Home Performace Report

T. Smith

Property Address:
115 E. Ogden
Naperville IL

461 Cheyenne

Insight Property Services, Inc

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INSIGHT
PROPERTY SERVICES INC.

Table of Contents

Date: 1/1/2013	**Time:** 09:20 AM	**Report ID:** HP - 11-010
Property: 115 E. Ogden Naperville IL	**Customer:** T. Smith	**Real Estate Professional:**

Comment Key or Definitions

The following definitions of comment descriptions represent this inspection report. All comments by the inspector should be considered before purchasing this home. Any recommendations by the inspector to repair or replace suggests a second opinion or further inspection by a qualified contractor. All costs associated with further inspection fees and repair or replacement of item, component or unit should be considered before you purchase the property.

Inspected (IN) = I visually observed the item, component or unit and if no other comments were made then it appeared to be functioning as intended allowing for normal wear and tear.

Not Inspected (NI)= I did not inspect this item, component or unit and made no representations of whether or not it was functioning as intended and will state a reason for not inspecting.

Not Present (NP) = This item, component or unit is not in this home or building.

Repair or Replace (RR) = The item, component or unit is not functioning as intended, or needs further inspection by a qualified contractor. Items, components or units that can be repaired to satisfactory condition may not need replacement.

Standards of Practice:	**In Attendance:**	**Type of building:**
BPI Building Performance Institute	Homeowner	Single Family (1 story)
Home Faces:	**Weather:**	**Ground/Soil surface condition:**
North	Light Rain, Cloudy, Light Wind	Wet

Precipitation in last 3 days:
Yes

General Summary

Customer
T. Smith

Address
115 E. Ogden
Naperville IL

This Summary is not the entire report. The complete report may include additional information of concern to the customer. It is recommended that the customer read the complete report.

3. Heating / Cooling Performance

3.0 Heating Performance

Repair or Replace

The furnace is at least 25 years old and is less than 80% efficient. Considering the relative tightness of the home, upgrading the furnace is the next best opportunity for decreasing the home's gas bill. It is recommended this unit be upgraded to a sealed combustion, 96% efficient or greater unit with an integrated HRV for continuous, balanced fresh air ventilation.

3.1 Cooling Performance

Repair or Replace

The air conditioner is at least 20 years old, of an estimated life span of 20 yrs. The unit would benefit from regular cleaning and service. Consider upgrading the air conditioner along with the furnace to see reduced utility bills.

4. Building Enclosure Performance/Ventilation

4.2 Minimum Ventilation Requirement (MVR) - Safety Concerns

Action Recommended

MVR for this building = 148 cfm of continuous air flow

4. Building Enclosure Performance/Ventilation

The Minimum Ventilation Requirement (MVR) is a number of cubic feet per minute (cfm) of air the building needs to be safe and habitable for the occupants. It is derived from a formula based on several factors such as the volume of the home; number of occupants, geographic area, exposure to wind etc. and the larger cfm number is used as the MVR. A home can be sealed as tight as possible as long as you have continuous mechanical ventilation of at least the minimum CFM as described above.

The home has 46 cfm of exhaust capacity with the existing bath fan. However, running that fan is not the recommended method for achieving whole house ventilation.

4.6 Exhaust Fans (bathroom, dryer, etc.) and venting

Action Recommended

(1) There is no exhaust fan in the bathroom. It is recommended that every bathroom have a high-quality, quiet (<1.5 sones), 80+cfm exhaust fan installed. These fans should be exhausted to the outdoors by way of insulated ducting through a roof mounted, dampered vent.

4.9 Other Safety Items

Action Recommended

(1) The radon ventilation system did not vent above the roofline, which prevents radon gasses from possibly being reintroduced into the home through windows, doors, or other openings. Also, it is not standard practice for the radon ventilation to use the sump pit from which to draw soil gasses. This scope of this inspection did not include radon remediation, so it recommended to contact a radon remediation specialist for further consultation.

5. Exterior Moisture Management

5.1 Flashings, Gutters and Drainage

Inspected

(2) Valley roof sections not only carry a large amount of water, but that water is funneled down to a point. As shown in the diagram, the eave of the valley concentrates all the water from an entire corner of roof section to a single point. That point where roof sections are joined becomes a critically important area of water management. Having the chimney at the bottom of the roof valley makes the area even more critical as it must properly divert a large amount of water around it. This section of roof should be periodically monitored with regard to the integrity of the chimney flashing and also be kept clear of debris.

6. Air Control Layers

6.1 Air seal the attic top plates, electrical and plumbing penetrations

Repair or Replace

As the framing in a home dries over the years, the top plates of both interior and exterior walls allow large amounts of air to leak from the wall cavity and up into the attic. Recommend that these areas be sealed with a 2-part foam spray.

Penetrations in the form of plumbing penetrations, electrical conduit, boxes and fixtures should be exposed and sealed before additional insulating.

6.2 Soffits below non-conditioned space

Repair or Replace

6. Air Control Layers

The top of the soffit should be covered with foam board and sealed to the framing and drywall to create a continuous air tight sealing, the air barrier between the conditioned second floor and the unconditioned attic.

Recommend having a qualified contractor insulate, and air seal the soffit.

6.3 Thermal bypasses (between floors)

Repair or Replace

The stud cavity serving as a chase for the bathroom plumbing is a major air by-pass from the attic to the basement allowing cold air to fall and warm air to escape. Recommend the opening around the pipes be sealed with foam board and 1-part foam where the pipes pass into the attic.

6.4 Rim Joist insulation and air sealing perimeter of floor system

Repair or Replace

Recommend sealing the exterior rim joists of the home with 1" foam board should be cut to fit between the floor, foundation, and joists and sealed with 1-part foam.

6.5 Attached Garage air sealing (Firewall, Combustibles, and VOCs)

Repair or Replace

The wall that separates the garage from inside the home is important to prevent the air in the garage which may contain pollutants, chemicals etc. from entering the home. All wall penetrations should be sealed with a fire rated spray foam or caulk. Good garage door seals are critical for keeping harmful exhaust, chemical fumes and VOCs from entering the home from the garage. Replace and maintain as necessary.

6.8 Exterior doors: Air leakage, weather stripping and seals

Repair or Replace

(1) The back porch sliding doors are a significant source of air leakage, around the casing, threshold, and between the glass panes where they slide along the track guide. All sides of the door should be air sealed with a clear, paintable caulk and the weather strip between the sliding panels should be adjusted or replaced to make a tighter seal.

