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Report of Findings

Pereira v. Regency Homebuilders, LLC Construction Evaluation
Cause No: 6016378

Julie Pereira v. Regency Homebuilders, LLC

Rimkus Matter No: 100314106

Prepared For:
Meredith Law Firm, PLC
1715 Aaron Brenner Drive, Suite 450
Memphis, TN 38120

Attention:
Mr. Bryan Meredith

Bobby G. Kendall, P.E.
Tennessee Professional Engineer No. 119257
Senior Consultant

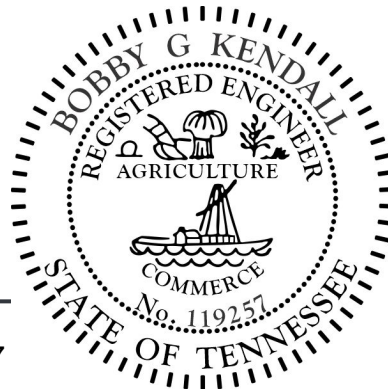




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Section I

INTRODUCTION

Ms. Julie Pereira reported that there were construction defects to her residence, which was constructed from 2020-2021 by Regency Homebuilders, LLC. The Pereira residence was located at 5055 Adagio Lane in Lakeland, Tennessee.

Rimkus was retained to evaluate the reported deficiencies, including footings and Outdoor Living Area (OLA) porch and patio concrete, and to opine on previous documentation regarding the suitability of the soils on which the residence was constructed. Bobby G. Kendall, P.E., Senior Consultant, performed our inspection on August 29, 2025, and prepared this **Report of Findings**. All measurements and dimensions are approximate unless otherwise noted.

This report was prepared for the exclusive use of Meredith Law Firm, PLC, and is not intended for any other purpose. Our report is based on the information available to us at this time, as described in the **Basis of Report**. The opinions and conclusions herein are based on sufficient facts or data; they are the product of our analysis utilizing reliable, generally accepted principles and methods in our applicable professional field; and they reflect a reliable application of these principles and methods to the facts of this matter. Should additional information become available, we reserve the right to determine the impact, if any, the new information may have on our opinions and conclusions and to revise our opinions and conclusions if necessary and warranted. This report was reviewed by Mr. Kurt A. Bergman, Construction Practice Leader.

Section II

CONCLUSIONS

1. The footings of the Pereira residence were not constructed as indicated on the construction drawings.
2. The placed fill and portions of the concrete slab and footings did not comply with minimum requirements of the 2015 IRC as adopted by the Board of Commissioners of Shelby County, Tennessee, and in effect at the time of construction.
3. Cracks in the Outdoor Living Area (OLA) concrete were a result of the improper placement of reinforcing steel during the placement of the slab and/or the lack of contraction joints in the slab. The differential vertical movements of slab sections were further exacerbated by the inadequate compaction and subsequent consolidation of placed fill.
4. The deficiencies noted resulted in strength capacities lower than designed and/or specified by the IRC.

Section III

DISCUSSION

Background Information

The Pereira residence was a two-story, single-family house built on a concrete slab-on-grade foundation. The exterior walls were covered with brick veneer and composite siding. The roof was overlain with asphalt shingles (**Photographs 1 through 4**). The interior walls and ceiling were covered with painted gypsum board. The interior floors were covered with wood laminate, ceramic tile, and carpet. According to the Shelby County Assessor of Property, the 3,910 square feet (sf) house was constructed in 2021. A purchase agreement was signed by Julie Pereira and Joseph Pereira (buyers) with Regency Homebuilders, LLC on March 8, 2020. A construction permit was issued on September 2, 2020. The home was substantially completed in May of 2021 with a Certificate of Occupancy issued by the Memphis and Shelby County Office of Construction Code Enforcement on June 2, 2021. Sticking interior doors, uneven floors in the Great Room and Kitchen, cracks in patio concrete and brick veneer were observed beginning in July of 2021 and have continued through the summer of 2025. Throughout this report, the residence is referenced to face east (**Figure 1**).

