CAPITALinfrared
Thermal Imaging Solutions

Confidential Inspection Report

Client:
Kevin Richardson

Property Address:
123 Sample St, Washington, DC 20011

Inspector:
Kevin A. Richardson, CPI
Level III Certified Infrared Thermographer, #7493
Maryland Licensed Home Inspector, #29727
InterNACHI-Certified Professional Inspector, #4091175
InterNACHI-Certified Indoor Air Consultant, #IAC2-00-3862

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Date: 1/16/2014	**Time:** 02:00 PM	**Report ID:** Sample ITI Moisture
Property:	**Customer:**	**Real Estate Professional:**
123 Sample St Washington DC 20011	Kevin Richardson	Not Applicable

Scope of Survey

This Infrared Thermal Imaging (ITI) Building Envelope Survey was performed in accordance with the **Infraspection Institutes Standard for Infrared Inspection of Building Envelopes**. This standard covers procedures for conducting infrared inspections of building envelopes for the purpose of detecting thermal patterns caused by excess energy loss, latent moisture, or structural details. It's a common document for the end user to specify infrared inspections and for the infrared Thermographer to perform them. The standard lists the joint responsibilities of the end user and the infrared Thermographer that, when carried out, will result in the safest and highest-quality inspection for both. The standard also outlines specific content for documenting the results of an infrared inspection and addresses the criteria for infrared imaging equipment, such as spatial resolution and thermal sensitivity. It addresses meteorological conditions under which infrared inspections should be performed and addresses operating procedures and operator qualifications. Lastly, the standard addresses verification of infrared data using invasive test methods.

The purpose of an infrared inspection of a building envelope is to locate and document abnormal patterns of infrared radiation from the building envelope (exceptions) that can be potential problems for the end user.

- Conductive exceptions are usually caused by insufficient, improperly installed, damaged or water-saturated insulation and/or structural components.
- Convective exceptions are usually caused by cracks and holes that permit the uncontrolled movement of air across the building envelope.

Destructive testing is necessary to verify the presence of water in the insulation. Opinions about the causes of these exceptions, the integrity of the building envelope, or recommendations for corrective actions requires skills beyond those of infrared Thermography. Infrared Thermography will be presented as a visual inspection technique to gather and present information about the system at a specific time. Providing destructive testing of any structures for verification of suspected problems is beyond the scope of infrared Thermography.

Data from infrared inspections may be used to assess the condition of a building envelope or for quality assurance inspections of new installations, repairs, or retrofits. The survey does not provide methods to determine the cause of latent moisture within a building envelope or its point of entry. It does not address the suitability of any particular material or system to function satisfactorily as waterproofing or insulation.

Limitations (Applicability of Constructions)

Applicable constructions include insulated building sidewalls, exterior insulated finish systems (EIFS), and other building finishes which can absorb moisture. Certain construction details can preclude the detection of exceptions. Examples include, but are not limited to, stone or brick facades and walls containing dead air spaces. Some construction materials can preclude the detection of exceptions. Examples include, but are not limited to, high density materials such as brick, block, stone, spandrel glass, and metal. For materials with highly reflective surfaces in the spectral range of the infrared thermal imager, infrared inspections are not practical until the surface is naturally or temporarily dulled. The wetting rates of construction materials vary according to the type of material and environmental exposure. Details with insulations that wet slowly, such as EIFS, usually should not be inspected until they are at least three months old. Infrared inspections are not intended to identify the source of the moisture.

Data Interpretation

The interpretation of infrared data is a process of pattern recognition for the purpose of differentiating exceptions from those caused by the following:

- Variations in the type, thickness, density, or continuity of insulation.

- Variations in wall thickness, moisture content, or continuity.
- Variations in the type or thickness of wall surfacing.
- Variations within the building walls.
- Inconsistencies in walls due to damage, repairs, coatings, or overlays.
- Variations in temperature behind walls.
- Fasteners, flashings, flanges, or projections from walls or discontinuities within them.
- Variations in surface emittance.
- Infrared radiation from nearby sources.
- Hot or cold air from nearby sources.
- Moisture or debris on inspected surfaces.
- Variations in shape or geometry of inspected surfaces.
- Accurate interpretation of infrared data requires verification

Verification

In order to determine the cause of exceptions, verification of infrared data must be carried out by the following invasive test methods: visual testing or moisture meter probes.