7. Thermal Layer

7.0 Recommended additional attic insulation

Repair or Replace

The attic currently has about an R-8 and should be increased to at least an R-38, the current code minimum. Recommend the attic be insulated to an a more cost effective R 50-60 with blown cellulose (settles to an air-impermeable mass - unlike fiber glass), **only after air sealing and attic ventilation** issues have been completed.

1. Owner/Occupant Interview

Items

1.0 Are you able to provide Insight with floor plans of your home?

No

1968

1.1 Approximately how old is your home?

Yes

1962

1.2 Approximately how long have you lived in your home?

Yes

2.5 mo.

1.3 How many people live in your home?

Yes

3

1.4 How many bedrooms and bathrooms?

Yes

2/2

1.5 Do you plan to stay in your home for 5 years or more?

Yes

1.6 Have there been any structural changes to your home that you are aware of? If so, what was done and and approximately when was it done?

Unknown

1.7 Do you plan on any extensive remodeling or additions to the home?

Yes

Finish the basement

1.8 Do you have any energy bill concerns?

Yes

Gas bill high

1.9 Are there any "hot" or "cold" spots in the home? Where?

No

1.10 Do you feel like your home is drafty? If so where?

Yes

Windows (West)

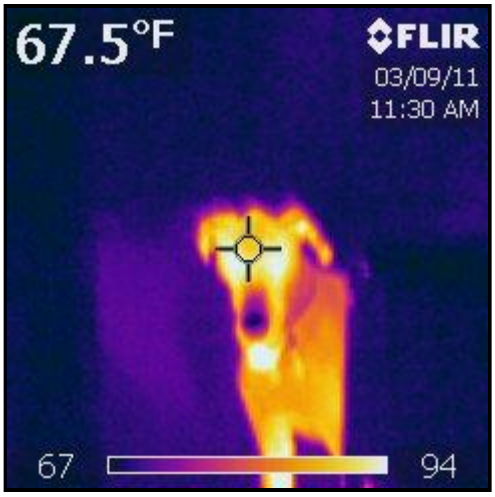
1.11 Have you ever noticed ice damming (large icicle formations around your roof perimiter)?

No

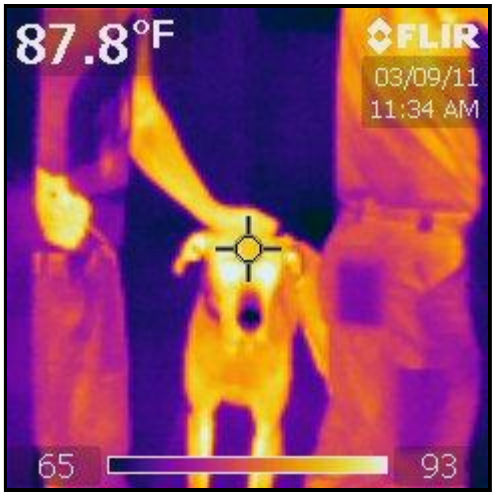
1.12 Do you have pets indoors?

Yes

1 dog & 1 cat



1.12 Picture 1 Oz in Infrared



1.12 Picture 2 Oz and Crew

1.13 Are there pet access doors to the outside?

No

1.14 Are there any open fireplaces, gas logs or un-vented appliances in the home?

Yes

Wood only

1.15 Do you smoke tobacco products indoors?

No

1.16 Do you sometimes smell sewer, soil or musty odors?

No

1.17 Does anyone in your home have frequent headaches?

No

1.18 Do you sometimes smell combustion odors?

No

1.19 Does anyone in your home have allergies?

No

1.20 Do you feel like you have excessive dust in your home?

No

1.21 Does anyone in your home experience dry sinuses in winter?

No

1.22 Do you humidify your home in winter?

Yes

Room humidifier in Liam's room

1.23 Do your windows sweat in summer or winter?

Yes

North & West windows

1.24 Have you noticed any additional (non-window) condensation in your home?

No

1.25 Do you have any existing mold, mildew, or excessive moisture concerns?

No

2. Combustion Appliance Zone CAZ

Styles & Materials

CAZ Location (s):
Basement

Outside Temperature:
42 degrees F

Minimum Draft Pressure:
-1.7 pascals

CAZ Depressirization Limit (BPI Table):
-5 pascals

Worst Case CAZ Depressurization:
-0.3 pascals

Water Heater Temperature at Steady State:
440 degrees F

Water Heater CO ppm at Steady State:
8 ppm

Water Heater Draft Pressure Reading:
-5.6 pascals

Heat System Temperature at Steady State:
450 degrees F

Heat System CO ppm at Steady State:
9 ppm

Heat System Draft Pressure Reading:
-9.4 pascals

Gas Oven Maximum CO ppm:
135 ppm

Gas Oven Max CO Time (minutes):
1.22 minutes

Gas Oven CO ppm at Steady State:
17 ppm

Gas Oven Temperature at Steady State:
300 degrees F

Items

2.0 Baseline CO (outside main entrance of home)

Inspected

The baseline test for **carbon monoxide outside** your home was **0 ppm**.

2.1 Measurement of CO (ppm) upon entering home

Inspected

The baseline test for **carbon monoxide inside** your home was **0 ppm**.

2.2 Combustion appliance minimum required Draft Pressure

Inspected

This test is conducted indoors but is based on the outside temperature and determines a minimum draft test limit for the venting capability of the combustible appliances inside at the CAZ (Combustion Appliance Zone). The Minimum draft test limit used on this home at time of inspection is **-1.7 (Pa)**.

2.3 CAZ Depressurization limit

Inspected

The Depressurization Limit of your Combustion Appliance Zone (CAZ) is **-5 Pa**. This number is determined by the type or types of combustion appliances in your home and how they are currently vented. Using BPI Standards (Building Performance Institute), the number given (in units of air pressure called Pascal or Pa) is the maximum depressurization allowed in the combustion appliance zone under a worst case scenario. The Building Analyst, using the home's exhaust fans, air handler and doors, created a scenario that generated the most negative pressure possible near the gas appliances in order to determine if your appliances will continue to remove their toxic exhaust to the outdoor air, or if they will spill exhaust and CO back into your home.

2.4 CAZ Base Pressure (WRT outside)

Inspected

The Baseline for this Combustion Appliance Zone (CAZ) test is **-2.4 Pa**. This number was obtained by using the Manometer in the CAZ with reference to the outside. This number is used to determine the Net Worst Case Depressurization.

