HEDDERMAN ENGINEERING, INC.
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Date, 2018

TO: CLIENT

REF: CONDITION OF PROPERTY SURVEY

Dear CLIENT:

At your request, a visual survey of the house located at ADDRESS, was made by INSPECTORS.

Transmitted herewith are the structural and mechanical inspection reports stating our professional opinions on whether the items of construction included in the survey are performing their intended function on the day of the inspection, or are in need of repair. The scope of our inspection and other important information, particularly in the area of dispute resolution should a question arise, is contained in our Service Agreement, which has been included at the end of this report.

Thank you for asking HEDDERMAN ENGINEERING, INC. to perform this important inspection work for you. If you have any questions after reviewing this report, please feel free to call me at my office.

At your service,

HEDDERMAN ENGINEERING, INC.
Tim Hedderman, President

ADDRESS OF HOUSE

INTRODUCTION

The purpose and scope of the inspection are detailed below, as well as in the executed Service Agreement at the end of this report. Also included are the limitations of the inspection.

PURPOSE

The purpose of the inspection was to view the components of the house included in the inspection and to give our opinions on whether or not these specific items were functioning at the time of the inspection, or were in need of repair. Although this report may include observations of some building code violations, total compliance with structural, mechanical, plumbing, electrical codes, specifications, and/or legal requirements is specifically excluded. This also applies to all non-code making bodies, including but not limited to, the Brick Institute of America and the Texas Lathing and Plastering Contractors Association and their respective recommendations of building construction details. **We do not perform "code" inspections**, and since building codes change every few years, our inspections are **not** done with the intention of bringing every item in the house into compliance with current code requirements. Rather, the standard of our inspections is a performance standard to determine if the items inspected are functioning at the time of the inspection, or if they are in need of repair. This is particularly applicable to Home Warranty policies, where the standards of the Home Warranty service company may differ than the scope of our stated performance standard for judging whether a piece of equipment is functional or in need of repair. If you intend to rely on a Home Warranty policy, then it is recommended that you **contact the Home Warranty company of your choice for a more in-depth analysis of what may be required to meet their standards should a claim be made against their policy**. It has been our experience that Home Warranty companies may require the equipment to be in total compliance with current code (even if it was

installed before the current code was adopted) to be covered under their policy, and if so, it is recommended that you contact the appropriate service companies for a code compliance certification inspection.

This report is provided solely for the use of the person to whom this report is addressed, and is in no way intended or authorized to be used by a third party, who may have different requirements, and to whom we have not contracted to perform the inspection. If a third party chooses to use this inspection report, they do so without HEDDERMAN ENGINEERING, INC. permission or authorization, and they do so at their own risk.

It is our purpose to provide information on the condition of the house on the day of the inspection. It is not our purpose to provide discussions or recommendations concerning the future maintenance of any part of the house, or to verify the adequacy and/or design of any component of the house. It is pointed out that other engineers/inspectors may have contrasting opinions to those given in this report.

Items that we find that in our opinion are in need of repair will typically include the recommendation to **Obtain a Cost Estimate** from qualified contractors. The scope and cost of the actual repairs can vary significantly from company to company, and it is your responsibility to see that the scope of work needed and actual cost of repairs is confirmed by contacting one or more qualified service companies **before your option period ends or before closing on the property**. This report may also contain informational items which are included as a courtesy to help you become more aware of the condition of the house.

In the performance of this inspection, HEDDERMAN ENGINEERING, INC. has acted as an engineering consultant subject to the standards of the State Board for Professional Engineers.

SCOPE

The scope of the inspection included limited, visual observations at the interior and exterior of the structure. Only those items readily visible and accessible at the time of the inspection were viewed and are included in this report. Any items causing visual obstruction, including, but not limited to furniture, furnishings, floor or wall coverings, pictures, foliage, registers and grills on HVAC ductwork, soil, appliances, insulation, etc., were not moved.

The basis of our opinions will be the apparent performance of that portion of the house readily visible at the time of the inspection. Disassembly or removal of any portion of the structure, mechanical equipment, plumbing equipment, or electrical equipment is beyond the scope of this inspection.

There is no warranty or guarantee, either expressed or implied, regarding the habitability, future performance, life, insurability, merchantability, workmanship, and/or need for repair of any item inspected.

The components of the house included in scope of the inspection, if present and applicable, include:

Structural: Foundation, primary load-carrying framing members, roof surface, water penetration, and miscellaneous items related to the house.

Mechanical: Air conditioning and heating systems, water heaters, built-in kitchen appliances, and garage door openers.

Plumbing: Water and gas supply lines, sinks, toilets, tubs, showers, visible drain lines inside the house, and vents.

Electrical: Service entrance conductors, electric meter, distribution panel, visible wiring, light fixtures, switches, and receptacle outlets.

Sprinkler: Control panel, solenoid valves, backflow prevention device(s), piping, and sprayer heads.

Pool: The basin, deck, pumps, filters, piping, heater, and electrical.

Items specifically excluded from our inspection include:

Tainted and Corrosive sheetrock (Chinese Sheetrock),
All pests, wood destroying insects, conducive conditions, ants, or rodents.
All equipment related to mosquito control.
All items related to major geological conditions such as faults or subsidence.
All underground piping, including water, sewer, and gas piping.
Water softening and water treatment systems.
Identifying products that have been recalled.
Pressure testing of gas system.
All low voltage lighting systems and/or photocells.
All low voltage data systems such as telephone, cable TV or data lines.
All fire detection, carbon monoxide, smoke alarms and/or security alarm systems.
All environmental hazards, or any toxic/hazardous materials including, but not limited to: radon gas, lead, formaldehyde, electromagnetic, any and all items related to asbestos.
A backup generator and transfer switch panel.
Any electrical load analysis on the electrical system to determine adequacy of the service or any branch circuit.

If you desire information or inspections concerning the items listed above, or any other items, then it is recommended that you contact the appropriate service companies.

Also excluded from the scope of the inspection are any and all items related to mold and/or all microbial substances. Due to the current limitations of coverage on most homes by the insurance industry in Texas, where damages due to mold and/or other microbial substances may not be covered, we routinely recommend that you have a mold inspection by a qualified professional before you close on the house.

Built-in appliances and mechanical equipment were operated in at least one, but not all, of their operating modes, where possible. If you desire for every operating mode of each piece of equipment to be operationally checked, then it is recommended that you contact a service company. Equipment and materials that are not visible, including structural components, underground plumbing and gas lines, and all other items not normally available for ready viewing, are excluded from the scope of this inspection. If you desire an inspection on the underground plumbing pipes or a hydrostatic test to determine if the plumbing pipes are leaking under the house, then it is recommended that you contact a plumber. No electrical circuit or load analysis will be performed on the electrical system.

We make no representation regarding the condition of this house other than as contained in this written report. Any verbal discussions concerning this house that were made at the time of the inspection, and not contained in this written report, are not to be relied upon.

Although the structural portion of this inspection was made by an engineer, it cannot be considered to be a formal engineering study since no calculations, structural analysis, or physical material testing were performed. If engineering drawings/specifications have been made available during this inspection and, if they have been viewed, it is pointed out that all such viewing is strictly cursory, and in no way should our cursory examination be construed as providing engineering judgments concerning the adequacy or acceptability of the drawings/specifications.

It is pointed out that it is possible for latent defects to exist in the structure and its related equipment, underground piping, and systems that are not visible at the time of the inspection, and may not be able to be viewed during a limited visual inspection. This is particularly applicable in items relating to water, such as roof leak, water penetration conditions, etc., where the condition may exist, but not be visible at the time of the inspection (e.g. where it has not rained for a period of time, allowing materials time to dry out). HEDDERMAN ENGINEERING, INC. does not claim or warrant that the observations listed in this report represent every condition that may exist. In using the information supplied by this inspection, one must recognize the limitations of a limited, visual inspection, and accept the inherent risk involved.