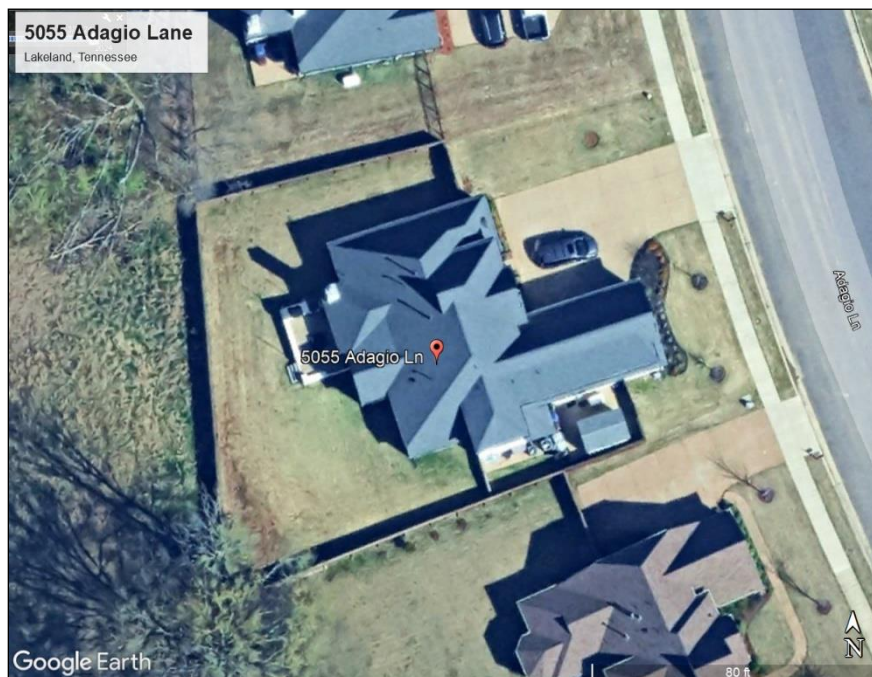


Figure 1—Aerial view of the Pereira residence. Imagery by Google Earth. Image date of March 10, 2024.

Document Review

Mr. Bryan Meredith provided documents for review and evaluation. Upon review, we noted the following:

- Plans and Permits (70-page document):
 - Memphis and Shelby County Building Permit No. 1116613 approved on September 2, 2020, with 2015 IRC referenced as code in force.
 - City of Lakeland Building Permit No. 59358 approved on August 21, 2020.
 - B&W Engineering Laboratories, Inc. Soil Compaction Test Report No. D-2952 for support of plumbing lines only. Concluded that the degree of fill compaction within the planned building area exceeds the 90% requirement of the Shelby County plumbing code.
 - Memphis and Shelby County Code Enforcement Footing/Foundation Form Letter. This was a third-party pre-pour inspection conducted by AFA Engineering on October 12, 2020, and stamped and signed on December 22, 2020.
 - Building Plans by Gardo Design Group included Foundation Plan, 1st and 2nd Floor Plans, 1st and 2nd Floor Framing Plans, Roof Plan, Elevations, Sections. Additional details for slab and continuous footing were not provided. These were requested at the time of our inspection and were available at the time of this report.
- Poe Engineering Inspection Reports—Poe Engineering, Inc. performed five inspections of the property. Dates, purpose, and conclusions of each follows:
 - May 22, 2021: Asked to determine if any signs of settlement or structural concerns. The report concluded that the residence is structurally sound and there was no evidence of foundation settlement.
 - February 14, 2022: Asked to determine if slab was properly repaired following repair of sewer line. The report concluded that the repaired slab was structurally sound.

- February 17, 2022: Asked to determine if foundation settlement had occurred. The report concluded that the residence was structurally sound and that there was no evidence of any foundation settlement.
- January 10, 2023: Asked to determine the cause of cracks in brick veneer, exterior rear patio, and binding doors. The report concluded that all observations were cosmetic in nature and not indicative of foundation failure.
- June 2, 2025: Asked to determine if the residence is structurally sound. The report concluded that cracks in brick veneer and interior sheetrock are cosmetic in nature and not indicative of foundation failure. The report concluded that rear patio has significant cracks that increased since previous inspection. Recommended repairs.
- Engineering Design & Testing Corp. (EDT) Foundation and Supporting Soil report dated August 29, 2025. On August 7, 2025, EDT performed soil sampling, and the report concluded that the current soil bearing capacity does not meet the minimum requirements of the IRC.
- Photographs and videos taken by the homeowner during construction, during plumbing/slab repairs, and others since occupancy, and include:



Figure 2 - Photograph taken by homeowner during plumbing repairs, which required demolition of main slab. Tape measure is inserted in area of required 30-inch by 30-inch footing.