2.5 Worst Case Depressurization using the home's mechanical ventilation equipment

Inspected

Atmospherically vented water heaters, like the one here, are susceptible to exhaust spillage because they do not create a strong draft. A strong negative pressure (ie. air being sucked into the return ducts at the open

filter slot) can draw air down the water heater flue causing it's exhaust to spill into the home. We created a Worst Case Depressurization of **-0.3 Pa** by using the home's exhaust fans & air handler and closing certain doors. This is below the limit of **-5 Pa**. A follow-up Combustion Safety Test should be completed after any air sealing work or changes to the mechanical or ventilation systems.

2.6 Water Heater Spillage Test

Inspected

Spillage Test Results: A spillage test was conducted on the water heater. According to BPI Technical Standards, combustible appliances can spill fumes for up to 60 seconds on start up. Your water heater "Passed" the spillage test.

2.7 Water Heater Draft Test

Inspected

Minimum Draft Pressure Test: This test is to determine if there is enough "draw" or negative pressure that will remove the toxic fumes of the exhaust in the vent pipe of the water heater to the outdoor air. **The Draft Pressure reading on the water heater during "Worst Case Depressurization" was -5.6 Pa.** This number should be more negative than the Minimum Required Draft Pressure of **-1.7 Pa**.

The Draft test on the water heater passes and draft pressure is venting the exhaust safely to the outdoors as intended.

2.8 Water Heater CO at Steady State

Inspected

CO Output Test: The CO output of the water heater at steady state temperature was measured at **8 ppm**. CO less than 25 ppm is ideal. 26-100 ppm recommends a cleaning and adjustment. 100+ ppm requires the unit be thoroughly serviced, cleaned and adjusted by a qualified technician.

2.9 Heat System Spillage Test

Inspected

Spillage Test Results: A spillage test was conducted on the gas furnace. According to BPI Technical Standards, combustible appliances can spill fumes for up to 60 seconds on start up. Your heat system "Passed" the spillage test.

2.10 Heat System Draft test

Inspected

This test is to determine if there is enough "draw" or negative pressure in the flue in order to remove the exhaust fumes to the outside. **The Draft pressure reading on the gas furnace during "Worst Case Depressurization" was -9.4 (Pa).** This number should be more negative than the Minimum Draft Pressure we already established as **-1.7 (Pa)**.

The Draft test on this appliance passes and draft pressure is venting the exhaust safely to the outdoors as intended.

2.11 Heat System CO at Steady State

Inspected

CO Output Test: The CO output of the gas furnace at steady state temperature was measured at **9 ppm**. CO less than 25 ppm is ideal. 26-100 ppm recommends a cleaning and adjustment. 100+ ppm requires the unit be thoroughly serviced, cleaned and adjusted by a qualified technician.

2.12 Combination Spillage Test

Inspected

Spillage Test Results: A spillage test was conducted on the commonly vented combustion appliances. According to BPI Technical Standards, combustible appliances can spill fumes for up to 60 seconds on start up. Your commonly vented appliances "Passed" the spillage test.

2.13 Summary: Did this home pass the BPI Combustion Appliance Safety Test?

Inspected

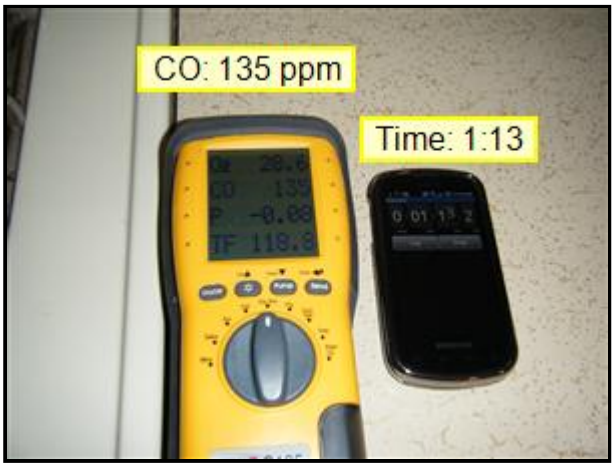
Yes, this home's Combustion Appliance Zone CAZ and combustion appliances passed the technical standards above set by BPI Building Performance Institute.

If this test was a preliminary to conducting a blower door test to determine how leaky or air tight your home is, you are now ready to continue on with a blower door test to determine the best methods in air sealing your home. The blower door test will help determine how tight your home can be while maintaining enough indoor air quality using the **Building Airflow Standard.** If you would like to know more about how you can benefit from air sealing your home please ask.

2.14 Gas Oven Max CO (ppm at time interval)

Inspected

Your oven outputs high levels of CO upon startup and reaches a maximum of **135 ppm** about **1.22 minutes** into its warm up cycle. Recommend having the burners cleaned and adjusted by a qualified appliance repair technician and retested for CO output at startup. In the mean time, do not open the oven while it's warming up as this will prolong the period of high CO production as well as increase CO exposure levels.

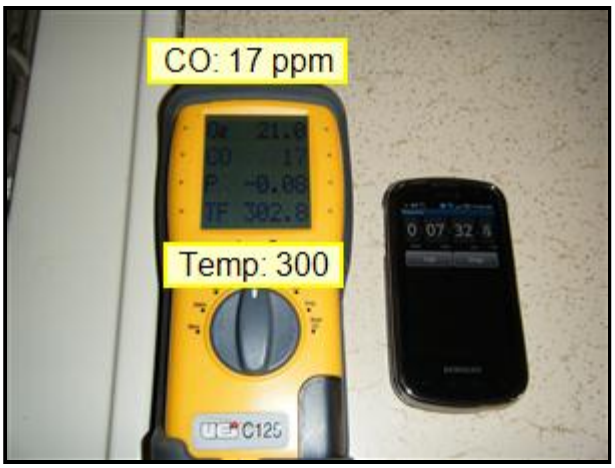


2.14 Picture 1 Gas Oven Max CO

2.15 Gas Oven CO test at Steady State (ppm)

Inspected

The CO measured at Steady State operation of the gas oven is **17 ppm at 300 degrees.** CO less than 25 ppm is ideal. 26-100 ppm recommends a cleaning and adjustment. 100+ ppm requires the unit be thoroughly serviced, cleaned and adjusted by a qualified service technician.



2.15 Picture 1 Gas Oven Steady State CO

2.16 Gas Meter/Pipe leaks (outside)

Inspected

There were no gas leaks detected outside the home.