Terminology

For the purpose of this survey,

Building envelope: those portions of the building that separate conditioned from unconditioned spaces.

End user: the person requesting infrared Thermographic inspections.

Exception: an abnormally warm or cool portion of a building that may be a potential problem for the end user.

Infrared inspection: the use of infrared imaging equipment to provide specific thermal information and related documentation about a structure, system, object or process.

Infrared thermal imager (infrared camera): a camera-like device that detects, displays and records the apparent thermal patterns across a given surface.

Infrared thermographer: a person who is trained and qualified to use an imaging radiometer.

Inspection window: the time period during which infrared inspections of building envelopes can be successfully conducted.

Moisture meter probe: an invasive (electrical resistance or galvanometric type) test that entails the insertion of a meter probe(s) into a material to indicate the presence of moisture.

Qualified assistant: a person provided and authorized by the end user to perform the tasks required to assist the infrared Thermographer. He/she is knowledgeable of the operation and history of the building to be inspected and is trained in all the safety practices and rules of the end user.

Qualitative infrared thermography: the practice of gathering information about a structure, system, object or process by observing images of different patterns of infrared radiation, and recording and presenting that information.

Quantitative infrared thermography: the practice of measuring temperatures of the observed patterns of infrared radiation.

Standard: a set of specifications that define the purposes, scope and content of a procedure.

Thermogram: a recorded visual image that maps the apparent temperature pattern of an object or scene into a corresponding contrast or color pattern.

Thermographer: see Infrared thermographer.

Report Glossary

To assist clients in understanding certain glossary terms which may appear in the body of this Inspection Report, those terms are also listed and defined below.

Adverse Condition: A condition determined in accordance with the contractual scope of inspection and which is (1) producing a detrimental effect on Systems or Components and/or (2) impairing the **Normally Intended Function or Operation** of Systems or Components and/or (3) not consistent with **Generally Established Practice(s)**.

Corrective Action: This designates **Adverse Conditions** for which evaluation by a **Qualified** individual is recommended as soon as possible for any necessary modifications or corrective measures. If, in the process of evaluating and addressing such conditions, it is determined that there are other **Adverse Conditions** present for which modifications or corrective measures are also deemed necessary, it is recommended that they be addressed at that time. It is further recommended that a copy of the appropriate portion or portions of the inspection report be provided to all **Qualified** individuals retained to evaluate and/or perform modifications or corrective measures to address **Adverse Conditions** documented in the Inspection Report.

Recommended Upgrade: Information regarding a System or Component which is provided solely as a courtesy to Clients for their consideration as part of any upgrading and maintenance program they may choose to implement. **Recommended Upgrade** conditions are not **Adverse Conditions**. **Recommended Upgrades** should be performed by **Qualified** personnel in accordance with all applicable industry standards and governmental requirements.

Generally Established Practice(s): Historically and conventionally applied method(s) and/or means of installation, assembly, operability, maintenance, and/or use.

Inspected: The System or Component was examined and no **Adverse Conditions** were observed.

Normally Intended Function or Operation: The historic and conventional purpose or use for which a System or Component was installed and/or for which it was designed and intended by its manufacturer.

Not Applicable: Indicates that the specific System or Component was not present or that examination of a specific System or Component is outside of the contractual scope of inspection.

Not Inspected: Indicates that the specific System or Component was not evaluated because it was not **Readily accessible** or **Safely Accessible** due to weather, landscaping, personal property, pets, factors beyond the inspector's control, and/or factors beyond the contractual scope of inspection. When the Inspection Report indicates that a specific System or Component could not be evaluated, the Inspection Report will also indicate the specific reason(s).

Qualified: Having the training, skills, expertise, and experience necessary to competently address the referenced condition(s) and, where required, holding all applicable licenses, and meeting all applicable governmental requirements.

Routine Maintenance: This designates conditions which are typical and common for the age and type of referenced System or Component. To reduce the potential for additional or accelerated deterioration, it is recommended that **Routine Maintenance** conditions be addressed as part of a regular property and Building Systems maintenance routine. Optional modification or upgrading of existing Systems or Components may also be considered when such work is performed. **Routine Maintenance** conditions are not **Adverse Conditions**.

Note: Potential costs which may be associated with additional evaluation of an **Adverse Conditions** or with any modifications or corrective measures which may be deemed necessary to address an **Adverse Condition** are not factors and are not considered by the inspector when recommending a **Corrective Action** designation for any **Adverse Condition**.