Figure 3—Photograph taken by homeowner during plumbing repairs, which required partial demolition of main slab. The Welded Wire Reinforcement (WWR) is observed to be lying directly on top of vapor retarder.



Figure 4—Photograph taken by homeowner during placement of OLA patio slab. Steel reinforcement is observed to be lying on the ground.

Observations

Photographs of typical (representative) observed conditions and damage are contained in **Attachment A, Photographs**. These photographs, along with the following narrative, are considered sufficient to describe the general condition of the residence. However, the photographs are not intended to show all conditions and/or damage that may exist. The following observations were made at the Pereira residence on August 29, 2025:

- The concrete slab in the great room was exposed due to a previous plumbing repair and elevated moisture content, preventing the installation of flooring. The slab had cracks up to 1/8 inch in width (**Photographs 5 and 6**). The moisture content of the main slab was elevated (**Photographs 7 and 8**).

- There were isolated hairline-width cracks in the gypsum board ceiling in the great room. There was a nail pop and a hairline-width crack in the gypsum board ceiling in the northwest bedroom on the ground floor (**Photographs 9 and 10**). A second-story closet door was difficult to close and open. There was evidence of previous repair attempts (**Photographs 11 and 12**).
- A relative elevation of the Outside Living Area (OLA) concrete deck was conducted during our inspection. The southwest corner of the patio was approximately 2 inches lower than the northwest corner (**Photographs 13 and 14**). There were cracks in the mortar and cracked bricks in the veneer of the porch and patio outdoor kitchen. (**Photographs 15 through 17**).
- A relative elevation survey of the backyard was conducted during our inspection. The finished floor elevation of the residence was 3 to 5 feet higher than the apparently undisturbed soil along the west fence line (**Photographs 18 and 19**).
- The exterior brick veneer had both stair-step cracks and cracked brick on the north, east, and west elevations (**Photographs 20 and 21**).
- Three areas around the footings of the residence had been excavated prior to our inspection. There were voids and honeycombing of the concrete visible. (**Photographs 22 and 23**).

Analysis

Put simply, footings are the structural components of a building system that distribute all structural loads to the ground. A typical footing in modern residential construction, and that at the Pereira residence, is a thickened portion of the concrete slab, with additional reinforcement, along the exterior walls and under interior load-bearing walls. The proper design and construction of footings is a critical component of any building system. Therefore, codes related to the construction of footings contain specific requirements that are widely adopted as statute by local authorities.

The 2015 International Residential Code (IRC) was adopted by the Board of Commissioners of Shelby County, Tennessee, and was in effect at the time of the construction of the Pereira residence. We noted the following regarding Sections of the IRC that were applicable to the construction of the footings and main slab of the building:

- Section R401.2 *Requirements* states “Fill soils that support footings and foundations shall be designed, installed, and tested in accordance with accepted engineering practice”.

Note: An estimated 3-5 feet of fill was placed at the property prior to the construction of the footings. There was no documented design, nor testing subsequent to the placement of fill soils.

- Section R401.4 *Soil tests* includes Table R401.4.1, which provides the presumptive load-bearing pressure of the different soil classes. For clays, this value is 1,500 pounds per square foot (psf). Note b. of the table further states, “Where the building official determines that in-place soils with an allowable bearing capacity of less than 1,500 psf are likely to be present at the site, the allowable bearing capacity shall be determined by a soils investigation”.

Note: There was no indication that the soils had undergone review by building official(s). However, limited testing at the site demonstrated soil strengths less than those of the IRC design values.

- Section R403.1 *General* states “all exterior walls shall be supported on continuous solid or fully grouted masonry or concrete footings...” and that the “footings shall be supported on undisturbed soil or engineered fill”. Section R403.1.4 as adopted by the Board of Commissioners of Shelby County, further states, “All footings shall bear on undisturbed or properly compacted soils”.

