



January 1, 2023

Mr. Sam Sample
1313 Mockingbird Lane
Munster, Texas 75201

Dear Mr. Sample:

Re: 221-B Baker Street, Holmes, Texas

As requested, we are pleased to send you the attached reports for the structural, mechanical, and electrical inspections performed on the above property. The inspection includes: the structure, foundation, roof, load-bearing walls, ceilings, floors, potential and/or existing water penetration, plumbing system (excluding water wells, septic tanks, yard sprinkler systems, or foundation watering systems), electrical power system, heating and cooling equipment, and where applicable, the fireplace, built-in range, ovens, dishwasher, disposal, oven/range exhaust fans, and trash compactor. This inspection specifically excludes any hazardous gases or materials, such as asbestos, radon, etc. A leak test of the gas lines, if desired, should be made by a qualified plumber who has the equipment and time to install a pressure gauge and pressurize the system.

We understand the reason for the inspections to be pursuant to a pre-purchase contract for the property. This property may have many positive qualities, but this report generally includes comments that relate to defects or irregularities. As pointed out in the stated purpose of the reports, all of the comments and observations are strictly my opinions, and they may not necessarily agree with other professionals.

Professional Engineering Inspections, Inc. does not warrant or guarantee the continued performance of any property inspected beyond the day of inspection. If an extended warranty is desired, please contact a home warranty company that provides the level of service you desire.

As pointed out in the stated purpose of the reports, all of the comments and observations are strictly my opinions, and they may not necessarily agree with other professionals.

This report concludes all obligations related to inspection work provided for the above property for the fee paid. Thank you for asking PROFESSIONAL ENGINEERING INSPECTIONS, INC. to perform this inspection work. If you have further questions, please feel free to call on us.

Sincerely yours,
Edward Robinson, P.E.
President

EGR/nr
Attachments

PROFESSIONAL ENGINEERING INSPECTIONS, INC.

P. O. BOX 859
FRIENDSWOOD, TEXAS 77549
<http://www.profengineering.com>
Firm Registration #1503
(713) 664-1264

STRUCTURAL INSPECTION REPORT

Mr. Sam Sample
221-B Baker Street
Holmes, Texas
January 1, 2023

This report is divided into two sections: an opinions section and an observations section. The opinions section is intended to provide an opinion of the building foundation performance, the condition of the roof, the structural performance, and the general status of need for maintenance as compared to other buildings of similar age. The observations section is an attachment intended to provide a list of observations and/or considerations which provide a basis for the opinions stated in section one.

I. INTRODUCTION

A. Property Description

The property inspected is a house, having wood framing, brick veneer and fiber cement and hardboard siding, a composition shingle roof, and a concrete slab on grade foundation. It is understood that the age of the structure is 35 years.

B. Purpose

This inspection was to evaluate the condition of the foundation, roof, and structure of the building in order to provide information related to their condition and an opinion as to whether they are in need of repair. The data obtained and included in this report will provide insight into the overall condition of the property and information that will assist in maintaining it in the best possible condition during future years. Some of the comments contained in the observations attachment to this report are related to need for preventative maintenance and may not indicate need for immediate repair.

C. Scope

The scope of this inspection included visual observations of those portions of the foundation, roof, and structural components readily visible without moving or removing items causing visual obstruction. Observations were made at the exterior and interior of the structure, including the attic from the readily accessible interior and the roof from the surface. The items listed in the observations attachment are not claimed to be a total list of problems or defects, but rather a representative list of items on which the stated opinions are based. Estimates of repairs should be obtained from a building contractor who can determine the extent of repairs necessary. There is no warranty implied nor stated as a part of Professional Engineering Inspections, Inc. performing this inspection work. This information is provided for the use of the person to whom this report is addressed and is in no way intended to be used by a third party, who may have different requirements. If a third person chooses to use this information, caution is advised because there may be addendums that affect the information contained herein or the stated opinion.

STRUCTURAL SAMPLE

No special testing was performed to determine if leaks existed in the plumbing system below this building's foundation. Below the foundation plumbing leaks which were not detectable as part of a cursory inspection have been attributed to differential movement in the foundation of some buildings in the past. In some cases, the effects of plumbing leaks below a foundation can result in a need for repair of the foundation. If it is determined by the client that they wish to have the plumbing systems tested, then testing should be performed by a qualified plumber who can provide cost estimates for repair if it is found to be necessary.

Inspection for hazardous gases or materials, such as radon or asbestos, or for latent defects in the roof, foundation, or structure is considered beyond the scope of this inspection. This inspector has not been trained to detect such materials, and no tests were performed to discover any latent defects in the foundation, structure, roof, or maintenance of the building that may become evident after taking possession of the building.

The photographs included in the photo attachment to this report and referenced by some items in the report are only intended to provide a general representation of the condition discussed in the referencing paragraph. The referenced photographs do not necessarily represent all locations where described conditions exist and such should not be assumed. Photographs are taken at the discretion of the inspector and are not provided for all irregularities observed during the inspection or included in this report.

II. FOUNDATION OPINION

The evidences and consequences of differential settlement observed and/or detected indicate that the foundation of this building has experienced minimal differential settlement. No observations were made that would indicate that the foundation is in need of repair.

Differential settlement of building foundations is a common problem in this area because of the expansive clay soil and changing weather conditions. As a building resting on the expansive soil ages, it is probable the foundation will continue to experience differential movement, regardless of how well it was constructed or its present condition. Most buildings, with average owner foundation maintenance, may require foundation repair in a period of 35 to 40 years. If the building is to be left unoccupied for an extended period of time, provision should be made to have the yard watered frequently during dry periods. Constant care and/or maintenance is necessary to maintain movement to a minimum. See the attached Foundation Care Information for recommendations.

III. ROOF OPINION

The roof was inspected to provide information as to its general condition and an opinion as to whether or not it is serviceable. A serviceable roof may leak but it is repairable.

The composition shingle roof appeared to be in fair to good/serviceable condition and should have normal years of useful life remaining for a roof of its type. There was a need for some maintenance as indicated in the observations attachment.

STRUCTURAL SAMPLE

IV. STRUCTURE OPINION

No irregularities were observed that would indicate that the basic structure of the building, including load-bearing walls and other framing members, was in need of repair or not performing adequately with the exception: wood rot could be observed at the structure around the fireplace chase in the attic space. The extent of rot could not be determined at the west side and should be investigated.

Vertical bracing in the attic space was buckled where it lacked adequate stiffeners.

If there is a desire to make repairs to components of the structure, they should be made by a qualified construction contractor who can determine the extent and cost of repair necessary.

V. DEFERRED MAINTENANCE OPINION

The number and/or degree of deferred maintenance observations were slightly more than normal. Deferred maintenance is defined as the need for immediate maintenance related to drainage, water penetration, rotted wood, need for paint, etc.

VI. SPECIAL NOTICE

Opinions and comments contained in this report are based on observations made at the time of inspection. The observations contained in the attachment are to be considered a part of this inspection in order that the reader be aware of the items observed or considered that provided a basis for the opinions expressed above. Opinions related to compliance with specifications, legal, and/or code requirements are specifically excluded as being a part of our agreement to perform this inspection. There is no guarantee or warranty as to future performance, life, and/or need for repair of any item inspected, nor should same be assumed.

PREPARED BY:

This document is provided as a sample only and is for a fictional building. Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act. The digital seal is found on the cover page.

Edward Robinson, P. E.
Registered Professional Engineer

ER/nr
Attachment.



This document is for Sample purposes only. This is not an engineering document and thus has not been signed and sealed.

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OBSERVATIONS/RECOMMENDATIONS ATTACHMENT

Mr. Sam Sample
221-B Baker Street
Holmes, Texas
January 1, 2023

This attachment, which provides a basis for the opinions stated in the body of the report, is to be considered a part of the inspection report. The following observations are indicative of the conditions considered or existing at the time of the inspection and should not be considered a total list of irregularities but a representative list of items considered.

FOUNDATION

1. Drainage at the perimeter of the building foundation, which can have an effect on the rate of differential settlement of the foundation, was poor at a portion of the perimeter, where it appears that water stands or runs alongside the foundation during or immediately after rains. The more significant locations included: at the east side of the dining room. The recommendations contained in the attached Foundation Care Information should be implemented to maintain the rate of differential settlement to a minimum.
2. Drainage below the deck at the rear of the building, which was against the foundation and covered much of the foundation, could not be determined based on a visual inspection due to the lack of access below the deck. If soil loss is occurring, which is not uncommon on downslope sides of the foundation, it may eventually have some effect on the performance of the foundation.
3. The sheetrock floating material had popped off the heads of the nails at the dining room and at the garage. This sometimes happens when there is foundation movement causing the sheetrock to shear against the wood framing of the building.
4. Sheetrock cracks above doors and windows and in the ceiling, generally associated with differential settlement in a building foundation, were minimal in number and degree.
5. Out-of-levelness of door tops, window sills, built-in furniture, and other horizontal surfaces was normal and acceptable in degree.
6. Some cracks were observed in the exterior brick veneer. The degree was acceptable for structures in this age group. Locations included: at the west exterior of the building at the master bathroom window; at the columns at the enclosed porch; and at the east side of the building at the dining room quoin corner.

STRUCTURAL OBSERVATIONS SAMPLE

7. No significant cracks were observed in the floor concrete, but small cracks probably exist since cracks exist in almost all concrete due to its nature. Small or moderate cracks that may exist in the concrete floors below carpeting or other floor coverings would have no bearing on the inspector's opinion of the foundation performance.
8. The most significant concern related to cracks in the foundation concrete is the possibility of wood destroying insects entering the building through the cracks. Termites have been known to enter a building through floor cracks.
9. The corner was chipped off the concrete grade beam of the foundation at the southeast corner of the southeast bedroom and at the southwest corner of the quarters' living room, which is usually caused by differential settlement that has caused shearing between the brick veneer and the concrete grade beam. Chipped corners indicate foundation differential settlement, but there is no need for foundation repair because of the chipped corner.
10. Small cracks were observed in the concrete floor at the garage. Cracks such as these are not unusual in flat concrete work and can be observed in most concrete floors in buildings resting on expansive clay soil within 1 to 2 years after construction is completed.
11. Separations or differential movement of materials were observed. The degree of separation observed was acceptable for a building of this age. Locations included between: the brick veneer and the door frames, the brick fence and the building, the brick veneer and the foundation, the concrete walk and the foundation, the picture molding and the wall and/or ceiling.
12. Large trees were observed relatively near the building being inspected. Construction research has indicated that large trees, which grow closer than their mature height to a building that is resting on expansive soil, can cause rapid and severe differential settlement. The effect on the rate of differential settlement, which can result in need for foundation repair, will become more pronounced as the tree grows.
13. Differential settlement caused by expansion and contraction of the expansive soil on which the concrete driveway rests has caused it to crack and break. This is pointed out even though the drive is not a part of the building foundation because it is indicative of the type of movement caused by the expansive soil on which the building rests.
14. Because the building is believed to be resting on expansive soil which exists in this area, it is recommended that an automatic watering system be installed to maintain a uniform moisture content in the soil. Maintaining a uniform moisture content in the soil will prevent it from shrinking and causing cracks to develop in the walls, floors, and siding.
15. Consideration should be given to installing a root barrier between the trees and the building; if installing a barrier is not practical, the trees should be removed if they grow closer to the building than their mature height. If a root barrier is to be installed, a qualified tree expert should be employed to

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determine where the root barrier should be installed, since cutting off too much of the tree roots may be hazardous to the health of the tree.