2.16 Picture 1 Gas Meter

2.17 Gas Meter/Pipe leaks (inside)

Inspected

There were no gas leaks detected inside the home.

2.18 Smoke Detector

Inspected

The average service life of a smoke detector is 10 yrs. Be sure to replace batteries yearly and replace the units entirely after 10 years. Recommend one smoke detector per floor and one within 15 feet of the bed rooms.

2.19 CO Detector

Inspected

The average service life of a carbon monoxide detector is 2-3 yrs. Be sure to replace batteries yearly and replace the units entirely after 3 years. Recommend one CO detector near each CO source (water heater/ furnace, kitchen) and one within 15 feet of the bed rooms.

3. Heating / Cooling Performance

Styles & Materials

Number of Heat Systems (excluding wood):
One

Heating System Type(s):
Forced Air

Heating System Energy Source(s):
Natural gas

Heating System Brand (Model & Age):
BRYANT
Model #; Age(MFR Date) : 394GAW048125; 1985

Heating System Efficiency (AFUE):
unknown

Heating System Capacity (Btu):
130,000

Heating System AGA Venting category:
1 (- pressure, non-condensing, standard venting, 70% or less efficient)

Filter Type:
Disposable

Filter Size:
16x25

Ductwork:
Non-insulated

Water Heater Location:
Basement

Water Heater Power Source:
Gas (quick recovery)

Water Heater Manufacturer (Model # & Age):
WHIRLPOOL
Model #; Age(MFR Date) : bfg2h4040t3nov; 2006

Water Heater Capacity:
40 Gallon (1-2 people)

Water Heater AGA Venting category:
1 (- pressure, non-condensing, standard venting, 56% or less efficient)

Cooling Equipment Type:
Split system - forced air

Cooling Equipment Energy Source:
Electricity

Central Air Manufacturer:
CHRYSTLER
Model # : AirTemp; 1264-00K; mf 1980?

Number of Operable Fireplaces:
One

Types of Fireplaces:
Solid Fuel/ Wood
Open Combustion

Items

3.0 Heating Performance

Repair or Replace

The furnace is at least 25 years old and is less than 80% efficient. Considering the relative tightness of the home, upgrading the furnace is the next best opportunity for decreasing the home's gas bill. It is recommended this unit be upgraded to a sealed combustion, 96% efficient or greater unit with an integrated HRV for continuous, balanced fresh air ventilation.

3.0 Picture 1 Furnace

3.1 Cooling Performance

Repair or Replace

The air conditioner is at least 20 years old, of an estimated life span of 20 yrs. The unit would benefit from regular cleaning and service. Consider upgrading the air conditioner along with the furnace to see reduced utility bills.

3.1 Picture 1 AirTemp

3.2 Water Heater Performance

Inspected

The existing water heater is about 5 years old and should have a typical life span of 12-15 years. Recommend the unit eventually be upgraded to a power vented or sealed combustion unit. These are more energy efficient and they eliminate combustion safety risks due to exhaust spillage.

3.2 Picture 1 Water Heater

4. Building Enclosure Performance/Ventilation

Styles & Materials

Condtioned Space Volume (ft3):
25,348 Cubic Feet

Conditioned Space Floor Area (ft2):
2,987 Square Feet

Blower Door Diagnostics:
Measurement at CFM50= 2,205
Air Changes per hour ACH50= 5.22
LBL "N"-Factor= 18.5
Natural Air Changes per hour= 0.28 CFMn
Hours per Air Change = 3.54 hours

MVR Minimum Ventilation Requirement ASHRAE 62- 1989:
Ventilation for the people: = 45 CFM
Ventilation by Volume of Building 148
MVR Ventilation for this home is 148 CFM natural
MVR Ventilation (High Range) 2,735 CFM50
MVR Ventilation (Low Range) 1,915 CFM50
Potential Air Sealing for this home -530 CFM50

MVR Minimum Ventilation Requirement ASHRAE 62.2- 2007:
Number of bedrooms (plus 1)= 3
Square Feet Conditioned Area= 2,987
Option 1: CFM Fan Flow using MVG 30 CFM
Option 2 MVG using the Table 4.1 BPI Standards 60 CFM

Attic Ventilation:
Soffit Vents
Ridge vents

Range Hood Exhaust:
Filter/Recirculate

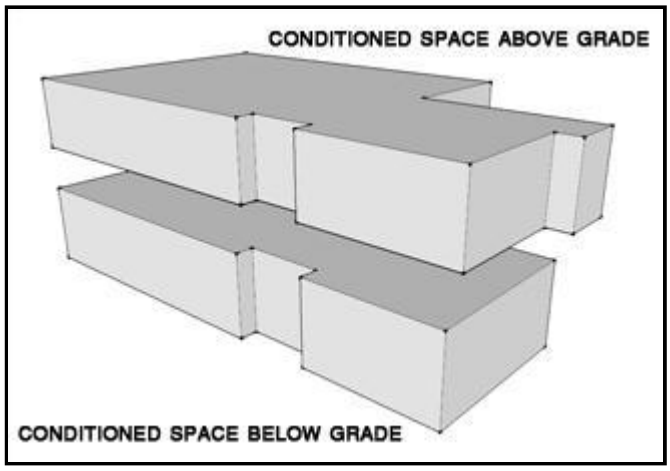
Total Mechanical Exhaust Capacity CFM:
Mechanical Exhaust Capacity = 46 cfm

Items

4.0 Rough outline of Air/Thermal boundary

Surveyed

The "Thermal Boundary" of your home is what separates the conditioned air inside from the outside air, attic or crawlspace. Typically the thermal boundary is made up of an air control layer (like gypsum board) and a thermal control layer (insulation). A thermal boundary has 6 sides (top, bottom, front, back and two sides). Anywhere along the thermal boundary that is not aligned properly (meaning air control layer or thermal control layer, missing or not in tact) energy loss can occur. Energy loss (money) can be heating or cooling and can be significant as breaks in the thermal boundary can allow air leaks through house pressures and heat flow through conduction. It is important to preserve the thermal boundary and air seal and insulate when remodeling.



4.0 Picture 1 Thermal Boundary

4.1 Home Air Leakage measurement (CFM@50)

Surveyed

The blower door measured **2,205 CFM50** of air being pulled in through air leaks in your home's Building Envelope. This air is coming in through gaps, cracks, cavities in and around the components that make up the home's Building Envelope (which is typical of all homes that have not been air sealed). A conversion calculation was done to estimate your home's "Natural" Air Changes per Hour of **0.28 ACHn**. The entire volume of air in you home is exchanged approximately once every **3.54 hour(s)**. The goal is 1 air change every 3 hours or .35 ACHn.