Note: The documentation supporting design or testing at the time that the fill was placed is limited to testing to confirm support beneath plumbing lines, and was not considered design/testing for the footings. In lieu of such, the placed fill at the site would not be considered “engineered fill” as required by R403.1 or “properly compacted soils” as required by R403.1.4.

An additional consideration in the placement of concrete slabs, such as those at the Pereira residence, is cracking. The curing of concrete is a chemical reaction whereby the cement is hydrated by joining with water molecules in the concrete mix. During this hydration process, the concrete shrinks, causing what is referred to as shrinkage cracking. While shrinkage cracking is unavoidable in concrete, there are ways to mitigate

the impact. Most common among these is the use of steel reinforcement for crack-width control. The IRC includes guidelines for the use of steel reinforcement as follows:

- Section R506.2.4 *Reinforcement Support* states that the “reinforcement shall be supported to remain in place from the center to upper one-third of the slab for the duration of the concrete placement”.

Note: Photos of the slab assembly during the plumbing repair show Welded Wire Reinforcement (WWR) located at the bottom of the slab, which would not comply with the requirements of R506.2.4.

At the Pereira residence, a relative elevation survey conducted during our inspection showed that the site was built up above the undisturbed soil prior to placement of the foundation. This is also consistent with fill values estimated by B&G in September 2020, indicating up to 2.5 feet of fill. Without any design, compaction, and testing related to the foundations, the placement of fill would not be in accordance with the requirements of IRC Section R401.2 and R403.1. Soil sampling and analysis occurred on September 2, 2020, and reported the soils to be “stiff brown silty clay w/ trace of sand”. Though the testing indicated compaction of between 93 and 97 percent, it was acknowledged that the initial report was to determine the “adequacy of existing material for the support of plumbing lines only” and was not intended for the determination of suitability for the placement of a foundation. Additional sampling and analysis conducted on August 7, 2025, reported the soils to be “soft, lean gray clay”. The 2025 EDT report included tests for bearing capacity completed with a Dynamic Cone Penetrometer, with calculated values between 260 psf and 660 psf. The latter report concluded that the bearing capacities were below the required IRC design values of 1,500 psf. This demonstrated that the fill material placed on or around October 20, 2020, prior to the foundation, did not meet the criteria required by the IRC and Table R401.4.1. An engineered fill plan for the site, properly executed, would have ensured that the placed fill met the minimum requirements of the IRC and/or those specified by the Engineer of Record for the design of the building. The infill soil characteristics revealed by bearing capacity tests, and omitted interior footing resulted in maximum strength capacities lower than designed and/or specified by IRC. The building plans reviewed did not specify loading or minimum bearing capacities for the foundation/footings in lieu of the IRC minimum requirements.

Three excavations at the footings of the residence had been performed prior to our inspection, which allowed a visible inspection of the footings at these areas. The footing details were not made available at the time of this report for comparison. However, the following observations were made. The footing thickness ranged from 14 to 17 inches. The vertical surface of the footings below the brick ledge was not uniform and had voids at the bottom. At two of the three locations, non-continuous concrete was observed with voids near the top of the footing at/near the bearing of the brick veneer. This indicated that portions of the designed section of the footing were discontinuous. Photographs and measurements taken by the homeowner during the plumbing and slab repair in February of 2020 and reviewed as part of our investigation, revealed the absence of a required (per the drawings) footing under a load-bearing wall near the center of the residence. Additionally, the main slab reinforcement required by the plans was observed to be lying directly on the vapor retarder and not installed in accordance with IRC Section R506.2.4.

This analysis, our observations, and review of available documents led to our conclusion that the footings of the Pereira residence were not constructed as indicated on the construction drawings; and the placed fill and portions of the concrete slab and footings did not comply with minimum requirements of the 2015 IRC as adopted by the Board of Commissioners of Shelby County, Tennessee, and in effect at the time of construction; and the deficiencies noted resulted in strength capacities lower than designed and/or specified by IRC.