16. There was a slot cast into the foundation at the east exterior of the dining room whose purpose was not determined. Reference Photograph 1
17. The concrete drive was cracked and uneven, which is an indication of differential movement in the drive, possibly caused by expansive soils and/or poor drainage.
18. The drive was broken at its west edge adjacent to the garage. It was indicated that soil loss has been occurring at this location, creating a hole that has been backfilled several times, which was indicated by the client based upon an interview by the contractor maintaining the irrigation system. This should be investigated since it may indicate a leak in the plumbing of the irrigation system or a yard drain system, which may continue to have a detrimental effect on the performance of the drive. Reference Photograph 2

ROOF

1. Most composition shingle roofs have a normal life expectancy of 15 to 20 years in this area, with an average life of 18 years. The life of the roof depends on pitch, color, exposure to chemical fallout, and exposure to the sun. The more reflective colors last longer, and dark roofs usually last from 4 to 6 years less. We understand the age of the composition shingle roof to be 10 years.
2. The composition shingle roof was starting to show signs of wear and deterioration in the form of: discolored shingles and rusted flashings.
3. You should make further inquiry as to the status of the following observed evidences of roof leaks, current or previous: decking stains at the hall bathroom; seam bulges in the living room; sheetrock patches in the master bathroom closet; rotted decking at the fireplace in the attic; and stained fascia at the east side of the northeast bedroom as viewed from the attic. You are cautioned that other evidences of roof leaks may exist which were not detected at the time of this inspection. Reference Photograph 3
4. An antenna or dish had been improperly mounted through the surface of the shingles at the roof. This can result in leaks at the fasteners as the roof ages, causing water entry and rot of the deck. Reference Photograph 4
5. Tree limbs were observed to be near or touching the roof and should be trimmed to prevent wear, which can lead to premature failure. The limbs should be cut back at least four feet from the roof surface each year.
6. There was evidence the shingles flared along the lower edge of the roof at the east side of the southeast bedroom. This can allow water penetration at the lower edges of the roof into the eaves below. This can occur as a result of improper installation of the drip edge flashing, decking, or fascia and should be investigated for repair. Reference Photograph 5

STRUCTURAL OBSERVATIONS SAMPLE

7. The valleys formed where the planes of the roof meet were clogged with debris such as leaves, twigs, paper, etc. The debris should be removed to eliminate the possibility of premature wear and rain water backing up in the valleys and leaking into the building.
8. The roof deck did not extend to the fascia boards along the lower edge of the roof, leaving a gap. The drip edge flashings were installed resting on the fascia boards rather than properly extending up the deck of the roof as required by current construction code. This allows the drip edge to lay horizontally, which could allow water running off the edge of the roof to be directed into the eaves and may be related to evidences of deterioration of the eaves at some locations. Repair may require replacement of the decking along the lower edge of the roof or implementation of a custom drip edge flashing that can extend up the deck the required 2 inches. Reference Photograph 6
9. The wrong roof jacks had been used at some of the gas-fired appliances, including at the north furnace and at the water heater at the attic. Gas-fired appliance flues are required to terminate at the exterior of the building and must penetrate the roof jack with a storm collar for safety. Reference Photograph 7
10. A roof sealant material had been used to seal the flashing details at the fireplace chase extending from the surface of the composition shingles to the brick veneer above the counterflashing. This is improper as it eliminates the flashing/counterflashing detail, which allows relative movement between the dissimilar materials of the masonry fireplace and wood structure supporting the roof. Proper repair would require removal and replacement of roofing and flashing details so that they can be reinstalled to eliminate the need for sealant, which may have a temporary life expectancy. Reference Photograph 8
11. Sealant had been applied at the cap at the fireplace flue chase where it had developed cracks. There were evidences of water penetration at the interior of the building, indicating past water penetration through the cap. The sealant may be a temporary repair, and this should be investigated by a chimney sweep. Reference Photograph 9

BUILDING STRUCTURE

1. Vulnerability to termite infestation was observed where wood, such as a deck or fence, or other wood material was in contact with the soil and the sides of the building. Subterranean termites can gain access to the building through the wood without being observed.
2. Vulnerability to termite infestation was observed where siding was in contact with the soil. Subterranean termites can enter the structure below or through the siding without being observed.
3. Some of the horizontal purlins that support the mid section of the roof were not uniformly supported at regular intervals by the vertical bracing. The

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vertical braces should be spaced at uniform intervals along the length of the purlins, with a separation of no more than four feet.

4. The ridge beams were not wide enough to support the entire width of the miter cut on the end of the roof rafters. Even though this is a common observation, the greatest strength requires that the ridge beam be wide enough to uniformly distribute the roof load across all the width of the rafter miter cuts.
5. One or more of the vertical braces at the attic that support the roof had buckled, apparently because of excessive loading. The buckled bracing should be replaced. Excessive loading can be caused by differential movement of the building foundation.
6. Some of the vertical bracing for the roof was installed so that it transfers the roof load to the open ceiling of the building. Vertical bracing should be installed so that the roof load is transferred to load-bearing walls or specially prepared beams or trusses.
7. Some of the vertical braces for the roof were too long to have no stiffening. Braces over eight feet in length should be stiffened with a similar member on edge against the flat surface of the existing brace.
8. Investigation of the building for termite infestation or damage was not the intent of this inspection. It is recommended that an inspection be performed by a licensed pest control inspector, who can determine the possibility of termite infestation and/or damage. It is possible that termite infestation and/or damage exist in the building that are not apparent and cannot be detected without removal of wall covering and/or siding.
9. A stud had been cut away at the head of the master bath shower enclosure, as viewed through an access opening in the adjacent closet. This reduces the stiffness of the wall at this location and is improper. Studs are normally bored for installation of the faucets or partially notched.
10. Ridge bracing was not installed at all locations where it is customary, including at all joints in the ridge, as observed over the dining room and garage areas. It was not evident this was affecting performance.
11. The deck structure at the west side of the building was not evaluated as a part of this inspection to determine the quality of framing or its condition due to a lack of access below the deck. Some evidence that wood rot was starting to occur could be observed at the stairs to the deck adjacent to the area of the living room.
12. Cracks could be observed in the brick veneer at the base of the columns at the back porch. The configuration of the cracking observed may indicate wood-framed structure inside the columns that was in contact with the masonry and has become wet, causing it to expand and split the brick veneer. Further investigation is recommended and would require removal of brick

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veneer for inspection as water penetration to the structure could result in wood rot if it occurs frequently. Reference Photograph 10

13. There was a wood shed constructed at the north exterior of the quarters that appeared to be lightly framed and had a wood foundation which should be anticipated to deteriorate over time and increase the potential for wood-destroying insect infestation to the building since the structure was attached to the finish of the building.
14. Roof framing was rotted around the fireplace chase over the living room due to long-term water penetration. The framing on the west side of the chase was not readily accessible, and further investigation is recommended to determine the extent of repair required. Reference Photograph 11
15. Trusses had been constructed to support the midspan of the roof over the area of the garage nailed to the sides of the ceiling joists. Site-built trusses often do not perform as well as engineered trusses, and some of the connections were starting to separate, although the roof structure appeared to be performing satisfactorily. The trusses should be monitored and reinforced if the connections further separate. Reference Photograph 12

MAINTENANCE

1. There was no evidence of sheet metal flashings installed above framed windows mounted in exposed flat siding. In newer construction, flashings should extend to the surface of the wall over the windows. Windows installed without the flashings are prone to leak during rains. The method of flashing the windows was not determined.
2. Window screens were missing at some locations, including: at the kitchen, the dinette, and the northeast bedroom. It is not desirable to open windows in this area without screens because of insects.
3. Caution is advised that locks at one or more exit doors require keys to access the doors from both sides. This can present a hazard in the event of an emergency.
4. The gutters were observed to be filled with debris; cleaning is suggested to prevent clogging of down spouts, which will allow the gutters to overflow to the perimeter of the building foundation.
5. Area drains were installed at some locations around the building. These are normally installed to carry water from the yard away from the building, and failure of these drains may allow water to stand in the yard or, in some cases, may create a potential for water entry. Testing the performance of the drain is beyond the scope of this inspection. The area drains should be maintained, which may require cleaning and periodic repair.
6. The fireplace draw was not checked during this inspection because it is outside the scope of the inspection. A qualified chimney sweep should be asked to check the fireplace for draw and proper performance.

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7. The fireplace flue at the living room could not be viewed along its length without special tools. It is recommended that a qualified chimney sweep be employed to check the fireplace system before using it.
8. There was no spark arrester at the fireplace flue outlet. If wood logs or other materials that emit sparks are to be burned in the fireplace, a spark arrester should be installed.
9. The attic insulation was observed to be missing or out of place at the master bedroom, the master bathroom, the hall bathroom, the living room, the study, the dinette, the kitchen, and the quarters' area, which can result in loss of energy. The insulation should be replaced.
10. Insulation at the ceilings in the attic was observed to be approximately 6-12 inches of blown fiberglass insulation based upon observations made at accessible locations.
11. There was evidence that animals have been accessing the attic, as indicated by damage to the insulation where it has become matted by animal traffic. The point(s) of animal access should be located and repaired to allow the insulation to be replaced where damaged.
12. Some of the uninsulated interior walls of the house were open to the attic at furr downs, which will result in loss of energy during the seasonal extremes. The openings should be sealed and covered with insulation.
13. Evidence of water entry, past or current, was observed at the quarters' microwave oven cabinetry, as indicated by water streaks below the outlet; at the quarters' living room, as indicated by stained carpeting; at the enclosed porch glass walls and south partition wall addition; at the west wall of the living room at the fireplace, as indicated by a seam bulge; at the fireplace firebox, as indicated by mineral deposits; and at the master bathroom closet adjacent to the shower. There is a need for further inquiry or investigation. Reference Photograph 13
14. Moisture readings made during this inspection were higher than considered acceptable at the base of the wall of the master bathroom closet adjacent to the master shower. This may indicate active water entry. There is a need for further inquiry or investigation.
15. One or more of the door panels of the overhead door(s) at the garage were bent. Where the damage was unacceptable in appearance or severe, the damaged sections should be replaced.
16. Wood rot was observed at the bottom of the main garage door facings. This occurs as a result of the lower portion of the facing being frequently wet for extended periods of time.
17. The carpet was observed to be stained and/or dirty at the quarters' living room, at the northeast bedroom, and at the master bedroom bath closet, and it may be that the stains cannot be removed.

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18. The caulk between the window frames and the brick veneer was missing, pulling apart, or had never been applied around the perimeter of the windows. The joints should be re-caulked.
19. Some of the foundation steel reinforcing bar was exposed at locations along the exterior grade beam of the building. The steel was installed too close to the concrete surface and has begun to corrode. The bar should be painted or coated with a rust preventative to prevent corrosion that leads to additional spalling of the surface concrete.
20. The wood filler at the expansion joints in the concrete flatwork around the building were rotted. This can result in water entry between sections of the concrete, which can adversely affect its performance. Replacement of the filler is recommended.
21. The weather stripping was noted to be damaged or missing at the dinette, the living room, the garage, and the quarters' kitchen, which is a source of energy loss because of air infiltration.
22. Wood rot was observed at the entry door threshold, at the entry door jamb, at the siding trim at the breezeway between the house and garage at the dinette, at the jamb at the ½ bathroom entry door at the breezeway, at the garage door overhead door facings, at the siding trim at the enclosed porch, at the door jamb at the master bathroom closet entry adjacent to the shower, at the tack strips below the carpeting at the master bathroom closet adjacent to the shower, in the fascia at the front porch, at the soffit at the northeast bedroom, at the siding trim at the master bedroom window, at the deck near the stairs, at the fascia and soffit at the northwest enclosed porch, at the siding trim and window facing at the west dinette, at the soffit at the southwest quarters, at the fascia at the west quarters, and at the soffit at the northeast dining room. The rot should be further investigated to determine the necessity and extent of repair required.
23. There was a gap below the exit door from the living room to the enclosed porch, which could be a source for energy loss.
24. The Seller's Disclosure indicated that the building has previously flooded, and there was evidences of replacement of drywall visible at some locations. Evaluation of the adequacy of remediation was beyond the scope of this inspection and would require special testing. If additional information is desired, it should be obtained from the owner. Further investigation would require destructive testing and/or testing for indoor air quality.
25. There was a tree at the front of the building outside the southeast bedroom that was growing near the building and may rub the eave under high winds. Consideration should be given to removing the tree.
26. Not all windows in the building were operated. Many of the windows had an interior glass pane that had to be lifted before the window could be easily opened and may restrict access to the windows in the event of an emergency. Windows were identified that could not be opened with normal force,

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including at the southeast bedroom and at the study/bedroom. It is possible additional windows exist that are in need of adjustment or repair since not all windows were individually evaluated, and it is recommended all windows be evaluated, including at sleeping rooms, to ensure they operate properly.