1. General Information

Styles & Materials

Roof-Type:
Gable

Roof Covering:
3-Tab fiberglass
Slate

Roof Ventilation:
Passive

Chimney (exterior):
Brick

Siding Material:
Vinyl
Wood

Exterior Entry Doors:
Wood
Fiberglass
Single pane

Ceiling Material:
Plaster

Wall Material:
Plaster

Items & Components

1.0 Purpose of Survey

General Comments

Primary purpose of conducting building envelope survey: **Latent Moisture**

DC Property Inspections, LLC was contracted by the client to find and locate the source of a suspected plumbing leak and/or determine the direct cause of moisture intrusion which occurred approximately 24-48 hours prior to the Inspection.

Infrared inspections may be conducted to detect evidence of latent moisture within building materials. Infrared inspections may be conducted from the exterior and/or the interior of a building. Vantage point should be selected to provide the greatest probability of detection. Inspection Procedures With help from the end user or the end user's representative, the thermographer will define the areas to be inspected. Latent moisture generally causes a change in the thermal capacitance and/or thermal conductivity of building materials. Moisture evaporating from a surface will generally cause a pronounced cooling in the wet areas.

Infrared inspections to detect latent moisture shall be conducted when conditions are most favorable for gathering accurate data. Inspections conducted from the exterior of the building should be performed post sunset following a sunny day with calm wind conditions. Exceptions associated with latent moisture will generally appear warm. Inspections conducted from the interior of the building may be performed during daytime hours provided that solar loading of exterior walls is not significant. Exceptions associated with latent moisture may appear as warm or cold, depending upon environmental conditions.

The infrared inspection shall be conducted in an organized fashion to ensure complete coverage of all areas of interest. Items to be inspected shall include walls, windows, and doors. For interior inspections, floors and ceilings should be included as well. Detected exceptions should be documented with a thermogram and daylight photograph. These may be substituted by marking the location and size of exceptions on blueprints or drawings. For large structures, recording thermal imagery to videotape can provide a dynamic record of the infrared inspection. Detected exceptions should be verified by independent means. This may include visual confirmation or the use of invasive testing such as moisture meter probes.

1.1 Description of Building

General Comments

The subject property is a colonial style single family home built in 1900, which has 8 bedrooms and 4.5 bathrooms. The total square feet is approximately 5,939. It's located at 123 Sample St NW, Washington, DC 20011. The property is currently furnished and is occupied. The property is being utilized as both a residential and commercial property (non-profit).

1.1 Item 1(Picture)

1.1 Item 2(Picture)

1.2 Data Interpretation

General Comments

The interpretation of infrared data is a process of pattern recognition for the purpose of differentiating exceptions from those caused by the following:

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- Variations in wall thickness, moisture content, or continuity.
- Variations in the type or thickness of wall surfacing.
- Variations within the building walls.
- Inconsistencies in walls due to damage, repairs, coatings, or overlays.
- Variations in temperature behind walls.
- Fasteners, flashings, flanges, or projections from walls or discontinuities within them.
- Variations in surface emittance.
- Infrared radiation from nearby sources.
- Hot or cold air from nearby sources.
- Moisture or debris on inspected surfaces.
- Variations in shape or geometry of inspected surfaces.

1.3 Inspection Limitations

General Comments

(1) Applicable constructions include insulated building sidewalls, exterior insulated finish systems (EIFS), and other building finishes which can absorb moisture. Certain construction details can preclude the detection of exceptions. Examples include, but are not limited to, stone or brick facades and walls containing dead air spaces. Some construction materials can preclude the detection of exceptions. Examples include, but are not limited to, high density materials such as brick, block, stone, spandrel glass, and metal.

For materials with highly reflective surfaces in the spectral range of the infrared thermal imager, infrared inspections are not practical until the surface is naturally or temporarily dulled. The wetting rates of

construction materials vary according to the type of material and environmental exposure. Details with insulations that wet slowly, such as EIFS, usually should not be inspected until they are at least three months old. Infrared inspections are not intended to identify the source of the moisture.

(2) When this report notes any condition which indicates the past or current presence of moisture, active leaks, or the potential for moisture intrusion including but not limited to any of the conditions listed below, it is important to understand that these conditions may contribute to the creation of environments which have the potential to support bio-organic growth such as mold and mildew. However, the presence of any of such conditions **DOES NOT** necessarily indicate that mold or mildew **IS OR IS NOT** present at the subject property.