4.2 Minimum Ventilation Requirement (MVR) - Safety Concerns

Action Recommended

MVR for this building = 148 cfm of continuous air flow

The Minimum Ventilation Requirement (MVR) is a number of cubic feet per minute (cfm) of air the building needs to be safe and habitable for the occupants. It is derived from a formula based on several factors such as the volume of the home; number of occupants, geographic area, exposure to wind etc. and the larger cfm number is used as the MVR. A home can be sealed as tight as possible as long as you have continuous mechanical ventilation of at least the minimum CFM as described above.

The home has 46 cfm of exhaust capacity with the existing bath fan. However, running that fan is not the recommended method for achieving whole house ventilation.

4.3 Air Sealing and Mechanical Ventilation

Surveyed

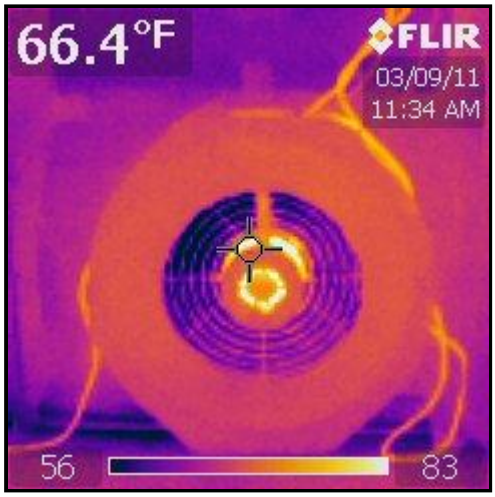
(1) Air sealing your home can usually provide the biggest savings on your power bill and the quickest return when spending energy dollars. Air sealing has many benefits. It results not only in immediate savings seen on your power bill, it also can increase comfort throughout your home removing hot and cold sports and maintaining even temperatures. Often, when its time to replace the heating or cooling system, a much smaller unit can do the job since there aren't as many air leaks, which saves on replacement cost and heating or cooling bills.

(2) The home has a natural air exchange rate of 0.28 Air Changes per Hour (3.54 hours per air change). By air sealing the home further, the air changes per hour will decrease. At 1 air change every 4 hours, a home needs balanced mechanical ventilation in order to provide adequate fresh air exchange. This would come in the form of a heat recovery ventilator (HRV). This unit exhausts stale air and intakes fresh air at a 1:1 ratio while recovering 70%+ of the heat from the exhausted air. Failing to install a fresh air ventilation unit on a home this tight would result in decreased indoor air quality and potential health issues.

4.4 Individual room air leaks (pressure difference) during blower door test

Yes

(1) With the home depressurized to -50 Pa, rooms were closed and the pressure difference measured tells how much pressure relief is resulting from leaks to the outside. 0 is no leaks. 50 is "open door" leaky.



4.4 Picture 1 Blower Door Test

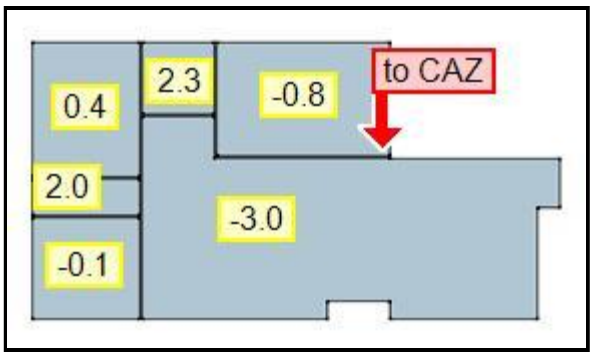
4.4 Picture 2 Blower Door Room Pressures

(2) While all rooms showed some evidence of air leakage during the blower door test, the kitchen and basement showed the greatest air leakage. The basement has the most surface area exposed to the outside and the kitchen has multiple penetrations due to the soffits and connections to both the basement and garage. Comprehensive air sealing efforts will result in a significant increase in comfort.

4.5 Room Pressure test with Air handler

Yes

Using the air handler fan each room was tested by placing a manometer tube in the room with reference to the hall or main part of home and closing the door. Positive pressure readings of more than 3 pascals in a room indicates the need for more return air or a more balanced system between return and supply. There were no signs of duct imbalance during the room pressure test.

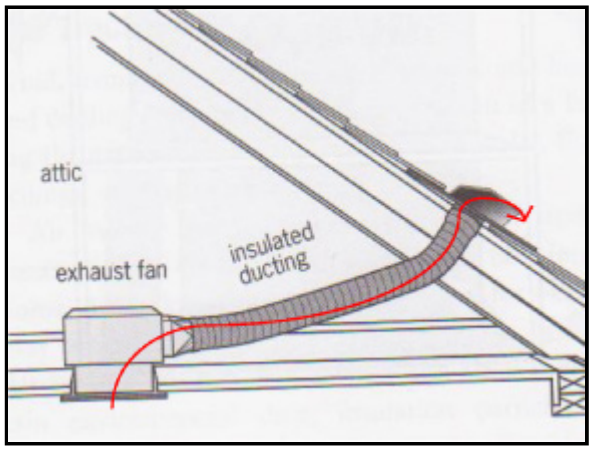


4.5 Picture 1 Air Handler Pressure Test

4.6 Exhaust Fans (bathroom, dryer, etc.) and venting

Action Recommended

(1) There is no exhaust fan in the bathroom. It is recommended that every bathroom have a high-quality, quiet (<1.5 sones), 80+cfm exhaust fan installed. These fans should be exhausted to the outdoors by way of insulated ducting through a roof mounted, dampered vent.



4.6 Picture 1

(2) The existing bath fan appears to take several minutes to reach its full capacity, which is still lower than the normally recommended 80 cfm rated capacity. Recommend upgrading the existing bath fan in conjunction with the addition of the second bathroom vent fan. These fans should be exhausted to the outdoors by way of insulated ducting through a roof mounted, dampered vent.