27. It appeared a section of the clay flue liner at the fireplace flue was missing near the top of the flue chase approximately even with the roof framing level. This should be investigate by a chimney sweep since this may leave a section of masonry exposed prone to erosions, which may present a fire hazard if the fireplace were used frequently as a wood-burning fireplace. Repair could require replacement of the top section of the flue to install a liner.
28. Much of the plank siding hardboard-type siding that had been patched with fiber cement at many locations. The old hardboard siding was showing evidences that it was swelling along its lower edges, which is an indication of advanced deterioration. It should be anticipated that the remaining hardboard siding has a limited-service life and that replacement could be justified now or at any time in the future as deterioration continues and becomes excessive, requiring excessive maintenance.
29. The exit door from the 1/2 bathroom at the garage was rotted at the core and was in need of replacement.
30. The plastic laminate at the garage cabinetry was delaminating at the sides of the cabinetry, which may indicate previous water penetration.
31. The steel door at the quarters' kitchen entry to the garage showed evidences of corrosion at its inner surface. The cause was not determined.
32. The ash dump appeared to have been discontinued at the living room fireplace, possibly to convert it to a gas log. This would require cleaning from the interior of the building.
33. The knob at the southwest exit door from the living room had been partially disassembled, and the lock mechanism may no longer be functional, where it could be easily defeated from the exterior of the door.
34. Mineral deposits were visible in the fireplace firebox behind the gas log, which are consistent with water soaking through the fireplace cap at the roof and discharging from the base of the fireplace. Reference Photograph 14
35. There was evidence that the irrigation system around the building was spraying against the building, leaving mineral deposits, as indicated by observations made at the east garage and dining room. The emitter should be adjusted or repaired since spraying against the building or other hardscape surfaces is unacceptable and could increase the potential for water entry.
36. The entry door did not close directly over the threshold, leaving a small portion of the wood sill strip exposed and rotted. This may increase the potential for water entry.

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37. Water streaks could be observed at the leaded glass of the dining room, and spalling of the sealants could be observed at the leaded glass at the garage. It appears there is a need to service the leaded the glass to prevent further water entry.
38. Doorstops were missing between the pocket door between the dining room and living room, allowing the doors to pull out of the pockets.
39. The concrete surface of the enclosed porch at the west side of the building extended past the constructed wall panels and glass walls with no apparent flashing. Sealants had been applied at the constructed walls at the north side of the porch area, indicating previous problems with water entry. This is prone to allow water penetration under the wall assembly and glass wall as sealants deteriorate due to the lack of a flashing, and deterioration at the added partition walls at the north and south sides may occur, if it has not already occurred. Reference Photograph 15
40. The deadbolt lock was engaged at the southwest door to the enclosed porch at the living room. The door was not operated or evaluated.
41. The wood flooring was separating at its joints at the south bedroom hall at the entry to the master bedroom and was in need of repair.
42. Wood flooring was worn at some locations in the building and appeared to be an engineered-type flooring, which may not be refinishable. Repair may require replacement of the flooring where it is deteriorated or damaged. Matching the flooring may be impractical, requiring replacement over large areas.

FOUNDATION CARE INFORMATION

Maintenance Recommendations For Foundations On Expansive Clay Soil

INTRODUCTION

Differential movement of building foundations is a common problem in this area, because of the highly expansive clay soil and changing weather conditions, and costs owners thousands of dollars a year in repair bills. As the building ages, it is probable the foundation will continue to experience differential movement, regardless of how well it was constructed or its present condition. This differential movement does not stop as buildings become older; older structures with a history of minimal differential movement have been known to develop foundation problems in a very short time due to changing conditions at the perimeter of the building foundation.

REASON FOR FOUNDATION PROBLEMS

The primary reason for foundation problems is the highly expansive nature of the clay soil on which the building rests. The clay expands or contracts as its moisture content changes with the weather. Depending on the area, the amount of contraction or shrinkage ranges from minimal to upwards of 65% of the total wet volume. The average amount of shrinkage that can be expected in this region is approximately 35%, with wide variation depending on the location. For example, a sample of water-saturated clay will shrink up to an average of 35% when dried completely. This shrinkage accounts for the large cracks that form in the soil after an extended dry period. The more expansive the clay, the larger the cracks.

EFFECT OF PLANTS ON FOUNDATION PERFORMANCE

Because of the highly expansive nature of the soil, trees and other large plants can significantly contribute to differential settlement of a foundation. The roots of trees and large plants consume the moisture from the soil, causing the soil to shrink much faster than other soil areas exposed to the weather. The soil where the moisture is lost more rapidly will sink lower than the surrounding soil, causing evidences and consequences of differential settlement in building structures. Research studies indicate that a tree should be at least as far away from a building as the mature height of the tree to minimize the effect of drying caused by the tree.

EFFECT OF WET SPOTS AT THE SIDE OF A FOUNDATION

Wet spots caused by dripping faucets, leaking drains, air conditioning condensate drains, leaking water pipes, etc., can cause differential settlement at the location where the soil has been kept wet. The foundation may sink into the soil at a wet area while the soil dries and shrinks at other locations because the drying soil allows the foundation to move downward and overload the wet area.

EFFECT OF POOR DRAINAGE AT THE PERIMETER OF A FOUNDATION

Water standing or running alongside a foundation after rains may cause differential settlement of a foundation. If soil grading is such that water runs alongside a foundation during rains, the water will run under the edge of the foundation and carry away soil supporting the foundation. The effect is much more pronounced if the soil was very dry prior to the beginning of the rain. In addition, if water is allowed to stand alongside a foundation, it will flow below the foundation and dissolve the clay supporting the foundation, carrying it into the cracks that develop in the yard outside the foundation area during extended dry periods. This problem is more severe if the soil in the general area has been very dry, but it is less severe if the soil has been maintained moist.

FOUNDATION CARE PROFESSIONAL ENGINEERING INSPECTIONS

FOUNDATION MAINTENANCE RECOMMENDATIONS

An owner can significantly reduce the rate of differential settlement by observing the following recommendations:

1. Try to maintain a constant moisture content in the soil around the foundation. Water the soil evenly and around the entire foundation during extended dry periods. This should prevent a gap from opening between the soil and foundation edge. However, if a gap does appear, water frequently (at least daily) around the entire foundation during extended dry periods (6 to 7 days in the summer). Do not apply water directly into the gap. Instead, water 1 to 2 feet away from the foundation edge. Some homeowners choose to install a fully automated foundation watering system to eliminate the need to remember to water. It is best to add water about three times per day to insure that the applied water has time to soak into the soil.
2. Cut and cap the roots of any large trees growing closer to the foundation than the mature height of the trees. The roots from a large tree or several medium size trees can consume more water from the soil than can be added with a watering system. This will limit the consumption of water from the soil below the foundation and may prevent excessive differential settlement and cracks in the structure. It is recommended that a professional tree expert be used to prevent damage to the trees. When a tree grows too close to a building to allow cutting and capping of the roots, it is advisable to remove the tree or make special provision for watering the soil below the foundation.
3. Properly grade the soil by filling in low spots and leveling off high spots adjacent to the foundation so that the surface of the soil slopes gradually away from the building. A recommended slope is 1 inch per foot for a distance of 3 to 4 feet from the foundation.
4. Control roof water runoff and help prevent soil erosion by using a gutter and downspout system. This is especially important if a building has no eaves which overhang the walls or if the eaves are less than 1 foot wide.
5. Water trees and shrubs growing near a building during extended dry periods as they cause shrinking of the soil due to their high water consumption. Keep in mind that moderate to large trees consume 50 to 75 gallons of water from the soil every day.

SUMMARY

Remember: the intent of foundation maintenance is to maintain a constant moisture content in the soil around and below the entire foundation and to prevent soil erosion that can result from water flowing off the roof or other large flat surfaces near the building.

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1. There was a slot cast into the foundation at the east exterior of the dining room whose purpose was not determined.

2. The drive was broken at its west edge adjacent to the garage. It was indicated that soil loss has been occurring at this location, creating a hole that has been backfilled several times, which was indicated by the client based upon an interview by the contractor maintaining the irrigation system. This should be investigated since it may indicate a leak in the plumbing of the irrigation system or a yard drain{...full text in report}



3. You should make further inquiry as to the status of the following observed evidences of roof leaks, current or previous: decking stains at the hall bathroom; seam bulges in the living room; sheetrock patches in the master bathroom closet; rotted decking at the fireplace in the attic; and stained fascia at the east side of the northeast bedroom as viewed from the attic. You are cautioned that other{...full text in report}



4. An antenna or dish had been improperly mounted through the surface of the shingles at the roof. This can result in leaks at the fasteners as the roof ages, causing water entry and rot of the deck.

5. There was evidence the shingles flared along the lower edge of the roof at the east side of the southeast bedroom. This can allow water penetration at the lower edges of the roof into the eaves below. This can occur as a result of improper installation of the drip edge flashing, decking, or fascia and should be investigated for repair.



6. The roof deck did not extend to the fascia boards along the lower edge of the roof, leaving a gap. The drip edge flashings were installed resting on the fascia boards rather than properly extending up the deck of the roof as required by current construction code. This allows the drip edge to lay horizontally, which could allow water running off the edge of the roof to be directed into the eaves and may be related to evidences {...full



7. The wrong roof jacks had been used at some of the gas-fired appliances, including at the north furnace and at the water heater at the attic. Gas-fired appliance flues are required to terminate at the exterior of the building and must penetrate the roof jack with a storm collar for safety.

8. A roof sealant material had been used to seal the flashing details at the fireplace chase extending from the surface of the composition shingles to the brick veneer above the counterflashing. This is improper as it eliminates the flashing/counterflashing detail, which allows relative movement between the dissimilar materials of the masonry fireplace and wood structure supporting the roof. {...full text in report}



9. Sealant had been applied at the cap at the fireplace flue chase where it had developed cracks. There were evidences of water penetration at the interior of the building, indicating past water penetration through the cap. The sealant may be a temporary repair, and this should be investigated by a chimney sweep.



10. Cracks could be observed in the brick veneer at the base of the columns at the back porch. The configuration of the cracking observed may indicate wood-framed structure inside the columns that was in contact with the masonry and has become wet, causing it to expand and split the brick veneer. Further investigation is recommended and would require removal of brick veneer for inspection as water {...full text in report}

11. Roof framing was rotted around the fireplace chase over the living room due to long-term water penetration. The framing on the west side of the chase was not readily accessible, and further investigation is recommended to determine the extent of repair required.



12. Trusses had been constructed to support the midspan of the roof over the area of the garage nailed to the sides of the ceiling joists. Site-built trusses often do not perform as well as engineered trusses, and some of the connections were starting to separate, although the roof structure appeared to be performing satisfactorily. The trusses should be monitored and reinforced if the connections further {...full text in report}



13. Evidence of water entry, past or current, was observed at the quarters' microwave oven cabinetry, as indicated by water streaks below the outlet; at the quarters' living room, as indicated by stained carpeting; at the enclosed porch glass walls and south partition wall addition; at the west wall of the living room at the fireplace, as indicated by a seam bulge; at the fireplace firebox, as indicated by mineral {...full text in report}

14. Mineral deposits were visible in the fireplace firebox behind the gas log, which are consistent with water soaking through the fireplace cap at the roof and discharging from the base of the fireplace.



15. The concrete surface of the enclosed porch at the west side of the building extended past the constructed wall panels and glass walls with no apparent flashing. Sealants had been applied at the constructed walls at the north side of the porch area, indicating previous problems with water entry. This is prone to allow water penetration under the wall assembly and glass wall as sealants {...full text in report}

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MECHANICAL INSPECTION REPORT

Mr. Sam Sample
221-B Baker Street
Holmes, Texas
January 1, 2023

I. SUMMARY OF INSPECTION

The following summary lists the specific equipment inspected (and only the equipment inspected) and indicates an opinion of the status of the equipment at the time of the inspection.

EQUIPMENT INSPECTION SUMMARY

FUNCTIONAL	REPAIR	ITEM
()	(X)	Dishwasher
(X)	()	Microwave Oven
()	(X)	Range Vent Hood
()	(X)	Range
()	(X)	Vented Range
()	(X)	Oven/Range
()	(X)	Oven
()	(X)	Fireplace
()	(X)	Plumbing
()	(X)	Disposal
()	(X)	Water Heater
()	(X)	Air Conditioning
()	(X)	Furnace
()	(X)	Garage Door Opener
()	(X)	Patio Gas Grill
INFORMATION		Smoke Detector

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()	(X)	Ceiling Fans
()	(X)	Other Comments

II. INTRODUCTION

A. Description of Property Inspected

The equipment inspected included the built-in appliances, visible plumbing, air conditioning, and heating of the building located at the above address.

B. Purpose

The purpose of this inspection was to visually inspect and operate the equipment listed above to observe and provide an opinion of any deficiencies apparent at the time of the inspection.