It is recommended that you obtain as much history as is available concerning this house. This historical information may include copies of any seller's disclosures, previous inspection or engineering reports, building drawings and/or specifications, bids to perform repair work on the house, knowledge of any drainage problems, receipts from repair work that has been performed, reports performed for or by relocation companies, municipal inspection departments, lenders, insurers, and appraisers. You should attempt to determine whether repairs, renovation, remodeling, additions or other such activities have taken place at this house.

DESCRIPTION OF HOUSE

The house was a one story wood frame dwelling with brick veneer and wood siding, a composition shingle roof, and was supported on a monolithic slab on grade concrete foundation. The house had a three car detached garage connected to the house by a breezeway. The house was vacant at the time of the inspection, and the house, according to HAR, was built in 1961.

FOR THE PURPOSES OF THIS INSPECTION, NORTH WILL BE ASSUMED TO BE FROM THE REAR OF THE HOUSE TOWARDS THE FRONT.

STRUCTURAL

FOUNDATION

Description

The foundation was a concrete slab on grade, and appeared to be reinforced with steel reinforcing rods (rebar).

EVIDENCES OF DIFFERENTIAL MOVEMENT

Note that it is not HEI's purpose to exhaustively document each and every evidence that may be related to foundation movement, but rather to document a representative sample and/or the most significant evidences of movement upon which we base our opinion on the condition of the foundation.

Levelness

The floors were checked with an electronic level, and were observed to be sloping generally from the family room and kitchen areas to the rest of the house. The difference in elevation between the high point and low point was 3.4 inches. The high point was located at the breakfast room, and the low point was located at the north bathroom. The unlevelness takes place over a horizontal distance of approximately 70-75 feet.

See our field sketch showing the elevation readings at the end of this report. Note that the "R" on the sketch is our randomly chosen starting reference point, where the elevation is 0, and all other elevation readings are taken relative to the reference point, and are measured in inches to the nearest 1/10 inch.

We typically point out that foundations are rarely constructed perfectly level, so most properties have some unlevelness (typically ¾ to 1-1/2 inches) built into the foundation as part of original construction. We have no knowledge as to how much unlevelness was built into this house foundation during original construction.

Veneer Cracks

Cracks and/or patches were observed throughout the exterior veneer.

Width or depth reference to indicate the degree of separation in building materials or degree of deterioration in building materials




Sheetrock Cracks

Sheetrock cracks, patches, and/or compression ridges were observed throughout the house.





Concrete Cracks

Cracking of the foundation concrete exists in virtually all foundations. Although no cracks were observed in this foundation, it is probably not an exception. It is pointed out that cracking is a normal property of concrete and other brittle materials, and Hedderman Engineering, Inc. assumes no responsibility should cracks be found that are not mentioned in this report.

The corner of the foundation was observed to be chipped. This condition is typically caused by differences in thermal expansion between the brick veneer and the concrete foundation. Also, this condition can be caused by a lack of reinforcement in the corner of the foundation during original construction. In our opinion, this condition does not affect the overall structural integrity of the foundation.

Separations of Materials

Some separations and differential movement of materials due to differential foundation movement were observed, including the following:

- Window frames were separated from the exterior brick veneer approximately 1/8 inch.

- The frieze board was separated at the roof soffit approximately 1/8-3/8 inch.

- Doors that were sticking were observed at multiple locations.

- Door frames that were out of square, leaving a triangular separation between the door and the door frame at the top of the door were observed at multiple locations, where a separation of approximately 1/2 inch was visible at the top of the door.

- Doors that were trimmed at the top and/or bottom were observed at multiple locations.

- The floor tile was cracked at the foyer area.

- The wall tile was cracked at the guest quarters bathroom and south bathroom.

- The countertop was separated from the wall at the kitchen sink.

Width or depth reference to indicate the degree of separation in building materials or degree of deterioration in building materials




Separated frieze board molding


Separated wall tile

FOUNDATION CONCLUSIONS

Most of the structures previously inspected by this firm have experienced some degree of differential foundation movement, and this structure was no exception. After careful examination, it is our opinion that the degree of the foundation movement is more than what is acceptable. The most significant movement was located at:

North bathroom area: where the floors sloped 2.0 inches in approximately 20-25 feet

South bathroom area: where the floors sloped 2.0 inches in approximately 20-25 feet

Guest quarters bathroom area: where the floors sloped 1.8 inches in approximately 25-30 feet

Due to the more than acceptable amount of movement of the foundation of this structure, it is our opinion that releveling of the foundation is needed at this time. It is recommended that at least three foundation repair contractors be contacted in order that they may make their own assessment of the scope and cost of the work needed to bring this foundation back to an acceptable degree of levelness.

Obtain Cost Estimate

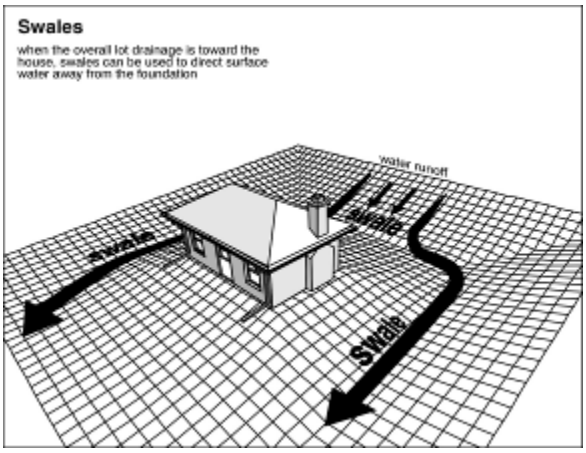
Sewer Line Test

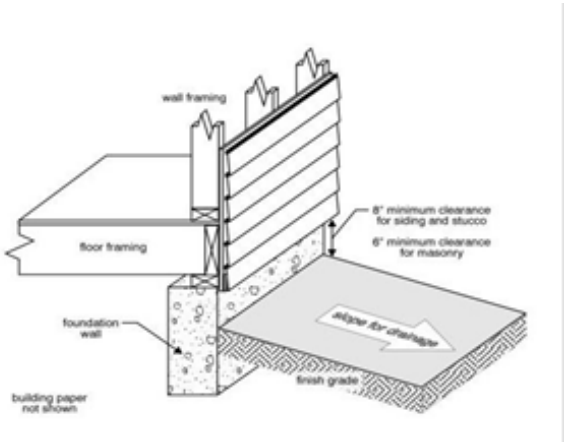
It is recommended that a plumber be contacted to perform camera observation or leak testing on the underground sewer piping to determine if the underground piping is leaking. A leaking sewer pipe can contribute significantly to the instability of the

supporting soils by introducing excessive moisture into the soils, thus weakening them, resulting in foundation settlement.

Perimeter Grading/Drainage

This inspection does not include determining if the property is in the 100 year flood plain. For further information regarding the elevation of this lot check with your survey and/or a land surveyor.





Poor Drainage

The grade was essentially flat, and it appears that water may pool at some areas after a rain. Further investigation with the homeowner is recommended to determine if water pools for a significant time after a rain. If so, an underground drainage system may need to be installed, and you should contact a company specializing in underground drainage system for a cost estimate.

R401.3

OTHER OBSERVATIONS

Trees/Foliage

Trees and/or foliage were observed in the vicinity of the house, which can contribute significantly to differential movement of the house foundation. Care should be taken to prevent the trees and foliage from removing an excessive amount of water from near the foundation of the house. Consideration should also be given to cutting the tree roots that extend under the foundation, and installing a root barrier to prevent any further moisture from being removed from under the interior of the house.

