WILLCOX INSPECTIONS 713-461-0009 www.willcoxinspections.com

PROPERTY INSPECTION REPORT

		(Name of Cl	lient)		
Concerning:				Houston, T	exas
		(Address or Other Identification	n of Inspected	Property)	
By:	Fred Willcox	Professional Inspecto	or #160	February, 2009	
	(Name and I	License Number of Inspector)			(Date
	File No	713 461 0000 m	www.will	ovingnostions our	n

This property inspection report may include an inspection agreement (contract), addenda, and other information related to property conditions. If any item or comment is unclear, you should ask the inspector to clarify the findings. It is important that you carefully read ALL of this information.

This inspection is subject to the rules ("Rules") of the Texas Real Estate Commission ("TREC"), which can be found at www.trec.state.tx.us.

The TREC Standards of Practice (Sections 535.227-535.231 of the Rules) are the minimum standards for inspections by TREC-licensed inspectors. An inspection addresses only those components and conditions that are present, visible, and accessible at the time of the inspection. While there may be other parts, components or systems present, only those items specifically noted as being inspected were inspected. The inspector is not required to move furnishings or stored items. The inspection report may address issues that are code-based or may refer to a particular code; however, this is NOT a code compliance inspection and does NOT verify compliance with manufacturer's installation instructions. The inspection does NOT imply insurability or warrantability of the structure or its components. Although some safety issues may be addressed in this report, this inspection is NOT a safety/code inspection, and the inspector is NOT required to identify all potential hazards.

In this report, the inspector will note which systems and components were Inspected (I), Not Inspected (NI), Not Present (NP), and/or Deficient (D). General deficiencies include inoperability, material distress, water penetration, damage, deterioration, missing parts, and unsuitable installation. Comments may be provided by the inspector whether or not an item is deemed deficient. The inspector is not required to prioritize or emphasize the importance of one deficiency over another.

Some items reported as Deficient may be considered life-safety upgrades to the property. For more information, refer to Texas Real Estate Consumer Notice Concerning Recognized Hazards, form OP-I.

This property inspection is not an exhaustive inspection of the structure, systems, or components. The inspection may not reveal all deficiencies. A real estate inspection helps to reduce some of the risk involved in purchasing a home, but it cannot eliminate these risks, nor can the inspection anticipate future events or changes in performance due to changes in use or occupancy. It is recommended that you obtain as much information as is available about this property, including any seller's disclosures, previous inspection reports, engineering reports, building/remodeling permits, and reports performed for or by relocation companies, municipal inspection departments, lenders, insurers, and appraisers. You should also attempt to determine whether repairs, renovation, remodeling, additions, or other such activities have taken place at this property. It is not the inspector's responsibility to confirm that information obtained from these sources is complete or accurate or that this inspection is consistent with the opinions expressed in previous or future reports.

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Items identified in the report do not obligate any party to make repairs or take other action, nor is the purchaser required to request that the seller take any action. When a deficiency is reported, it is the client's responsibility to obtain further evaluations and/or cost estimates from qualified service professionals. Any such follow-up should take place prior to the expiration of any time limitations such as option periods. Evaluations by qualified tradesmen may lead to the discovery of additional deficiencies which may involve additional repair costs. Failure to address deficiencies or comments noted in this report may lead to further damage of the structure or systems and add to the original repair costs. The inspector is not required to provide follow-up services to verify that proper repairs have been made.

Property conditions change with time and use. For example, mechanical devices can fail at any time, plumbing gaskets and seals may crack if the appliance or plumbing fixture is not used often, roof leaks can occur at any time regardless of the apparent condition of the roof, and the performance of the structure and the systems may change due to changes in use or occupancy, effects of weather, etc. These changes or repairs made to the structure after the inspection may render information contained herein obsolete or invalid. This report is provided for the specific benefit of the client named above and is based on observations at the time of the inspection. If you did not hire the inspector yourself, reliance on this report may provide incomplete or outdated information. Repairs, professional opinions or additional inspection reports may affect the meaning of the information in this report. It is recommended that you hire a licensed inspector to perform an inspection to meet your specific needs and to provide you with current information concerning this property.

ADDITIONAL INFORMATION PROVIDED BY INSPECTOR

STRUCTURAL INSPECTION

PURPOSE:

The purpose of a structural inspection is to perform a visual inspection, in a limited period of time, of the structural components of the building and to express an opinion as to whether, in the sole opinion of the inspector, they are performing satisfactorily or are in need of immediate repair. The main objective of the inspection and of this report is to better appraise you, our client, of the conditions existing at the time of the inspection. We cannot and do not represent or warrant that the structure, or any of its parts or components, will continue to perform satisfactorily in a manner that will be acceptable to you or that they will continue to perform the function for which they were intended. We do not represent or warrant that the future life of any item will extend beyond the time of this inspection. It is the intention and purpose of the inspector, made on the day and at the time of the inspection, as to the condition and performance of the structure inspected. Use of this report by third parties is unauthorized and unintended. Opinions of the inspector are subjective based on his education and experience and should not be considered conclusive.

Estimates for repair, if included, are provided as a courtesy and should be considered approximate. These estimates should not be viewed as bids for the actual performance of the work or of the repair suggested. It is recommended that you confirm the actual need for repair, the scope of the work, and the approximate cost with a qualified, appropriate service company. A PRUDENT BUYER WILL SECURE FIRM ESTIMATES FROM A QUALIFIED REPAIR COMPANY BEFORE CLOSING.

THIS INSPECTION AND REPORT WERE PREPARED FOR YOUR EXCLUSIVE USE. USE OF THIS REPORT BY, OR LIABILITY TO THIRD PARTIES, PRESENT OR FUTURE OWNERS AND SUBSEQUENT BUYERS IS SPECIFICALLY EXCLUDED. RELIANCE ON THIS REPORT BY THIRD PARTIES, PRESENT OR FUTURE OWNERS AND SUBSEQUENT OWNERS IS AT THEIR PERIL. NO WARRANTIES OR GUARANTIES TO THIRD PARTIES, PRESENT OWNERS OR FUTURE OWNERS ARE IMPLIED OR SHOULD BE ASSUMED.

Notwithstanding any provision in this agreement to the contrary, any dispute, controversy, or lawsuit between any of

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the parties to this agreement about any matter arising out of this agreement shall be resolved by mandatory and binding arbitration administered by the American Arbitration Association ("AAA") pursuant to the Texas General Arbitration Act and in accordance with this arbitration agreement and the Commercial Arbitration Rules of the AAA. To the extent that any inconsistency exists between this arbitration agreement and such statutes and rules, this arbitration agreement shall control. Judgment upon the award rendered by the arbitrators may be entered in, and enforced by, any court having jurisdiction and in accordance with the practice of such court.

Recovery for any claim arising from this inspection for whatever cause is strictly limited to the total amount of the fee paid to the inspector or this company by you, our client. Acceptance of this report confirms your acceptance of all the conditions contained in this report.

In any dispute, controversy, or lawsuit arising from this agreement, the prevailing party shall be entitled to recover from the unsuccessful party, reasonable and necessary attorney's fees incurred in connection with such dispute, controversy, or lawsuit. This agreement is entered into in Harris County, Texas and shall be construed and interpreted in accordance with the laws of the State of Texas. Venue for any action brought to enforce this agreement shall lie in Harris County, Texas.

SCOPE:

This inspection is limited to observations of only those components of the structure and those portions of the roof framing and surface readily accessible and visible without moving or the removal of any item or object that would obstruct visual observation. The comment of "inspected" noted by any section of this report means that, at a minimum, all parts and components of that section listed in the Minimum Standards of Inspections as published by the Texas Real Estate Commission were inspected. These standards are treated as minimums and they do not limit the ability of the inspector to inspect or comment on the property as the inspector deems appropriate. Any item not capable of being seen at the time of the inspection, that is concealed by objects, vegetation or the finishes of the structure is specifically excluded as being beyond the scope of this inspection. Conditions not readily and visually apparent at the time of the inspection, were not considered in reaching the conclusions or rendering the opinions contained in this report.

Specifically excluded from the inspection and this report are:

- 1) boring, digging or probing the soil or structure
- 2) location or effects of geological faults or of any underground structure or object
- 3) location of gas lines and/or systems
- 4) presence of asbestos and/or radon gas
- 5) lead based paint and/or products made from or containing lead
- 6) adequacy of site drainage

7) opinions relating to compliance with any specifications, legal and/or code requirements or restrictions of any kind, and

8) determination of the presence or health effects of molds, mildew, etc.

NOTE: No environmental inspections of any kind were performed during this inspection. Even if comments are made regarding certain aspects or issues, inspections and/or any determination of the presence or possible dangers of materials organisms or microbial organisms including, but not limited to asbestos, lead, formaldehyde, mildew, molds, fungi, etc. are specifically excluded from the inspection and from this report. If you have any concerns over the presence or possible future growth of any of these type items, you should, as part of your due diligence, have the environmental inspections of your choice performed on the house prior to closing.

Items not specifically noted as "inspected" in the following report are not cover by the report and should not be assumed to be good, bad, performing the function for which they were intended or in need of repair by the lack of notation. No verbal statements by the inspector are to be considered a part of the inspection or of this report. It is again emphasized that this is a limited visual inspection made in a limited amount of time. Some defects may not be apparent during the time of the inspection. This is not intended to be an exhaustive evaluation of the structure, nor is

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it intended to be a total list of defects, existing or potential. No inspection or advice is given regarding the need for continuing or future maintenance of the structure or grounds. The inspector does not take care, custody or control of the structure at any time. If the house is occupied at the time of the inspection, it is possible that visible defects may have been concealed or covered by furniture, fixtures, appliances and/or clothing, etc. Once the owner/occupant vacates the property, any visible defect that becomes apparent should be reported to you via an updated seller's disclosure form. The photographs included in this report are intended to be used to illustrate some, but not all, of the defects and to clarify the text information in the report. All photographs taken at the subject property may not be included in the report. The photographs are not intended to be all inclusive or to describe all conditions noted on the property.

MECHANICAL REPORT

This limited visual inspection was performed, for the exclusive use of the client, with the intent of observing and reporting deficiencies apparent at the time of the inspection without disassembly of any unit or item inspected. This inspection was made of the physical condition of electrical switches, cover plates and convenience outlets that were accessible without moving furniture or fixtures. All functional equipment, in operable condition, was operated in at least one, but not necessarily every, mode to demonstrate its condition. Compliance with codes and/or adequacy of wiring and circuitry is beyond the scope of this inspection and report and is specifically excluded. If more in-depth information is desired or required on the electrical system or systems, it is recommended that a qualified electrician be consulted. It is emphasized that this is a limited visual inspection made in a limited amount of time. Some defects may not be apparent during the time of the inspection. This inspection is not intended to be an exhaustive evaluation of all the systems and appliances in the structure, nor is it intended to be a total list of defects, existing or potential. Items marked as "inspected" mean that, at a minimum, all parts and components of that section or item listed in the Minimum Standards of Inspections as published by the Texas Real Estate Commission were inspected. Items not noted as "inspected" in the following report are not covered by the report and should not be assumed to be good, bad, performing the function for which they were intended or in need of repair by lack of notation. The term "No Comments" indicates that the unit was performing the function for which it was intended without the apparent need of immediate repair at the time of the inspection. No verbal statements by the inspector are to be considered a part of the inspection or of this report.

INSPECTIONS OF GAS LINES AND/OR SYSTEMS OR FOR THE PRESENCE OF ASBESTOS, LEAD PAINT, PRODUCTS CONTAINING LEAD, RADON GAS OR OTHER ENVIRONMENTAL HAZARDS, INCLUDING MOLDS, MILDEWS OR FUNGI, ARE SPECIFICALLY EXCLUDED.