4.6 Picture 2 Vents Into Attic

4.7 Exhaust hood for gas cooktops/stove and vented to the outside

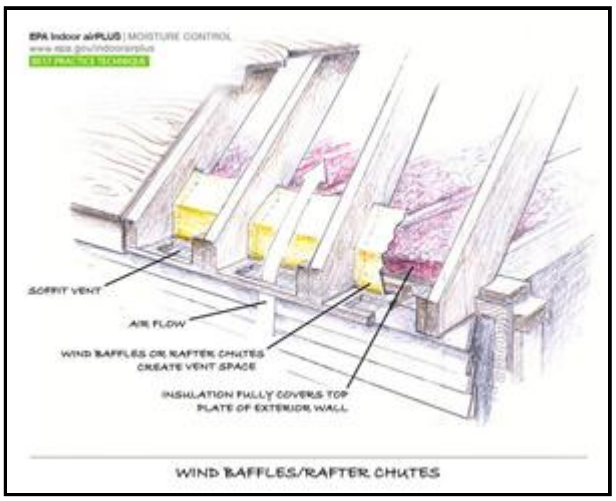
Action Recommended

It is recommended that the exhaust hood be vented to the exterior in order to control exhaust gases and moisture generated by cooking. Until then, recommend a window be opened for ventilation when the oven is used.

4.8 Modify Attic Ventilation

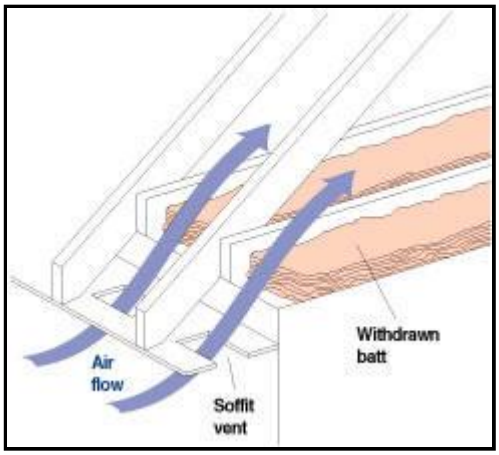
Action Recommended

(1) The attic currently does not contain wind baffles. It is recommended to install vent chutes with wind baffles between each rafter and seal the perimeter top plates with 2-part foam. This will halt wind washing through insulation and ensure a clear ventilation space, should additional insulation be installed.



4.8 Picture 1 Wind Baffles

(2) Ventilation of the home attic is important for two reasons. During the summer, excess heat that builds up in the attic during the day results in high energy costs for cooling. Also, moisture produced within the home may move into the attic if ceiling vapor barriers are not used. If this moisture is not exhausted from the attic, it can condense and cause insulation and construction materials to deteriorate. Thus, temperature and moisture control are the major reasons for providing attic ventilation.



4.8 Picture 2 Attic Soffit Ventilation

(3) The attic could benefit from having additional soffit vents cut into the eave overhangs to allow additional ventilation capacity. This is especially true when increasing the tightness of the conditioned space of the home, when the attic no longer relies on ventilation from the rest of the house. Minimum required ventilation is to have 1 square foot of ventilation for every 300 square feet of attic floor area. Minimum recommended ventilation is to have 1 square foot of ventilation for every 150 square feet of attic floor area is often recommended. For this attic, that means about 8 to 16 square feet of soffit ventilation.

4.8 Picture 3 Existing Soffit Vents

4.8 Picture 4 Add Additional Vents

4.9 Other Safety Items

Action Recommended

(1) The radon ventilation system did not vent above the roofline, which prevents radon gasses from possibly being reintroduced into the home through windows, doors, or other openings. Also, it is not standard practice for the radon ventilation to use the sump pit from which to draw soil gasses. This scope of this inspection did not include radon remediation, so it recommended to contact a radon remediation specialist for further consultation.

4.9 Picture 1 Radon Exhaust Near Window

(2) The floor drain in the basement is connected to the waste water system without being sealed off with a check valve or P-trap. Not having a check valve allows the intrusion of drain line gasses or even waste water in case of the system getting backed up.

Recommend installing a secure, semi-permanent seal at the floor drain (plug or other seal). This will prevent water backing up into the basement through the floor drain. The next lowest point of entry in case of the waste water getting backed up would be the basement utility sink drain, which is a better location to monitor for water intrusion.

4.9 Picture 2

5. Exterior Moisture Management

Styles & Materials

Viewed roof covering from:
Ground

Roof Covering:
Architectural

Roof Covering Color:
Medium

Chimney (exterior):
Brick

Siding Style:
Brick

Siding Material:
Full brick

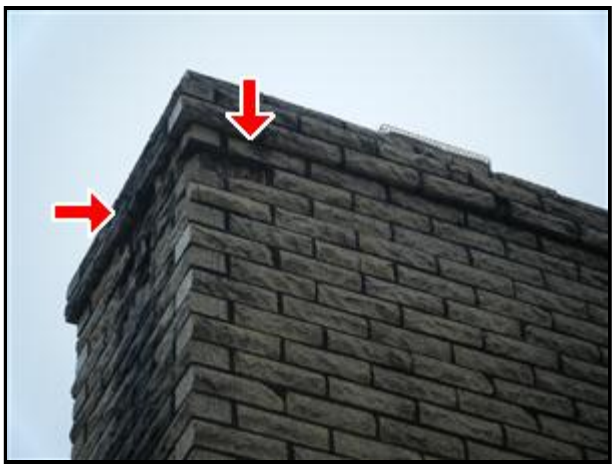
Foundation:
Poured concrete

Items

5.0 Roof Covering and Penetrations

Inspected

There is some evidence of damage to the bricks at the top of the chimney. This should be repaired by a qualified masonry contractor to prevent further deterioration.