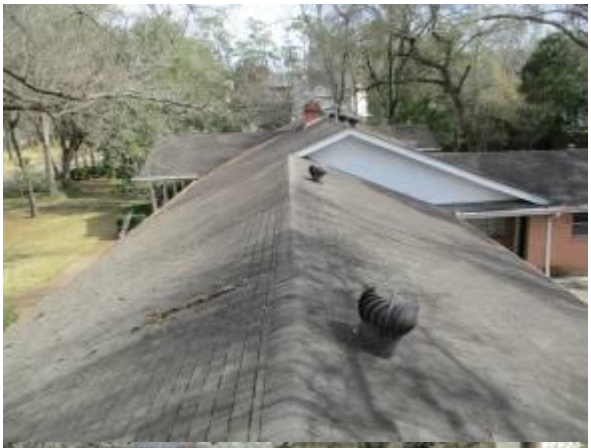
Foundation Grade Beam

The face of the foundation concrete was spalled, and the reinforcing steel used in the construction of the foundation was observed to be exposed. The rust should be removed from the rebar, and the rebar grouted to prevent further deterioration. Locations included: North perimeter grade beam
Obtain Cost Estimate

ROOF

Life expectancy

The pitched roof surface was constructed of composition shingles, and the low-sloped portion of the roof was covered by a modified bitumen roofing system. The life expectancy of a composition shingle roof has been observed to vary from 15 to 20 years, with most requiring replacement at about 17-20 years. The life expectancy of a modified bitumen roof is estimated to be approximately 15 years. We understand from the owners disclosure that the age of the composition shingle roof is approximately 15 years, and the modified bitumen roof is approximately 15 years.



The roof was viewed from the surface of the roof at the time of the inspection.

Observations

After observing the interior of the structure, evidences of roof leaks were visible, where the ceiling was water stained. It is recommended that a roofing contractor be contacted to find the source of the leaks, and to make any needed repairs.
Locations included: Chimney chase, sun room skylight, sun room south roof edge

Obtain Cost Estimate

After observing the interior of the structure, evidences of roof leaks were visible in the attic, where the roof decking and/or roof framing members were water stained. It is recommended that a roofing contractor be contacted to find the source of the leaks, and to make any needed repairs.
Locations included: Chimney chase, roof decking near the chimney, Catch bowl above ht east bedroom area
Obtain Cost Estimate




After observing the interior of the structure, evidences of roof leaks were visible in the eaves at multiple areas around the house. It is recommended that a roofing contractor be contacted to find the source of the leaks, and to make any needed repairs.
Obtain Cost Estimate





The composition roof surface was showing evidences of some deterioration, including shingles that were brittle, discolored, and starting to lose their aggregate. Several of the shingles at the west section of the roof were damaged by previous excessive ivy growth. It is recommended that the shingles at the west side of the property be replaced.
Obtain Cost Estimate

We observed shingles with broken corners or broken tabs.
Obtain Cost Estimate

We observed rust on some of the metal roof accessories, and although the accessories are still performing their intended function, it is recommended that the rust be removed.
Locations included: Roof Jacks.




Ivy damaged shingles above the garage


The modified bitumen roof surface was showing a moderate amount of deterioration, including discoloration of the surface, granular loss, cracks in the asphalt at the edges of the sheets, and excessive mastic application in areas.

Other conditions observed during the course of the inspection related to the roof surface included the following:

The roof decking was observed to be plywood.

Debris was observed on the roof, and the debris should be removed to prevent premature deterioration of the roof surface.

Tree limbs were observed to be in close vicinity of the roof, and need to be trimmed back to prevent them from rubbing across the roof surface.
Obtain Cost Estimate

We observed one or more lead roof jacks at the roof penetrations that have been damaged, apparently by squirrels eating the lead jacks. The jacks can now allow water to enter the attic space as a roof leak, and the roof jacks need to be repaired as necessary to ensure that all the roof jacks are watertight.
Obtain Cost Estimate

One or more of the lead roof jacks at the roof penetrations were not properly folded into the top of the vent pipe since the vent pipes are longer than the roof jacks. Have a roofer make the repairs.
Obtain Cost Estimate
P2606.1




Roof Conclusions

After observing the condition of the roof surface, it is my opinion that the roof surface is in serviceable condition at this time, and has some life remaining with some repairs needed at this time. However, it can be anticipated that replacement of the roof surface will become needed within the next few years. Since it can be anticipated that the roof will need replacement in the next few years, it is recommended that a budget be established to provide the necessary funds for the new roof. Contact a roofing contractor for a cost estimate.

STRUCTURAL FRAMING

Description

The house was observed to be a one story wood frame structure that includes the standard major framing components, including wall framing and ceiling joists, and roof framing constructed of prefabricated trusses.

Observations

We did not observe metal hurricane clips/straps installed at the attic framing members. These clips/straps provide a stronger structure that will be more resistant to wind uplift from hurricane and tornadoes.

Attic Framing

The attic space was viewed from the access walkway.

One or more of trusses has had structural members cut and/or removed. The damaged truss needs to be repaired, and it is recommended that the manufacturer of the trusses be contacted if possible to design a repair, or that a structural engineer be contacted to design the repair.
Location included: Attic space just west of the chimney
Obtain Cost Estimate

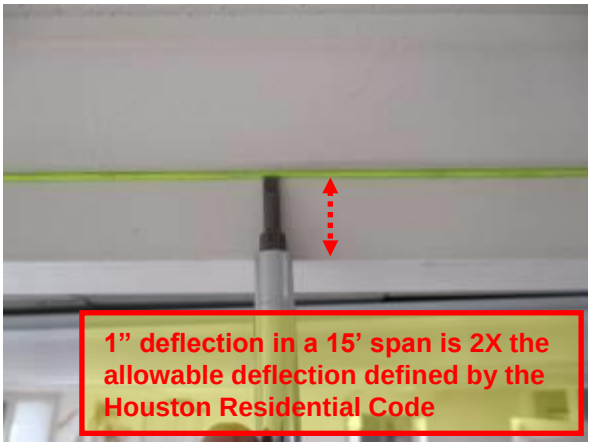
Deflected Framing

The ceiling framing had a more than normal amount of unlevelness. The allowable deflection in ceiling framing members is one inch deflection in a 30-foot horizontal distance (L/Δ = 360 per the building code). Therefore, further investigation is recommended to determine the cause of the deflection, and the extent of any repairs that may be needed.

Obtain Cost Estimate

Locations included: Sun Room and Garage

Width or depth reference to indicate the degree of separation in building materials or degree of deterioration in building materials



1" deflection in a 15' span is 2X the allowable deflection defined by the Houston Residential Code

The header over the garage door was visibly deflected, and has deflected beyond an acceptable degree (allowable deflection = one inch deflection in a 30-foot horizontal distance (L/Δ = 360 per the building code)). Therefore, the header was not performing its intended function and repairs are recommended at this time.

Obtain Cost Estimate




Framing Conclusions

The primary load carrying members of the structural framing that were accessible and viewed at the time of the inspection were performing their intended function with the exception of the item(s) listed above. Have a contractor confirm the scope of repairs needed, along with a cost estimate for all repairs.
Obtain Cost Estimate

WATER PENETRATION

We checked around all window and door openings with a moisture meter, and found no evidence of elevated moisture at the time of the inspection.

Evidences of water penetration to the interior of the structure were observed, including the following conditions and locations. Further investigation is recommended with service companies to determine the source(s) of the water penetration along with any secondary damages, and also to provide a cost estimate for any needed repairs.

Water stains/damage were observed.
Obtain Cost Estimate
Locations included: Sun Room exterior door

The source of the water penetration appears to be a lack of gutters which allows the water from the roof runoff to splash against the structure. It is recommended that gutters be installed to eliminate the source of the water, and that repairs be made to seal the door and threshold and correct any secondary damages.
Obtain Cost Estimate

Lack of gutters


Rotted door trim

A substantial vulnerability to water penetration was observed at penetrations/openings through the exterior building envelope, and it is recommended that all penetrations/openings be sealed against water penetration. Typical examples on a structure may include light fixtures, air conditioning refrigerant lines, water piping, gas piping, vent caps, windows, doors, expansion joints, weepholes, etc. Below is a representative sample of locations and/or photographs showing some, but not necessarily all, locations where there is a vulnerability to water penetration. Have a contractor provide a cost estimate to seal all vulnerable areas on the exterior building envelope against water penetration.