Additional pages may be attached to this report. Read all pages of this inspection report very carefully. This report may not be complete without the attachments. If an item is present in the property but is not inspected, the "NI" column will be checked and an explanation is necessary. The inspector may provide comments whether or not an item is deemed in need of repair.

<u>REFERENCES TO THE BUILDING CODES ARE IN ITALICS AND UNDERLINED TEXT AND ARE USED</u> <u>SOLELY FOR CLARIFICATION OF THE ITEM NOTED. THE QUOTATIONS FROM THE BUILDING CODE</u> <u>ARE FROM THE INTERNATIONAL BUILDING CODE PUBLISHED BY AND COURTESY OF THE</u> <u>INTERNATIONAL CODE COUNCIL, INC. UNLESS OTHERWISE NOTED.</u>

I. STRUCTURAL SYSTEMS

The subject structure was a two story, single family dwelling supported on what appeared to be a concrete slab-on-grade foundation. The exterior veneers were brick and wood fiber products siding. The roof was

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covered with composition shingles. The house was occupied at the time of the inspection. For the purposes of this report the house will be considered to be facing south. The weather was cloudy at the time of the inspection. There was no seller's disclosure document available for review at the time of the inspection.



A. Foundations

Type of Foundation(s): Appeared to be a concrete slab on grade foundation Comments:

Information: The foundation appeared to be performing without the obvious need of immediate remedial leveling at the time of the inspection, in my opinion.

B. Grading & Drainage – Comments:

Items noted during the visual inspection that were deemed deficient, are in need of repair, adjustment, restoration, that require comment, continuation of the due diligence process and/or servicing or items noted for information include but are not limited to:

<u>Deficiency:</u> The surrounding soils were in contact with the exterior finish of the structure along the south wall.

<u>Information</u>: The soil should be lowered to provide a clearance of four inches between the surface of the soil and the lower edge of the exterior veneer if the veneer is masonry and six inches if the veneer is other than masonry per Section R404.1.6 of the IRC. Soil in contact with the veneer allows easy access to the wall cavity and framing to insects. This situation also allows moisture to penetrate into the framing and interior wall coverings and floor coverings. The soil should be graded to prevent water from standing next to the foundation.

References: 404.1.6 Height above finished grade.

<u>Concrete and masonry foundation walls shall extend above the finished grade adjacent to the foundation at all</u> points a minimum of 4 inches (102 mm) where masonry veneer is used and a minimum of 6 inches (152 mm) <u>elsewhere.</u>

<u>Deficiency:</u> The front flower beds were sculpted so that the elevations of the beds appeared to be higher that the elevation of the foundation and the flower beds sloped toward the house.

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<u>Information:</u> Current codes provide that all ground water within ten feet of the foundation must drain away from the house. The flower beds should be lowered and the beds should be sloped to provide positive drainage of ground water away from the foundation.

References: 401.3 Drainage.

Surface drainage shall be diverted to a storm sewer conveyance or other approved point of collection so as to not create a hazard. Lots shall be graded so as to drain surface water away from foundation walls. The grade away from foundation walls shall fall a minimum of 6 inches (152 mm) within the first 10 feet (3048 mm).





C. Roof Covering Materials

Type(s) of Roof Covering: Composition Viewed From: from a ladder the edge of the Roof Comments:

Items noted during the visual inspection that were deemed deficient, are in need of repair, adjustment, restoration, that require comment, continuation of the due diligence process and/or servicing or items noted for information include but are not limited to:

NOTE: The surface of a roof begins to deteriorate as soon as it is placed into service and exposed to the elements. The degree of deterioration accelerates with the age of the roof and cannot be determined accurately by a visual inspection. Roof leaks can and may occur at anytime, regardless of the age of the roof, and cannot be accurately predicted. If roof leaks do occur, their presence does not necessarily indicate the need for total replacement of the roof coverings. Responsibility for future performance of the roof is specifically excluded from this report.

NOTE: The surface of the roof was not accessible to this inspector. The roof was viewed from a ladder at the lower eaves of the roof. All slopes of the roof could not be seen by this method. An inspection of the roof covering materials in this manner is not an effective inspection. A competent roofer with the equipment capable of safely reaching and staying on all of roof surfaces should be engaged to perform a proper inspection of the surface of the roof covering materials.

<u>Deficiency:</u> Water stains, indicating the possibility of active roof leaks, were found on the roof decking materials and framing members in the attic, etc.

<u>Information</u>: The source(s) of the water stains should be determined and repaired. While the stains may be from old leaks, it is assumed that if the roof covering materials had been repaired that the stain roof decking, ceiling or wall covering materials would have also been repaired.





<u>Deficiency:</u> Decayed roof decking materials were noted on the roof decking materials in the attic and along the drip and rake edges of the roof.

<u>Information</u>: The extent of the decayed materials could not be determined. All decayed roof decking materials should be replaced. For further information, see the paragraph on deteriorated materials in the "Walls" section of this report.



Deficiency: The counter flashing appeared to be improperly installed in some areas.

<u>Information</u>: The tab on the counter flashing is supposed to be cut back into the brick veneer to create a positive seal over the flashing. Instead, the edge of the tab was placed against the exterior of the veneer and the counter flashing was nailed to the veneer. A sealant was then applied to the opening that still exists between the top of the counter flashing and the brick veneer. If sealants were capable of preventing leaks over the life of the roof, then metal flashing would not be necessary. This installation will leak much sooner than properly installed counter flashing would. If the flashing is not cut into the brick veneer, maintenance will need to be performed on a periodic basis.





<u>Deficiency:</u> Counter flashing was not installed at the junctions of the brick veneer with the roof over the garden window.

<u>Information</u>: The purpose of counter flashing is to seal the opening between the tops of the step flashing sections and the brick veneer. The tab on the counter flashing is supposed to be cut back into the brick veneer to create a positive seal that covers the gap between the top of the flashing and the side of the brick. Flashing and counter flashing must be installed for the roof to perform properly without continual maintenance over its lifetime.



Deficiency: There was no drip edge or rake edge flashing materials installed in some areas.

<u>Information</u>: Drip and rake edge flashing materials are not required by the shingle manufacturer but they are recommended. As most of the roof perimeter had drip edge and rake edge flashing, it is assumed that it was intended that all of the roof perimeter was to have edge flashing installed. It is recommended that drip and rake edge flashing material should be installed when the roof covering materials are replaced.

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Deficiency: The drip edge flashing was installed on top of the rake flashing.

<u>Information</u>: This creates an open seam for water traveling down the slope of the roof and can be a source of a leak or leaks. The drip edge flashing should be installed under the rake flashing to eliminate the open seam.

<u>Deficiency</u>: J flashing was used to seal the junctions between the roof's surface and the side walls.

<u>Information</u>: Section R905.2.8.4 of the International Residential Code (IRC) and the manufacturer of the shingles, per the instructions on the shingle bundles and on their websites, require that the junctions between the roof's surface and the side walls be flashed by the step flashing method. Step flashing creates redundancy in the metal sealing the roof/wall junctions. J flashing only provides a single layer of metal. Redundancy in water proofing materials on the surface of the roof is preferable. Many builders or roofers state that J flashing is an "approved alternate method". You should determine who "approves" the material as an alternate method and what their liability to you would be in case of a leak and damage to your property. Building officials do not have the absolute right to change the code. They can only change the code when a code cannot be met and the system used as an alternative at least meets the requirements of the code section.

References: 905.2.8.4 Sidewall flashing.

Flashing against a vertical sidewall shall be by the step-flashing method.

<u>R104.1 General.</u>

The building official is hereby authorized and directed to enforce the provisions of this code. The building official shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of its provisions. Such interpretations, policies and procedures shall be in conformance with the intent and purpose of this code. Such policies and procedures shall not have the effect of waiving requirements specifically provided for in this code.

R104.10 Modifications.

Wherever there are practical difficulties involved in carrying out the provisions of this code, the building official shall have the authority to grant modifications for individual cases, provided the building official shall first find that special individual reason makes the strict letter of this code impractical and the modification is in compliance with the intent and purpose of this code and that such modification does not lessen health, life and fire safety requirements or structural. The details of action granting modifications shall be recorded and entered in the files of the department of building safety.

The building official has the authority to accept modifications of the code provisions in specific cases. For the building official to allow a modification, he or she must first determine that the strict application of the code is impractical for a specific reason. When the building official grants a modification, it is not a waiver from the requirements. It should be thought of as fulfilling the requirements to the greatest extent possible but deviating from the requirements slightly in order for the intent of the provisions to be met. The modification must not lessen the health, fire-safety, life-safety or structural requirements of the code. All modification actions must be recorded in the files of the building department.

R104.11 Alternative materials, design and methods of construction and equipment.

The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. An alternative material, design or method of construction shall be approved where the building official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code.

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Compliance with the specific performance-based provisions of the International Codes in lieu of specific requirements of this code shall also be permitted as an alternate.

Deficiency: There were offsets in the roof decking materials along the rakes.

<u>Information</u>: These offsets create openings for water to enter the structure. These offsets should be sealed to prevent water penetration.



<u>Deficiency:</u> There was a shingle tab in the front gutter.

<u>Information</u>: It could not be determined if a tab was missing from the surface of the roof at the time of the inspection as all of the surfaces of the roof were not visible. It is possible that the tab was from damage to the roof that had been repaired as there appeared to have been some repairs made to the roof covering materials. The roof should be inspected from the surface of the roof to determine if there are missing tabs.



<u>Deficiency:</u> Exposed fasteners were noted in several areas of the roof's surface and some fasteners had pushed through the shingle tabs.

<u>Information</u>: The heads of the nails will rust and deteriorate, leaving openings through the roof covering material. The exposed fasteners should be covered and sealed.

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<u>Deficiency</u>: Some of the roofing shingles were improperly or inadequately fastened to the roof deck.

<u>Information</u>: All shingles are required to have a minimum of four fasteners per shingle, six fasteners in high wind zones. The fasteners are required to be located in the nailing strip so that the fastener penetrates the shingle in approximately the middle of the shingle and penetrates the underlying shingle along the top of that shingle. Fasteners are required to be located close to the rakes and ends of each shingle to reduce the chances of the shingle from being stripped in high winds. All shingles should be properly and correctly fastened to the roof deck to prevent the shingles from being stripped from the roof in high wind conditions.

References: R905.2.5 Fasteners.

Fasteners for asphalt shingles shall be galvanized steel, stainless steel, aluminum or copper roofing nails, minimum 12 gage [0.105 inch (2.67 mm)] shank with a minimum 3/8-inch (9.5mm) diameter head, ASTMF 1667, of a length to penetrate through the roofing materials and a minimum of 3/4 inch (19.1 mm) into the roof sheathing. Where the roof sheathing is less than 3/4 inch (19.1 mm) thick, the fasteners shall penetrate through the sheathing. Fasteners shall comply with ASTM F 1667.

R905.2.6 Attachment.

Asphalt shingles shall have the minimum number of fasteners required by the manufacturer. For normal application, asphalt shingles shall be secured to the roof with not less than four fasteners per strip shingle or two fasteners per individual shingle. Where the roof slope exceeds 20 units vertical in 12 units horizontal (20:12), special methods of fastening are required. For roofs located where the basic wind speed per Figure R301.2(4) is 110 mph (177 km/h) or greater, special methods of fastening are required. Special fastening methods shall be tested in accordance with ASTM D 3161, modified to use a wind speed of 110 mph (177 km/h). Shingles classified using ASTM D 3161 are acceptable for use in wind zones less than 110 mph. Shingles classified using ASTMD3161 modified to use a wind speed of 110 mph are acceptable for use in all cases where special fastening is required.