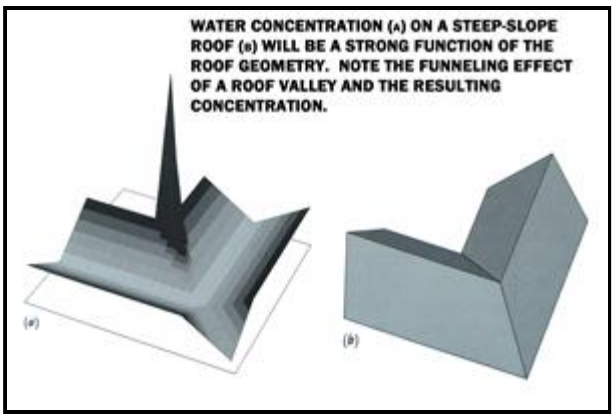
5.0 Picture 1 Chimney Damage

5.1 Flashings, Gutters and Drainage

Inspected

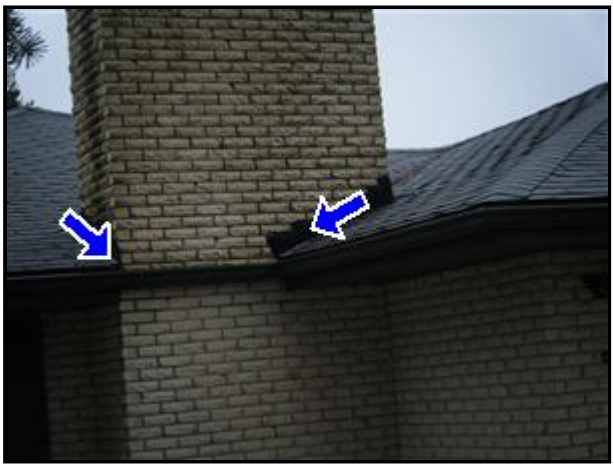
(1) The gutters are in fair condition and seem to be managing rain water effectively. Gutters should be periodically cleaned. There is no obvious evidence of water overtopping the gutters, but the north face of the building may already be near or at capacity. Recommend monitoring during rain events to determine whether additional downspouts are needed (wherever rain is spilling over gutters).

(2) Valley roof sections not only carry a large amount of water, but that water is funneled down to a point. As shown in the diagram, the eave of the valley concentrates all the water from an entire corner of roof section to a single point. That point where roof sections are joined becomes a critically important area of water management. Having the chimney at the bottom of the roof valley makes the area even more critical as it must properly divert a large amount of water around it. This section of roof should be periodically monitored with regard to the integrity of the chimney flashing and also be kept clear of debris.



5.1 Picture 1 Valley Roof Water Concentration

5.1 Picture 2 High Water Concentration at Chimney



5.1 Picture 3 Critical Water Management

5.1 Picture 4 Possible Overspill

5.2 Grading not directing water away from structure

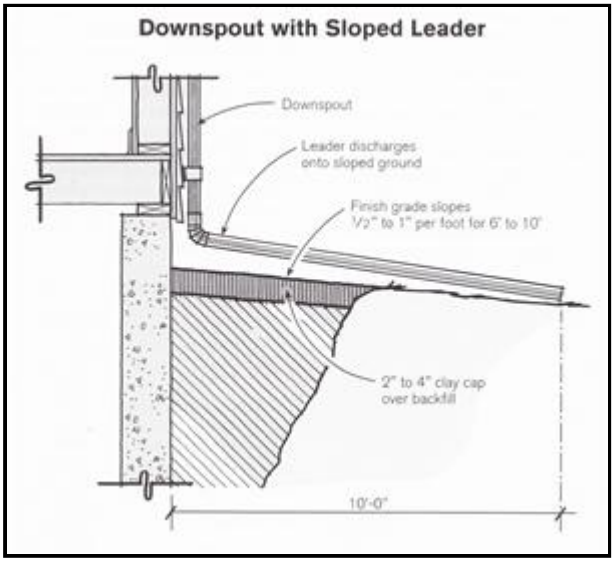
Inspected

(1) Exterior grading (dirt or mulch) should be below the level of the concrete foundation walls and not be in contact with any brick. Brick is quite porous and allows water to enter the wall structure easily.

5.2 Picture 1 Brick at Ground

(2) There is a not a significant amount of slope in the front, rear or sides to drain water away from the home. The slope should allow water to flow away from the home's foundation to prevent any flooding, or damage to

the home. Because the existing grading is relatively flat, the ground around the foundation should be monitored for signs of drainage concerns, especially during heavy rain.



5.2 Picture 2 Grading Away

5.2 Picture 3 Minor Slope

5.2 Picture 4 Driveway Grading

5.3 Porch Stoop/Flooring or Steps allowing water to enter the building

Inspected

The wood floor on the porch deck at the rear of home shows signs of moisture damage. Water can cause further deterioration if not repaired and sealed properly. This is a cosmetic issue for your information.

5.3 Picture 1

6. Air Control Layers

Styles & Materials

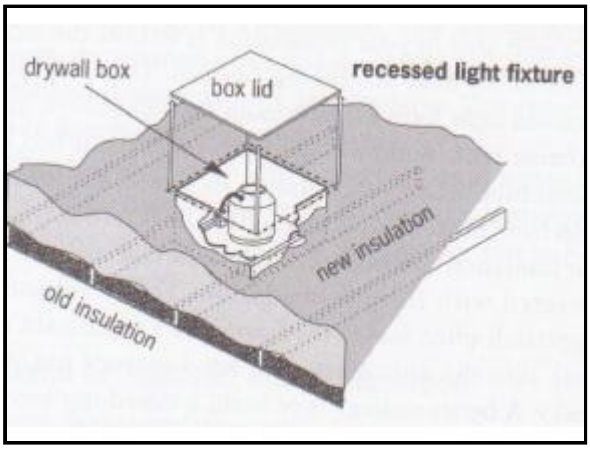
Ceiling Materials:	Wall Material:	Floor Material:
Drywall	Drywall	Concrete Slab (Lower Level)

Items

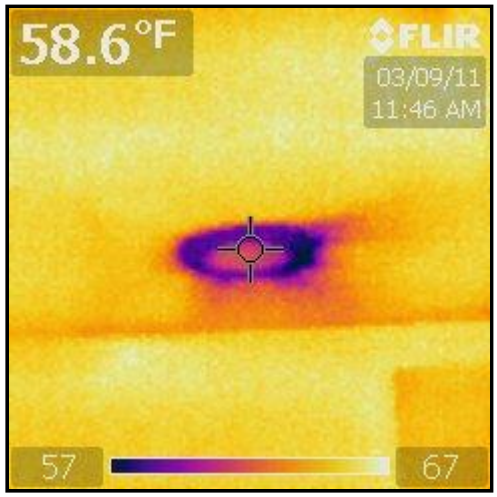
6.0 Recessed lights (regarding safely insulating, air sealing or replacing with IC Rated)

Inspected

All recessed lights in the attic need to have air-tight, foam box, with 4" of internal clearance installed over each unit and sealed to the drywall and surrounding framing. Since all of the existing can lights are in soffit spaces rather than in the attic space, the goal would be to create an air barrier at the top of the soffit (at the ceiling level). This recommended practice for air sealing attic can lights does not apply today, but is something to be aware of for future reference.