Obtain Cost Estimate


Wood rot/Ivy growth


Damaged gutters/Cracked brick veneer


Leaking gutters/Damaged eaves

Poor sealant detail

FIREPLACE/CHIMNEY

Description

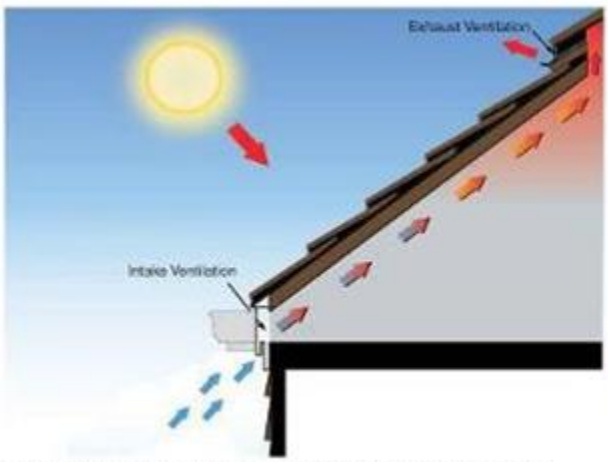
The fireplace was a masonry fireplace with a ceramic gas log that vented up a chimney through the roof. The fireplace was **NOT** equipped with a gas line.

ATTIC

The attic was entered and was viewed from the access decking provided in the attic.

The attic did not have adequate service decking to all the equipment in the attic. The service decking should be a continuous deck that is a minimum of 24 inches wide, that extends from the attic access opening to all equipment in the attic. In addition, the decking should be free from any obstructions, such as gas lines, electrical wiring, ductwork, framing members, etc.
Obtain Cost Estimate

VENTILATION

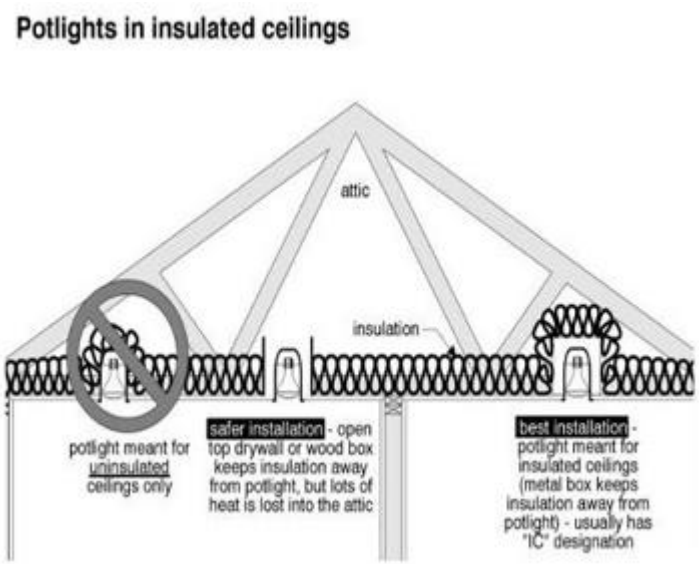


Clip art showing eaves and fascia ventilation

The ventilation for the attic consisted of screened vents in the soffits, and whirlybird vents in the roof.

The insulation in the attic was very thin by today's standards. This attic appeared to have approximately 1-3 inches of batt insulation in the ceiling. It is recommended that consideration be given to installing additional insulation. Current construction standards for new homes have insulation that is a minimum of an R-30 rating.

The insulation was in contact with the recessed lights, which can be a fire hazard and shorten the life of the light bulbs. It is recommended that the insulation be pulled back to provide a three inch air space.
Obtain Cost Estimate



The insulation in the attic was missing at some of the vertical walls, and needs to be replaced.
Obtain Cost Estimate

The insulation in the attic was missing from between some of the joists.
Obtain Cost Estimate

We observed extensive evidence of rodent infestation in the attic, including rodent droppings, discoloration of the insulation possibly from rodent urine, trails through the insulation, etc. Although HEI disclaims inspections for rodents, it is recommended that further investigation be done to find the source of entry of the rodents into the attic, and to make all needed repairs to clean and sanitize the attic from the fecal and urine material. It is recommended that you contact a pest control company concerning this condition.

Obtain Cost Estimate


Fresh rodent droppings and a pungent odor were present at the time of inspection

INTERIOR ITEMS

Doors

We observed exterior doors that were equipped with keyed deadbolts, rather than thumbed deadbolts. In case of emergency, you would have to find a key to unlock the door, which could be hazardous. It is recommended that the keyed deadbolts be replaced with thumbed deadbolts. It is pointed out for informational purposes that current code requirements prohibit the use of keyed deadbolts.
Locations included:
R311.4.4

Windows

Cracked/broken windows were observed that need to be replaced.
Obtain Cost Estimate
Locations included: Rear sun room, Sun room entry door, North bedroom, North garage

Floor Coverings

Floor tiles were cracked and it is recommended they be replaced.
Obtain Cost Estimate

Wood floors were discolored in areas and should be re-finished.
Obtain Cost Estimate

The carpet was not stretched and should be repaired.
Obtain Cost Estimate

Sheetrock

Patches in the sheetrock were seen throughout eh house. The cause of the patching could not be determined at the time of the inspection, and further investigation into the cause of the patch with the homeowner is recommended.

Mold/Mildew was observed at multiple location in the house. It is recommended that a mold inspector be contacted to make an assessment of this condition and recommend any necessary repair.

Obtain Cost Estimate

Locations included: North bathroom, living room air register, utility room ceiling, utility room duct, master closet air register, guest quarters closet wall base




Water stains were observed at the dining room, living room, north bathroom, south bedroom and bathroom, and master suite ceilings. The source of the water stains could not be determined at the time of the inspection, but possible sources include roof leaks, plumbing leaks in the bathrooms located above the stained areas, or possibly some other source. Have a service company determine the source of the water stains, and provide a cost estimate for any necessary repairs.







The kitchen cabinets were sagging and should be repaired at the sink area.
Obtain Cost Estimate

BUILDING ENVELOPE

Wood Rot

Wood rot was observed and it is recommended that the damaged wood be replaced. It is pointed out that additional damage could be present under the rotted material that will not be visible until the outer rotted materials are removed. Have a service company determine the entire scope of wood rot throughout the house, and provide a cost estimate to replace all rotted wood.

Obtain Cost Estimate






Eaves

The eaves were in poor condition at the time of inspection and all damaged sections should be replaced.
Obtain Cost Estimate

EXTERIOR ITEMS

Gutters and Downspouts

The gutters were in generally poor condition. The gutters and downspouts are essentially at the end of their normal, useful life and should be replaced.
Obtain Cost Estimate






Flatwork Concrete/Patios/Walkways

The sidewalk was cracked and uneven at the front of the house, and presents a tripping hazard.
Obtain Cost Estimate

Detached Garage

The concrete floor of the garage was observed to have several cracks, but was still functional at the time of the inspection. However, the portion of the cracks that were visible were observed to be approximately 1/16 inch wide. The exterior perimeter of the garage has experienced some settlement, but the degree is not such at this time to recommended foundation releveling.

MECHANICAL

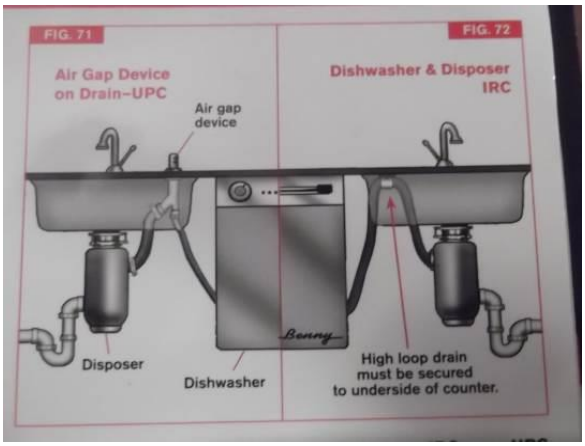
APPLIANCES

A continuity check was made of the exterior metal casings of the built-in kitchen appliances, and it showed that the metal casings were bonded for the built-in kitchen countertop appliances.