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In all cases, the minimum number of fasteners for asphalt shingles must be the number required by the shingle manufacturer. It is typical for asphalt strip shingles to be attached to the roof sheathing by at least four fasteners for each strip shingle. If individual shingles are installed, at least two fasteners are required per shingle. For very steep roof slopes, the manufacturer's installation instructions should be reviewed for any special fastening methods. Where the basic wind speeds in accordance with Figure R301.2 (4) are greater than or equal to 110 mph (177.1 km/h), special testing is required to determine how such roofing should be fastened. The fastening methods must be specifically tested to ASTM D 3161, but the test must be modified to accommodate the wind speed of 110 mph (177.1 km/h). ASTM D 3161 deals with several ranges of wind speeds. More basic wind speeds are considered up to 110 mph (177.1 km/h). Therefore, areas prone to higher winds must comply with the modified test. From the Commentary to the IRC.

Example provided by GAF/Elk Roofing Materials Installation Instructions.



Deficiency: Some of the shingles had not bonded or sealed to each other.

<u>Information</u>: These shingle tabs could be lifted by hand. An adhesive strip is manufactured into each shingle. The adhesive is softened by the heat of the sun and bonds to the shingle below. Some manufacturers contend that the bonding or sealing of the shingles to each other is more important than the location of the fasteners in securing the

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shingles to the roof deck. Failure of the shingles to bond makes it far more likely that the shingles will be stripped off the roof when the roof covering material is subjected to high wind loads. Failure of the shingles to bond or seal is often an indication of a manufacturer's defect. The manufacture should be contacted for recommendations on the replacement of the shingles or for the application of an adhesive to seal the shingles.

References: R905.2.4 Asphalt shingles.

Asphalt shingles shall have self-seal strips or be interlocking, and complywithASTMD225 or D 3462.



<u>Deficiency</u>: The shingles were not bonded to the started course in some areas.

<u>Information</u>: A starter course is required to be installed. Starter courses are made by using a special starter strip made by the shingle manufacturer or by removing the tags from an ordinary shingle and installing the shingle with the tab removed so that the adhesive line is at the bottom. This allows the shingle above to bond or seal to the starter strip. One of the purposes of the starter course is to provide a bonding strip for the shingle above to reduce the chances of the first shingle course being lifted in high wind conditions. The started course should be manually sealed to the shingles above or the starter course should be replaced.

References: Provided by GAF/Elk Roofing Materials, Inc.





<u>Deficiency</u>: The dish for the satellite antenna system had been bolted to the roof deck through the shingles.

<u>Information</u>: There was no attempted to make the junction of the bracket with the shingles or the penetrations of the bolts through the shingles water proof. The bracket junction and the bolt penetrations should be made water proof or the dish should be removed from the surface of the roof. If the dish is removed, the damaged shingles should be replaced.

Deficiency: The PVC sewer vent pipes above the surface of the roof had not been painted.

Information: The PVC pipes must be painted to protect the PVC from degradation by the ultra violet rays of the sun.



Deficiency: Some of the sewer vent pipe penetrations of the roof deck were sealed with neoprene roof jacks.

<u>Information</u>: The effective life of these roof jacks is limited to a few years. The roof jacks should be checked annually for cracks and separations from the vent pipes. These type jacks are known to leak after a few years use.

<u>Deficiency:</u> There were indications that some of the shingles on the roof had been replaced indicating past repairs which may indicate that the roof leaked in the past.

Information: Information on the replaced shingles should be obtained from the current owner.

<u>Deficiency:</u> The roof covering materials appeared to have reached the end of their useful economic life and should be replaced at this time, in my opinion.



D. Roof Structure & Attic

Viewed From: the Interior of the Attic Approximate Average Depth of Insulation: 6 inches Approximate Average Thickness of Vertical Insulation: 6 inches Comments:

Items noted during the visual inspection that were deemed deficient, are in need of repair, adjustment, restoration, that require comment, continuation of the due diligence process and/or servicing or items noted for information include but are not limited to:

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NOTE: The western half of the second story attic behind the water heater was not accessible and could not be inspected. The attic framing, the roof deck and the parts, components and systems contained in this section of the attic were not accessible and were not inspected. The attic framing, the roof deck and the parts, components and systems contained in this section of the attic are specifically excluded from the inspection and from this report.

Deficiency: The chimney chase was supported on the roof deck.

<u>Information</u>: The chase should have been a continuous structure from the foundation to the top of the chase. The roof framing did not appear to have been reinforced to accommodate the additional load of the chase. There were limited provisions made to restrain the chase from rotating in high winds. The chase should be properly supported and restrained from overturning.

References: R1002.5 Support.

Where factory-built chimneys are supported by structural members, such as joists and rafters, such members shall be designed to support the additional load.

Deficiency: The attic was inadequately ventilated in my opinion.

<u>Information</u>: While the ventilation of the attic may meet the requirements of the IRC, the IRC is intended to be a worldwide code. Its provisions may not be adequate or reasonable for certain areas of the globe. The IRC in no way limits a builder from exceeding the minimum requirements of the code in order to provide a better product for the consumer. Additional ventilation should be installed in my opinion.

Deficiency: There was no landing at the top of the attic access ladder.

<u>Information:</u> A landing that connects to the walkway to the appliances should be installed at the top of the attic access ladder on the attic floor for safety.

References: M1305.1.3 Appliances in attics.

Attics containing appliances requiring access shall be provided with an opening and a clear and unobstructed passageway large enough to allow removal of the largest appliance, but not less than 30 inches (762 mm) high and 22 inches (559 mm) wide and not more than 20 feet (6096 mm) in length when measured along the centerline of the passageway from the opening to the appliance. The passageway shall have continuous solid flooring in accordance with Chapter 5 not less than 24 inches (610 mm) wide. A level service space at least 30 inches (762 mm) deep and 30 inches (762 mm) wide shall be present along all sides of the appliance where access is required. The clear access opening dimensions shall be a minimum of 20 inches by 30 inches (508 mm by 762 mm), where such dimensions are large enough to allow removal of the largest appliance.

E. Walls (Interior & Exterior) – Comments:

Items noted during the visual inspection that were deemed deficient, are in need of repair, adjustment, restoration, that require comment, continuation of the due diligence process and/or servicing or items noted for information include but are not limited to:

<u>Deficiency:</u> Indications of possible water penetration was noted on the interior of the window frame of the dining room and on the window treatment for that window.

<u>Information</u>: The sources of the water penetration should be determined and repaired. The presence of water penetration may indicate the growth of microbial organic organisms that may be toxic. Indoor air quality tests are not a part of this inspection. Should you desire an indoor air quality test, the test should be arranged prior to closing.

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Once the sources of the water penetration have been determined and repaired, all decayed, deteriorated or damaged materials, including walls covering materials, trim, moldings, and insulation and framing members should be removed and replaced and finished to match the existing structure.



Deficiency: The exhaust fan in the powder room was installed on the ceiling under the staircase.

<u>Information</u>: Staircases are required to be firestopped on the underside of the staircase and at the top and bottom of each flight. Firestopping is required in these areas to slow the speed of a fire and to keep the staircase standing and usable for as long as possible in the event of a fire. This requirement is made to give the people in the upper stories of the house a chance to escape. Proper firestopping should be provided for safety.

References: R602.8 Fireblocking required.

Fireblocking shall be provided to cut off all concealed draft openings (both vertical and horizontal) and to form an effective fire barrier between stories, and between a top story and the roof space. Fireblocking shall be provided in wood-frame construction in the following locations.

1. In concealed spaces of stud walls and partitions, including furred spaces and parallel rows of studs or staggered studs; as follows:

1.1. Vertically at the ceiling and floor levels.

1.2. Horizontally at intervals not exceeding 10 feet (3048 mm).

2. At all interconnections between concealed vertical and horizontal spaces such as occur at soffits, drop ceilings and cove ceilings.

3. In concealed spaces between stair stringers at the top and bottom of the run. Enclosed spaces under stairs shall comply with Section R311.2.2.

4. At openings around vents, pipes, and ducts at ceiling and floor level, with an approved material to resist the free passage of flame and products of combustion.

5. For the fireblocking of chimneys and fireplaces, see Section R1001.16.

6. Fireblocking of cornices of a two-family dwelling is required at the line of dwelling unit separation.

To restrict the movement of flame and gasses to other areas of a building through concealed passages in building components such as floors, walls and stairs, fireblocking of these concealed combustible spaces is required to form a barrier between stories and between a top story and the roof space. From the Commentary to the IRC.

R311.2.2 Under stair protection.

Enclosed accessible space under stairs shall have walls, under stair surface and any soffits protected on the enclosed side with 1/2-inch (12.7 mm) gypsum board.

Often times the space under a stairway is used for storage, since this space is often of little use for other purposes. The code permits the use of an open space beneath a stair without the need for any additional protection.

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Additionally, if the space is walled off and there is no access to the area, then the code is also not concerned. If, however, the area beneath the stairway is enclosed and any type of access is provided into the space, then the walls, soffits and ceilings of the enclosed space must be protected on the enclosed side with at least 1/2-inch (12.7 mm) gypsum board. From the Commentary to the IRC.

R602.8.1.2 Fireblocking integrity.

The integrity of all fireblocks shall be maintained.

Piping, ducts, or other similar items that pass through firestops must be installed so that the integrity of the firestop is maintained. This may be accomplished by packing an oversized hole with an acceptable fireblocking material. From the commentary to the IRC.



<u>Deficiency:</u> The exterior frame windows, door and other wall penetrations installed through the wood siding were not properly flashed.

<u>Information</u>: Metal flashing, called "Z" flashing, should have been installed during construction of the structure. Z flashing is cut into the frame siding and covers the top piece of trim to prevent water from entering the trim or window frame. Z flashing is meant to prevent water penetration, not to act as a drain after water penetration has occurred. Proper Z flashing materials should be installed to prevent water penetration.

References: 703.8 Flashing.

Approved corrosion-resistive flashing shall be provided in the exterior wall envelope in such a manner as to prevent entry of water into the wall cavity or penetration of water to the building structural framing components. The flashing shall extend to the surface of the exterior wall finish and shall be installed to prevent water from reentering the exterior wall envelope. Approved corrosion-resistant flashings shall be installed at all of the following locations: 1. At top of all exterior window and door openings in such a manner as to be leakproof, except that self-flashing windows having a continuous lap of not less than 1 1/8 inches (28 mm) over the sheathing material around the

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perimeter of the opening, including corners, do not require additional flashing; jamb flashing may also be omitted when specifically approved by the building official.

2. At the intersection of chimneys or other masonry construction with frame or stucco walls, with projecting lips on both sides under stucco copings.

3. Under and at the ends of masonry, wood or metal copings and sills.

4. Continuously above all projecting wood trim.

5. Where exterior porches, decks or stairs attach to a wall or floor assembly of wood-frame construction.

6. At wall and roof intersections.

7. At built-in gutters.

The code requires that all points subject to the entry of moisture be appropriately flashed. Roof and wall intersections and parapets create significant challenges, as do exterior wall openings exposed to the weather. Where wind-driven rain is expected, the concerns are even greater. While the code identifies a number of locations where flashing is specifically required, the entire exterior envelope must be weather-tight to protect the interior from weather. Therefore, any location on the exterior envelope that provides a route for the admission of water or moisture into the building must be properly protected. From the commentary to the IRC.



