs of conditions which will be discussed in the following sections.

1.1. Purpose of Assessment,

The purpose of this assessment is to express our professional opinion of the condition of the structure and nature of distress observed.

This report is not intended to bind any party to make any repairs or replacements. This report has been prepared in accordance with ASCE-11 (American Society of Civil Engineers “Guideline for Structural Condition Assessment of Existing Buildings”).

1.2. Scope of Assessment,

The scope of this assessment is defined by ASCE-11 as a “Preliminary Assessment.” The opinions stated in this report are based upon visual observations at the site and review of available relevant documents. This report includes only the visible elements and conditions stated in the report.

This report specifically does not address inaccessible areas or hidden conditions.

1.3. Testing.

To our knowledge, no relevant testing has been performed and is not the basis of any opinions expressed in this report.

1.4. Reports.

We have received a report from Dammon Engineering titled “Structural Inspection” dated September 28th, 2016. No other reports have been made available relevant to this structure.

1.5. Definitions.

- Front: the side of the structure facing the public access street
- Rear: the side of the structure opposite of the front
- Left side: the left-hand side of the structure as viewed from the front
- Right side: the right-hand side of the structure as viewed from the front

2.0 DESCRIPTION OF THE STRUCTURE

2.1 General.

The structure is estimated to be approximately 1 year in of age. The construction type is classified as type 5B construction by the current building code. It is a single-story wood framed “stick-built” construction with multiple exterior veneers and a shingle roof. The structure is supported by a concrete slab on ground foundation.

2.2 Dates of Construction, Alteration and Repair.

It is our understanding that the structure was constructed in 2015. Any repairs/renovations, if any, to the structure are unknown at this time.

2.3 History.

It is our understanding that the Burke’s are the original owner of the residence.

2.4 Collected Data.

As stated above, the data used in preparation of this report are visual observations, photographs, floor elevation measurements and any documentation noted in section one.

3.0 DISCUSSION OF SITE VISIT

The residence, in general, is representative of residential construction quality for the region and era. There were several areas of the residence where distress was observed to veneers (sheetrock, trim work, exterior siding, exterior brick veneer, etc.). As stated above, only visual observations were made during the site visit, no detailed surveys were taken. The following sections discuss our observations.

3.1. Location.

The residence is located at 350 Sandy Brook Circle, Madisonville, LA. From our research, the site is lot 31 Black River Forest Subdivision.

3.2. Dates.

The site visits this report is based upon were performed on Wednesday, July 6th and Friday, December 9 th, 2016.

3.3. Weather Conditions.

The weather conditions during the July site visit were partly cloudy with an approximate temperature of 89 degrees F. The weather conditions during the December site visit were sunny with an approximate temperature of 36 degrees F.

3.4. Topography.

The residence is located in a suburban area of sloping topography with the rear of the residence at the edge of a significant slope to the rear of the property. Our research shows that the existing site sloped from front to rear and that a minimum of 4 feet of fill was placed at the rear of the left side of the residence and that it is likely 3 feet of fill was placed at the right rear of the residence. Most of the grade at the perimeter of the residence was shaped to

promote drainage away from the residence. However, during the July visit to the site the front of the residence was observed to be in need of drainage. During the December visit to the site recently installed catch basins were observed at the front of the residence.

3.5. Soils,

a. Geotechnical Investigation,

It is my understanding that no geotechnical investigations have been performed nor are any reports available regarding the nature of the soil supporting the structure.

b. Natural Soils,

The soils at the site are presumed to be predominantly clay. Clay soils are subject to volume changes when changes in moisture content occur. These types of soils generally change in volume from alternating wet and dry periods. Volume changes in soils can cause movements in the structures they support. If the volume changes are uniform beneath a structure, the movement is generally not noticed. However, when there are movements that are not uniform, structures supported by such soils are subjected to differential movements which generally result in distress to veneers (cracking of sheetrock, floor tile, brick, etc.). Given the above cautionary information, it is recommended that the foundation be maintained such that water does not collect around the foundation.