C. Scope

The scope of this inspection included visual observations of the above listed mechanical equipment and appliances without disassembly of any unit inspected and without removing items causing visual obstruction. The functional equipment was operated in at least one mode, but not necessarily every mode, suited to demonstrate its condition. All the comments and information provided in this report are strictly opinions and may not necessarily agree with other professionals. Items which are not listed in this report were not inspected and should not be assumed to be functional or nonfunctional.

Evaluation for evidences or consequences of flooding damage to mechanical systems was beyond the scope of this inspection. Further inquiry of the owner to provide more detailed information on the history of flooding of the building and the affected mechanical systems, if any, is recommended since flooding could cause latent damage to mechanical systems that may not be apparent based on a visual inspection.

The photographs included in the photo attachment to this report and referenced by some items in the report are only intended to provide a general representation of the condition discussed in the referencing paragraph. The referenced photographs do not necessarily represent all locations where described conditions exist and such should not be assumed. Photographs are taken at the discretion of the inspector and are not provided for all irregularities observed during the inspection or included in this report.

III. OBSERVATIONS

A. DISHWASHER

1. There was no proper trap or anti-siphon device in the dishwasher drain line to prevent the kitchen sink from draining into the dishwasher when the sink is drained or when the sink drain is clogged. As a minimum, it is normally recommended a loop be installed in the drain line in contact with the underside of the kitchen counter or as close as possible to create a trap.
2. Due to the age and condition of this equipment, it is the opinion of this inspector that its remaining serviceability is limited. (Information)

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3. The control panel labeling was worn off at the door. This makes operating the dishwasher more difficult, and a contractor should be consulted for replacement of the labeling or the control panel face.

B. RANGE VENT HOOD (main house)

1. The fan of the range vent hood was nonfunctional. The motor, wiring, or switch may be defective.
2. The grease screen was damaged, and repair would require replacement.
3. The vent flue pipe at the attic space for the range vent was a convoluted vent flue pipe, which is no longer considered acceptable. Vent flue pipes are now required to be smooth to reduce the potential for accumulation of grease.
4. Due to the age and condition of the range vent hood equipment, it is the opinion of this inspector that its remaining serviceability is limited. (Information)

C. RANGE VENT HOOD (quarters)

1. The fan of the range vent hood vibrated excessively during operation, indicating a need for repair.
2. Due to the age and condition of the range vent hood equipment, it is the opinion of this inspector that its remaining serviceability is limited. (Information)
3. The range vent for the quarters' range/oven was a recirculating type rather than an exterior discharging type range vent. Because the range/oven was a gas-fired range/oven, the use of an exterior discharging range vent is recommended to improve indoor air quality. (Information)
4. The range vent light was nonfunctional. This may be due to a defective lightbulb, switch, or related wiring.

D. KITCHEN RANGE (main house)

1. The igniter for the burners was not functional at the left burners, which were intermittent. The igniters must be repaired if the burners are to self-light when turned on.
2. Flames at the burners stood off the burners at the highest settings, indicating a need for adjustment of the gas/air mixture.
3. Due to the age and condition of this equipment, it is the opinion of this inspector that its remaining serviceability is limited. (Information)

E. FREE STANDING RANGE/OVEN (quarters)

1. Due to the age and condition of this equipment, it is the opinion of this inspector that its remaining serviceability is limited. (Information)

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2. There was no anti-tip device installed at the range/oven to prevent it from tipping forward in the event that weight is placed on the open door. An appropriate restraint should be installed.
3. The interior light at the oven was not functional. The lightbulb, switch, or related wiring may be defective.
4. The oven temperature was measured to be 323 degrees Fahrenheit when the thermostat knob was set for 350 degrees Fahrenheit. It is recommended that the thermostat control the temperature within plus or minus 25 degrees; however, many oven manufactures allow up to 50 degrees Fahrenheit variation.
5. The ignitors for the range burners operated intermittently, requiring adjustment or repair.

F. OVEN

1. The interior light at the oven was not functional. The lightbulb, switch, or related wiring may be defective.
2. The meat temperature probe at the oven was not tested during this inspection because of the requirement for special equipment to determine that the system is operating properly. (Information)
3. The oven temperature was measured to be 372 degrees Fahrenheit when the thermostat knob was set for 350 degrees Fahrenheit. It is recommended that the thermostat control the temperature within plus or minus 25 degrees; however, many oven manufactures allow up to 50 degrees Fahrenheit variation.
4. The hinges at the oven were noisy. (Information)
5. The control face membrane was broken at the oven and should be replaced to maintain its reliability.

G. FIREPLACE

1. There was no stop installed at the damper to prevent the damper from fully closing. Although some conditioned air will be lost to the outside, the stop is necessary as a safety device to allow toxic combustion gases to escape.
2. The fireplace draw was not checked during this inspection because there was no fire in the firebox. If there is concern related to draw, a qualified chimney sweep should be asked to check the fireplace for draw and proper performance. (Information)
3. There were no carbon monoxide detectors observed. It is recommended that carbon monoxide detectors be installed when gas logs are used to detect any carbon monoxide that may vent into the house. (Information)
4. There was no way to see up the fireplace flue without special equipment because of the way it was constructed. If the fireplace is to be used as a wood-burning

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fireplace, it would be advisable to have a chimney sweep inspect the flue; they will have tools that allow them to see up the flue to determine that it is in good operating condition. (Information)

H. PLUMBING

Miscellaneous Plumbing

1. Where visible water distribution plumbing was observed, it appeared to be fabricated from copper. The drain plumbing was fabricated from PVC, and the vent plumbing was fabricated from PVC. (Information)
2. A main water service shutoff valve was not located. One may exist, and further inquiry of the owner is recommended to determine its location. If a valve cannot be located at the building, it may be necessary to turn water off at the main water meter in the event of an emergency or need to service the water distribution system, which often requires a special tool. (Information)
3. The main gas service shutoff valve was located at the south side of the building near the condensing units. (Information)
4. Anti-siphon devices were not installed at one or more of the hose bibbs around the house. Lack of an anti-siphon device at the hose bibbs may allow non-potable water or other contaminants to be drawn into the water supply pipes in the event of a loss of water pressure. (Information)
5. The main sewer cleanout was observed to be located at the east exterior of the building at the southeast bedroom. This cleanout is usually required when the main sewer line to the building becomes clogged. (Information)
6. Uninsulated pipe was observed at the irrigation systems at the north and south sides of the building and at the deck, which may freeze during cold weather. Exposed pipe should be insulated. (Information)
7. Uninsulated pipe was observed at the attic, which may freeze during cold weather and is a source for energy loss at hot water distribution pipe. Exposed pipe should be insulated in the attic. (Information)
8. Active plumbing leaks were observed at the south side of the building at the irrigation supply line to the anti-siphon device. Consult a licensed plumber for repairs and cost estimates.
9. An anti-siphon device was observed at the water supply to the sprinkler system. Evaluation of the sprinkler system is not a part of this inspection, and the sprinkler anti-siphon device should be tested by a qualified plumber to ensure that it operates properly since failure could result in contaminated water being drawn into the water supply of the house.
10. Evaluation of the sprinkler system is not a part of this inspection. If desired, it should be performed by a contractor licensed by the Texas Commission on Environmental Quality (TCEQ) who can provide information on the layout, its

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compliance with current TCEQ requirements, and a written statement of its condition. (Information)

11. Standing pilots existed at the water heaters. It was indicated by the client that it was desirable to know which appliances may require lighting of pilot lights. (Information)
12. There was a gas meter located at the front yard. There is typically a service valve at the gas meter, and additional service valves were observed at the house. (Information)
13. It was indicated by the client that the irrigation system was not functioning properly. This was not verified as a part of this inspection and should be evaluated by a TCEQ licensed contractor who can provide a written statement of its condition. (Information)
14. There was evidence that the irrigation system may spray water on the building, as indicated by hard water deposits at the front wall of the building. Evaluation of the irrigation system was beyond the scope of this inspection, and it should be evaluated by a TCEQ licensed contractor who can make repairs or adjustments as necessary to meet the requirements of the TCEQ, which prevents water from spraying onto the building or hardscape surfaces. (Information)

Utility Room/Area

15. The dryer discharge hood was bent and was missing a damper and should be replaced.

Kitchen Sink (quarters)

16. The vegetable sprayer was leaking, possibly at the spray head.
17. The sink faucet was leaking at a valve stem when the water was turned on.

Disposal (quarters)

18. The cutting hammers were stuck, indicating there may be corrosion between the hammers and the grinder flywheel or they were missing, reducing the grinding effectiveness. It is likely that the unit will have to be replaced if they cannot be permanently freed or repaired.

Bathroom (kitchen)

19. There was no caulking around tub/shower valves to prevent water from leaking into the wall cavity.
20. There is the possibility of a leak into the wall cavity at the shower toe feeler when the shower is in use because the toe feeler did not touch the wall. Caulking should be applied between the wall and the toe feeler.

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21. Open grout and/or tile joints could be observed at the corners of the tub/shower enclosure. The grout joints should be regROUTED or sealed to prevent water penetration to the wall cavity.
22. The diverter valve for the tub/shower allowed a significant amount of water to continue to flow to the tub when the shower was selected.
23. The water closet was loose on the floor and requires repair. Excessive movement can result in damage to the wax seal.
24. The shower enclosure was a below grade shower below the finish surface of the foundation at the interior of the building. In some buildings of this age and older, below grade showers were sometimes installed without a shower pan to provide waterproofing. This often cannot be determined based on a visual inspection, and the lack of a shower pan in a below grade shower can increase the potential for moisture to migrate through the foundation concrete causing long-term deterioration to the surrounding structure or finishes. Further investigation, requiring destructive testing, would be necessary to make this determination. If repairs become necessary at the shower enclosure and deterioration has occurred around it, it can increase the cost of repair.
(Information)
25. The bowl filler at the toilet tank was not connected and should be secured.

Bathroom (garage 1/2)

26. The lavatory water supply line was leaking.

Bathroom (quarters)

27. There was no evidence of a shower pan leak observed; however, because of the age of the building and the appearance that the shower pan has not been replaced, caution is advised. It may be desirable to perform a leak test on the shower pan. If leaking, it could cost more than \$1,200.00. (Information)
28. Open grout and/or tile joints could be observed at the corners of the tub/shower enclosure. The grout joints should be regROUTED or sealed to prevent water penetration to the wall cavity.
29. The showerhead could not be tested because the shower diverter was not functional at the toe filler, requiring replacement of the shower diverter.

Bathroom (master)

30. There is the possibility of a leak into the wall cavity at the shower toe feeler when the shower is in use because the toe feeler did not touch the wall. Caulking should be applied between the wall and the toe feeler.
31. The exhaust fan was improperly vented to the attic. It should be vented to the outside to prevent accumulation of moisture and odor in the attic. Reference Photograph 1

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32. The lavatory mechanical drain stopper was not functional.
33. The water closet seat was loose on the bowl. This is a very minor problem if the retaining bolts are in good condition and will allow tightening.
34. The shower enclosure was a below grade shower below the finish surface of the foundation at the interior of the building. In some buildings of this age and older, below grade showers were sometimes installed without a shower pan to provide waterproofing. This often cannot be determined based on a visual inspection, and the lack of a shower pan in a below grade shower can increase the potential for moisture to migrate through the foundation concrete causing long-term deterioration to the surrounding structure or finishes. Further investigation, requiring destructive testing, would be necessary to make this determination. If repairs become necessary at the shower enclosure and deterioration has occurred around it, it can increase the cost of repair.
(Information)
35. A lavatory cold water valve was stiff, indicating it may have a limited-service life. (Information)
36. There was evidence that the grout joints in the shower enclosure had been patched, as indicated by variations in color at the grout joints. The reason for regrouting was not determined, and further inquiry of the owner should be made.
(Information)
37. The bathtub faucet was noisy when operated, making a whining noise. The cause was not determined but may indicate a need for adjustment or repair of a valve seat.
38. PVC had been used in the water distribution system at the control valve of the shower enclosure. PVC is not typically considered acceptable for use inside the building where it is required that CPVC be used. Reference Photograph 2
39. High moisture readings and evidences of deterioration in the finishes could be observed at the base of the wall at the master bathroom closet adjacent to the shower. The source for moisture causing high moisture readings and deterioration was not determined. Further inquiry of the owner to provide history of repairs at the shower is recommended. Investigation may require removal of wall coverings at the base of the wall. Reference Photograph 3

Bathroom (south hall)

40. There was no caulking around tub/shower valves to prevent water from leaking into the wall cavity.
41. Open grout and/or tile joints could be observed at the corners of the tub/shower enclosure. The grout joints should be regROUTED or sealed to prevent water penetration to the wall cavity.
42. The drain trap area at the head of the bathtub was not inspected for leaks or other irregularities due to lack of ready access. (Information)

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- 43. The diverter valve for the tub/shower allowed a significant amount of water to continue to flow to the tub when the shower was selected.
- 44. Water was high at the standpipe of the toilet tank. The water level should be approximately 1 inch below the top of the pipe as required by most manufacturers to prevent water loss to the standpipe.
- 45. The water closet was loose on the floor and requires repair. Excessive movement can result in damage to the wax seal.