Courtesy of James Hardie Products, Inc.

Courtesy American Plywood Association, Inc.

Deficiency: All penetrations through the cladding materials had not been sealed or flashed.

<u>Information:</u> Any and all penetrations are required to be sealed and/or flashed in such a manner as to prevent water penetration through the cladding materials. All wall penetrations should be properly flashed and sealed. See information on Section 703.8 of the IRC above.



Deficiency: Efflorescence was noted on the exterior brick veneer in some areas.

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<u>Information</u>: Efflorescence is the leaching of calcium salts caused by water flowing through the bricks. The leaching of the calcium salts weakens the brick over time. The sources of the water penetration should be identified and corrected. Proper wall drains should be installed. The bricks should be cleaned and sealed to prevent further water penetration problems.





<u>Deficiency:</u> Deteriorated wood was found on the interior of the house on the master bathtub enclosure, on the exterior siding, trim, window frames, door frames, fascia and rood decking materials, etc.

<u>Information</u>: The presence of deteriorated wood indicates the need for an examination by a qualified licensed pest control inspector. Presence or damage from termites, rot or other wood infesting organisms is not part of this report. Detection of wood infesting organisms is reserved by Texas Law to the structural termite inspection. All deteriorated material, regardless of the cause, should be removed and replaced with sound new lumber finished to match the existing structure.





Deficiency: A control joint in the brick veneer had not been sealed with a caulk.

<u>Information:</u> While the control joint is present to allow movements in the brick veneer wall to relieve stress, a pliable water proof caulk over a backer rod must be installed to reduce, if not eliminate, water penetration into the wall cavity.

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<u>Deficiency:</u> The junctions of the window frames and door frames with the brick veneer were not properly caulked.

<u>Information</u>: The lack of caulk can allow water into the wall cavity and can allow a more ready transfer of air from the exterior of the house to the interior of the house. All of the wall openings should be properly sealed to reduce water penetration, to reduce access to pests and insects and to limit the transference of air from the interior of the house to the exterior atmosphere.

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<u>Deficiency</u>: The vertical junction of the brick veneer with the wood fiber products siding was not sealed.

<u>Information</u>: The vertical junction should be sealed to prevent water penetration and to reduce access openings to pests and insects.



Deficiency: A piece of trim was missing from above the front door.

<u>Information</u>: The piece of trim was used to seal the opening between the front door frame and the brick veneer. The missing section of trim should be replaced.



<u>Deficiency:</u> Much of the exterior "wood" siding was made of a particle board generally marketed under the name of "masonite".

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<u>Information</u>: Masonite siding deteriorates much like an old sponge. As the material deteriorates, the layers of the laminated materials separate and fall of the house. Masonite siding has been the subject of any number of lawsuits and funds from these lawsuits had been set aside for the replacement of the siding. It is not known if any of these funds are still available. You should determine if there are funds from these lawsuits available for the replacement of the siding. The siding showed minor evidence of delamination and decay at the time of the inspection however, the rate of deterioration of the siding, once deterioration begins, is usually rapid. Plans should be made to replace the defective siding. Some sections of Masonite siding had already been replaced.



F. Ceilings & Floors – Comments:

Items noted during the visual inspection that were deemed deficient, are in need of repair, adjustment, restoration, that require comment, continuation of the due diligence process and/or servicing or items noted for information include but are not limited to:

<u>Deficiency:</u> There were patches in the drywall coverings of the ceilings in the living room, master closet and upstairs hallway, etc.

<u>Information</u>: The causes of the patches could not be determined. Information on the patches should be obtained from the current owner.





Master closet ceiling



Living room ceiling

Upstairs hallway ceiling

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<u>Deficiency:</u> High moisture contents were found in the hardwood flooring slats by the use of a non destructive water meter throughout the first story of the house where hardwoods were installed.

<u>Information:</u> High moisture contents may indicate moisture penetration through the flooring system. All sources of possible moisture penetration should be determined and corrected. The moisture content of the surface of the concrete slab should have been determined prior to the installation of the hardwood flooring according to manufacturer's and the industry's installation policies. The moisture content of the surface of the slab should be determined at this time. If there is excessive moisture in the surface of the slab the floor will not stay bonded and the flooring may deteriorate. You should consult a competent hardwood flooring contractor for information on drying the hardwood flooring and keeping it dry in the future.



G. Doors (Interior & Exterior) – Comments:

Items noted during the visual inspection that were deemed deficient, are in need of repair, adjustment, restoration, that require comment, continuation of the due diligence process and/or servicing or items noted for information include but are not limited to:

Deficiency: There were double cylinder dead bolts on the exterior doors.

Information: Keyless dead bolts are required on exterior doors for safety to allow egress without searching for a key in an emergency. When in an emergency, many people panic and loose the ability to reason. The use of a keyless deadbolt removes the necessity of a person have to think logically to locate a key when faced with an emergency situation. The keyed deadbolts should be replaced with keyless deadbolt on the interior side of the doors.

References: 311.4.4 Type of lock or latch.

<u>All egress doors shall be readily openable from the side from which egress is to be made without the use of a key or special knowledge or effort.</u>

H. Windows – Comments:

Items noted during the visual inspection that were deemed deficient, are in need of repair, adjustment, restoration, that require comment, continuation of the due diligence process and/or servicing or items noted for information include but are not limited to:

Deficiency: Some of the windows were difficult to open, close and/or latch.

<u>Information</u>: The windows should be adjusted to open, close and latch properly. The bedroom windows are considered emergency escapes. If the windows are difficult to operate, the occupant of the room may not be able to escape during a fire or other emergency.

Deficiency: Torn or damaged window screens should be repaired or replaced.

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I. Stairways (Interior & Exterior) – Comments:

Items noted during the visual inspection that were deemed deficient, are in need of repair, adjustment, restoration, that require comment, continuation of the due diligence process and/or servicing or items noted for information include but are not limited to:

Deficiency: The balusters or spindles on the staircase guardrails were too far apart for current standards.

<u>Information</u>: The balusters or spindles are required to be installed so that a 4 inch diameter sphere cannot pass through the balusters. This is to prevent a child from getting through the guardrail and falling.

References: R312.2 Guard opening limitations.

<u>Required guards on open sides of stairways, raised floor areas, balconies and porches shall have intermediate rails</u> or ornamental closures which do not allow passage of a sphere 4 inches (102mm) or more in diameter.

Exceptions:

The triangular openings formed by the riser, tread and bottom rail of a guard at the open side of a stairway are permitted to be of such a size that a sphere 6 inches (152 mm) cannot pass through.
Openings for required guards on the sides of stair treads shall not allow a sphere 43/8 inches (107 mm) to pass through.



J. Fireplace/Chimney - Comments:

Items noted during the visual inspection that were deemed deficient, are in need of repair, adjustment, restoration, that require comment, continuation of the due diligence process and/or servicing or items noted for information include but are not limited to:

<u>Deficiency:</u> Gas logs were installed in the fireplace. The damper should be equipped with a spacer so that the damper can be partially opened when the gas logs are in use.

<u>Information</u>: Many people think that the burning of these artificial logs presents no hazard. Natural gas is combusted to make the fire. The combustion of natural gas produces carbon monoxide gas, which can be harmful or fatal. The purpose of the spacer is to hold the damper slightly open allow the carbon monoxide to escape from the interior of the house. With the use of the spacer, the owner/occupant does not have to remember to open the damper when the fireplace is in use. A damper spacer should be installed for safety.

<u>Deficiency:</u> The crown was not accessible and could not be observed. The crown is specifically excluded from this report.



K. Porches, Balconies, Decks, and Carports – Comments:

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NOTE. There were no visible structural defects noted in the existing porches or decks that indicated the need for immediate repair at the time of the inspection, in my opinion.

L. Other – Comments:
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II. ELECTRICAL SYSTEMS

A. Service Entrance and Panels – *Comments:*

Items noted during the visual inspection that were deemed deficient, are in need of repair, adjustment, restoration, that require comment, continuation of the due diligence process and/or servicing or items noted for information include but are not limited to:

<u>NOTE</u>: Electrical service was provided to the house by underground conductors. The conduit protecting the conductors was continuous and was not damaged, where visible. The meter was securely attached to the structure. The grounding conductor was visible and appeared to be securely fastened to the grounding electrode.

<u>Deficiency:</u> There was only one grounding electrode visible on the property.

<u>Information</u>: Grounding requires the use of a grounding system. A second means of grounding should be installed in accordance with Sections E3507.6 and E3508 of the IRC. The IRC and the NEC require that a grounding system be installed. A grounding system, as defined by the electrical codes, means two direct grounding electrodes or a made electrode and a concrete encased electrode with access to the connection of the concrete encased electrode. Access to a concrete encased electrode or to a grounding ring does not have to be provided and may not be visible. The presence of a proper grounding electrode system should be verified or a proper grounding electrode system should be installed for safety.

References: E3507.6 Common grounding electrode.

The service grounding electrode in or at a building shall be used to ground conductor enclosures and equipment in or on that building. Two or more grounding electrodes that are effectively bonded together shall be considered as a single grounding electrode system.

This section requires that the grounding electrode used to ground the service neutral conductor must also be used to ground all the metallic enclosures in the electrical system. With one grounding electrode used to ground all of these components, there will not be a different potential; all enclosures will be at the same zero voltage potential as the grounded service conductor. Where two or more grounding electrodes are used at the premises, they must be effectively bonded together and considered as one grounding electrode. This keeps all non-current carrying metal surfaces in the electrical system at earth potential. From the Commentary to the IRC.

<u>Deficiency</u>: The grounding electrode was not fully buried into the ground.

<u>Information:</u> The grounding rod is required to be buried its full length into the earth. The connection of the grounding electrode to the grounding conductor and the grounding conductor itself should be protected from physical damage.

References: E3508.2.2 Installation.

The electrode shall be installed such that at least 8 feet (2438 mm) of length is in contact with the soil. It shall be driven to a depth of not less than 8 feet (2438 mm) except that, where rock bottom is encountered, the electrode shall be driven at an oblique angle not to exceed 45 degrees from the vertical or shall be buried in a trench that is at least 2.5 feet (762 mm) deep. The upper end of the electrode shall be flush with or below ground level unless the aboveground end and the grounding electrode conductor attachment are protected against physical damage.

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Deficiency: A grounding conductor was connected to an exterior faucet on the east side of the house.

<u>Information</u>: This conductor may serve as a bond on the copper water pipes but cannot be the service grounding system as defined by the National Electric Code. As the main water shut off valve was in the laundry room, the bonding conductor connection to the exterior faucet could not have been within five feet of where the water main pipe entered the structure. A second proper earth grounding made electrode should be installed for safety.

References: E3508.1 Grounding electrode system.

Where available on the premises at each building or structure served, electrodes specified in Sections E3508.1.1, E3508.1.2 and E3508.1.3, and any made electrodes specified in Section E3508.2, shall be bonded together to form the grounding electrode system. Interior metal water piping located more than 5 feet (1524mm) from the point of entrance to the building shall not be used as part of the grounding electrode system or as a conductor to interconnect the electrodes that are part of the grounding electrode system.



<u>NOTE</u>: The breaker panel was an interior 200 Amp Challenger box with 150 Amp main disconnects. The service entrance conductors were 2/0 aluminum conductors. The conductors to the interior of the house were copper. The branch circuits were rated as follows:

1 50-240	820-120
1 40-240	1415-120
2 30-240	





Deficiency: The circuits were not properly labeled or identified in the breaker panel.