During the July site visit, the soils at the front of the residence were observed to be somewhat wet. At that time, we recommended that drainage from that area be improved so that wet soils would not adversely affect the foundation performance. As stated above clay soils that are allowed to gain moisture may change volume and affect the foundation. As stated above, catch basins have been recently installed at the front of the residence, which should be monitored for proper drainage.

c. Fill,

Although we do not have accurate records of how much fill was placed for the construction of the residence, but as stated above, our research indicates a minimum of 4 feet of fill was placed for the construction of the residence. However, we have not received any records in regards to soil placement (how much material was stripped from the site, type of fill material, compaction tests, etc.). Without this information, it is assumed that the soils are as stated above and that the perceived settlement is likely due to multiple factors such as consolidation of the fill, consolidation of underlying soils, expansive soil and/or movement of the structure downhill as the structure is at the edge of a large slope.

3.6. Foundation,

The concrete slab on ground foundation was observed during my site visit. A crack was observed in the concrete at the rear porch. At this time, the nature of the crack is unknown, but could be related to the perceived settlement. Other than the above stated crack and the perceived settlement which will be discussed in the following section, no distress to the foundation was observed. At this time, we do not have records to form an opinion as to the condition of the foundation other than stated above. We will need information such as the concrete mix design, concrete trip tickets, post-tension installation records and post-tension stressing records to better understand the condition of the foundation.

3.7. Floors,

The floors of the residence were covered with wood and ceramic tile. In general, the wood and ceramic tile were observed to be in adequate condition. However, the joints in the wood flooring were observed in several locations to have gaps. No cracks were observed in the tile.

The floors of the structure were stated to be un-level. The report by Dammon Engineering indicates such as well as our own floor elevation measurements. It should be noted that our floor elevation measurements differed from the measurements recorded in the report by Dammon Engineering. Using the

foyer at the front door as the baseline elevation, our measurements indicate the largest difference of 1.7 inches at the rear left of the residence (master bathroom) and the largest rise in elevation of 1.8 inches at the rear right of the residence ("BR-2" as noted on the building plans). The differences in elevation measurements by Dammon Engineering and our measurements can be the result of several factors such as different equipment, tolerances within the equipment, different personnel and differences in the locations of measurement.

Noticeable slopes in floors are generally undesirable. However, tolerance (or intolerance) to floor slopes is generally individual preference. A noticeable floor slope does not constitute a structural failure, unless it presents an unsafe or unsanitary condition. Although there is much distress to the sheetrock veneers and trim work, no unsafe or unsanitary conditions were observed.

3.8. Walls,

a. Exterior Wall Veneers,

The exterior siding at the rear porch was observed to have a separation at a corner. At this time the nature of this distress is unknown, but is difficult to attribute to anticipated settlement at the rear of the residence nor can it be easily attributed to either of the sets of floor measurements.

The exterior brick veneer was observed to be in adequate condition with only one minor crack at the garage. It should be noted that the Brick Industry Association recommends that expansion joints be placed at a maximum of 30 feet to minimize the appearance of cracks due to temperature expansion/contraction. Such expansion joints would accommodate some soil/foundation movement.

b. Interior Wall Veneers & Ceilings,

The interior wall veneers of the residence were observed to have several areas of distress, cracking of sheetrock. Additionally, there were several areas where the trim work and false beams showed

separation. At this time the nature of the distress is unknown, but may be due to perceived soil settlement. It is our recommendation that the distress be repaired and monitored for reoccurrence (please see the last section of the report for additional recommendations).

3.9. Roof,

The roof was observed from ground level on the exterior and, in general, appears to be in adequate condition.

3.10. Review of Dammon Engineering Report,

As stated in section 1.4 we have received a copy of the report for the residence issued by Dammon Engineering. We have reviewed the report and offer the following comments:

- Fill: The report states that “the owner stated that there was approximately 2-1/2 feet of fill brought in for the foundation to meet the BFE.” As stated above our research indicates that very little fill was placed at the front of the residence while at least 4 feet of fill was placed at the left rear of the residence. It is important to understand the depth of fill and that the depth of fill varies as the deeper the fill the more settlement is anticipated. And, if the depth of fill is not uniform, differential settlement is anticipated (especially, when the variation could easily be 3 feet).
- Floor level measurements: The report states that “there is a – 2 5/8 inch difference noted to the rear of the home in the master bedroom.” Our measurements indicate a difference of 1.2 inches from the baseline elevation to the master bedroom. As stated above, difference in measurements taken at different times by different personnel and different equipment are understandable. However, given that the difference is approximately 1 ½ inches it is advisable that measurements be taken again. Additionally, no mention was made in the report in regards to flooring type. It is important to account for the height of flooring in the measurements as our measurements indicate that the floor tile in the master bathroom is 0.2 inches (almost a quarter

of an inch) above the wood flooring of the master bedroom. Lastly, it should be noted that some of our measurements relatively matched the measurements in the Dammon Engineering report others varied significantly. It is our recommendation that a third party obtain floor elevation measurements and submit to our office for review.