The Outdoor Living Area (OLA) at the Pereira residence included a covered porch approximately 19 feet x 12 feet with an uncovered patio extending approximately 12 feet off the porch. The original concrete in this area was demolished and replaced following a finishing error by the builder (washed instead of stamped concrete). Photographs and videos taken by the homeowner show that the concrete was observed to have cracks within a week after the second placement. Additionally, the cracks were observed to be widening on subsequent visits by Poe Engineering. Cracks up to 0.2 inches with differential heights in the concrete were observed during our inspection. Relative elevations taken during our inspection show approximately 2 inches of fall from the northeast corner of the porch to the southwest corner of the patio. These movements were attributable, in part, to differential movement (e.g., settlement) correlating to the consolidation of the placed fill, as well as the lack of control joints and/or reinforcement.

As outlined in earlier analysis, the IRC includes guidelines for the use of steel reinforcement. Additionally, the American Concrete Institute (ACI) Residential Code Requirements 332-14 includes guidelines for the use of contraction (control) joints to reduce cracking in these slabs as follows:

- ACI 332-14 Table 10.5.2 specifies the maximum contraction joint spacing to be between 8 and 15 feet, depending on the slab thickness and maximum aggregate size.

At the Pereira residence, photographs taken during the construction of the rear porch and patio show steel reinforcement lying on the ground without proper support in accordance with the IRC provisions outlined above. Additional photographs and videos showed control joints in the original concrete, but no control joints were placed in the slab when the patio was re-poured. Although the slab details were not fully indicated in the building plans, the 24-foot dimension of the slab would have required at least one, if not two, contraction joints to control the cracking of the concrete during the hydration process to comply with ACI 332-14. A review of NAHB construction performance standards indicates that cracks in finished/exposed slabs should be limited to 0.1875 inches. The measured cracks of up to 0.2 inches did not comply with the expected NAHB performance criteria. This analysis, our observations, and review of the provided documents, photographs, and videos led to our conclusion that the cracks in the Outdoor Living Area (OLA) concrete were the result of improper placement of reinforcing steel during the placement of the slab and/or the lack of contraction joints in the slab. The differential vertical movements of slab sections were further exacerbated by the inadequate compaction and subsequent consolidation of placed fill.

Section IV

BASIS OF REPORT

1. Inspection of the Pereira residence located at 5055 Adagio Lane in Lakeland, Tennessee, by Bobby G. Kendall, P.E., on August 29, 2025. The inspection included photographs, measurements, and observations.
2. Aerial imagery by Google Earth. Image date of March 10, 2024.
3. International Residential Code, 2015.
4. American Concrete Institute Code Requirements for Residential Concrete, ACI 332, 2014.
5. Moisture content measurements were taken using a Moisture Encounter Plus surface moisture meter by Tramex.
6. Relative elevation measurements were taken using a ZipLevel High Precision Altimeter Pro-2000 by Technidea.
7. Photographs of the great room main slab excavation taken by Ms. Julie Pereira, February 10, 2022, provided to Rimkus by Mr. Bryan Meredith.
8. Photographs of the OLA concrete slab placement taken by Ms. Julie Pereira, date unknown, and provided to Rimkus by Mr. Bryan Meredith.
9. "Wood Handbook: Wood as an Engineered Material," Forestry Products Laboratory, U.S. Department of Agriculture, April 2010.
10. "Wood Flooring Installation Guidelines," National Hardwood Flooring Association, 2019.
11. National Association of Home Builders "Residential Construction Performance Guidelines", 5th Edition.
12. We reviewed the following documents:
 - a. Regency Purchase Agreement, dated March 8, 2020, with amendments 1 through 2-9.

- b. Building Permit with attachments, dated September 2, 2020.
- c. Building plans by Gardo Design Group, dated July 2020.
- d. B&W Engineering Laboratories, Inc. Soil Compaction Test Report No. D-2952, dated September 2, 2020.
- e. Brewer Landscaping fill dirt invoice, dated June 29, 2020.
- f. Memphis and Shelby County Code Enforcement Footing/Foundation Form Letter, dated December 22, 2020.
- g. Memphis and Shelby County Office of Construction Code Enforcement Final Inspection, dated June 2, 2021.
- h. Poe Engineering Inc. Inspection Reports, dated: May 22, 2021, February 14, 2022, February 17, 2022, January 10, 2023, June 2, 2025.
- i. Brough & Stephens Inc. Inspection Report, dated November 22, 2021.
- j. Memphis and Shelby County Division of Planning and Development site inspection results, dated April 1, 2025.
- k. Engineering Design & Testing Corp. Foundation and Supporting Soil report, dated August 29, 2025.
- l. Photographs and videos taken by Ms. Julie Pereira, dated 2020 through 2025.
- m. Arbitration Respondent Answers and Counter-Claim for Regency Homebuilders, LLC v. Julie Pereira, date of document not provided.