<u>Information</u>: As the circuits were not identified, it could not be determined if the circuits were properly sized for the listed appliances. Over sizing of overcurrent protective devices on any appliance is a recognized fire hazard. The National Electric Code, Section 408.4, states that identifying circuits as 'bedrooms or wall outlets or light switches' is not adequate. Labeling must be specific as to which appliances are to be protected by the over current device. The circuits should be rated and certified by a competent electrician according to the listings of the appliances.

<u>Deficiency:</u> The aluminum service entrance current carrying conductors had not been treated with an antioxidizing compound.

<u>Information</u>: The service entrance conductors between the meter and the breaker panel were aluminum conductors, as are almost all service conductors throughout this area. The aluminum conductors should be cleaned and treated with an anti oxiding compound. Electricity tends to flow on the surface of a conductor and aluminum oxide is a worse conductor than aluminum. The presence of aluminum oxide increases the resistance of the conductor, which increases the heat in the conductor and forces an increase in electrical flow in order to maintain the electrical service, all of which increases electrical use and your cost for electricity. While the metals used for the connectors for the panel are compatible for use with aluminum wiring as far as thermal expansion is concerned, the possibility of galvanic action remains. The anti oxidizing mastic should be replaced as it dissipates.

<u>References:</u> It is very important to use an approved oxide-inhibiting compound on aluminum conductors. Where aluminum conductors are subject to moisture or even very high humidity, oxidation can occur. Oxidation of aluminum can cause a thin film or layer, which looks like a powder, on the conductor. It will result in heat build-up by impeding the current flow. From the Commentary to the IRC.

Deficiency: The main service conductors had been notched when the insulation was cut.

<u>Information</u>: The conductor material cannot be damaged as the damage to the surface of the conductor disrupts the flow of electricity. As electricity travels on or near the surface of a conductor, a nick in the conductor creates a point of resistance. The resistance causes an increase in the current to overcome the resistance which increases the heat of

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the conductor. The increase in heat increases the rate of deterioration of the conductor. The damage conductors should be replaced.

References: E3306.9 Terminals.

Connection of conductors to terminal parts shall be made without damaging the conductors and shall be made by means of pressure connectors, including set-screw type, by means of splices to flexible leads, or for conductor sizes of No. 10 and smaller, by means of wire binding screws or studs and nuts having upturned lugs or the equivalent. Terminals for more than one conductor and terminals for connecting aluminum conductors shall be identified for the application.

<u>Connections must be made without damaging the conductors. When stripping the insulation from the ends of</u> <u>conductors, it is easy to nick or cut into the wire. Using improper techniques or tools when stripping the conductors</u> <u>may damage the softer aluminum conductors. From the Commentary to the IRC.</u>



<u>Deficiency:</u> The conductors entering the panel board were bundled.

<u>Information</u>: Section 312.5 (C) of the National Electric Code (NEC) provides that each cable shall be secured to the cabinet. The section prohibits the installation of several cables bunched together through a knockout or chase unless specific rules are followed under the exception. Bundling of the conductors eliminates air space and restricts the diffusion of heat. The conductors entering the panel board should be separated for safety.

References: Section 312.5 (C) of the National Electric Code

Where cable is used, each cable shall be secured to the cabinet, cutout box or meter socket enclosure.

The main rule of 312.5 (C) prohibits the installation of several cables bunched together and run through a knockout or chase nipple. Individual cable clamps or connectors are required to be used with only one cable per clamp or connector, unless the clamp or connector is identified for more than a single cable.

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<u>Deficiency:</u> Although the breaker panel was not labeled, it could be determined that some of the 240 volt breakers were oversized for the appliances on the circuit.

<u>Information</u>: For example, the oven was a 4.7 kW, or 20 Amp, appliance. The north air conditioning condensing unit allowed for a maximum overcurrent protective device of 25 Amps. As there were no 20 or 25 Amp, 240 volt circuit breakers in the panel board, it can be safely assumed that the breakers to these appliances are oversized. The purpose of the breaker is to provide protection to the conductors first and to the appliances second. Over sizing is not allowed as the appliance could burn and the breakers will not necessarily trip. This is an unsafe condition. All unsafe conditions should be properly repaired.

References: E3303.3 Listing and labeling.

<u>Electrical materials, components, devices, fixtures and equipment shall be listed for the application, shall bear the label of an approved agency and shall be installed, and used, or both, in accordance with the manufacturer's installation instructions.</u>

E3304.3 Circuit characteristics. The overcurrent protective devices, total impedance, component short-circuit current ratings and other characteristics of the circuit to be protected shall be so selected and coordinated as to permit the circuit protective devices that are used to clear a fault to do so without extensive damage to the electrical components of the circuit. This fault shall be assumed to be either between two or more of the circuit conductors or between any circuit conductor and the grounding conductor or enclosing metal raceway. Listed products applied in accordance with their listing shall be considered to meet the requirements of this section.

Deficiency: Multiple grounded (neutral) conductors were connected under one screw on the bus bars.

<u>Information</u>: The IRC (International Residential Code) and the National Electric Code provide that all current carrying conductors be connected to any and all electrical component by only one screw. As electricity travels on the surface of a conductor, poor contact at the connection points reduces the surface area of the contact point and can result in damage to the conductor. The grounded conductors should be separated so that only one conductor is connected to each port of the bus bars.

References: E3306.9 Terminals.

Connection of conductors to terminal parts shall be made without damaging the conductors and shall be made by means of pressure connectors, including set-screw type, by means of splices to flexible leads, or for conductor sizes of No. 10 and smaller, by means of wire binding screws or studs and nuts having upturned lugs or the equivalent. Terminals for more than one conductor and terminals for connecting aluminum conductors shall be identified for the application.

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Connections must be made without damaging the conductors. When stripping the insulation from the ends of conductors, it is easy to nick or cut into the wire. Using improper techniques or tools when stripping the conductors may damage the softer aluminum conductors. In many installations, two or more conductors are connected under one terminal since it is easy to install them and they will fit. However, terminals for connecting multiple conductors must be listed for this purpose. Most modern equipment such as panelboards has terminal strips with a sufficient number of terminals to connect all necessary circuit conductors. In some cases, it may be necessary to install additional terminal strips in order to terminate each conductor under a separate terminal. If the terminals are approved for the connection of more than one conductor, the approval will be stated in the listing information or supplied with the packaging of the equipment. (From the Commentary to the IRC).



Deficiency: The conductors and components on the interior of the panel had been painted.

<u>Information</u>: Paint is an inhibitor to electrical current. The presence of paint on the conductors and components increases the resistance in the conductors and components which causes an increase in amperage flow. It is the amperage that creates heat. All electrical components and conductors are designed to dissipate certain amounts of heat. The presence of inhibitors can cause an increase in amperage to overcome the additional resistance cause an increase in heat. This unnecessary excess heat reduces the functional life of the conductors and components and the appliances, increases electrical usage and raises electrical bills and increases the chances of a fire starting. The panel and all other foreign materials or compounds should be removed from all electrical conductors and components for safety.

References: E3304.6 Integrity of electrical equipment.

Internal parts of electrical equipment, including busbars, wiring terminals, insulators and other surfaces, shall not be damaged or contaminated by foreign materials such as paint, plaster, cleaners or abrasives, and corrosive residues. There shall not be any damaged parts that might adversely affect safe operation or mechanical strength of the equipment such as parts that are broken; bent; cut; deteriorated by corrosion, chemical action, or overheating. Foreign debris shall be removed from equipment.



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<u>Deficiency:</u> Some of the internal current carrying components of the panel showed indications of heat damage.

<u>Information</u>: All electrical components and rules include concerns over the diffusion of heat. The movement of electrical current across a conductor generates heat. Inhibitors increase heat. When components show indications of heat damage, the cause(s) of the excess heat should be determined and corrected. The heat damaged components should be replaced for safety.



<u>Deficiency:</u> A new electric range and a new electric over had been installed. The original 3 conductor system remained from the breaker panel to the appliance junction box.

<u>Information</u>: The electrical circuit servicing the new range and the new oven had not been updated as required by the model building codes. Under the rules that were in place at the time the range and oven were replaced, all 240 circuits servicing appliances with 120 volt components, such as a light, heat indicator lights, a clock and/or a timer, etc. require four conductors to provide a neutral (grounded) conductor to complete the 120 volt circuit. The lack of a grounded (neutral) conductor means that either the uninsulated equipment grounding conductor must be used as a neutral conductor of that the casing of the unit acts as the neutral. This means that the uninsulated grounding conductor will carry electrical current or the appliance itself will complete the 120 volt circuit meaning that the appliance surfaces may be electrically charged. Either situation is a fire, shock and/or electrocution hazard. The circuit should be immediately updated to meet modern requirements for safety to prevent electric current from flowing on the uninsulated branch grounding conductor or on the appliance. This is an unsafe condition. All unsafe conditions should be properly corrected.

<u>Deficiency</u>: The range and oven appeared to be serviced by a single branch circuit.

<u>Information:</u> While this is allowed, under certain circumstances, by the National Electric Code, the practice is not allowed by the manufacturers of most appliances. The restrictions of the manufacturer take precedence over the code. In this installation, the conditions of the code do not appear to have been met in any case. The range and oven should be serviced by separate electrical circuits. The code allows the combination of one range and one oven mounted oven, located in the same room, per Table 220.55 of the NEC, when the kW ratings of the units are added and treated as a single range. As the kilowatt rating of the range was not visible, it could not be determined what size the circuit should be. The sizing of the circuit should be certified as being correct and safe or the circuits should be separated.

Deficiency: The conductors in the panel were not properly color coded.

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Information: Neutral (white insulated) conductors were used as hot conductors and were not identified as hot, or ungrounded, conductors. All hot (ungrounded) conductors are required to be identified by the use of any color other than white, gray or green or bare copper. The conductors should be properly identified for safety.

References: E3307.3 Ungrounded conductors.

Insulation on the ungrounded conductors shall be a continuous color other than white, gray or green.

Deficiency: Sheet metal screws were used to attach the dead front to the box.

Information: The fasteners must be blunt tipped to prevent the fasteners from penetrating a live conductor. The sheet metal screws should be replaced with blunt tipped fasteners for safety.

Deficiency: There were no arc-fault breakers installed in the panel.

Information: Arc-fault circuits are required for all outlets family rooms, dining rooms, living rooms, parlors, libraries, dens, bedrooms, sunrooms, recreations rooms, closets, hallways, or similar rooms or areas. Arc-fault devices monitor the electrical current wave. If the wave pattern changes, indicating a spark or fire, the arc-fault protective device turns the electricity off. This deprives the fire of fuel which, hopefully, extinguishes the fire. It is hoped that the deprivation of fuel will cause the fire to extinguish itself. The requirement for the installation of arcfault protective devices began with the requirement for the use of arc fault protected outlets in the bedrooms only. This requirement was introduced with the publication of the 1999 National Electric Code (NEC). The 2008 edition of the NEC requires the use of arc fault protected circuits in the areas listed above. This information is provided to advise you that these safety devices are available should you want them installed in your home.



B. Branch Circuits, Connected Devices, and Fixtures

Comments:

Items noted during the visual inspection that were deemed deficient, are in need of repair, adjustment, restoration, that require comment, continuation of the due diligence process and/or servicing or items noted for information include but are not limited to:

NOTE: The kitchen appliances were tested for bonding and/or grounding. Continuity to ground was obtained on all the kitchen appliances indicating that the appliances were bonded and/or grounded.

Deficiency: There was no visible electrical bonding conductor to the natural gas distribution system or to all of the low voltage systems.