- Visible rot, damage, or staining consistent with the presence of moisture on or in any interior or exterior building component
- The presence of moisture (whether in the form of dampness, condensation, or standing water) on interior or exterior building surfaces or components, in soil adjacent to the building, in under building crawlspaces, or in attic spaces
- The presence of staining which is consistent with past or present moisture on any interior or exterior surfaces or components
- Damaged, loose, or missing exterior surface moisture collection and discharge system components
- Flat or negative exterior site grading, planter boxes or other moisture trapping construction or areas adjacent to the foundation perimeter
- Flat or negatively sloped concrete flatwork; pavers, flagstone, or other water-impervious material flatwork; or paving; adjacent to the foundation perimeter
- Leaking, damaged, or improperly assembled potable water piping or fittings
- Damage to or mineral encrustation, rust, or moisture staining on water heaters, boilers or their related components
- Mineral encrustation, rust, or moisture staining on potable water supply or distribution piping, fittings, or related components
- Leaking, damaged, or improperly assembled plumbing drain, waste and venting piping or fittings
- Mineral encrustation, rust, or moisture staining on plumbing drain, waste, and venting piping, fittings, or related components
- Damaged, loose, or improperly installed plumbing fixtures
- Damaged, improper, or missing seals at plumbing fixtures, fixture trim, or fixture enclosures
- Damaged, loose, or missing bathtub enclosure or shower enclosure components
- Improper or missing roof, penetration, exterior wall, opening, deck, foundation, or other flashings
- Rust, staining, or mineral encrustation on air handling system components, air-conditioner condensate collection and discharge system components, or on evaporative cooling system components
- Damaged, missing, or improperly installed or assembled air-conditioning system condensate collection or discharge components or evaporative cooling system cabinet, reservoir, water supply or overflow components
- The presence of central humidification systems which are attached to the conditioned air distribution ductwork, to air handlers, or to central heating plants/furnaces; rust, mineral encrustations, or moisture staining on such systems; or damaged or loose permanently attached central humidifiers
- The presence of evaporative cooling equipment and evaporative cooling system air distribution ductwork

- Damaged, missing or improperly installed or assembled combustion by product venting system components serving natural gas-fired, liquefied petroleum gas-fired, or oil-fired components
- Damaged, obstructed, loose, missing, or improperly assembled or installed clothes dryer venting components
- Damaged, loose, missing, or improperly assembled or installed bathroom, laundry area, or kitchen ventilation fan duct system components
- Damaged, missing, or improperly installed roof covering materials
- Improper or missing ventilation or vapor retarders in walls, floors, attic areas or under building crawlspaces
- Standing water in subsurface water collection sump pits.

This information is intended only as a guide. The scope of this inspection and report and the standards in accordance with which this inspection is conducted specifically exclude determining the presence or absence of any hazardous substance. This includes, but is not limited to, determining, testing for, and/or reporting on the presence or absence of any exposed or contained airborne, waterborne or surfaceborne environmental hazards or toxic, harmful, irritating, or dangerous chemicals or substances; mold, mildew or other bio-organic growth or bio-hazards; allergens, irritants, bacteria, viruses, fungi, mycotoxins, or other pathogens; animal excretions, dangerous, damaging, or poisonous animals or insects; toxic flora, gases including radon gas and formaldehyde gas; asbestos, lead in paint or any other products; urea formaldehyde foam insulation, petrochemicals, volatile organic substances or pesticides.

Therefore, if you have any concerns regarding any environmental or wildlife issues and/or desire to obtain information regarding the presence or absence of any environmental hazards or toxic or dangerous substances at the subject property, it is recommended that you retain the services of qualified individuals or companies specializing in the area or areas of your specific concern.

1.4 General Information about Moisture Intrusion

General Comments

Moisture intrusion can be the cause of building defects, as well as health ailments for the building's occupants.

Some common moisture-related problems include:

- structural wood decay;
- high indoor humidity and resulting condensation;
- expansive soil, which may crack the foundation through changes in volume, or softened soil, which may lose its ability to support an overlying structure;
- undermined foundations;
- metal corrosion;
- ice dams; and
- mold growth. Mold can only grow in the presence of high levels of moisture. People who suffer from the following conditions can be seriously (even fatally) harmed if exposed to elevated levels of airborne mold spores: asthma; allergies; lung disease; and/or compromised immune systems.

