January 1, 2020

Re: Visual Structural Review
123 Main St.
Overland Park, KS 12345

Daniel Schroeder, P.E.

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Lenexa, KS 66219
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Dear Mr. John Doe:

The residence located at the above address was visually evaluated on January 1, 2020, to determine the structural integrity of the foundation. The structure is a one-story house and generally faces west for purposes of this report. This report sets forth observations and recommendations based on the visual evaluation.

I. Executive Summary

A. Structural Remedial Measures Recommended

The following structural remedial measures are recommended at this time.

- Install 2 vertical I-beam braces on the east end of the south wall, spaced approximately 6ft on center (one on each side of the window, see Appendix B).
- Install mortar between the existing I-beam braces and the foundation walls, 2 on the west wall and 4 on the east wall.

Vertical braces were installed on the east and west walls and appear to be functioning properly. Monitor for future movement. Follow the grading and water management plans below to reduce the chance of future structural movement.

The deadman anchor installed on the east wall appears to be functioning properly. Deadman anchors should be maintained by a qualified contractor. The anchor must be tightened periodically, and only during a dry season.

B. Non-structural Remedial Measures Recommended

The following non-structural remedial measures are recommended to improve foundation performance and reduce future movement.

- Improve grade on the east side of the house, especially under the low-lying deck. A swale may be necessary.
- Maintain functioning gutters. Functioning gutters should slope towards the downspout and be cleaned periodically. Downspouts should extend at least 6ft from house.

- See Appendix A for General Water Management Recommendations

II. Detailed Observations and Recommendations

A. Foundation

The foundation consists of poured concrete walls that form a basement beneath the house. It is assumed that the footings are monolithically poured concrete spread footings resting on native, undisturbed soil.

1. Lateral Movement

Excessive lateral movement was observed on the east end of the south wall; remediation is required. The wall has moved in approximately 2" as measured with a 4ft carpenter's level. 2 vertical I-beam braces should be installed, see Appendix B for location.

The east wall has shifted laterally, and vertical braces and a deadman anchor were previously installed. These braces appear to be functioning properly. Deadman anchors should be maintained by a qualified contractor. The anchor must be tightened periodically, and only during a dry season.

The southern portion of the west wall has shifted laterally, and vertical braces were previously installed. These braces appear to be functioning properly. Minor lateral movement (less than 1") was observed on the northern portion of the west wall. This minor movement can typically be stabilized by improving the grade and drainage around the house, as discussed in more detail below.

Lateral movement is generally caused by excessive hydrostatic pressure around the foundation walls. Specifically, expansive clay soil, which is common in the Kansas City area, shrinks and expands based on its relative moisture content; excessive water causes the clay soil to expand and exert increased force on the foundation. Poor grade and drainage around the foundation increase hydrostatic pressure and contribute to lateral movement of the foundation walls. Maintaining proper grading and drainage is thus important for improving foundation performance and reducing future movement.

2. Vertical Movement

No indications of excessive vertical movement were observed. Some differential shifting and normal shrinkage of building materials has occurred. This type of cracking is common and does not pose a structural concern at this time.

Vertical movement is generally caused by heaving, settling, and shifting of the subsoil beneath the foundation. This occurs as the expansive clay soil, which common in the Kansas City area, expands and shrinks. As the subsoil absorbs water, it expands and heaves the foundation upward; as the subsoil dries, it shrinks and results in settlement.

Maintaining proper grading and drainage is necessary to avoid excessive water around the foundation and associated heaving. Additionally, during hot and dry weather patterns, the soil near the home should be watered with 1-2 inches of water per week to avoid soil shrinkage and associated settlement.

B. Grading and Drainage

The grade on the east side of the house should be improved, especially under the low-lying deck. The grade should fall a minimum of 1 inch per foot for at least 6 feet from the foundation. Hard surfaces should fall at least 1 inch per 48 inches from the home. A swale may be necessary to achieve the proper fall from the foundation.

Drainage should be improved by cleaning the gutters, downspouts, splash blocks, and subterranean drain tile (if applicable). All downspouts should extend at least 6' from the house. Maintaining proper grading and drainage is necessary to reduce future foundation movement, as explained above.

See Appendix A for General Water Management Recommendations.

C. Limitations of Evaluation

The structural analysis provided under this agreement is visual only. When making visual observations, certain assumptions about the methods of construction and site conditions must be made. These assumptions cannot be verified without expensive and destructive testing. Similarly, finished surfaces and excessive clutter can lead to the same limitations.

A "structurally sound" foundation does not guarantee a dry basement. While poor management of water leads to many foundation issues, water intrusion into the basement is not necessarily a structural issue. A "structurally sound" foundation may experience seasonal movement that causes cracking in the concrete or drywall above. Some movement is considered normal and does not necessarily require foundation repair, although it should be monitored for excessiveness.

For a full explanation of the limitations of this evaluation, please refer to the signed contract.