Information: All metal piping systems, including the water and gas pipes are required to be bonded to the breaker panel or grounding electrode to equalize the differing electrical potentials on all elements that are capable of carrying electricity. These systems also include the telecommunications systems, cable systems and satellite systems, etc. Without bonding, a person or a flammable item could be the medium through which the potentials are equalized, which could result in a shock, electrocution and/or fire. Proper bonding should be installed for safety.

References: E3509.6 Metal water piping bonding.

The interior metal water piping system shall be bonded to the service equipment enclosure, the grounded conductor at the service, the grounding electrode conductor where of sufficient size, or to the one or more grounding electrodes used. The bonding jumper shall be sized in accordance with Table E3503.1. The points of attachment of *the bonding jumper(s) shall be accessible.*

E3509.7 Bonding other metal piping.

I=Inspected	NI=Not Inspected	NP=Not Present	D = Deficiency

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Where installed in or attached to a building or structure, metal piping systems, including gas piping, capable of becoming energized shall be bonded to the service equipment enclosure, the grounded conductor at the service, the grounding electrode conductor where of sufficient size, or to the one or more grounding electrodes used. The bonding jumper shall be sized in accordance with Table E3808.12 using the rating of the circuit capable of energizing the piping. The equipment grounding conductor for the circuit that is capable of energizing the piping shall be permitted to serve as the bonding means. The points of attachment of the bonding jumper(s) shall be accessible.

Communications systems, cable TV, and similar systems must be grounded. If the enclosures, raceways, and noncurrent carrying metal surfaces of these other systems are not bonded to the premises wiring system, they could operate at a difference in potential. Intersystem bonding is required to reduce the shock hazard and minimize the possible fire danger. Where the service equipment cabinet and meter base are flush with a brick or stucco wall, the raceways are concealed within the wall, the grounding electrode conductor is not accessible, and the ground rod has been buried, there is nothing available to which to bond the metallic jacket of the communications cable. If the installer drives a separate ground rod to bond the cable TV cable shield and boxes to, it would be a code violation if not bonded to the service electrode system. An accessible means external to the service equipment enclosures must be provided. If the underground service lateral is run in metal conduit installed on the surface of the wall from the ground up, or if the overhead service riser is external, which it most often is, or if the grounding electrode conductor is run to a ground rod along the outside wall, these would be accessible means for intersystem bonding. In some cases, especially where the service equipment is flush with the wall, it may be necessary to bond a size 6 AWG bare copper conductor to the enclosure and leave several inches of the conductor outside the equipment so that it is accessible for the connection of bonding jumpers of other systems. From the Commentary to the IRC.

<u>Deficiency:</u> There was inadequate clearance in front of the air conditioning mechanic's disconnects at the air conditioning condensing units.

<u>Information:</u> All energized electrical equipment and panelboards are required to have unobstructed access 36 inches deep in front of the equipment and 30 inches wide, at a minimum. Proper access for the mechanic's disconnects should be provided according to Section E3305.2 of the IRC and Section 110.26(A) of the National Electric Code.

References: From the National Electric Code

The intent of 110.26(A) is to provide enough space for personnel to perform any of the operations listed without jeopardizing worker safety. Examples of such equipment include panelboards, switches, circuit breakers, controllers and controls on heating and air conditioning equipment. It is important to understand that the word examination includes such tasks as checking for voltage with a portable voltmeter. 110.26(A) NEC.



Deficiency: Some of the lighting fixtures such as those fixtures in the attics, etc. did not operate.

<u>Information</u>: This may be caused by burned out light bulbs however; the inspector could not make this determination. The fixtures should be made operable.

I=Inspected	NI=Not Inspected	NP=Not Present	D = Deficiency	

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<u>Deficiency:</u> All electrical outlets in "wet" locations were not protected by Ground Fault Circuit Interrupter devices (GFCIs).

<u>Information</u>: Wet locations are defined, by the 1996 National Electric Code, as any counter outlet in the kitchen, any outlet in a bathroom, garage, exterior, wiring to a whirlpool bath or Jacuzzi or to swimming pools, hot tubs or spas. Wet locations are basically any area where you and the electrical device you are using are likely to come into contact with water. GFCIs became part of the code in the mid 1980's and locations they are required in are constantly being added. The lack of GFCIs is considered to be an unsafe condition. All unsafe conditions should be properly repaired.

References: Section 3802 of the IRC.

<u>Deficiency:</u> Electrical outlet box extenders were not installed on electrical wall outlets and lighting switch outlet boxes installed through additional wall covering surfaces in the kitchen and bathrooms, etc.

<u>Information</u>: The electrical outlet boxes were fastened to the wall framing and there are spaces existing between the front of the outlet box and the cover plate. When outlet boxes and switch boxes are installed through additional wall covering materials, such as tile or cultured marble, etc, an outlet box extender is required to be installed to seal the opening between the outlet box and the cover plate. See section E3806.5 of the International Residential Code.

References: E3806.5 In wall or ceiling.

In walls or ceilings of concrete, tile or other noncombustible material, boxes shall be installed so that the front edge of the box will not be set back from the finished surface more than 0.25 inch (6.4 mm). In walls and ceilings constructed of wood or other combustible material, outlet boxes shall be flush with the finished surface or project therefrom.



<u>Deficiency:</u> There was an electrical outlet installed on the kitchen island as required by the National Electric Code (NEC) and the IRC.

<u>Information</u>: The purpose of the outlet is so that electrical appliances on the island can be connected to the electrical system without the use of an extension cord. There have been numerous accidents involving children pulling on electrical cords and pulling cooking devices containing very hot or boiling substances onto themselves. Just because a there is an electrical outlet located on the island does not remove the hazard of a child pulling on an electrical cord. When counter top cooking devices are used on the island or on any counter top, you should be aware of the location of the electrical cord and any hazard this may present to a child.

Deficiency: An electrical wall outlet in the master bathroom was installed over the bathtub area.

Information: This is an obvious hazard. While the IRC and the National Electric Code require the installation of an

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electrical wall outlet within 30 inches of the edge of a lavatory in a bathroom, there is no rule that mandates the installation of an electrical wall outlet near a bathtub. No electrical devices should remain plugged into this outlet and no electrical devices should be attached to this outlet when someone is using the bathtub. An electrical device that fell into the tub could cause the user of the tub to be electrocuted.

References: E3901.7 Wet locations.

<u>A switch or circuit breaker located in a wet location or outside of a building shall be enclosed in a weatherproof</u> enclosure or cabinet. Switches shall not be installed within wet locations in tub or shower spaces unless installed as part of a listed tub or shower assembly.

There is no exception to the rule that a common light switch wired to control a fan, lighting outlet, or other load cannot be installed in the bathtub or shower space; however, the code does not provide an exact definition or dimension of tub or shower space. It seems logical, though, that the switch should be out of the reach of someone in the tub or shower. From the Commentary to the IRC.



<u>Deficiency:</u> Child proof covers were installed in some of the electrical wall outlets.

<u>Information</u>: The electrical wall outlets equipped with child proof covers were not inspected. The child proof covers should be removed and the outlets should be properly inspected prior to the closing on the house.

<u>Deficiency:</u> Smoke alarms were not located in all areas currently required and considered necessary for safety.

<u>Information</u>: Smoke alarms are required to be located in each sleeping room, outside of each sleeping area and on each story of the structure, at a minimum.

<u>Deficiency:</u> The inter-connectivity of the smoke alarms could not be verified.

<u>Information:</u> The smoke alarms must be inter-connected so that when one alarm is activated, all alarms sound. The inter-connectivity should be verified or the smoke alarms must be inter-connected prior to the closing on the house.



III. HEATING, VENTILATION AND AIR CONDITIONING SYSTEMS

A. Heating Equipment Type of System: Central Forced Energy Source: Natural Gas Comments: MAKE: Leppox MODEL NO. Upl

DOWNSTAIRS UNIT MAKE: Lennox MODEL NO. Unknown SERIAL NO. Unknown

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UPSTAIRS UNIT MAKE: Not Accessible Unknown MODEL NO. Unknown SERIAL NO. Unknown

Items noted during the visual inspection that were deemed deficient, are in need of repair, adjustment, restoration, that require comment, continuation of the due diligence process and/or servicing or items noted for information include but are not limited to:

DOWNSTAIRS UNIT

<u>Deficiency:</u> The unit was not properly accessible. The unit was not inspected.

<u>Information</u>: Gas fired appliances in the attic are required to be accessible by a 22" wide, unobstructed walkway. The unit is required to be located within 20 feet of the attic access opening. The units also require a work platform a minimum of 30 inches by 30 inches on all sides of the unit and a light to be installed near the unit. These items are for the safety of the technicians who must service the units and for safe access to the unit during an emergency. Proper and safe access should be provided for safety. The unit should be properly inspected prior to the closing on the house.

References: M1305.1.3 Appliances in attics.

Attics containing appliances requiring access shall be provided with an opening and a clear and unobstructed passageway large enough to allow removal of the largest appliance, but not less than 30 inches (762 mm) high and 22 inches (559 mm) wide and not more than 20 feet (6096 mm) in length when measured along the centerline of the passageway from the opening to the appliance. The passageway shall have continuous solid flooring in accordance with Chapter 5 not less than 24 inches (610 mm) wide. A level service space at least 30 inches (762 mm) deep and 30 inches (762 mm) wide shall be present along all sides of the appliance where access is required. The clear access opening dimensions shall be a minimum of 20 inches by 30 inches (508 mm by 762 mm), where such dimensions are large enough to allow removal of the largest appliance.

<u>Deficiency:</u> There was no work platform installed at the unit.

<u>Information</u>: A work platform a minimum of 30 inches wide and 30 inches deep should be installed on each side of the unit for safe access to the unit as required by the manufacturer's installation instructions and by the model building codes.



<u>Deficiency</u>: The type of furnace installed does not lend itself to a visual inspection of the heat exchanger.

<u>Information</u>: Forced draft heaters used serpentine shaped heat exchangers and most of the surfaces of the heat exchanger are hidden from view. In order to inspect the heat exchanger, the unit must be disassembled and filled

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with water, which is beyond the scope of this inspection. Water leaking from the heat exchanger indicates the presence of a hole(s) in the heat exchanger. A competent HVAC contractor should be contacted to make an inspection of the heat exchanger prior to closing.

<u>Deficiency:</u> The flexible gas pipe used to connect the unit to the metal gas pipe extended through the side of the heater.

<u>Information:</u> Flex pipe should not be extended through the side of the heater as the vibration of the heater can cause a hole to be worn in the flex material. The flexible pipe should be removed from the interior of the heater and a metal pipe should be installed from the interior of the heater to the exterior of the heater housing.



UPSTAIRS UNIT

<u>Deficiency:</u> The unit was not properly accessible at all. The unit was not inspected and is specifically excluded from the inspection and from this report.

<u>Information</u>: Gas fired appliances in the attic are required to be accessible by a 22" wide, unobstructed walkway. The unit is required to be located within 20 feet of the attic access opening. The units also require a work platform a minimum of 30 inches by 30 inches on all sides of the unit and a light to be installed near the unit. These items are for the safety of the technicians who must service the units and for safe access to the unit during an emergency. Proper and safe access should be provided for safety. Once proper access has been provided, the unit should be properly inspected prior to the closing on the house.

References: M1305.1.3 Appliances in attics.