Dishwasher

No items requiring repair were visible at the time of the inspection for the operation of the dishwasher. The unit was run through a cycle at the time of the inspection, and appeared to be operating properly.

No items requiring repair were visible at the time of the inspection for the operation of the dishwasher. The dishwasher drain line was connected to an anti-siphon device at the kitchen sink, which was functional at the time of the inspection.



Disposal

No items requiring repair were visible at the time of the inspection for the operation of the disposal.

Vent Fan - Downdraft

No items requiring repair were visible at the time of the inspection to the operation of the downdraft vent fan. The vent fan was observed to be venting properly to the outside.

Gas Cooktop

No items requiring repair were visible for the operation of the gas cooktop. All of the burners and controls were operating properly at the time of the inspection.

Electric Oven

The oven thermostat was checked, and was not properly calibrated. The thermostat was set at 350 degrees, and the oven did not heat to within the allowable ±25 degrees. The oven was checked with an oven thermometer, and found to heat to 380 degrees. Have a service company make the necessary adjustments to the thermostat.
Obtain Cost Estimate

The interior light was non-functional. The cause could be a burned out light bulb, a defective switch, or related wiring.
Obtain Cost Estimate

Microwave Oven

No items requiring repair were visible at the time of the inspection for the heating operation of the microwave. A cup of water was placed in the unit, and the microwave heated the water adequately. It is pointed out that the unit was not checked for microwave leakage.

Refrigerator/Freezer

that our inspection of the refrigerator is only cursory to see if the refrigerator compartment is cooling, and the freezer compartment is freezing. The freezer was cooling to 0 degrees and the refrigerator to 38 degrees at the time of the inspection, according to the digital display.

Garage Door Openers

No items requiring repair were visible at the time of the inspection for the openers. The auto-reverse mechanisms were operational, and the sensitivity setting on the mechanisms were adequate. Also, the infrared auto reverse mechanisms were functional.

Utility Room

The utility room contained a washing machine and dryer. Neither the washing machine nor dryer were operationally checked at the time of the inspection and are omitted from the scope of the inspection. Also, no water was run down the drain line for the washing machine.

The 240-volt outlet for an electric dryer was the newer style 4-prong outlet, rather than the old style 3-prong outlet. If your electric dryer has a 3-prong plug, then it will not be compatible, and will need to be changed to a 4-prong plug.

The utility room contained both the 240-volt electric outlet for an electric dryer, and also a gas supply line for a gas dryer.

Mechanical Exhaust Vents

No items requiring repair were observed to the operation of the bath vent fans at the time of the inspection. The bath vent fans responded to the switches, and were functional at all the bathrooms.

PLUMBING

A plumbing system typically consists of three major components, including the potable water supply piping; the waste or drain piping; and the plumbing fixtures. The supply piping brings the water from the public water main or a private well through the water meter to the main shut off valve at the house. The water distribution piping brings the water from the main shut off valve at the house to the individual fixtures throughout the house. The water distribution system is under pressure, usually from 40 psi to 70 psi. The waste or drain piping carries the waste water and products underground to the sewer system or septic tank, and the waste piping is not under pressure, but operates by gravity flow. We typically run water down the drains from the sinks, tubs, showers, and toilets, but this cannot simulate the waste flow characteristics of full occupancy. There may be partial blockage of the underground waste lines from debris, broken pipes, or tree roots that cannot be detected by a visual inspection. If you desire a more in-depth inspection of the water supply, water distribution, and waste/drain systems, it is recommended that you contact a qualified plumber.

Water Service / Supply Piping

The water pressure to the house at the time of the inspection was checked with a pressure gauge at a hose bibb, and the pressure was observed to be 70 psi.

Plumbing Fixtures

SINKS AND LAVATORIES

No items requiring repair were visible at the time of the inspection to the operation of the sinks and/or lavatories. The sinks were filled with water, and were observed to be draining properly, with no leaking piping or slow drains.

TOILETS

The toilet fill valve(s) was leaking inside the toilet tank and is in need of replacement
Locations included: all toilets
Obtain Cost Estimate each

TUBS/SHOWERS

No items requiring repair were observed in the operation of the whirlpool tub. The recirculation pump, aerators, and Ground Fault Circuit Interrupt device were functioning properly.
Locations included: the master bathroom

The shower head was partially clogged, and needs to be cleaned/replaced.
Locations included: master bathroom
Obtain Cost Estimate

Miscellaneous Interior Plumbing

The water in the house was run for approximately 30 minutes at the sinks and tubs. In addition, the toilets were flushed three or four times each, and the sinks and tubs were filled, and allowed to drain. No evidences of slow drains were visible. If you desire a hydrostatic test to determine if the underground piping is leaking or clogged, then it is recommended that you contact a plumber.

Drains/Wastes/Vents

The main sewer clean out was located at the front of the house. The clean out is needed in the event of a stoppage in the main sewer drain line, and the clean out is where a sewer snake would be installed to remove the clog in the drain line.

OTHER SYSTEMS

Sprinkler System

The automatic sprinkler system was manufactured by Rain Bird, and contained 5 zones. The control panel was located inside the garage.

The Wilkins PVB backflow prevention device, with the two shut off valves on the water supply line to the sprinkler system, was located at the south side of the house.

Heads were spraying the house, and need to be adjusted on zones 3, 4, and 5.
Obtain Cost Estimate

Heads were spraying the fence, and need to be adjusted on zone 3.
Obtain Cost Estimate

One of the heads was broken on zone 1.
Obtain Cost Estimate

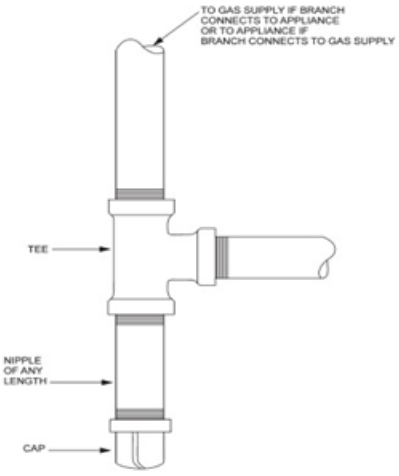
A head was leaning, and needs to be adjusted on zone 1.
Obtain Cost Estimate

Gas System

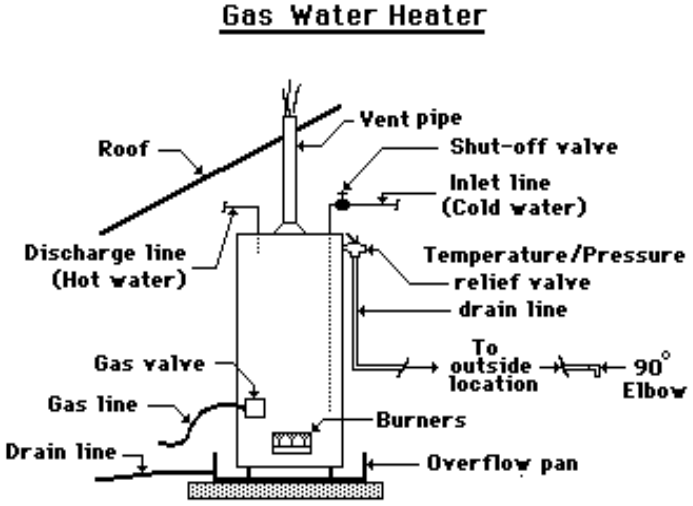
The gas meter, with the main shut off valve for the gas to the house, was located at the north side of the house.