Section V
ATTACHMENTS

A. Photographs

B. Curriculum Vitae

Section V
ATTACHMENT A

Photographs

Photographs taken during our inspection, including photographs that were not included in this report, were retained in our files and are available to you upon request.

Photograph 1
Northeast view of the Pereira residence.



Photograph 2
Southeast view of the Pereira residence.



Photograph 3

Northwest view of the Pereira residence.



Photograph 4

Southwest view of the Pereira residence.



Photograph 5

The main slab in the great room of the residence was exposed due to previous plumbing repairs. The slab had cracks up to 1/8 inch in width.



Photograph 6

The cracks in the main slab extended to the edges of the slab on the east and west sides of the interior.



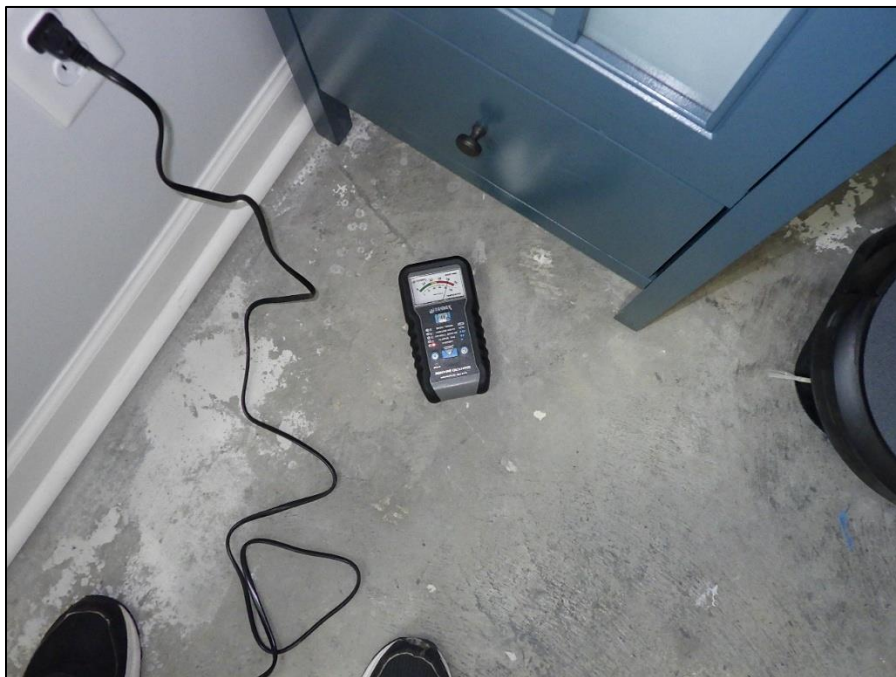
Photograph 7

The moisture content levels were elevated in the exposed portions of the main slab. The readings were above the NWFA maximum allowed for the installation of engineered wood flooring.