Attics containing appliances requiring access shall be provided with an opening and a clear and unobstructed passageway large enough to allow removal of the largest appliance, but not less than 30 inches (762 mm) high and 22 inches (559 mm) wide and not more than 20 feet (6096 mm) in length when measured along the centerline of the passageway from the opening to the appliance. The passageway shall have continuous solid flooring in accordance with Chapter 5 not less than 24 inches (610 mm) wide. A level service space at least 30 inches (762 mm) deep and 30 inches (762 mm) wide shall be present along all sides of the appliance where access is required. The clear access opening dimensions shall be a minimum of 20 inches by 30 inches (508 mm by 762 mm), where such dimensions are large enough to allow removal of the largest appliance.

B. Cooling Equipment

Type of System: Central Split, Zoned Comments: Electricity

SOUTH CONDENSING UNIT MAKE: Lennox MODEL NO. HS255111P SERIAL NO. 5894B05249 MINIMUM CIRCUIT AMPACITY: 31.3 MAXIMUM OVERCURRENT PROTECTION: 50 R.L.A.: 23.7 MEASURED AMPERAGE LOAD: Not Applicable EVAPORATOR COIL MAKE: Lennox MODEL NO. C22461 SERIAL NO. 5192M77037 B.T.U. RATING: TEMPERATURE DIFFERENTIAL MEASURED ACROSS THE EVAPORATOR COIL: Not Applicable

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NORTH CONDENSING UNIT MAKE: Lennox MODEL NO. HS252511P SERIAL NO. 5193E30857 MINIMUM CIRCUIT AMPACITY: 15.6 MAXIMUM OVERCURRENT PROTECTION: 25 R.L.A.: 11.6 MEASURED AMPERAGE LOAD: Not Applicable EVAPORATOR COIL MAKE: Unknown MODEL NO. SERIAL NO. B.T.U. RATING: TEMPERATURE DIFFERENTIAL MEASURED ACROSS THE EVAPORATOR COIL: Not Applicable

Items noted during the visual inspection that were deemed deficient, are in need of repair, adjustment, restoration, that require comment, continuation of the due diligence process and/or servicing or items noted for information include but are not limited to:

Deficiency: The outside ambient temperature was too low to operate the units.

<u>Information</u>: Once the outside temperature has exceeded 65 degrees for at least a 24 hour period, the units may be operated and tested. The units should be certified as operating normally by a competent H.V.A.C. contractor prior to closing.

<u>Deficiency:</u> The air conditioning equipment was comprised of older equipment that may be reaching the end of its economic life expectancy.

<u>Information</u>: Provisions should be made to anticipate the replacement of the equipment in the near future in my opinion.

DOWNSTAIRS SYSTEM

<u>Deficiency:</u> The evaporator coil and the condensing coil may not be compatibly sized, if the model numbers of the units were correctly interpreted.

<u>Information</u>: The evaporator coil appeared to be rated at three and one half tons and the condensing coil appeared to be rated at four tons. If the sizing is correctly understood, the condensing coil can discharge more heat than the evaporator coil can absorb. This may reduce the efficiency of the system and may shorten the life expectancies of the units. Some manufacturers disclaim this type of installation. These manufacturers void their warranties if the units are not compatibly sized.

References: Lennox nomenclature.

Old Nomenclature

BTU = TONS	BTU = TONS
-14 = 1 ton	-95 = 7½ tons
$-21 = 1\frac{1}{2}$ tons	-135 = 10 tons
-26 = 2 tons	-185 = 15 tons
$-31 = 2\frac{1}{2}$ tons	-275 = 20 tons
-41 = 3 tons	-300 = 25 tons
$-46 = 3\frac{1}{2}$ tons	-360 = 30 tons
-51 = 4 tons	-415 = 33 tons
-65 = 5 tons	-450 = 37 tons
-81 = 6 tons	-600 = 50 tons

UPSTAIRS SYSTEM

<u>Deficiency:</u> The unit was not properly accessible at all. The unit was not inspected and is specifically excluded from the inspection and from this report.

I=Inspected	NI=Not Inspected	NP=Not Present	D = Deficiency	
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<u>Information</u>: Appliances in the attic are required to be accessible by a 22" wide, unobstructed walkway. The unit is required to be located within 20 feet of the attic access opening. The units also require a work platform a minimum of 30 inches by 30 inches on all sides of the unit and a light to be installed near the unit. These items are for the safety of the technicians who must service the units and for safe access to the unit during an emergency. Proper and safe access should be provided for safety. Once proper access has been provided, the unit should be properly inspected prior to the closing on the house. The system should be operated and proper operation of the system should be verified.

References: M1305.1.3 Appliances in attics.

Attics containing appliances requiring access shall be provided with an opening and a clear and unobstructed passageway large enough to allow removal of the largest appliance, but not less than 30 inches (762 mm) high and 22 inches (559 mm) wide and not more than 20 feet (6096 mm) in length when measured along the centerline of the passageway from the opening to the appliance. The passageway shall have continuous solid flooring in accordance with Chapter 5 not less than 24 inches (610 mm) wide. A level service space at least 30 inches (762 mm) deep and 30 inches (762 mm) wide shall be present along all sides of the appliance where access is required. The clear access opening dimensions shall be a minimum of 20 inches by 30 inches (508 mm by 762 mm), where such dimensions are large enough to allow removal of the largest appliance.

<u>Deficiency:</u> There were rust stains on the roof of the bay window.

<u>Information</u>: The presence of the rust stains indicates that the upstairs evaporator coil's primary drain pipe had been, and may still be, blocked. A blocked primary drain pipe usually indicates that the evaporator coil is dirty. The evaporator coil should be opened and inspected. The coil should be cleaned if necessary. The primary drain pipe should be cleared of all obstructions if necessary.



C. Duct System, Chases, and Vents – Comments:

Items noted during the visual inspection that were deemed deficient, are in need of repair, adjustment, restoration, that require comment, continuation of the due diligence process and/or servicing or items noted for information include but are not limited to:

<u>NOTE.</u> There were no visible defects noted in the visible conditioned air supply ducts or ducting system that appeared to require immediate repair at the time of the inspection, in my opinion.

<u>Deficiency:</u> The type B vent pipe terminations for the natural gas fired heating and water heating appliances had inadequate clearance above the roof deck.

<u>Information</u>: The current requirement is that the termination is at least two feet above any part of the roof deck within ten feet of the vent pipe. The requirement is made to ensure proper drafting of the chimney. The terminations of the vent pipes should be raised or relocated for safety.

References: G2427.5.3 (503.5.4) Chimney termination.

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Chimneys shall extend at least 3 feet (914 mm) above the highest point where it passes through a roof of a building and at least 2 feet (610 mm) higher than any portion of a building within a horizontal distance of 10 feet (3048 mm). (SeeFigureG2427.5.3.) Chimneys shall extend at least 5 feet (1524 mm) above the highest connected equipment draft hood outlet or flue collar. Decorative shrouds shall not be installed at the termination of factory-built chimneys except where such shrouds are listed and labeled for use with the specific factory-built chimney system and are installed in accordance with the manufacturer's installation instructions.





IV. PLUMBING SYSTEM

A. Water Supply System and Fixtures

Location of water meter: Southwest corner of lot in the street right of way Location of main water supply valve: In the laundry room Static water pressure reading: 66 psi Comments:

Items noted during the visual inspection that were deemed deficient, are in need of repair, adjustment, restoration, that require comment, continuation of the due diligence process and/or servicing or items noted for information include but are not limited to:

<u>Deficiency:</u> Some of the PVC sewer cleanout pipes, supply pipes, drain pipes and/or electrical conduits on the exterior of the house were exposed to the sunlight.

<u>Information:</u> PVC pipe is broken down by the ultra violet rays of the sun. The PVC pipes must be painted with a UV resistant paint to protect the PVC from degradation by the ultra violet rays of the sun. Any deteriorated or brittle pipes should be replaced.

Deficiency: The faucet seal leaked on one of the master bathroom lavatories.

<u>Information</u>: Leaks through the faucet seal allows water to run down the side of the faucet and onto the drain board or counter top. The faucet seal should be replaced to stop the leak.

<u>Deficiency:</u> There were tile ledges built alongside the master bathroom hydro therapy bathtub.

<u>Information</u>: These ledges must be built so that they channel the water back into the tub. The ledge must also have a pan underneath as tile is porous and water will ultimately leak through the tile. Water leaking through the tile can cause the wood decking and framing supporting the tile to decay. If a pan were present, the termination of the pan diverting water back into the bathtub could be seen. A permanent water proofing system should be installed or the ledge should be removed. If you choose to leave the ledge you should keep the ledge dry.

Deficiency: Back flow prevention devices were not installed on all of the exterior faucets.

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<u>Information</u>: Back flow prevention devices are required on all exterior faucets to reduce the possibility of contamination of the potable water supply system. It is recommended that they be installed.



<u>Deficiency:</u> The supply hoses to the clothes washing machine in the laundry room did not appear to have been reinforced.

<u>Information</u>: Clothes washing machine supply hoses that are not properly reinforced with metal may split and leak. The supply hoses should be replaced with reinforced hoses meant for clothes washing machines.

<u>Deficiency:</u> There were no sediment traps or "dirty legs" installed on the natural gas distribution pipes prior to the connections to the water heater and heaters.

<u>Information:</u> Sediment traps are required to collect debris in the natural gas. Debris can cause gas valves to stay open which will keep the gas flowing to the burners. The continual operation of the burners can cause the unit(s) to catch fire. Proper sediment traps should be installed where required for safety.

References: G2419.4 (408.4) Sediment trap.

Where a sediment trap is not incorporated as part of the gas utilization equipment, a sediment trap shall be installed downstream of the equipment shut-off valve as close to the inlet of the equipment as practical. The sediment trap shall be either a tee fitting with a capped nipple in the bottom opening of the run of the tee or other device approved as an effective sediment trap. Illuminating appliances, ranges, clothes dryers and outdoor grills need not be so equipped.

Sediment traps are designed to cause the gas flow to change direction 90 degrees at the sediment collection point, thus causing the solid or liquid contaminants to drop out of the gas flow. See Commentary Figure G2419.4(1).



Figure G2419.4(1) SEDIMENT TRAP

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Deficiency: The natural gas pipe supply pipe penetration through the brick veneer is required to be sleeved so that no friction between the brick veneer and the gas pipe can develop and so that corrosives from the brick veneer cannot attack the gas pipe.

Information: Friction between the brick veneer and the pipe can cause the pipe to be damaged. The penetration of the gas pipe through the brick veneer should be sleeved for safety.

References: G2415.7 (404.7) Above-ground piping outdoors.

All piping installed outdoors shall be elevated not less than 3 1/2 inches (152 mm) above ground and where installed across roof surfaces, shall be elevated not less than 3 1/2 inches (152 mm) above the roof surface. Piping installed above ground, outdoors, and installed across the surface of roofs shall be securely supported and located where it will be protected from physical damage. Where passing through an outside wall, the piping shall also be protected against corrosion by coating or wrapping with an inert material. Where piping is encased in a protective pipe sleeve, the annular space between the piping and the sleeve shall be sealed.

B. Drains, Wastes, and Vents – Comments:

Items noted during the visual inspection that were deemed deficient, are in need of repair, adjustment, restoration, that require comment, continuation of the due diligence process and/or servicing or items noted for information include but are not limited to:

NOTE: When a house is newly built or remodeled, or when a house has been vacated from even for a short period of time, it is not unusual for the plumbing system to back up when the new owner occupies the structure. This is due to the fact that the contractors building or remodeling the house use the plumbing system as a method of cleaning everything from paint to putty to anything else you can think of. Solids in the pipes tend to congeal as water drains from the pipes through lack of use and the solids can form barriers in the pipes. Before occupying the structure, you should repeatedly fill all plumbing fixture in an attempt to insure that the drains will operate once you and your family have moved into the property. Information.