GAS PIPING – SEDIMENT TRAPS

One or more gas supply line(s) was not equipped with a sediment trap on the gas line as shown in the clip art below. Have a plumber make the needed repairs.
Obtain Cost Estimate
G2419.4 (408.4)



Clip art showing a sediment trap in gas line



Manufacturer	Size	Date	Piping Type	Location
State	40 Gallon -Gas	2003	Copper	Attic
State	40 Gallon -Gas	2003	Copper	Attic

The temperature of the hot water was measured to be 126 degrees at the kitchen sink at the time of the inspection. Normally, 120-125 degrees is the recommended maximum temperature of hot water to prevent accidental scalding. See the chart below for more information about hot water burns, as taken from the International Residential Code, 2012.

TIME AND TEMPERATURE RELATIONSHIP TO SERIOUS BURNS		
	Adults (skin thickness of 2.5 mm)	Children (skin thickness of .56 mm)
WATER TEMPERATURE	Time required for a third-degree burn to occur	
155°F 68°C	1 second	0.5 second
148°F 64°C	2 seconds	1 second
140°F 60°C	5 seconds	1 second
133°F 56°C	15 seconds	4 second
127°F 52°C	1 minute	10 seconds
124°F 51°C	3 minutes	1.5 minute
120°F 48°C	5 minutes	2.5 minutes
100°F 37°C	Safe temperature for bathing	Safe temperature for bathing

For SI: °C = [(°F) - 32]/1.8 or $\left(\frac{°F + 40}{18}\right) - 40 = °C$

Figure P2708.3
TEMPERATURE BURN CHART

The water heaters were functional at the time of the inspection. However, due to the age and/or condition of the equipment, it is the opinion of the inspector that they have only a limited amount of life remaining. Normal life expectancy of a water heater in the Houston area is approximately 7 to 10 years.

The tanks were observed to be gurgling while they were heating, indicating a build-up of scale and other deposits inside the water heaters. The water heaters were still functional at the time of the inspection, and we do not recommended that they be replaced at this time. However, it can be anticipated that the condition will continue to worsen until the water heaters are replaced.

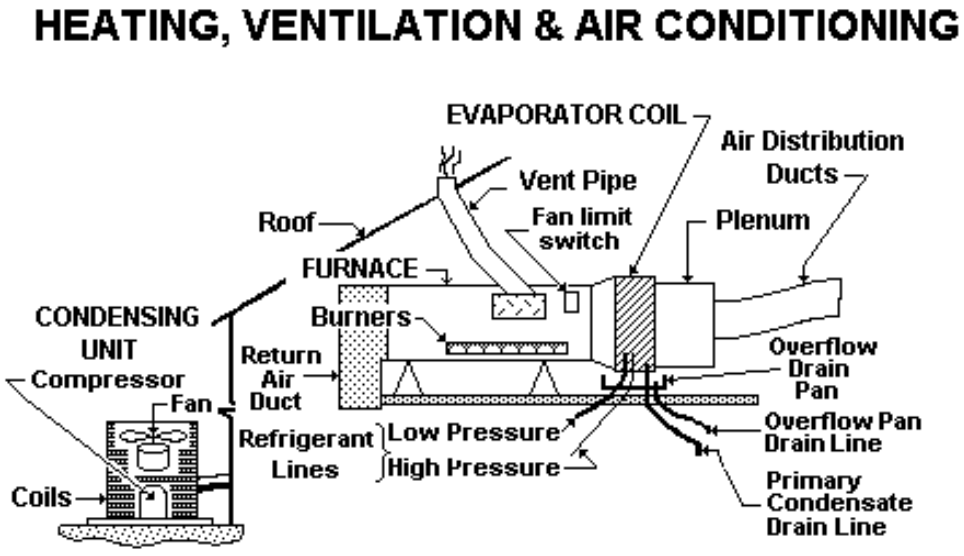
Temperature/Pressure Relief Valves

The temperature/pressure relief valves were not operationally checked at the time of the inspection. Valves typically do not reseat properly when they are operated, which causes the valves to leak. It is best to replace a temperature/pressure relief valve every two years to prevent it from getting clogged with mineral deposits.

Water Heater Plumbing

The piping at the top of both water heaters was severely corroded at the fittings, and is in need of repair.

Obtain Cost Estimate



The air conditioning for the house was provided by two forced air split systems, and the equipment for the individual zones was as follows:

Zone	Condensing Unit		Date	Evap. Coil	Date	ΔT(degrees)
North zone	5-ton	Amana	2014	5-ton	2014	17
South zone	3-ton	Amana	2012	3-ton	2011	17

It is pointed out that our inspection of the air conditioning and heating system(s) is a limited, visual inspection where we check the equipment as it has been installed to determine whether or not the system(s) is cooling and/or heating at the time of the inspection. Our inspection is necessarily a cursory inspection, as we do not determine the sizing, adequacy, or design of any component in the system, or the compatibility of the individual components, nor the installation of the system(s) to be in conformity to the latest building code requirements. If you desire an in-depth analysis of the HVAC system(s), then it is recommended that a service company be contacted to analyze the system(s). This is particularly important if the system(s) is an older system and has only a limited amount of remaining life due to its age and/or condition.

Cooling Performance

We measure the temperature drop (ΔT) across the coil(s) at each unit at the time of the inspection and our observations have been recorded above in the description of each zone. It is pointed out that our measurements of the cooling performance of the equipment is only at a “point in time”, and cannot reflect whether the equipment has been recently serviced, or what the future performance of the equipment will be after the day of the inspection. Further investigation with the homeowner is recommended to determine when the equipment was last serviced.

No items requiring repair were visible at the time of the inspection for the cooling performance of the equipment.

Evaporator Coil

Overflow Pans – Rust

The overflow pans under the evaporator coils had rust in the pans, apparently from

water overflowing the condensate drain lines into the overflow pans. No water was in the pans at the time of the inspection, but, since we only ran the units for a few minutes, it is recommended that the drain lines be checked by an air conditioning service company.
(see photo below)
Obtain Cost Estimate


Overflow Pans – Float Switch

The overflow pans under the evaporator coils were equipped with float switches which should shut off the air conditioning units if the pans fill with water.


Primary Condensate Drain Line(s)

The primary condensate drain lines were observed to empty into the P-traps under the sinks at the master bathroom and the second floor hall bath. This is correct, and no repairs are needed. However, for your information, it is pointed out that it is not uncommon to hear the sound of dripping water at the sinks, which is related to the

proper function of the drain lines, and not to a leak at the sink, or in the wall.

HEATING

The heating for the house was provided by two gas-fired furnaces located in the attics. The equipment for the individual zones was as follows:

Zone	Manufacturer	Size	Date	Location
1st floor	Carrier	110,000-BTU	2004	Attic
2nd floor	Carrier	66,000-BTU	2004	Attic

Observations

The furnaces were operationally checked at the time of the inspection, and no repairs were indicated to the operation of the furnaces. The furnaces responded to the thermostats, and the burners came on, and were heating.

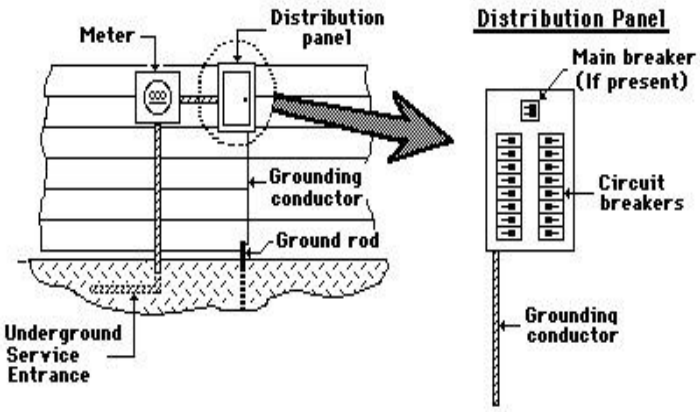
Due to the age and/or condition of the equipment, it is the opinion of the inspector that the units have only a limited amount of remaining life. Therefore, it is recommended

that a service company be contacted to dismantle the furnaces, and view the heat exchangers for cracks.
Obtain Cost Estimate