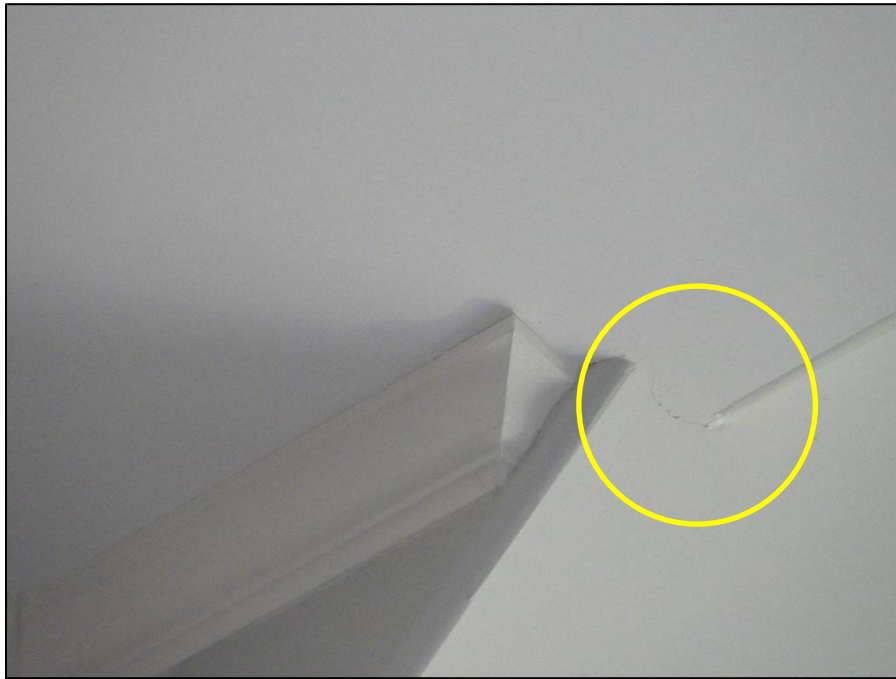
Photograph 8

Example of elevated moisture content reading in dining room. The readings were above the NWFA maximum allowed for the installation of engineered wood flooring.



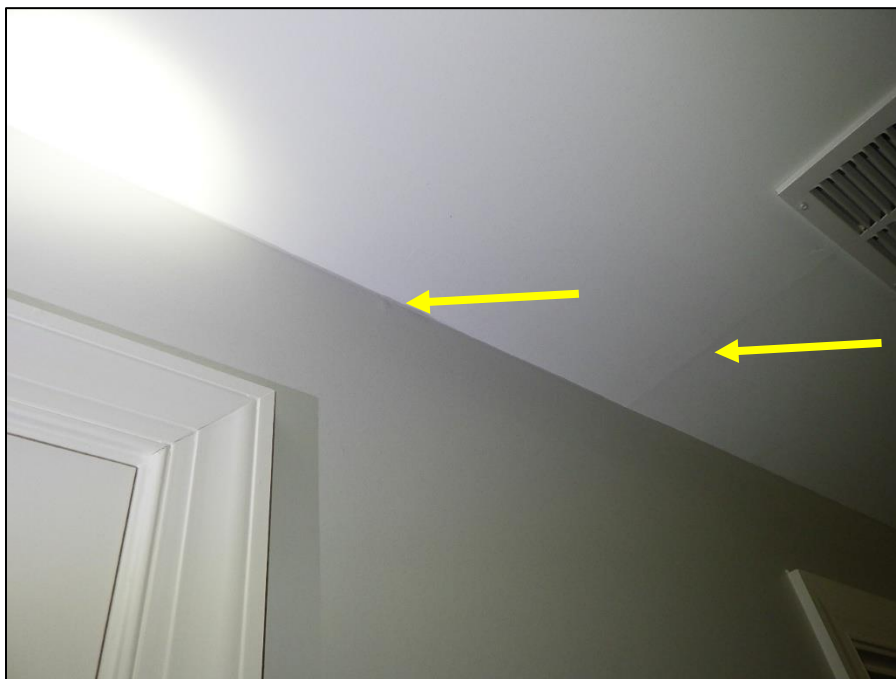
Photograph 9

There were isolated hairline-width cracks in the gypsum board ceiling in the great room and northeast bedroom on the ground floor.



Photograph 10

Example of hairline-width crack and nail pop in gypsum board ceiling and wall in northeast bedroom on the ground floor.



Photograph 11

A closet door on the second floor was difficult to open and close. The door and door frame were making contact in the upper right corner.



Photograph 12

The closet door from **Photograph 11** had evidence of previous repairs to the hinges.



Photograph 13

The OLA patio deck was sloped to the southwest approximately 2 to 3 inches.



Photograph 14

The OLA patio deck was sloped to the southwest approximately 2 to 3 inches.



Photograph 15

There were cracks in the brick veneer wall where the OLA kitchen area joined the west wall of the porch.



Photograph 16

The brick veneer wall on the OLA was cracked at the north side of the porch.