WATER HEATER (attic)

- 46. The water heater is a gas-fired water heater. (Information)
- 47. The hot water heater was observed to have insufficient clearance between the top and combustible materials. It is recommended that gas hot water heaters be installed in accordance with the manufacturer's clearance requirements printed on the side of the unit or in accordance with specifications obtained directly from the manufacturer. A qualified plumber should be asked to provide cost estimates for this repair.
- 48. There was no elbow at the termination point of the temperature/pressure relief valve drain line. An elbow should be installed to divert hot water or steam to the ground in the event the relief valve opens.
- 49. The temperature/pressure relief valve drain line and the catch pan drain line were connected together. If the relief valve opened, water would flow back into the catch pan and overflow onto the ceiling. A separate drain line should be added.
- 50. The double-wall pipe of the hot water heater vent was touching combustible material. Double-wall pipes should have a clearance of 1-inch minimum between any combustible surface and the wall of the pipe. Reference Photograph 4
- 51. The vent flue pipe did not extend through the roof jack at the roof as required by current construction requirements. This requires the vent flue to terminate at an exterior location, which will require replacement of the roof jack and extending the flue through the roof.

WATER HEATER (garage)

- 52. The water heater is a gas-fired water heater. (Information)
- 53. There was no elbow at the termination point of the temperature/pressure relief valve drain line. An elbow should be installed to divert hot water or steam to the ground in the event the relief valve opens.
- 54. The drain line of the temperature/pressure relief valve was routed upward from the valve, which will result in water standing on the operating mechanism of the valve, causing corrosion and malfunction of the valve. Reference Photograph 5

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55. The temperature/pressure relief valve was not functional at the time of this inspection, as indicated by the valve not opening when a significant force was applied to the test lever.
56. The double-wall pipe of the hot water heater vent was touching combustible material. Double-wall pipes should have a clearance of 1-inch minimum between any combustible surface and the wall of the pipe.
57. The hot gas vent pipe was not properly connected to the water heater draft diverter. Combustion products may be emptied into the building. Reference Photograph 6
58. There was no catch pan provided for the water heater, which was installed in the water heater closet with a foundation surface at the same height as the interior of the quarters. This could allow damage to items stored in the garage or quarters' area, and a catch pan should be installed.
59. Due to the age and condition of this equipment, it is the opinion of this inspector that its remaining serviceability is limited. (Information) Reference Photograph 7

I. AIR CONDITIONING (north zone)

1. The air conditioning system appeared to use R-22 refrigerant. This refrigerant is being phased out by the EPA and its production is scheduled to be discontinued by January 1, 2020. After it is discontinued it may become more difficult and more expensive to obtain this refrigerant for repair or maintenance. The need for significant repair or replacement of the equipment could require total replacement of the condensing unit and evaporator coil and the life of the equipment may be limited. (Information)
2. The screws that secure the access door of the condensing unit in place were missing.
3. It was observed that the air conditioner primary condensate drained into a dedicated trap. Careful observation of this dedicated trap is recommended to ensure that it does not dry out in the wintertime when the air conditioner is not used and allow sewer gases to be drawn back into the conditioned air stream. Further, algae may form in the drain trap, causing the drain to overflow. New installations are normally drained to the active trap of a lavatory, eliminating this concern. (Information)
4. The evaporator coil face was observed to be partially clogged with debris and dust, as observed through the access port at the evaporator coil. It is recommended that the coil be checked and cleaned. Other adjustments may be necessary after returning the coil to its normal operating condition. Reference Photograph 8
5. Some foam insulation was torn off the refrigerant return line near the condensing unit. Some energy will be lost as a result of the missing insulation. In newer

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construction, a protective covering is required on the insulation. (Information)
Reference Photograph 9

6. Some of the insulation was missing on the air distribution ducts in the attic over the kitchen. This will result in condensate collecting on the ducts and dripping to the ceiling during the summer.
7. The primary condensate drain line for the evaporator coil was not sufficiently insulated. A minimum 10-ft. of insulation is recommended. Reference Photograph 10
8. The return air chase was observed not to be properly sealed off at framing or sheetrock joints and may leak air from attic, walls, or both. In new construction, sealing of the chase is required; however, in older homes this was seldom performed.
9. The electric air conditioner has a capacity of 3.5 tons. A determination of adequacy of capacity is beyond the scope of a visual inspection. In older residential buildings that are not well air sealed and insulated, this size of system is considered to ordinarily cool a building of approximately 1,750 sq. ft. when a rule of thumb of 500 square foot per ton is considered. In newer construction smaller capacity equipment is often used where capacity of the equipment is based upon heat load calculations. Accurate sizing of equipment should be based upon Manual-J load calculation that take into consideration the efficiency of the structure and should be performed at the time the building is constructed or when the HVAC system is replaced. (Information) Reference Photograph 11
10. Batt fiberglass insulation could be observed in the return chase. This is considered unacceptable since this could result in insulation contaminating the air stream, allowing it to be distributed in the zone through the registers. The inside of the chase should be covered with drywall wall coverings or the insulation should be removed. Reference Photograph 12
11. A register was closed at the study/bedroom area. Balancing of airflow should be adjusted as necessary to maintain comfort in each room and closing of registers is not recommended. (Information)
12. The insulation vapor barrier joints on the ductwork in the attic spaces for all zones had not been taped at the joints. This is normally performed to reduce the potential for condensation to form at the ductwork inside the duct wrap, which could result in its corrosion.
13. Decking to the air handling equipment in the attic space was not continuous or complete. This could make accessing and servicing the equipment hazardous. (Information)
14. Ice formed at the bottom of the evaporator coil face, as observed through the inspection opening when the equipment was operated. This typically indicates the equipment is excessively low on refrigerant and should be further investigated by an air conditioning contractor who can determine the scope of

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repair or replacement required. Because of the age of the equipment and the type of refrigerant used, it may be determined that the equipment is functionally obsolete.

15. There was a thermal expansion device installed at the liquid line where it enters the evaporator coil that had not been insulated. This can allow the thermal expansion device to sweat and reduces efficiency of the equipment.
16. Due to the age and condition at the condensing unit and evaporator coil, it is the opinion of this inspector that the remaining serviceability is limited.
(Information)

J. AIR CONDITIONING (quarters zone)

1. The air conditioning system appeared to use R-22 refrigerant. This refrigerant is being phased out by the EPA and its production is scheduled to be discontinued by January 1, 2020. After it is discontinued it may become more difficult and more expensive to obtain this refrigerant for repair or maintenance. The need for significant repair or replacement of the equipment could require total replacement of the condensing unit and evaporator coil and the life of the equipment may be limited. (Information)
2. It was observed that the air conditioner primary condensate drained into a dedicated trap. Careful observation of this dedicated trap is recommended to ensure that it does not dry out in the wintertime when the air conditioner is not used and allow sewer gases to be drawn back into the conditioned air stream. Further, algae may form in the drain trap, causing the drain to overflow. New installations are normally drained to the active trap of a lavatory, eliminating this concern. (Information)
3. Mildew could be observed at diffuser outlets in the rooms, including at the quarters' bedroom and at the quarters' kitchen. This can indicate sweating of the diffuser grille due to air infiltration at the register box and, in some cases, may indicate a negative pressure created by poor balancing or a lack of adequate ventilation air. This should be investigated by an HVAC contractor.
(Information) Reference Photograph 13
4. The primary condensate drain line for the evaporator coil was not sufficiently insulated. A minimum 10-ft. of insulation is recommended.
5. The return air chase was observed not to be properly sealed off at framing or sheetrock joints and may leak air from attic, walls, or both. In new construction, sealing of the chase is required; however, in older homes this was seldom performed.
6. The electric air conditioner has a capacity of 1.5 tons. A determination of adequacy of capacity is beyond the scope of a visual inspection. In older residential buildings that are not well air sealed and insulated, this size of system is considered to ordinarily cool a building of approximately 750 sq. ft. when a rule of thumb of 500 square foot per ton is considered. In newer construction smaller capacity equipment is often used where capacity of the

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equipment is based upon heat load calculations. Accurate sizing of equipment should be based upon Manual-J load calculation that take into consideration the efficiency of the structure and should be performed at the time the building is constructed or when the HVAC system is replaced. (Information)

7. There was the sound of vapor bubbles in the liquid line at the expansion device located near the evaporator coil. This may indicate that the system is low on refrigerant. (Information)
8. The return plenum for the air handler contained one or more inappropriate installations, such as gas lines, electrical wiring, sewer vents, or refrigerant piping. The presence of these materials should be eliminated from the return air path. A qualified contractor should be asked to provide cost estimates for repairing this condition. (Information)
9. Air had been discharged from this zone to the 1/2 bathroom at the breezeway. There was no return path for this air, which may result in poor distribution as well as loss of conditioned air from the building envelope, causing uncontrolled infiltration affecting indoor air quality. Consideration should be given to implementing a return in the 1/2 bathroom.
10. There was insufficient space below the bedroom door at the quarters to allow for return air. Installation of a return air in the living space is recommended.
11. The diffuser at the kitchen was noisy when the air conditioning system was operating, indicating that balancing of airflow was poor in the quarters. (Information)
12. There was no service walk or service decking at the air handling equipment, making servicing the equipment hazardous.
13. The refrigerant line insulation at the attic space was split along its length and had not been adequately taped. This was allowing condensate to form on the refrigerant line which could allow it to drip to the ceilings below and should be corrected. Reference Photograph 14
14. There was a ductboard transition plenum between the furnace and evaporator coil that was of poor quality and did not appear to distribute air uniformly across the face of the evaporator coil, which may reduce energy efficiency.
15. The access port in the top of the ductboard transition was loose and separated, allowing conditioned air to escape to the attic space, requiring repair.
16. Due to the age and condition at the condensing unit, it is the opinion of this inspector that the remaining serviceability is limited. (Information)

K. AIR CONDITIONING (south zone)

1. The air conditioning system appeared to use R-22 refrigerant. This refrigerant is being phased out by the EPA and its production is scheduled to be discontinued by January 1, 2020. After it is discontinued it may become more difficult and

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more expensive to obtain this refrigerant for repair or maintenance. The need for significant repair or replacement of the equipment could require total replacement of the condensing unit and evaporator coil and the life of the equipment may be limited. (Information)

2. It was observed that the air conditioner primary condensate drained into a dedicated trap. Careful observation of this dedicated trap is recommended to ensure that it does not dry out in the wintertime when the air conditioner is not used and allow sewer gases to be drawn back into the conditioned air stream. Further, algae may form in the drain trap, causing the drain to overflow. New installations are normally drained to the active trap of a lavatory, eliminating this concern. (Information) Reference Photograph 15
3. The evaporator coil face was observed to be partially clogged with debris and dust, as observed through the access port at the evaporator coil. It is recommended that the coil be checked and cleaned. Other adjustments may be necessary after returning the coil to its normal operating condition. Reference Photograph 16
4. The return air chase was observed not to be properly sealed off at framing or sheetrock joints and may leak air from attic, walls, or both. In new construction, sealing of the chase is required; however, in older homes this was seldom performed.
5. There was some separation between the return chase and the end of the furnace, which is allowing attic air to be drawn into the conditioned air system. This leak should be repaired to prevent loss of energy.
6. The air conditioning system appeared to be low on refrigerant, as indicated by a low temperature differential across the evaporator coil. This should be investigated by an HVAC contractor who can measure the superheat of the system and, if required, determine the source of refrigerant leakage, make repairs, and recharge to the proper level with refrigerant.
7. The electric air conditioner has a capacity of 3 tons. A determination of adequacy of capacity is beyond the scope of a visual inspection. In older residential buildings that are not well air sealed and insulated, this size of system is considered to ordinarily cool a building of approximately 1,500 sq. ft. when a rule of thumb of 500 square foot per ton is considered. In newer construction smaller capacity equipment is often used where capacity of the equipment is based upon heat load calculations. Accurate sizing of equipment should be based upon Manual-J load calculation that take into consideration the efficiency of the structure and should be performed at the time the building is constructed or when the HVAC system is replaced. (Information)
8. The return plenum for the air handler contained one or more inappropriate installations, such as gas lines, electrical wiring, sewer vents, or refrigerant piping. The presence of these materials should be eliminated from the return air path. A qualified contractor should be asked to provide cost estimates for repairing this condition. (Information) Reference Photograph 17