Furnace Burner Compartments

The furnaces are constructed such that the units must be dismantled in order to view the entire heat exchangers. The units were not dismantled, and the heat exchangers were not able to be viewed for evidences of a crack. If further investigations are desired, then it is recommended that a service company be contacted to dismantle the units. Due to the age and/or condition of the furnaces, it is recommended that a service company be contacted to dismantle the furnaces, and view the heat exchangers for cracks. The service company should provide a written statement on the condition of the equipment.
Obtain Cost Estimate

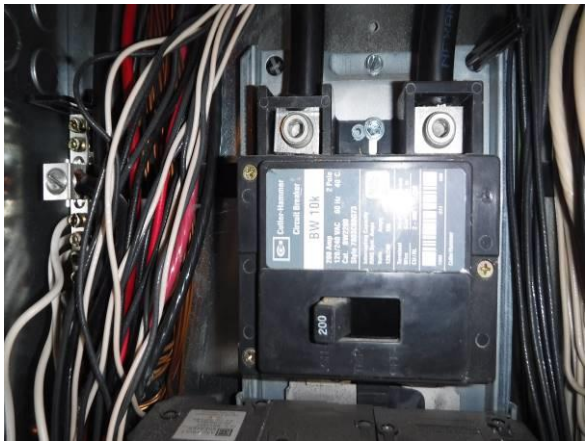
ELECTRICAL SERVICE

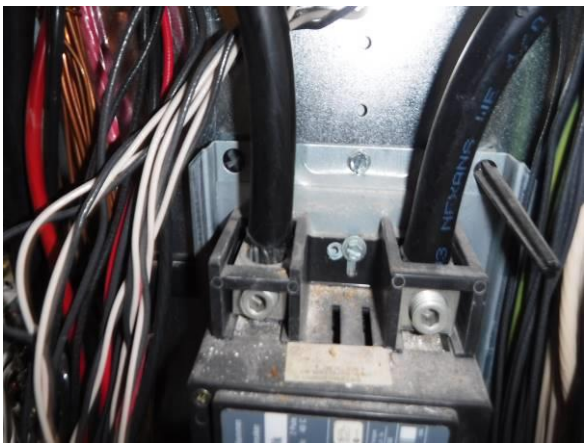


ELECTRICAL SERVICE
Type: Underground **Voltage**: 120/240 **Phase**: Single **Amps**: 200-Amps
Meter: North Side of the house

BREAKER PANELS
Manufacturer: Cutler Hammer
Rated Capacity: 200 Amps
Main Breaker: 200 Amps
Location: Inside garage

WIRING
Service Entrance Conductors: 4/0 Aluminum
Branch Circuit Wiring: Copper
Type of Wiring: Non-Metallic Sheathed (Romex)
Type of System: 3-wire grounded system

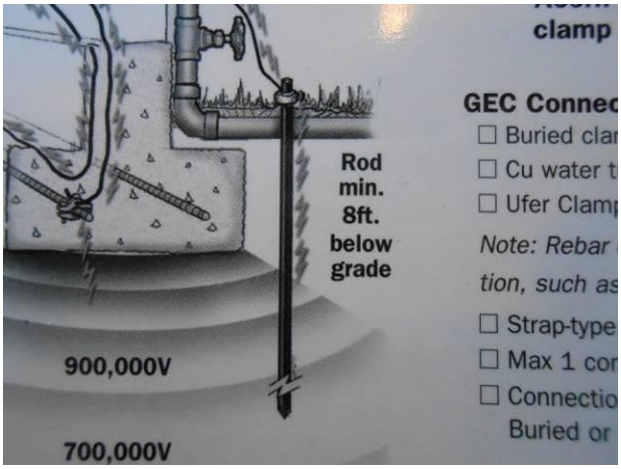






GROUND ROD

The ground rod was sticking out of the ground a few inches, and, since ground rods are typically 8 feet long and all 8 feet of the rod are required to be in the ground, it is recommended that the ground rod be pounded down flush with the top of the ground. The clamp on the rod should be an acorn clamp that is approved for direct burial in the ground.

Obtain Cost Estimate



Breaker Panel Box(es) (Panelboard)

It is a general recommendation that all circuit breakers be tripped off and on at least once a year to ensure that they are still physically able to trip off. Occasionally, the points on a breaker will fuse to the main bus in the panel, preventing the breaker from tripping off, even if there is an overload on the circuit. If this condition occurs, it can be a fire hazard.

Breaker Panel

Foreign matter was observed in the panel box, which can be a safety hazard, and it is recommended that the panel be cleaned

Obtain Cost Estimate

Arc Fault Circuit Interrupters

There were five Arc Fault Circuit Interrupters (AFCI) in the breaker panel, and the Arc Fault Circuit Interrupters were functional at the time of the inspection, and tripped off when the "test" buttons were pushed. This is an "as-built" condition, that does not meet current electrical code standards. For more information, please refer to the Texas Real Estate Commission Consumer Notice Concerning Recognized Hazards, at the following website link: http://www.trec.state.tx.us/pdf/contracts/OP-I.PDF

AFCI's devices are intended to protect against fires caused by electrical arcing in the wiring, by shutting off the power to the circuit when an electrical arc is detected in the circuit. Homes built prior to 2002 were not required by the National Electrical Code (NEC) to be protected by AFCI's. Between 2002 and 2008, the National Electrical Code required the electrical circuits in bedrooms to be protected by an AFCI. In 2014, the State of Texas adopted the 2014 National Electrical Code, and the circuits in the locations listed in the NEC reference below are now required to be protected for new construction. Since this house was built between 2002 and 2008, the breaker panel is required by the NEC to be equipped with AFCI's for the circuits in the bedrooms. However, you may want to consult with an electrician and consider having additional AFCI's installed for safety purposes.

The Arc Fault Circuit Interrupters in the panel were not operationally tested due to the house being occupied.

It is also pointed out that the AFCI breakers in the panel are the older type of AFCI, rather than the newer combination type. While replacement is not required, you may want to consult with an electrician to determine if you want to replace the existing AFCI breakers with the newer combination type AFCI breaker.
Obtain Cost Estimate/breaker.

It is pointed out that the 2014 revision of the National Electric Code now requires additional 120-volt circuits besides the bedrooms to be protected in houses built after

the 2014 code revision took effect. It is pointed out that this house is grandfathered against these new requirements in the 2014 NEC, and the NEC does not require retrofitting for grandfathered houses.

Following is the excerpt taken from the 2014 NEC listing the current locations:

NEC 2014 210.12 Arc-Fault Circuit-Interrupter Protection.
210.12 Arc-Fault Circuit-Interrupter Protection. Arc fault circuit-interrupter protection shall be provided as required in 210.12(A) (B), and (C). The arc-fault circuit interrupter shall be installed in a readily accessible location.
(A) Dwelling Units. All 120-volt, single phase, 15- and 20-ampere branch circuits supplying outlets or devices installed in dwelling unit kitchens, family rooms, dining rooms, living rooms, parlors, libraries, dens, bedrooms, sunrooms, recreation rooms, closets, hallways, laundry areas, or similar rooms or areas shall be protected by any of the means described in 210.12(A)(1) through (6).
(1) A listed combination type arc-fault circuit interrupter, installed to provide protection of the entire branch circuit.

ARTICLE 100 Definitions
Outlet. A point on the wiring system at which current is taken to supply utilization equipment.

Legend

The legend in the breaker panel was labeled to identify the circuits in the panel. We did not verify the accuracy of the labeling.

Wiring

We observed one or more white wires that were used as a “hot” wire, and were connected to a circuit breaker. Typically, the white wires are the grounded conductors, and if they are used as a “hot” conductor, they must be permanently marked or wrapped with black or red tape to identify them as a “hot” ungrounded conductor.
Obtain Cost Estimate
E3307.3

Wall Outlets

NOTE: Some of the receptacle outlets in the home were inaccessible and could not be reached for inspection due to furniture, heavy storage items, personal effects, or conditions outside the control of the inspector.