Note: People who do not suffer from these ailments may still be harmed by elevated levels of airborne mold spores.

How does moisture get into the house?

Moisture or water vapor moves into a house in the following ways:

- air infiltration. Air movement accounts for more than 98% of all water vapor movement in building cavities. Air naturally moves from high-pressure areas to lower ones by the easiest path possible, such as a hole or crack in the building envelope. Moisture transfer by air currents is very fast (in the range of several hundred cubic feet of air per minute). Replacement air will infiltrate through the building envelope unless unintended air paths are carefully and permanently sealed;
- by diffusion through building material. Most building materials slow moisture diffusion, to a large degree, although they never stop it completely;
- leaks from roof;
- plumbing leaks;
- flooding, which can be caused by seepage from runoff or rising ground water; it may be seasonal or catastrophic; and
- human activities, including bathing, cooking, dish washing and washing clothes. Indoor plants, too, may be a significant source of high levels of humidity.

Climate Zones

In the northern U.S., moisture vapor problems are driven primarily by high indoor relative humidity levels, combined with low outdoor temperatures during the winter. In the southern U.S. (especially the southeast), the problem is largely driven by high outdoor humidity and low indoor temperatures during summer months. Mixed climates are exposed to both conditions and can experience both types of problems. Humid climates, in general, will be more of a problem than dry climates. Wind-driven rain is the main cause of leaks through the building envelope.

Inspectors can check for moisture intrusion in the following areas:

Roofs

A roof leak may lead to the growth of visible mold colonies in the attic that can grow unnoticed. Roof penetrations increase the likelihood of water leaks due to failed gaskets, sealants and flashing. The number of roof penetrations may be reduced by a variety of technologies and strategies, including:

- consolidation of vent stacks below the roof;
- exhaust fan caps routed through walls instead of the roof;
- high-efficiency combustion appliances, which can be sidewall-vented;
- electrically powered HVAC equipment and hot water heaters that do not require flue; and
- adequate flashing. Oftentimes, inspectors discover missing, incorrectly installed or corroded flashing pipes.

Plumbing

- Distribution pipes and plumbing fixtures can be the source of large amounts of moisture intrusion. If the wall is moist and/or discolored, then moisture damage is already in progress. Most plumbing is hidden in the walls, so serious problems can begin unnoticed.
- One of the most important means of moisture management in the bathroom is the exhaust fan. A non-functioning exhaust fan overloads the bathroom with damp air. If the exhaust fan doesn't turn on automatically when the bathroom is in use, consider recommending switching the wiring

or switch. The lack of an exhaust fan should be called out in the inspection report. The fan should vent into the exterior, not into the attic.
- The bathroom sink, in particular, is a common source of moisture intrusion and damage. Although overflow drains can prevent the spillage of water onto the floor, they can become corroded and allow water to enter the cabinet.
- Use a moisture meter to check for elevated moisture levels in the sub-floor around the toilet and tub.
- Bathroom windows need to perform properly in a wide range of humidity and temperature conditions. Check to see if there are any obvious breaks in the weatherstripping and seals. Are there are stains or flaking on the painted surfaces?
- Check showers and bathtubs. Is the caulking is cracked, stiff or loose in spots? Are there cracked tiles or missing grout that may channel water to vulnerable areas? If some water remains in the bathtub after draining, it may be a warning sign of possible structural weakening and settlement in the floor beneath the tub.

Utility Room

- The water heater tank should be clean and rust-free.
- The area around the water softener tank should be clean and dry.
- Check that all through-the-wall penetrations for fuel lines, ducts, and electrical systems of heating system are well-sealed. All ducts should be clean and dust-free. Inspect the air supply registers in the house for dust accumulation.
- Filters, supply lines, exterior wall penetrations, vents, ductwork and drainage of the cooling system must all be in good working order to avoid moisture problems.

Attic

- Look for stains or discolorations at all roof penetrations. Chimneys, plumbing vents and skylight wells are common places where moisture may pass through the roof. Any such locations must be inspected for wetness, a musty smell and/or visible signs of mold.
- Are there areas of the insulation that appear unusually thin?
- Rust or corrosion around recessed lights are signs of a potential electrical hazard.