Photograph 17

There was a crack in the mortar of the soldier brick course above north door lintel of the OLA porch.



Photograph 18

A relative elevation survey of the back yard was performed with the finished floor used as a benchmark.



Photograph 19

A relative elevation survey of the back yard showed the undisturbed (native) soil along the west fence line to be 3 to 5 feet below the finished floor elevation.



Photograph 20

There were isolated stair-step cracks in the mortar of the brick veneer on the north, east, and west sides of the residence.



Photograph 21

There were isolated vertical cracks in the brick veneer on the north, east, and west sides of the residence.



Photograph 22

There were three excavations at the footings around the perimeter of the residence.



Photograph 23

Two of the three excavations had visible voids and/or honeycombing concrete.



Section V
ATTACHMENT B

Curriculum Vitae



Bob Kendall, P.E.

Senior Consultant

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Bartlett, TN 38133

Background

[\(901\) 573-5515](tel:(901)573-5515)

bobby.kendall@rimkus.com

Mr. Bob Kendall holds B.S. and M.S. degrees in Civil Engineering and is a registered professional engineer in Alabama, Arkansas, Florida, Kentucky, Louisiana, Mississippi, Missouri, Tennessee, and Texas. He has an extensive background in facilities planning, design, and construction management services and has combined this expertise with structural and building envelope failure analysis.

Mr. Kendall's extensive professional engineering experience includes assignments as project engineer, construction project manager, and construction administration. He has served on and led project teams for small and large construction projects in higher education, healthcare, municipal, public, and private settings.

Forensic Engagements

• Forensic Assignments

- Various Locations, Damage assessment and analysis of tornadoes, wind, hail, moisture intrusion, structural impacts, blasting/vibration, and construction defects.

Professional Experience

• Rimkus

2025 – Present

- Senior Consultant

Perform property loss consulting for residential, commercial, and industrial structures; structural engineering consulting; and catastrophe services.

• Kendall Brothers Trucking, LLC

2019 – 2025

- Founder and President

Founded and led operations for a small, upstart over-the-road trucking company.

• Methodist LeBonheur Healthcare

2017 – 2019

- Corporate Director, Construction Management

Directed construction of healthcare facilities ranging from interior renovations to new construction of a multi-story hospital tower.

- **Town of Arlington, Tennessee** **2016 – 2017**

 - Public Works Director
Directed all Public Works and Engineering operations of the municipality, including roads maintenance; wastewater collection and treatment; stormwater compliance; code enforcement; and construction inspection.

- **Naval Facilities Engineering Command** **2012 – 2016**

 - Executive Director, Construction and Facilities
Directed all facilities operations and construction for U.S. Government facilities, including building maintenance; grounds maintenance; water treatment and distribution; high and medium voltage electrical distribution; environmental services and compliance; and renovations and new construction.

- **U.S. Naval Mobile Construction Battalion** **2009 – 2011**

 - Project Engineer and Construction Project Manager
Performed project management and project engineer services for various expeditionary and long-term construction projects across the globe including North America, Africa, Europe, and Southwest Asia.

- **U.S. Naval Academy** **2006 – 2009**

 - Project Manager and Branch Head
Performed project management and project engineer services for various construction projects at the Navy's Flagship Higher Education Institution, including a \$15 million library renovation; \$22 million dining hall renovation; and \$55 million new construction of NCAA certified athletic fieldhouse.

Education and Certifications

- **Civil Engineering, M.S.:** University of Texas at Austin (2012)
- **Civil Engineering, B.S.:** University of North Florida (2003)
- **Licensed Professional Engineer:** Alabama, Arkansas, Florida, Kentucky, Louisiana, Missouri, Mississippi, Tennessee, and Texas
- **Level I Authorized Person** Association for Certified Rope Accessed Building Assessment Technicians
- **Organizations:** American Society of Civil Engineers (ASCE); Tennessee Society of Professional Engineers (TSPE); Memphis-Area Joint Engineers Council (MJEC) Past Chairman; Society of American Military Engineers (SAME) Past Post-President

Continuing Education

- **Association for Certified Rope Accessed Building Assessment Technicians:** 16 Hours Steep Roof Access Course