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9. There was no service decking provided to service the evaporator coil, which creates a hazard. Reference Photograph 18
10. There was exposed backing of the fiberglass batt insulation at the return chase, which is a fire hazard and may allow fiberglass to be drawn into the equipment and distributed through the house. The insulation should be removed or the return should be lined appropriately.
11. There was insufficient return air from the bedrooms when the doors were closed. It is recommended return airs be installed at each of the sleeping rooms or rooms where doors are anticipated to be closed frequently without adequate return.
12. Corrosion could be observed at the registers in the southeast bedroom and northeast bedroom. This may indicate periodic sweating of the registers, which often is an indication of infiltration air. This can occur if the airflow in the building is not adequately balanced with adequate return air. (Information)
13. There were duct runs to the enclosed porch that appear to be damper controlled. The control mechanism for the damper was not identified, and the damper control was not tested. The controls should be demonstrated by the homeowner, or further evaluation should be made by a licensed repair contractor. Reference Photograph 19
14. There was no return provided for the enclosed porch. This may result in air being discharged to the exterior of the building and causing uncontrolled infiltration air since the enclosed porch could be isolated from the conditioned space.
15. It was indicated that the south end of the building flooded. This may indicate that some of the mechanical systems, including condensing units in this area, may have flooded, and further inquiry of the owner as to the history of flooding and repair of mechanical systems is recommended since evidences of flooding were not identified at the condensing equipment. (Information)
16. Due to the age and condition at the condensing unit and the evaporator coil, it is the opinion of this inspector that the remaining serviceability is limited. (Information) Reference Photograph 20

L. FURNACE (north zone)

1. Heating for the building is provided by a gas-fired furnace. (Information)
2. The heat exchanger of the type furnace inspected could not be checked by visual examination. For a definitive condition of the heat exchanger, the furnace would have to be disassembled. If further investigation is desired, it is recommended that a qualified service company be employed to inspect the heat exchanger.
3. The hot gas vent of the furnace was in contact with combustible material at the attic, creating a fire hazard. A minimum of 1-inch clearance is required between a hot gas vent (even if the vent is double-wall) and any combustible surface.

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4. The roof jack being used for the furnace was the wrong type for use with an induced draft furnace. A pass-through type roof jack should be installed at this location to prevent flue gases from being forced back into the attic space.
5. Flexible gas coupling was routed into the furnace case. Most codes do not allow flexible coupling to extend inside the case as it is a fire hazard. The gas control valve should be hard-piped to the outside of the case, where flexible coupling should then be attached. Reference Photograph 21
6. The vent flue pipe appeared to be pieced together from segments with poorly made joints and evidence of leaks in at least one joint. This should be investigated by an air conditioning contractor who can repair or replace the flue as necessary. Reference Photograph 22
7. Due to the age and condition of this equipment, it is the opinion of this inspector that its remaining serviceability is limited. (Information)

M. FURNACE (quarters zone)

1. Heating for the building is provided by a gas-fired furnace. (Information)
2. The heat exchanger of the type furnace inspected could not be checked by visual examination. For a definitive condition of the heat exchanger, the furnace would have to be disassembled. If further investigation is desired, it is recommended that a qualified service company be employed to inspect the heat exchanger.
3. It was observed that the gas pipe was not secured at the furnace. This may allow the flexible coupling to become easily damaged by persons working on the furnace or storing items in the attic. The gas pipe should be securely fastened at this location to prevent any damage from occurring to the flexible coupling.
4. The vent flue pipe for the furnace was secured with screws at the joints. White mineral deposits could be observed along the joints at some locations which may indicate combustion gas leaks. Because the joints did not appear to be fitted together and should not require screws, this should be investigated by an air conditioning contractor who can determine the need for repair.
5. Due to the age and condition of this equipment, it is the opinion of this inspector that its remaining serviceability is limited. (Information)

N. FURNACE (south hall zone)

1. Heating for the building is provided by a gas-fired furnace. (Information)
2. The heat exchanger of the type furnace inspected could not be checked by visual examination. For a definitive condition of the heat exchanger, the furnace would have to be disassembled. If further investigation is desired, it is recommended that a qualified service company be employed to inspect the heat exchanger.

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3. The hot gas vent of the furnace was in contact with combustible material at the attic, creating a fire hazard. A minimum of 1-inch clearance is required between a hot gas vent (even if the vent is double-wall) and any combustible surface.
4. It was observed that the gas pipe was not secured at the furnace. This may allow the flexible coupling to become easily damaged by persons working on the furnace or storing items in the attic. The gas pipe should be securely fastened at this location to prevent any damage from occurring to the flexible coupling.
5. Due to the age and condition of this equipment, it is the opinion of this inspector that its remaining serviceability is limited. (Information)

O. GARAGE DOOR OPENER (east)

1. The remote controls for the garage door opener were not available at the time of this inspection. The performance could not be verified. The remote controls should be obtained from the current owner, who can demonstrate that the units are functional. (Information)
2. The keypad did not appear to function at the door operator.
3. There was a nest on top of the door operator that should be cleaned off.

P. GARAGE DOOR OPENER (center)

1. The remote controls for the garage door opener were not available at the time of this inspection. The performance could not be verified. The remote controls should be obtained from the current owner, who can demonstrate that the units are functional. (Information)
2. The keypad did not appear to function at the door operator.
3. The light at the wall control was not functional. This may require replacement of the controller if it is desirable to have a lighted button.

Q. GARAGE DOOR OPENER (west)

1. The remote controls for the garage door opener were not available at the time of this inspection. The performance could not be verified. The remote controls should be obtained from the current owner, who can demonstrate that the units are functional. (Information)
2. The keypad did not appear to function at the door operator.

R. PATIO GAS GRILL (enclosed patio)

1. When the valve was turned on to the grill, there was no evidence that gas was flowing from the burners. The grill may have been turned off through a service valve, although the location of a valve was not made at the time of this inspection. Further inquiry of the owner is recommended who can provide

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information on the location of the equipment service valve and provide a demonstration of the function of the equipment. (Information)

2. The grill had been covered with glass at the time of this inspection, indicating it may not be in use or intended for use. (Information)

S. SMOKE DETECTOR

1. Carbon monoxide detectors were not observed in the building at all locations where they are normally recommended. Where gas-fired appliances or a fireplace are in use, the installation of a carbon monoxide detector is recommended at each floor and within the immediate vicinity of sleeping rooms. In some cases, carbon monoxide detectors can appear to be smoke detectors, especially when mounted high on the wall or ceiling, and further inquiry of the current owner as to their locations is recommended. (Information)

T. CEILING FAN

1. Some ceiling fans observed in the house were out of balance. Locations included: at the dinette and quarters' bedroom.

U. OTHER COMMENTS

1. The were battery powered remote control blinds at the kitchen sink. The north blind was not functional.

IV. SPECIAL NOTICE

Estimates for repair are provided as a courtesy and are only approximate. These prices are based on the assumption that other services are being performed at the same time; that is, no service charges are included. They are not bids for performance of work. It is recommended that the need for repair, scope of work, and cost be confirmed by a qualified service company. Opinions and comments stated in this report are based solely on observations of apparent performance. Opinions related to compliance with specifications, legal and/or code requirements of any kind are specifically excluded as being covered in our agreement to perform this inspection. No guarantee or warranty as to future life, performance and/or need for repair of any item inspected is intended nor should same be assumed.

Prepared by

Edward Robinson, P.E.
Licensed Professional Engineer

ER/nr
Attachments



1. The exhaust fan at the master bath was improperly vented to the attic. It should be vented to the outside to prevent accumulation of moisture and odor in the attic.

2. PVC had been used in the water distribution system at the control valve of the master bath shower enclosure. PVC is not typically considered acceptable for use inside the building where it is required that CPVC be used.

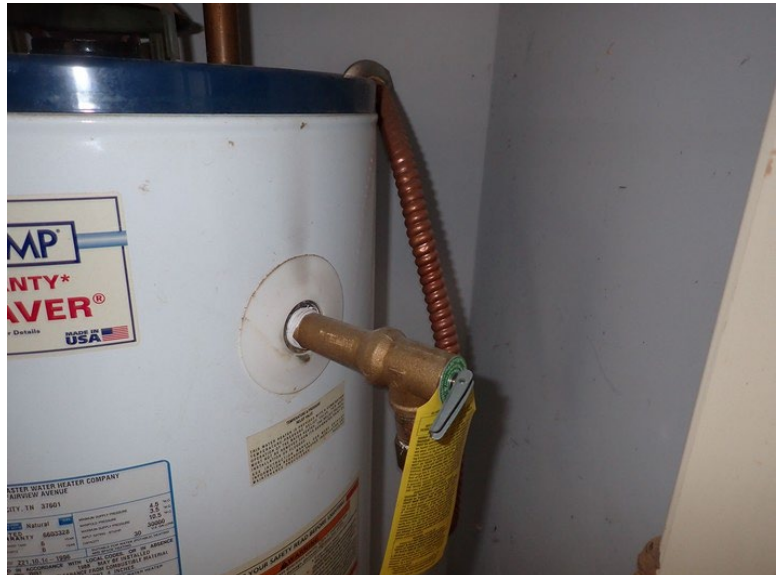


3. High moisture readings and evidences of deterioration in the finishes could be observed at the base of the wall at the master bathroom closet adjacent to the shower. The source for moisture causing high moisture readings and deterioration was not determined. Further inquiry of the owner to provide history of repairs at the shower is recommended. Investigation may require removal of wall coverings {...full text in report}

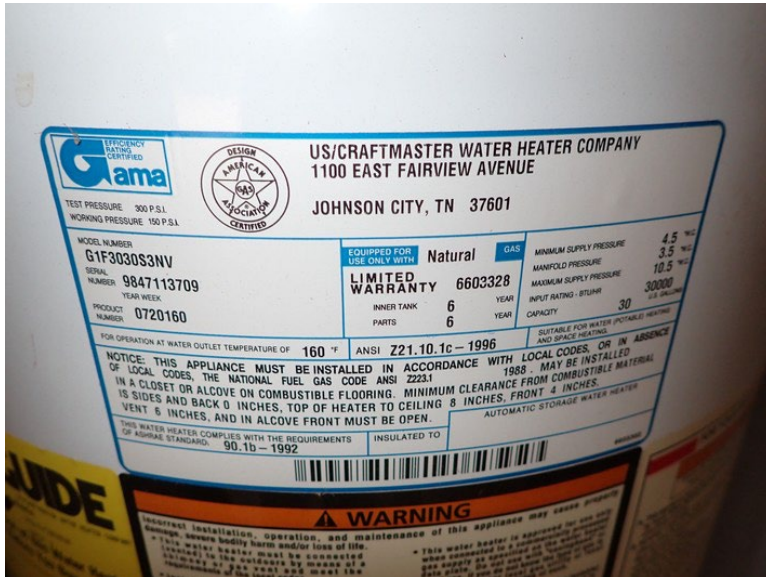


4. The double-wall pipe of the attic hot water heater vent was touching combustible material. Double-wall pipes should have a clearance of 1-inch minimum between any combustible surface and the wall of the pipe.

5. The drain line of the temperature/pressure relief valve for the garage water heater was routed upward from the valve, which will result in water standing on the operating mechanism of the valve, causing corrosion and malfunction of the valve.



6. The hot gas vent pipe was not properly connected to the garage water heater draft diverter. Combustion products may be emptied into the building.



7. Due to the age and condition of the garage water heater, it is the opinion of this inspector that its remaining serviceability is limited.

8. The north zone evaporator coil face was observed to be partially clogged with debris and dust, as observed through the access port at the evaporator coil. It is recommended that the coil be checked and cleaned. Other adjustments may be necessary after returning the coil to its normal operating condition.