Foundations

- Model building codes typically require damp-proofing of foundation walls. The damp-proofing shall be applied from the top of the footing to the finished grade. Parging of foundation walls should be damp-proofed in one of the following ways:
- bituminous coating;
- 3 pounds per square yard of acrylic modified cement;
- 1/8-inch coat of surface-bonding cement; or
- any material permitted for water-proofing.

In summary, moisture can enter a building in a number of different ways. High levels of moisture can cause building defects and health ailments.

2. Infrared Thermal Imaging (ITI) Building Survey

Styles & Materials

Standard of Practice:
Standard for Infrared Inspection of Building Envelopes

Lead Thermographer:
Kevin A. Richardson

Thermographer's Certification Level:
Level III Certified Infrared Thermographer, ID #7493

Qualified Assistant:
Not Applicable

Equipment:
FLIR SYSTEMS ThermaCAM T400

Field of View (FOV):
40x40 degrees (wide angle)

Emissivity:
1.00 (qualitative)

Outside Air Temperature:
40 Deg F

Indoor Air Temperature:
68 Deg F

Delta-T:
28 Deg F

Sky Conditions:
Partly Cloudy

Wind Speed:
<5 MPH

Relative Humidity:
45 - 50 %

Dew Point:
15 - 20 Deg F

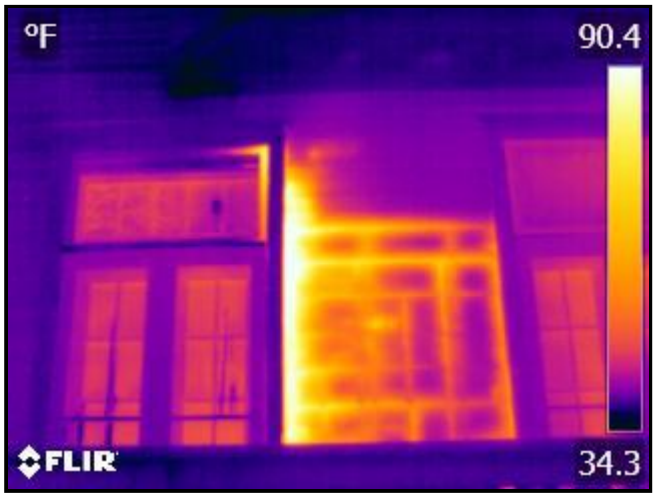
Items & Components

2.0 Thermal Anomalies (Exceptions) Detected During Exterior Scan

Adverse Condition

(1) A section of the exterior wall at the left side of home (facing front) displays **atypical** thermal anomalies. These type of thermal patterns are consistent with latent moisture. The thermal images below depict warm water flowing on the exterior house wall. There are hot and cold vertical riser pipes inside the wall cavity. I suspect there is a leak on the hot riser pipe, which is causing water to leak inside the wall cavity and on the exterior house wall.

(2) **Exterior Exception #1:** Warm water penetrating the exterior wall on the left side of home beneath the bay window. The water is suspected to be from a pipe leak (hot water pipe) near the upper right corner of the window/door adjacent to the dining room.

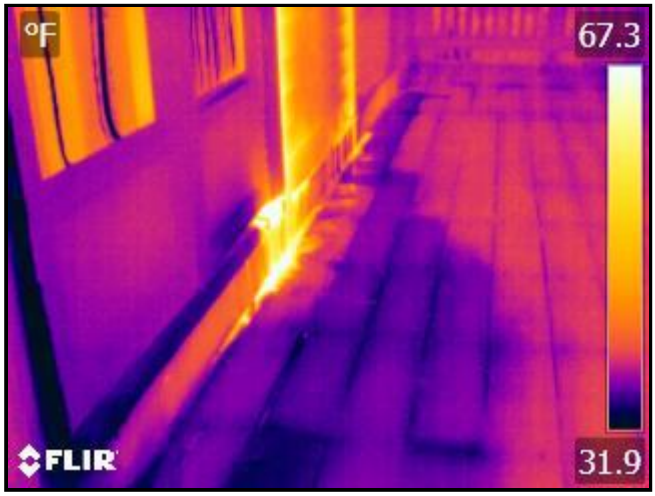


2.0 Item 1(Picture)

2.0 Item 2(Picture)

(3) **Exterior Exception #2:** Warm water penetrating the exterior wall on the left side of home beneath the bay window. The warm water is flowing down the exterior house wall and hitting the window/door

threshold and the floor of the wood deck. The exterior water flowing down the house wall, along with the water leaking inside the wall cavity, has caused moisture intrusion in the basement.