- Observations of interior distress: We have no objections or comments to the list of interior distress.
- Observations of exterior distress: We have no objections or comments to the list of exterior distress.
- Conclusion: The report states that “the fastest rate of settlement occurs in the first year after construction. By the fifth or sixth year the settlement has exponentially slowed...” We agree that the fastest rate of settlement occurs in the first year of construction. The statement in regards to settlement in “the fifth and sixth year” is incorrect. For properly compacted and drained fill, almost all of the settlement occurs in the first two years with the majority occurring in the first year. Settlement beyond two years of properly compacted and drained fill is negligible. The term “exponentially” is incorrect. Settlement of clay is correctly expressed as a logarithmic curve. Exponential curves are the direct inverse to logarithmic curves. Thus the “exponentially” term used in the Dammon Engineering report is incorrect. It is our opinion that given the age of the structure some minor settlement may still occur, but that the majority of the settlement has occurred.
- Recommendation: The report states “This home should be shored up to level and be stabilized.” The Dammon Engineering report shows no basis for this statement. Their report states that the maximum difference in elevation is 2 5/8 inches (which was not substantiated). A difference in elevation of 2 5/8” is not a basis for requiring nor advising underpinning (“shoring”). The measurements in their report represent data collected at one point in time. The slab foundation was without a doubt not perfectly level on the day it was constructed. Measurements

over 6-month time period would be required to indicate foundation movement. If movement was indicated over a 6-month period, the nature of the movement may not be the basis for advising underpinning. The report by Dammon Engineering does not address expansive soil, nor does it address the location of the foundation as related to the slope at the rear of the residence. The recommended “shoring” by the Dammon Engineering report is not the proper solution for expansive soils and would not stop down-hill movement of the foundation.

- Qualifications: The report by Dammon Engineering is signed and sealed by Brian Mistich, P.E. Our research indicates that Mr. Mistich is licensed as a mechanical engineer. Given that Mr. Mistich is licensed as a mechanical engineer and not a civil engineer, it is understandable that Mr. Mistich may not be aware of what his report recommends. To our knowledge, the study of mechanical engineering does not include civil engineering disciplines such as the study of structures, the properties of soil and foundation design. We would like a copy of Mr. Mistich’s resume and qualifications.

4.0 ANALYSIS

Calculations have been performed based on the foundation drawings and building code requirements and indicate that the foundation design meets building code requirements.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Given the above stated distress and observations, we request additional information so that we can better understand the nature of the observed distress. Please forward any geotechnical reports, information in regards to site preparation, compaction tests, fill material information, concrete mix design, concrete trip tickets,

post-tension installation, post-tension stressing, post-tension materials, photographs and any other relevant information in regards to the residence.

Based on the available information and the author's experience, knowledge of the area and the above stated observations, it is our opinion that the distress to the residence is likely due to multiple factors such as consolidation of the fill, consolidation of underlying soils, expansive soil and/or movement of the structure downhill as the structure is at the edge of a large slope.

It is our opinion that a large portion of the observed distress may be attributed to soil settlement of the large depth of fill at the rear of the residence, that some minor further soil settlement will occur over the next 6 months, and that any soil settlement beyond that point will be negligible. It is our opinion that the observed minor distress is not structural in nature and that the observed distress is recommended to be properly repaired and monitored for reoccurrence (periodic visual observation by the owner). It is our opinion that due to the additional anticipated minor soil settlement it is likely that some minor distress will reoccur and will require additional minor repairs.

In closing, please feel free to contact my office if you have any questions.

Additionally, we welcome an independent peer review of our report. Please note that this report is an instrument of professional service and is the property of Cypress Engineering. Any third party use of this report is prohibited.

Regards,

CYPRESS ENGINEERING, LLC

Dale A. Phillips, PE

LIMITATIONS

This report only reflects the conditions as observed during my site visit and the professional opinions regarding structural engineering formed based upon those observations. Any and all other disciplines of engineering or construction specialty areas (termites, mold, water infiltration, etc.) are not addressed nor warranted by this report. Discussion of non-structural items noted above are only included as they were observed during my visit. This is the first and only visit made to the site by the undersigned engineer. Cypress Engineering reserves the right to amend this report as additional information becomes available