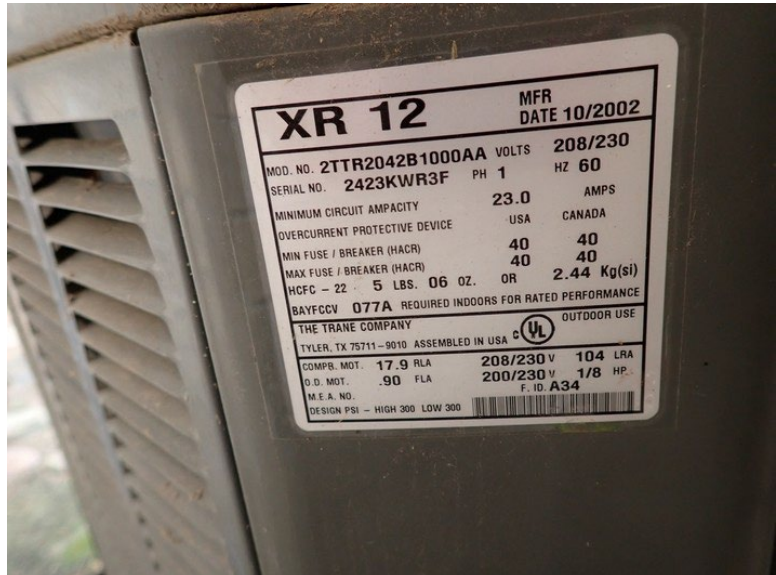


9. Some foam insulation was torn off the refrigerant return line near the north zone condensing unit. Some energy will be lost as a result of the missing insulation. In newer construction, a protective covering is required on the insulation.



10. The primary condensate drain line for the north zone evaporator coil was not sufficiently insulated. A minimum 10-ft. of insulation is recommended.

11. The north zone electric air conditioner has a capacity of 3.5 tons. A determination of adequacy of capacity is beyond the scope of a visual inspection. In older residential buildings that are not well air sealed and insulated, this size of system is considered to ordinarily cool a building of approximately 1,750 sq. ft. when a rule of thumb of 500 square foot per ton is considered. In newer {...full text in report}



12. Batt fiberglass insulation could be observed in the north zone air conditioning return chase. This is considered unacceptable since this could result in insulation contaminating the air stream, allowing it to be distributed in the zone through the registers. The inside of the chase should be covered with drywall wall coverings or the insulation should be removed.



13. Mildew could be observed at diffuser outlets in the rooms, including at the quarters' bedroom and at the quarters' kitchen. This can indicate sweating of the diffuser grille due to air infiltration at the register box and, in some cases, may indicate a negative pressure created by poor balancing or a lack of adequate ventilation air. This should be investigated by an HVAC contractor.

14. The quarters' zone refrigerant line insulation at the attic space was split along its length and had not been adequately taped. This was allowing condensate to form on the refrigerant line which could allow it to drip to the ceilings below and should be corrected.



15. It was observed that the south zone air conditioner primary condensate drained into a dedicated trap. Careful observation of this dedicated trap is recommended to ensure that it does not dry out in the wintertime when the air conditioner is not used and allow sewer gases to be drawn back into the conditioned air stream. Further, algae may form in the drain trap, causing the drain to overflow. {...full text in report}



16. The south zone evaporator coil face was observed to be partially clogged with debris and dust, as observed through the access port at the evaporator coil. It is recommended that the coil be checked and cleaned. Other adjustments may be necessary after returning the coil to its normal operating condition.

17. The return plenum for the south zone air handler contained one or more inappropriate installations, such as gas lines, electrical wiring, sewer vents, or refrigerant piping. The presence of these materials should be eliminated from the return air path. A qualified contractor should be asked to provide cost estimates for repairing this condition.

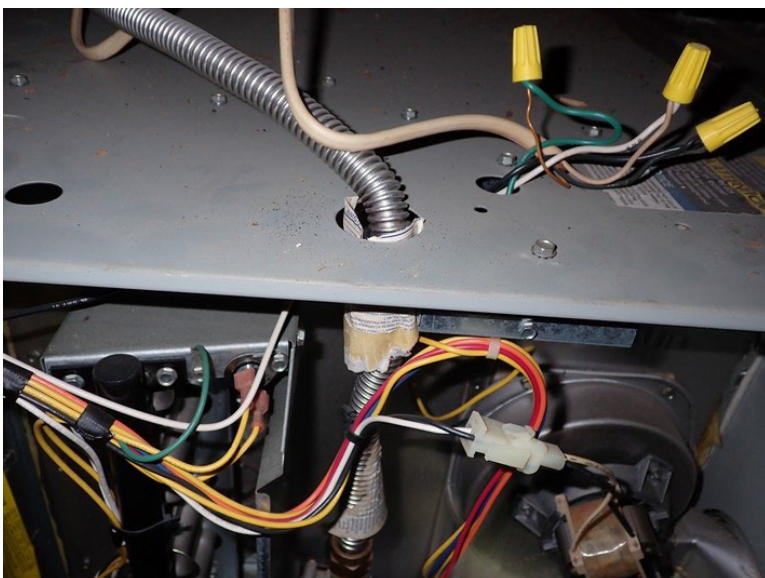


18. There was no service decking provided to service the south zone evaporator coil, which creates a hazard.



19. There were duct runs to the enclosed porch that appear to be damper controlled. The control mechanism for the damper was not identified, and the damper control was not tested. The controls should be demonstrated by the homeowner, or further evaluation should be made by a licensed repair contractor.

20. Due to the age and condition at the south zone condensing unit and the evaporator coil, it is the opinion of this inspector that the remaining serviceability is limited.



21. Flexible gas coupling was routed into the north zone furnace case. Most codes do not allow flexible coupling to extend inside the case as it is a fire hazard. The gas control valve should be hard-piped to the outside of the case, where flexible coupling should then be attached.



22. The north zone vent flue pipe appeared to be pieced together from segments with poorly made joints and evidence of leaks in at least one joint. This should be investigated by an air conditioning contractor who can repair or replace the flue as necessary.

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ELECTRICAL INSPECTION REPORT

Mr. Sam Sample

221-B Baker Street

Holmes, Texas

January 1, 2023

I. INSPECTION SUMMARY

The following summary lists the equipment inspected (and the only equipment inspected) and indicates the status of the equipment at the time of the inspection.

INSPECTION SUMMARY		
FUNCTIONAL	REPAIR	ITEM
()	(X)	Ground Check
()	(X)	Light Switches
()	(X)	Wall Outlets
()	(X)	Light Fixtures
()	(X)	Visible Wiring
()	(X)	Breaker Panel Box
()	(X)	Electrical Service
INFORMATION		Other

Resistance or visual ground check was performed on the following items and their condition was as follows:

GROUND CHECK SUMMARY		
GROUNDING	NOT GROUNDING	ITEM
()	(X)	Ground Rod
()	(X)	Outlets
(X)	()	Furnace
(X)	()	A/C Condensing Unit
(X)	()	Disposal
(X)	()	Dishwasher

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(X)	()	Range Top
(X)	()	Range Vent Hood
(X)	()	Range/Oven
(X)	()	Oven
(X)	()	Microwave Oven

II. INTRODUCTION

A. Description of Property

The property inspected consisted of the visible electrical wiring, circuit breakers, light fixtures, electrical outlets, light switches, and visible wiring connections to the appliances. Only those specific components of the electrical system listed above in the equipment status summary were inspected.

B. Purpose

The purpose of the inspection was to observe and point out visually apparent deficiencies in the electrical wiring and equipment at the time of the inspection and to determine if it is performing the function for which it was intended. A cursory evaluation was made to determine the adequacy of the capacity. There was no intent to closely examine and evaluate each of the primary or branch circuits. As a courtesy, for the purpose of planning only, a range of repair cost will be provided.

C. Scope

The scope of the inspection included visual observations of the electrical wiring, the main circuit breaker box, the visible wiring at the attic, and connections to the electrical appliances. Observations were made at the readily accessible light switches and electrical outlets. The switches were operated to determine whether or not they were mechanically functional. The readily accessible outlets were checked with a plug-in circuit analyzer to determine if they were properly wired. Only those items accessible without moving furniture, access covers, or other items were observed. It is specifically pointed out that routing of circuitry, adequacy of wiring, and/or compliance with electrical codes are not included as a part of this cursory inspection. An estimated cost of repair is provided for planning purposes only and may vary significantly, depending on the extent of the problem and the method by which repairs are made. If in-depth information is desired on the electrical system or any part thereof, it is recommended that you consult with a licensed electrician.

The photographs included in the photo attachment to this report and referenced by some items in the report are only intended to provide a general representation of the condition discussed in the referencing paragraph. The referenced photographs do not necessarily represent all locations where described conditions exist and such should not be assumed. Photographs are taken at the discretion of the inspector and are not provided for all irregularities observed during the inspection or included in this report.

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III. OBSERVATIONS

The following observations are indicative of the type irregularities observed during the course of the cursory electrical inspection. There may be other irregularities that exist but were not apparent and were not pointed out because they could not be seen.

A. Improper Grounding

Those items which are indicated as needing repair under this portion of the inspection should be provided with a positive earth ground or otherwise repaired to prevent the possibility of electrical shock to anyone who may use the equipment.

1. Three-prong outlets were detected that had no ground, including the following locations: at the living room counter. Since the instrument used to detect lack of ground cannot indicate whether the round (ground) portion of the receptacle is grounded or connected to the neutral wire and all outlets were not necessarily checked, other outlets may exist that are not properly grounded. In older buildings with only two wires to the outlets, properly installed two-prong outlets can be used to replace the three-prong outlets for acceptable, inexpensive repair.
2. The earth ground clamp connection to the ground rod used the wrong type of ground clamp and was loose, which may create an unreliable earth ground connection. Replacement with an appropriate ground clamp that maintains a tight connection is recommended.

B. Light Switches

Some light switches may not have been observed because of location or obstructions, such as stored items or furniture.

1. Light switch cover plates were observed to be broken or cracked in the following locations: at the kitchen range vent, at the kitchen bathroom, at the study, at the quarters' kitchen, and at the quarters' living room.
2. Light switches whose function could not be determined were observed in the following locations: at the kitchen range vent, at the foyer, at the kitchen, at the living room, and at the south bedroom hall. Further inquiry should be made of the current owner to determine the function of the switches. (Information)
3. Switches could not be located for some light fixtures observed in the following locations: the floodlight at the south quarters and the floodlight at the west gable of the enclosed porch. It is possible the lights are not functional or that the switches have been discontinued. Further inquiry should be made of the current owner to determine the function of the switches. (Information)
4. There was an improperly wired three-way switch located at the dining room. A qualified electrician should be contracted to correct the wiring at this location.

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C. Outlets

Some outlets may not have been observed because of location or obstructions, such as stored items or furniture.

1. Outlet cover plates were observed to be missing at the dinette.
2. Outlet cover plates were observed to be broken or cracked at the master bedroom.
3. Outlets were observed that did not function in the following locations: at the north wall of the dinette and at the north shed.
4. Outlets were observed which were loose on the wall at the master bedroom.
5. Ground fault interrupter appeared to be missing at some or all locations where they are typically required, including at the south exterior of the building, at the east exterior of the dining room, at the east kitchen counter, at the utility room, at the breezeway fence, at the south bathroom, at the west exterior of the kitchen, and at the west exterior of the quarters. It is not uncommon for them to have been omitted in older homes.
6. The ground fault interrupter at the utility room, at the 1/2 bathroom at the garage, and at the garage was not functional at the time of this inspection, as indicated by it not tripping when tested with a circuit tester and/or when the button was depressed.
7. Outlets were hanging by their wires and were in need of repair at the cabinet below the range.
8. The cover was missing from the floor outlet at the living room and should be replaced.
9. Weather covers and fully exposed outlets at the exterior walls were of the wrong type, and consideration should be given to replacing them with the correct covers, which allows items to be plugged in and still protected. (Information)
10. The outlet at the floor of the living room was loose in the floor and was in need of repair.

D. Light Fixtures

Some light fixtures may not have been observed because of location or obstructions, such as stored items or furniture.

1. Light fixtures that did not function were observed in the following locations: at the kitchen porch coach light, at the butler's pantry at the entry to the kitchen, at the north garage coach light, at the quarters' kitchen, at the rope lighting at the master bedroom window, and at the master bathroom closet.

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2. Light fixtures were observed to be hanging by their wires at the garage attic.
3. Light fixtures not properly secured to the surface on which they are mounted were observed at the north garage coach light.
4. Light fixtures which appeared to have burned-out bulbs, and may have other problems, were observed in the following locations: at the front fence and at the enclosed porch. Further investigation should be undertaken with bulbs that are known to be functional. (Information)
5. A pendant light had been installed over the tub at the master bathroom, which can pose a hazard. The fixture may require raising or elimination and should be reviewed by an electrician who can make recommendations for making the installation safe under current National Electric Code.