2.0 Item 3(Picture)

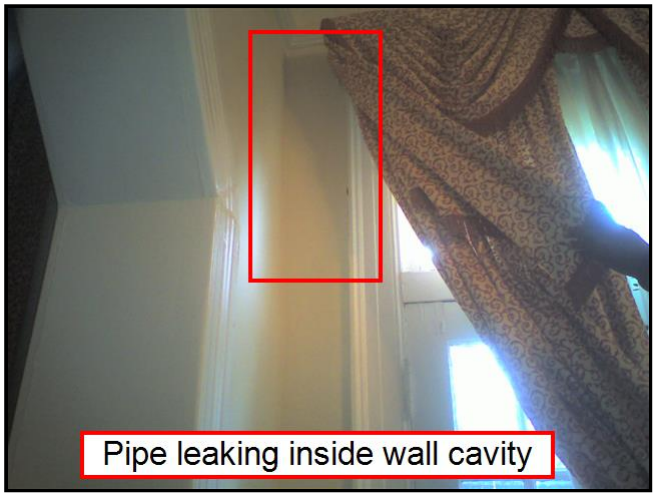
2.0 Item 4(Picture)

2.1 Thermal Anomalies (Exceptions) Detected During Interior Scan

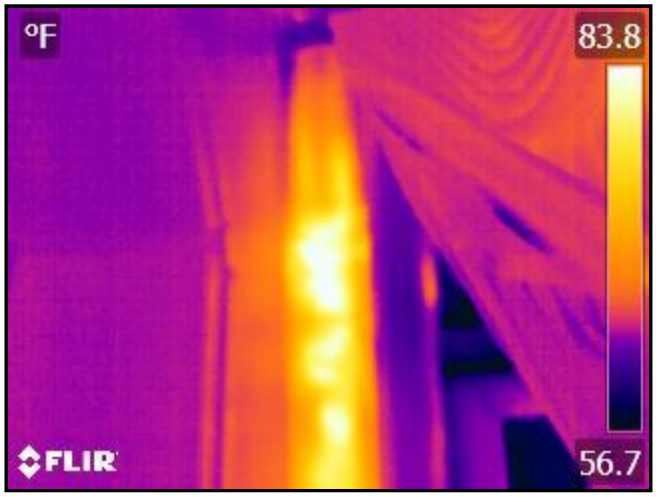
Adverse Condition

(1) A section of the interior wall and floor at the dining room (left wall - facing front) displays **atypical** thermal anomalies. These type of thermal patterns are consistent with latent moisture. The thermal images below depict warm water flowing inside the wall. There are hot and cold vertical riser pipes inside the wall cavity. I suspect there is a leak on the hot riser pipe, which is causing water to leak inside the wall cavity, on the floor of the dining room, and down into the finished basement.

(2) **Interior Exception #1:** Warm water leaking inside the wall cavity (left wall) on the left side of the tall window/door adjacent to the dining room. The water is suspected to be from a pipe leak (hot water pipe) inside the wall cavity.



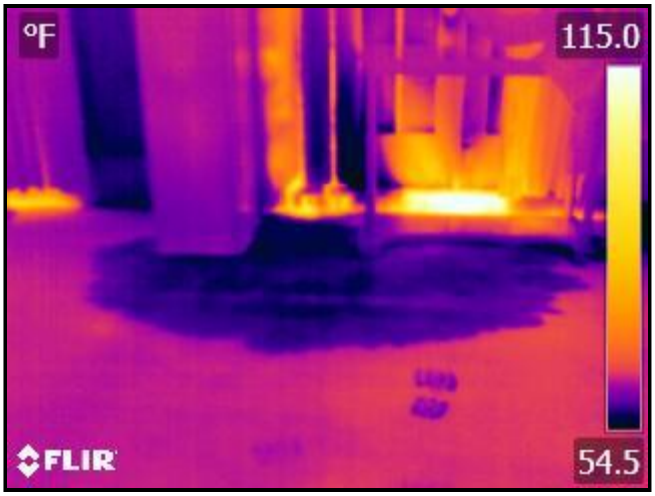
2.1 Item 1(Picture)



2.1 Item 2(Picture)

(3) **Interior Exception #2:** Warm water leaking inside the wall cavity (left wall) on the left side of the tall window/door adjacent to the dining room. The warm water is flowing inside the wall cavity and causing moisture intrusion on the floor. The water flowing inside the wall, along with the water leaking on the exterior wall, has caused moisture intrusion in the basement.