If you have any questions, please contact me via cell phone at 816-457-2733.

Regards,

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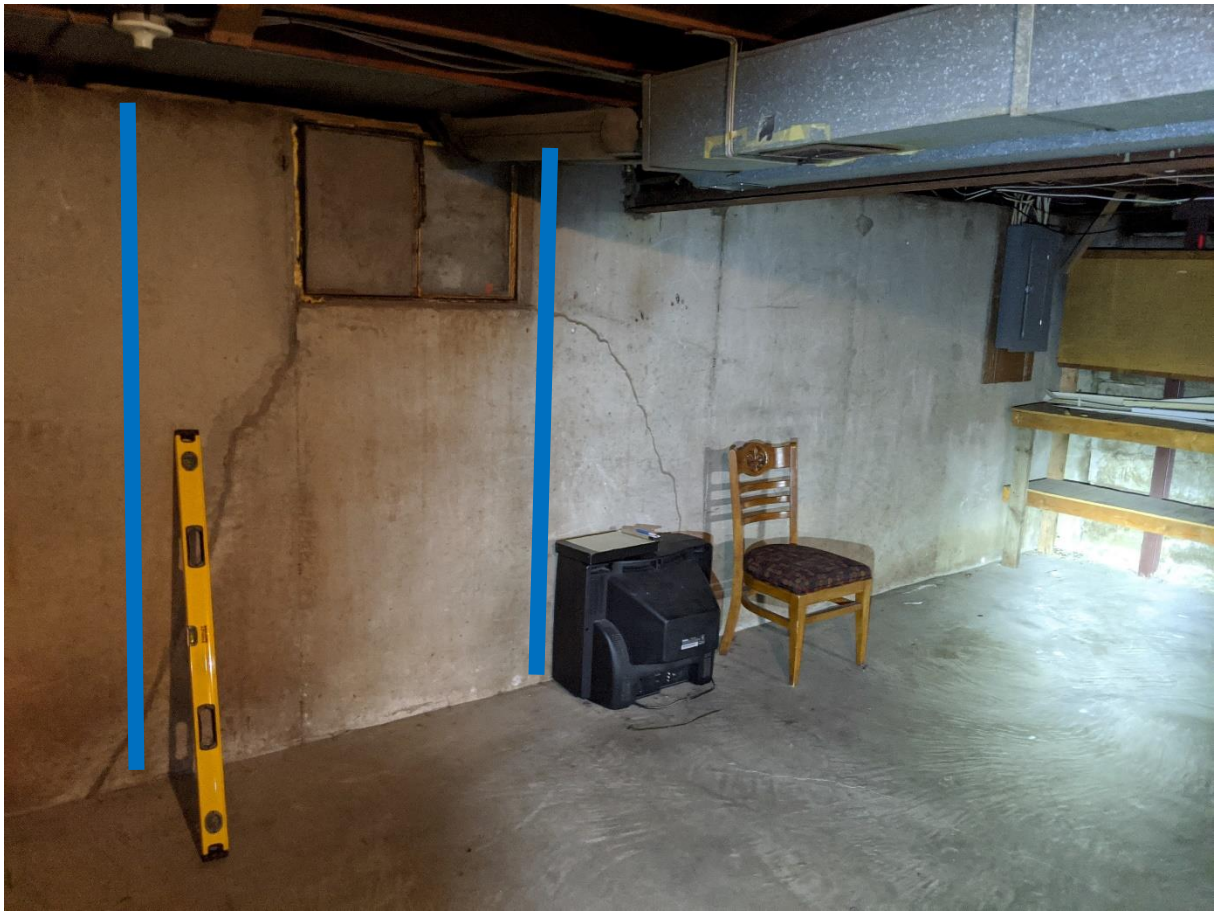
APPENDIX A – GENERAL WATER MANAGEMENT RECOMMENDATIONS

Managing water around the foundation is necessary throughout the life of the home. The water management strategies noted below help avoid common problems caused by extremely wet or dry conditions.

Soil in the Kansas City metro area often contains expansive clay soil, which shrinks and expands based on its relative moisture content. Excessive water causes clay soil to expand and exert increased force on the foundation. To avoid excessive water around the foundation, maintain clean, functioning gutters that have proper slope. The downspouts should extend a minimum of 6 feet from the home. Additionally, the grade around the home must direct water away from the foundation. The grade should fall a minimum of 1 inch per foot for at least 6 feet from the foundation. Hard surfaces should fall 1 inch per 48 inches from the home. Good grading can be accomplished by adding soil around the foundation, but it is important to leave a 6-inch gap between the top of the soil and the bottom of any siding. If soil cannot be added, a swale can be installed.

Extreme dry conditions cause clay soil to shrink. The shrinking soil can create voids under the foundation footings, which leads to settlement. During hot and dry weather patterns, the soil should be watered with 1-2 inches of water per week.

APPENDIX B – IMAGES



Approximate location of 2 braces