Deficiency: The kitchen sink drain "P" trap was reversed and was not self cleaning.

Information: "P" traps are used in fixture drain pipes to create a water deal. The water standing in the bottom of the "P" prevents sewer gases from entering the structure. P traps are designed with different length of pipe. The long end attaches to the vertical drain inlet pipe from the sink or lavatory. The short pipe connects to the horizontal drain pipe that goes through the wall. The difference in height gives pressure to the water and this helps to flush debris from the trap and reduces the likelihood of blocks being created. If the P trap is reversed, the depth of the trap reduces the water pressure and prevents the trap from being effectively flushed clean. The P trap should be replaced with a properly installed P trap.

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Items noted during the visual inspection that were deemed deficient, are in need of repair, adjustment, restoration, that require comment, continuation of the due diligence process and/or servicing or items noted for information include but are not limited to:

Deficiency: The capacity of the tank had been reduced.

<u>Information</u>: This condition is caused by the accumulation of minerals in the tank over time. The efficiency of the unit is reduced by this condition and its life expectancy is also reduced. The tank should be flushed in an attempt to remove some of the buildup. If the minerals have solidified and cannot be removed, the tank should be replaced.

D. Hydro-Massage Therapy Equipment – Comments:

Items noted during the visual inspection that were deemed deficient, are in need of repair, adjustment, restoration, that require comment, continuation of the due diligence process and/or servicing or items noted for information include but are not limited to:

NOTE: There were no visible defects noted in the operation of the hydro-therapy equipment that appeared to require immediate repair at the time of the inspection, in my opinion.

<u>Information</u>: The Ground Fault Circuit Interrupting (GFCI) device that protects the user of the hydromassage bathtub was located on the wall across from the bathtub in the master bathroom. Should the hydromassage bathtub not operate, you should see if the GFCI has tripped. If the GFCI is tripped, there may be an electrical hazard that may cause a shock or electrocution to the user of the bathtub. If the GFCI is tripped, an electrician should be consulted to determine the presence of any electrical defect.

V. APPLIANCES

A Dishwasher – *Comments:*

MAKE: Kitchenaid MODEL NO. KUDA03CTBS2 SERIAL NO. FU4902120

Items noted during the visual inspection that were deemed deficient, are in need of repair, adjustment, restoration, that require comment, continuation of the due diligence process and/or servicing or items noted for information include but are not limited to:

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Deficiency: There was an inadequate anti siphon loop installed in the drain pipe.

<u>Information</u>: An air gap or anti siphon loop is used to prevent backflow of contaminated water and bacteria from the disposer or plumbing drain back into the dishwasher. Many models come with backflow valves, but the anti siphon loop or mechanical air gap is still required. An anti siphon loop is created by forming an upside down "U" in the drain hose. The top of the "U" should be against the underside of the counter top. The hose is the tied in place, usually to the underside of the sink or to the faucet supply pipes.



<u>Deficiency</u>: The toggle switch controlling the dishwasher was not identified.

<u>Information:</u> All electrical control devices are required to be identified unless the purpose of the control device is clear. The toggle switch should be labeled to prevent a repairman from being called when the dishwasher is not operating and the switch is simply turned off.

B. Food Waste Disposer – Comments:

MAKE: Whirlaway MODEL NO. 191 SERIAL NO. 9M3506933

Items noted during the visual inspection that were deemed deficient, are in need of repair, adjustment, restoration, that require comment, continuation of the due diligence process and/or servicing or items noted for information include but are not limited to:

Deficiency: The hammers were frozen and did not operate.

<u>Information</u>: The hammers are attached to swivels and knock debris against the side of the disposer where the debris is shredded. It is possible for the unit to operate without the hammers, but the unit will not be very efficient. This condition occurs over time and is caused by the acids in foods attacking the metal inside the disposer and causing rust to develop. It is possible that the hammers may be freed by running hard ice through the disposer. The ice will clean the unit. If ice does not clean the unit, it is cheaper to replace the disposer than it is to try to repair it. Using ice in the disposer on a weekly basis is alleged to prevent the problem from reoccurring.

C. Range Exhaust Vent – *Comments:* Component of the Microwave Oven

Items noted during the visual inspection that were deemed deficient, are in need of repair, adjustment, restoration, that require comment, continuation of the due diligence process and/or servicing or items noted for information include but are not limited to:

<u>Deficiency:</u> The vent fan unit was a circulating type vent that leaves food odors and contaminates in the house.

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<u>Information:</u> Ranges should be vented to the exterior of the house. The building codes provide that if there is an openable window in the kitchen to the exterior of the structure, the window should be opened during all cooking operations at a minimum.

References: M1502.1 General.

<u>Range hoods shall discharge to the outdoors through a single-wall duct. The duct serving the hood shall have a</u> smooth interior surface, shall be air tight and shall be equipped with a backdraft damper. Ducts serving range hoods shall not terminate in an attic or crawl space or areas inside the building.

Exception: Where installed in accordance with the manufacturer's installation instructions, and where mechanical or natural ventilation is otherwise provided, listed and labeled ductless range hoods shall not be required to discharge to the outdoors.

A domestic kitchen exhaust system is one that serves appliances typically found in residential occupancies such as within dwelling units. When compared to commercial cooking operations, residential cooking operations are far less frequent, of shorter duration, have lower heat output, and produce fewer grease-laden vapors. However, airborne contaminant control may be even more important in residential cooking operations because of the lower or nonexistent ventilation rates typical of dwelling units. The ducts must be sealed air tight to prevent leakage of air and grease into wall and ceiling cavities. Ducts should be sealed with a material that is suitable for long-term exposure to elevated temperatures. Backdraft dampers prevent the filtration of outdoor air when the exhaust system is not operating. The hood manufacturer's instructions may require that the ducts be installed with a minimum clearance to combustibles. See the commentary for Section M1307.1.

The exception to this section allows the use of ductless (re-circulating) range hoods that have no means for discharge to the outdoors. Exhaust to the outdoors would be required if natural or mechanical ventilation was not provided. From the Commentary to the IRC.

D. Ranges, Cooktops, and Ovens – *Comments:*

RANGE MAKE: Kitchenaid MODEL NO. Not Visible SERIAL NO. Not Visible kW RATING: Not Visible

<u>NOTE</u>: There were no visible defects noted in the operation of the range that appeared to require immediate repair at the time of the inspection, in my opinion.



OVEN MAKE: Kitchenaid MODEL NO. KEBK101SSS00 SERIAL NO. XW2004041 kW RATING: 4.7 Items noted during the visual inspection that were deemed deficient, are in need of repair, adjustment, restoration, that require comment, continuation of the due diligence process and/or servicing or items noted for information include but are not limited to:

Deficiency: The oven thermostat was out of adjustment.

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Information: The thermostat should be calibrated to set the oven temperature to within 25 degrees of the dial setting. The temperature was set at 350 degrees for ten minutes. The internal temperature of the oven was then measured to be 410 degrees. The thermostat should be properly calibrated.

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E. Microwave Oven – Comments: MAKE: Kitchenaid MODEL NO. KHMS1850SSS-0 SERIAL NO. TRU3935711

NOTE: There were no visible defects noted in the operation of the microwave oven that appeared to require immediate repair at the time of the inspection, in my opinion.



G. Mechanical Exhaust Vents and Bathroom Heaters – Comments:

Items noted during the visual inspection that were deemed deficient, are in need of repair, adjustment, restoration, that require comment, continuation of the due diligence process and/or servicing or items noted for information include but are not limited to:

Deficiency: The bathroom exhaust fans and the vent pipes were dirty.

Information: The bathroom exhaust fans and vent pipes require cleaning and the fans should be serviced.

Deficiency: The exhaust fan was installed in the toilet room in the master bathroom.

Information: Bathroom exhaust fans are primarily intended to remove humidity from the bathroom that is produced by the use of the tub and/or shower. The exhaust fan and vent system are currently required to be installed in both bathrooms and toilet rooms. An additional exhaust fan and vent system should be installed in the tub and shower area of the bathroom.



Items noted during the visual inspection that were deemed deficient, are in need of repair, adjustment, restoration, that require comment, continuation of the due diligence process and/or servicing or items noted for information include but are not limited to:

NOTE: There were no visible defects noted in the garage door operators that appeared to require immediate repair at the time of the inspection, in my opinion.

Deficiency: The wall mounted control switches were loose on the wall.

Information: The wall mounted control switches should be properly secured to the wall.

I. Doorbell and Chimes – Comments:

Information: There were no visible defects noted in the doorbell that appeared to require immediate repair at the time of the inspection, in my opinion.



J. Drver Vents – Comments:

Items noted during the visual inspection that were deemed deficient, are in need of repair, adjustment, restoration, that require comment, continuation of the due diligence process and/or servicing or items noted for information include but are not limited to:

I=Inspected	NI=Not Inspected	NP=Not Present	D = Deficiency

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<u>Deficiency:</u> The dryer vent pipe appeared to exceed the maximum length allowed by Section M1501.3 of the IRC.

<u>Information</u>: Dryer vent pipe lengths are set at a maximum of 25 feet. This maximum length is then reduced by 5 feet for every 90 degree turn and 2.5 feet for every 45 degree turn in the vent pipe. The dryer vent pipe should be rerouted so that the maximum allowable length of the vent pipe is not exceeded. Exceeded the maximum allowable length causes the vent pipe to become clogged with lint, prevents the dryer from venting properly and creates a fire hazard.

References: M1501.3 Length limitation.

The maximum length of a clothes dryer exhaust duct shall not exceed 25 feet (7620 mm) from the dryer location to the wall or roof termination. The maximum length of the duct shall be reduced 2.5 feet (762 mm) for each 45-degree (0.79 rad) bend and 5 feet (1524 mm) for each 90-degree (1.6 rad) bend. The maximum length of the exhaust duct does not include the transition duct.

Exceptions:

1. Where a clothes dryer booster fan is installed and listed and labeled for the application, the maximum length of the exhaust duct, including any transition duct, shall be permitted to be in accordance with the booster fan manufacturer's installation instructions. Where a clothes dryer booster fan is installed and not readily accessible from the room in which the dryer is located, a permanent identifying label shall be placed adjacent to where the exhaust duct enters the wall. The label shall bear the words "This dryer exhaust system is equipped with a remotely located booster fan."

Clothes dryer exhaust systems are a potential hazard because of the combustible lint and debris that can accumulate in the duct if the system is not designed and constructed properly. The combination of combustible lint and the elevated temperature of the exhaust can create a fire hazard in the system. The dryer exhaust system must be independent of other systems to prevent the hazard associated with one exhaust entering into or affecting other systems or areas in the building. The discharge must terminate outdoors because the high levels of moisture in the exhaust can cause condensation to form on exposed surfaces or in insulation material if discharged indoors. This can cause structural damage, deterioration of building material, and contribute to the growth of mold and fungus. The exhaust also contains highly combustible clothes fibers and, in the case of gas-fired units, products of combustion. From Section M1501.1 of the Commentary to the IRC.

Deficiency: There was no backdraft damper on the termination cap for the dryer vent.

<u>Information</u>: A backdraft damper is required to prevent animals and pests from entering the house through the vent pipe system.

<u>References: M1501.1 General.</u>

Dryer exhaust systems shall be independent of all other systems, shall convey the moisture to the outdoors and shall terminate on the outside of the building. Exhaust duct terminations shall be in accordance with the dryer manufacturer's installation instructions. Screens shall not be installed at the duct termination. Exhaust ducts shall not be connected with sheet-metal screws or fastening means which extend into the duct. Exhaust ducts shall be equipped with a backdraft damper.

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