2.1 Item 3(Picture)



2.1 Item 4(Picture)

2.2 Summary and Recommendations

Adverse Condition

As mentioned above and based on the thermal images taken during the Inspection, I suspect warm water is leaking inside the wall cavity (left wall) on the left side of the tall window/door adjacent to the dining room. The hot riser pipe, which is located inside the wall cavity, is suspected to have ruptured. This has likely been caused by the extreme cold temperatures experienced in this area over the past several days. In older homes it's very common to have vertical riser pipes on an exterior wall. These pipes are subjected to extreme temperatures and should be properly insulated.

Pipes are most susceptible to freezing when located:

- In an outside wall;
- Under a sink on an outside wall;
- In an unheated crawlspace.

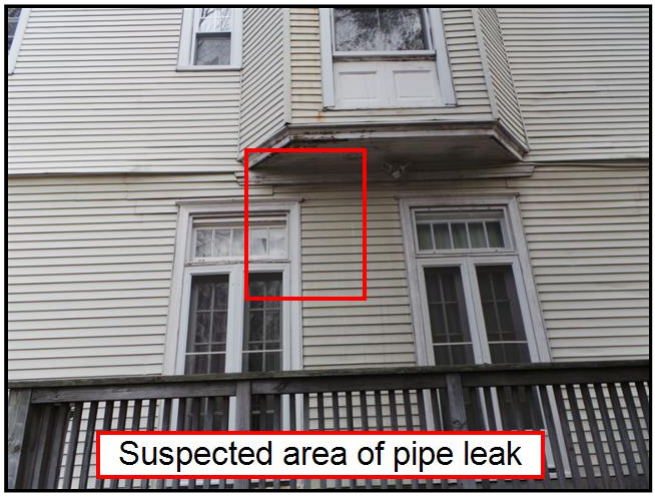
The pipe leak has potentially caused hundreds of gallons of water to leak inside the wall cavity, on the exterior wall, in the sub-flooring, and down into the ceiling, walls and floor of the finished basement. A **Qualified** Plumber should be retained to locate and fix the damaged pipe. I would suggest having the contactor start by cutting into the wall cavity in the dining room (See Pictures below). It is also recommended you retain the services of a **Qualified** Water Damage Restoration Contractor, which typically offers the following services:

- Drying equipment that help prevent property water damage like swelling and warping of floors, walls and furniture.
- Industrial grade dehumidifiers, which minimize secondary water damage.
- High-speed air movers, which helps evaporate moisture and creates airflow across walls, carpets, pads and furniture.

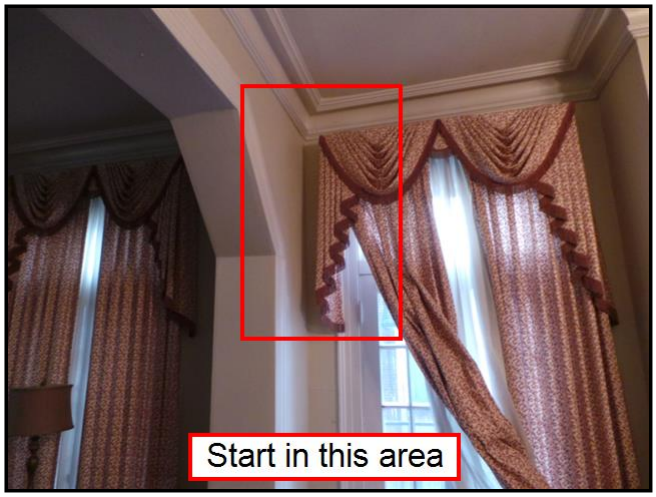
Recommend **Corrective Action** by a **Qualified** Contractor.

Note: The water to the property was shut-off prior to the Inspection. With the clients permission, the water was turned on briefly to determine or pinpoint the cause of the suspected water leak or moisture intrusion. After it was determined the water intrusion was caused by a leak on a hot water pipe suspected

to be inside the wall cavity, the main water valve to the home was shut-off by the client to prevent further damage or deterioration.



2.2 Item 1(Picture)



2.2 Item 2(Picture)