GROUND FAULT CIRCUIT INTERRUPT DEVICE

All of the outlets that were supposed to be protected by a ground fault circuit interrupt (GFCI) device were protected. This included the outlets at all the bathrooms, the exterior of the house, the undedicated outlets in the garage area, and at the kitchen countertop area. The GFCI devices were checked by pushing the “test button, and also with an exterior testing device, and were functioning properly.

Three prong outlets that were not grounded properly were located throughout the house. It is recommended that an electrician be contacted, and the necessary repairs made.

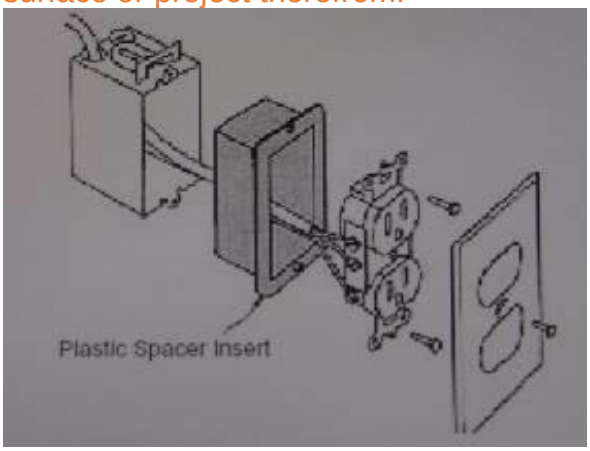
Obtain Cost Estimate

We observed outlets located in baseboard molding and countertop backsplashes that were not protected by extender boxes. This is considered to be a fire hazard, and it is recommended that the extender boxes be installed.

Obtain Cost Estimate

NEC 314.20

314.20 In Wall or Ceiling. In walls or ceilings with a surface of concrete, tile, gypsum, plaster, or other noncombustible material, boxes employing a flush-type cover or faceplate shall be installed so that the front edge of the box, plaster ring, extension ring, or listed extender will not be set back of the finished surface more than 6 mm (1⁄4 in.). In walls and ceilings constructed of wood or other combustible surface material, boxes, plaster rings, extension rings, or listed extenders shall be flush with the finished surface or project therefrom.



Light Fixtures

A fluorescent light fixture(s) was flickering or non-functional.
Locations included: master closet
Obtain Cost Estimate

A light fixture(s) was observed that was non-functional when the switch was turned on. The problem may be a burned out bulb, a defective light fixture, or defective switch.
Locations included: the master bedroom, the hall bathroom, the living room, and the kitchen.
Obtain Cost Estimate

CLOSE

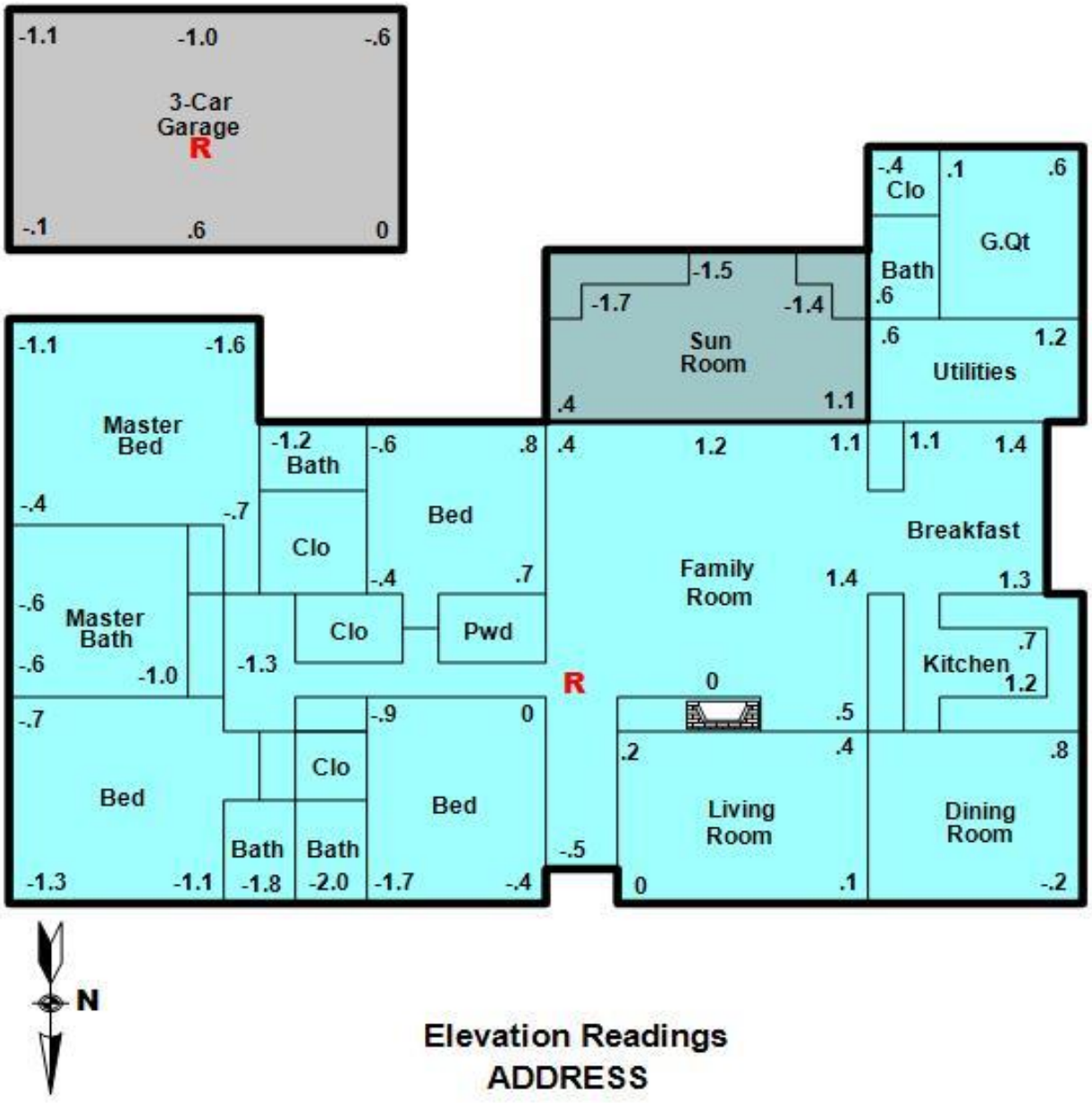
Opinions and comments stated in this report are based on the apparent performance of the items included within the scope of the inspection, at the time of the inspection. Performance standards are based on the knowledge gained through the experience and professional studies of the inspector. There is no warranty or guarantee, either expressed or implied, regarding the habitability, future performance, life, merchantability, and/or need for repair of any item inspected. It is suggested that it would be a prudent thing to purchase a Home Warranty Policy to protect the appliances and equipment against unforeseen breakdowns during the first year and for preexisting conditions. It is recommended that you research the various options available and protect yourself with a policy. Check with your agent for details and please read our comments concerning Home Warranty policies on page 2 of this report.

Thank you again for asking HEDDERMAN ENGINEERING, INC. to perform this inspection for you. If you have any questions after reviewing this report, please feel free to call the office. It is emphasized that the executed Service Agreement contract, which has been included at the end of this report, contains a provision under “Dispute Resolution” for you to contact HEI to resolve any disputes.

At your service,

Tim Hedderman
Registered Professional Engineer #51501
Texas Firm Number: 7942

DATE HEI CLIENT



Elevation Readings
ADDRESS

HEDDERMAN ENGINEERING, INC.
www.heddermanengineering.com Office 281-355-9911 Fax 281-355-9903 office@heddermanengineering.com

RECEIPT

DATE, 2018

TO: CLIENT

REF: Inspection of the house at ADDRESS.

Total cost of inspection:	XXXXXX
Total Paid:	XXXXXX
Total Due:	- 0 -