E. Visible Wiring

Some visible wiring was probably not observed because of obstructions (such as stored items, furniture, or structural portions of the building).

1. Electrical wire splices that were not in junction boxes were observed in the following locations: at the attic, at the north air handling unit, and at the attic over the dinette. Reference Photograph 1
2. Wiring that should be encased in conduit was observed in the following locations: at the cabinet below the kitchen sink and at the disposal at the quarters' kitchen. Wiring in storage areas or openly exposed should be protected by metal conduit.
3. Extension cord had been used for powering the kitchen range appliance at the cabinet below the range. This should be corrected by an electrician who can relocate the outlet, eliminating the need for the electric cord. Reference Photograph 2

F. Breaker Panel Box (study closet)

1. Neutral buss connections were made with more than one wire attached at each set screw. Normally, only one wire (circuit) is connected to each buss terminal opening. In some cases, this can require expansion of the buss. Reference Photograph 3
2. Wires in the breaker box were observed to be improperly terminated. Reference Photograph 4
3. It appeared that arc-fault circuit interrupters (AFCI) were missing on some circuits at the panel box where they are currently required. AFCI protection is required on homes constructed under the 2008 National Electric Code or later at appropriate locations, such as bedrooms and living areas, to reduce the potential of a fire due to short circuit. They often do not exist in older panels and adding them could require replacement of the panel box to install. There is no requirement for

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installation unless a major upgrade of the electrical system is performed.
(Information)

4. The function of the various circuits was not identified on the circuit breaker box panel. It is recommended that the circuit functions be properly identified. (Information)
5. Two breakers were observed that appeared to serve a single conductor, indicating that conductors may exist that are wired as a 240-volt circuit without appropriate ganging of the breakers serving the conductor to ensure that both legs of the circuit trip. This is sometimes performed to serve kitchen appliances which can share a common neutral, with each 110 leg used to provide power to a single appliance. This should be investigated and corrected by installing a ganging connection at the breaker as necessary to ensure that a hot common neutral does not exist in the event of only one leg tripping. Reference Photograph 5
6. A breaker or fuse panel was observed to be located in a clothes closet. Although this is common in older construction, current code prohibits the placement of over current devices in the vicinity of easily ignitable material, such as in clothes closets. The TREC currently requires that this installation be listed as an item in need of repair. A qualified electrician should be consulted for possible remedies and associated cost estimates if desired.
7. There was a breaker marked as providing power to the dock, which was not protected by a GFCI breaker. Breakers serving the dock should be GFI protected for safety. (Information)
8. Wires had been run through openings in the panel box that did not have strain relief and did not fill the openings to prevent a fire starting at the panel box from spreading to the structure. Reference Photograph 6

G. Breaker Panel Box (garage subpanel)

1. The ground and neutral wires were improperly bonded at the sub panel box at the garage. Reference Photograph 7
2. There was a breaker marked as providing power to the dock, which was not protected by a GFCI breaker. Breakers serving the dock should be GFI protected for safety. (Information)
3. Wires had been run through openings in the panel box that did not have strain relief and did not fill the openings to prevent a fire starting at the panel box from spreading to the structure. Reference Photograph 8
4. A 240-volt breaker at the bottom of the panel was turned off and taped. It was not determined what the breaker served, and further inquiry of the owner or further investigation by an electrician is recommended who can discontinue the circuit if not intended for use.

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5. Two breakers were observed that appeared to serve a single conductor, indicating that conductors may exist that are wired as a 240-volt circuit without appropriate ganging of the breakers serving the conductor to ensure that both legs of the circuit trip. This is sometimes performed to serve kitchen appliances which can share a common neutral, with each 110 leg used to provide power to a single appliance. This should be investigated and corrected by installing a ganging connection at the breaker as necessary to ensure that a hot common neutral does not exist in the event of only one leg tripping. Reference Photograph 9
6. The function of the various circuits was not identified on the circuit breaker box panel. It is recommended that the circuit functions be properly identified. (Information)

H. Electrical Service

1. The main service to the house was observed to be 120/240 volts with a 200-amp main disconnect(s). (Information)
2. The main service panel(s) was/were located at the panel box in the closet of the study/bedroom. (Information)
3. A door seal on the generator access cover was loose and fell loose every time the cover was opened, requiring repair.
4. The generator equipment was not evaluated as a part of this inspection to determine its condition and serviceability. This should be performed by a contractor affiliated with the generator manufacturer or a contractor qualified to service generator equipment. Further inquiry should be made of the homeowner to provide a service history on the equipment to better determine its condition and need for regular maintenance.
5. The generator had a 100-amp service disconnect at the generator control panel. It appeared the generator was configured at the switch panel to provide full replacement for the incoming power, although it may not be of adequate capacity to provide power to all circuits in the building simultaneously. A load capacity should be made by an electrician to determine circuits that could be operated simultaneously on the capacity provided.
6. The generator control panel indicated a need for servicing of the equipment. The servicing should be made by a contractor familiar with servicing and operation of the equipment or the manufacturer, who can provide a written statement of its condition. Reference Photograph 10
7. There was no key readily available to allow securing of the generator access cover. (Information)
8. The switch equipment for the generator was not tested as a part of this inspection. It should be tested by an electrician who can operate it in its

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normal modes of operation and ensure that its performing satisfactorily.
(Information)

9. The client indicated concern that the generator may have flooded in the past. The homeowner indicated in the Seller's Disclosure that flooding around the building and into the building has occurred. Evaluation of the generator for flood damage was beyond the scope of this inspection, and further inquiry or investigation by a contractor who services the equipment is recommended. (Information)

I. Additional Comments

1. It was indicated that the building has flooded in the past. Evidences of damage to the electrical system caused by flooding was not identified at the time of this inspection. Further inquiry of the owner to provide information on previous flooding and the extent to which it may have affected the electrical system is recommended. (Information)

IV. SPECIAL NOTICE

Opinions and comments stated in this report are based solely on observations of apparent condition and performance. Opinions related to compliance with specification, legal and/or code requirements of any kind are specifically excluded as being covered in our agreement to perform this inspection. No guarantee or warranty as to future life, performance and/or need for repair of any item inspected is intended, nor should same be assumed. The estimated repair costs do not necessarily include all repairs that are needed and are to be used for planning purposes only since the method of repair and extent of repair could vary considerably.

Prepared by

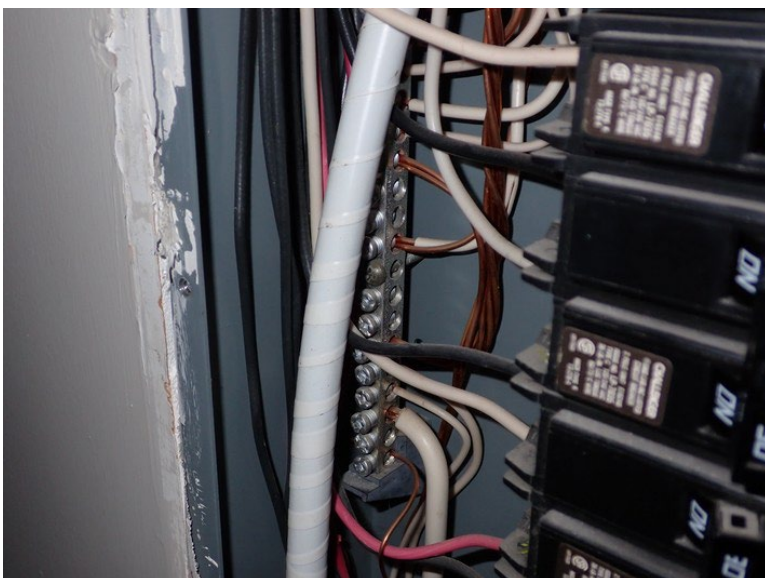
Edward Robinson, P.E.
Licensed Professional Engineer

ER/nr
Attachments

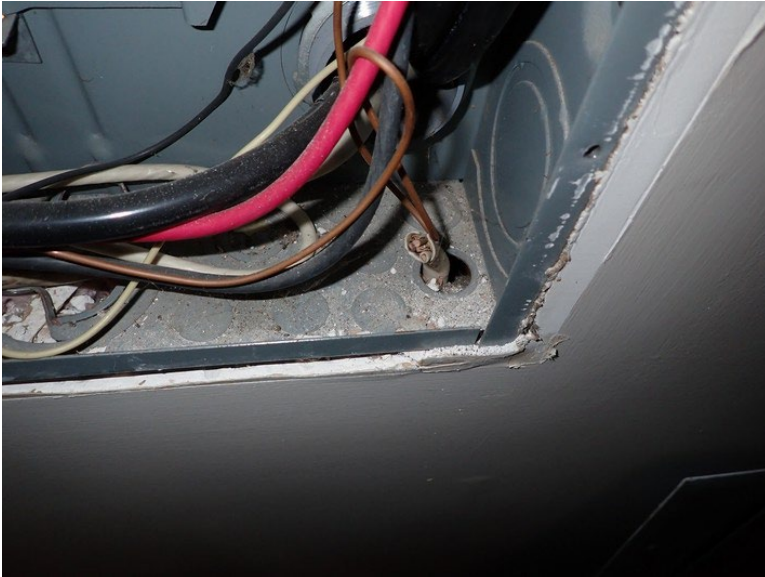


1. Electrical wire splices that were not in junction boxes were observed in the following locations: at the attic, at the north air handling unit, and at the attic over the dinette.

2. Extension cord had been used for powering the kitchen range appliance at the cabinet below the range. This should be corrected by an electrician who can relocate the outlet, eliminating the need for the electric cord.

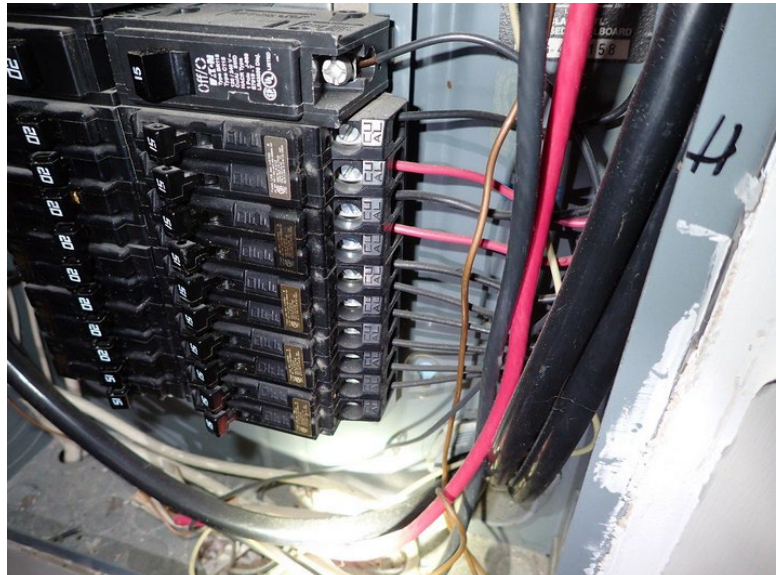


3. Neutral buss connections were made with more than one wire attached at each set screw at the study closet panel box. Normally, only one wire (circuit) is connected to each buss terminal opening. In some cases, this can require expansion of the buss.



4. Wires in the study closet breaker box were observed to be improperly terminated.

5. Two breakers were observed that appeared to serve a single conductor at the study closet breaker panel box, indicating that conductors may exist that are wired as a 240-volt circuit without appropriate ganging of the breakers serving the conductor to ensure that both legs of the circuit trip. This is sometimes performed to serve kitchen appliances which can share a common neutral {...full text in report}



6. Wires had been run through openings in the study closet panel box that did not have strain relief and did not fill the openings to prevent a fire starting at the panel box from spreading to the structure.



7. The ground and neutral wires were improperly bonded at the sub panel box at the garage.

8. Wires had been run through openings in the garage sub panel box that did not have strain relief and did not fill the openings to prevent a fire starting at the panel box from spreading to the structure.



9. Two breakers were observed that appeared to serve a single conductor in the garage sub panel box, indicating that conductors may exist that are wired as a 240-volt circuit without appropriate ganging of the breakers serving the conductor to ensure that both legs of the circuit trip. This is sometimes performed to serve kitchen appliances which can share a common neutral power to a {...full text in report}



10. The generator control panel indicated a need for servicing of the equipment. The servicing should be made by a contractor familiar with servicing and operation of the equipment or the manufacturer, who can provide a written statement of its condition.