6.0 Picture 1 Can Light in Attic



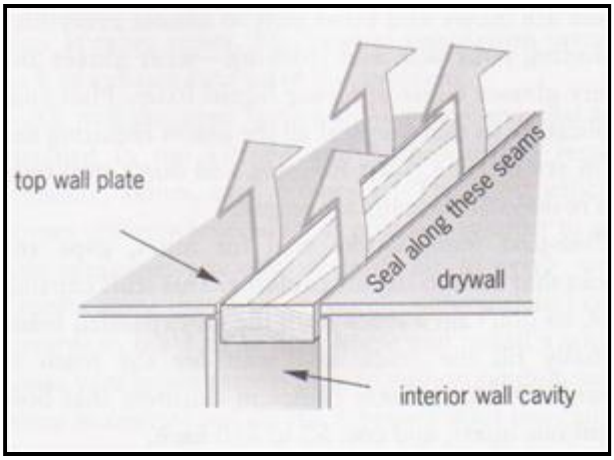
6.0 Picture 2 Recessed Light

6.1 Air seal the attic top plates, electrical and plumbing penetrations

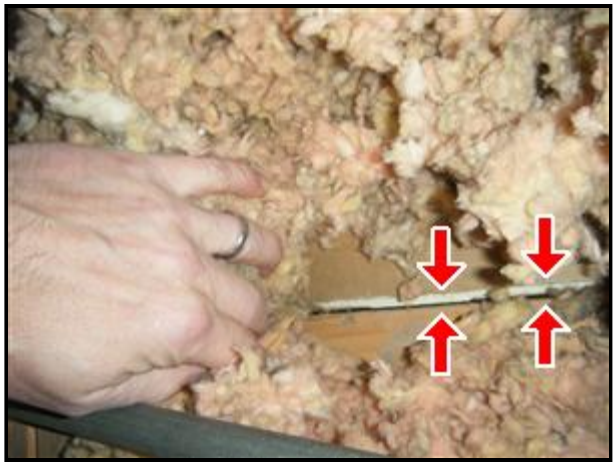
Repair or Replace

As the framing in a home dries over the years, the top plates of both interior and exterior walls allow large amounts of air to leak from the wall cavity and up into the attic. Recommend that these areas be sealed with a 2-part foam spray.

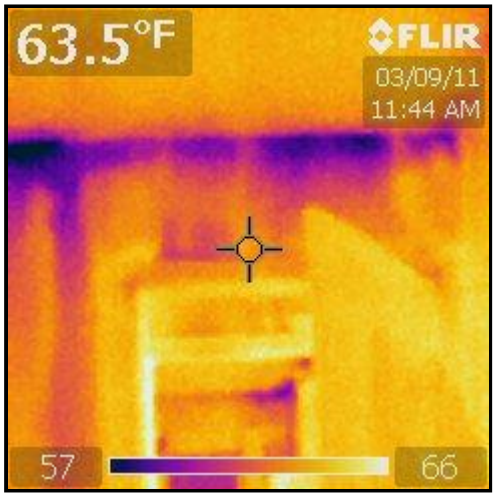
Penetrations in the form of plumbing penetrations, electrical conduit, boxes and fixtures should be exposed and sealed before additional insulating.



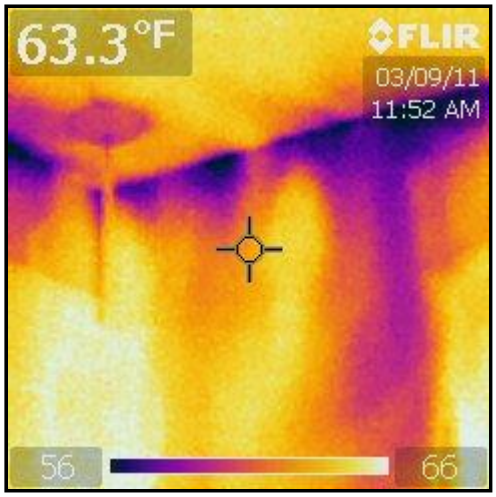
6.1 Picture 1 Top Plate Leakage



6.1 Picture 2 Top Plate Gaps



6.1 Picture 3 Along Top Plates



6.1 Picture 4 Bathroom Top Plate

6.1 Picture 5 Electrical Penetration

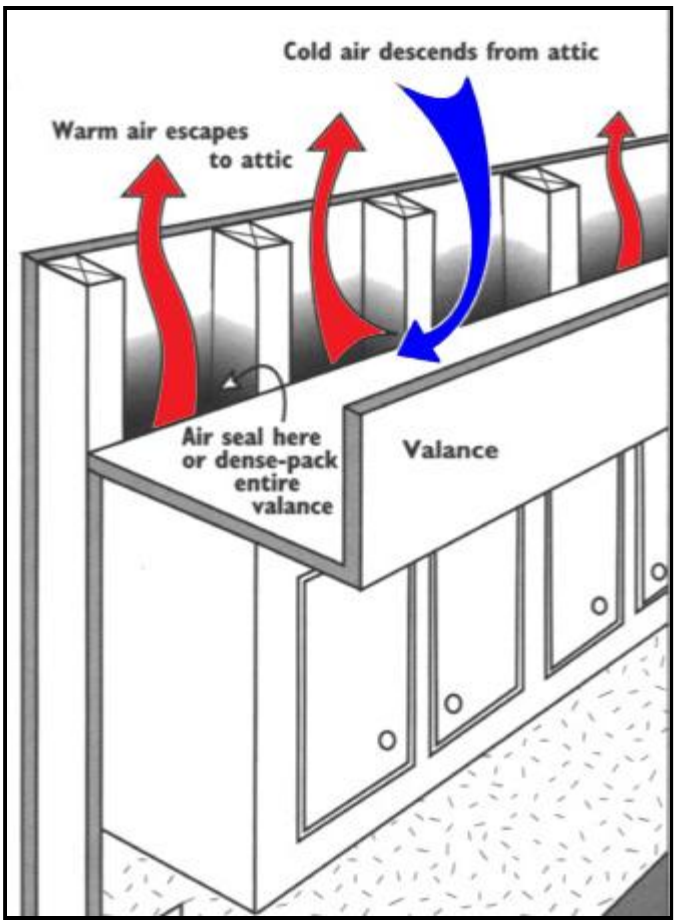
6.1 Picture 6 Dirty Insulation from Air Leakage

6.2 Soffits below non-conditioned space

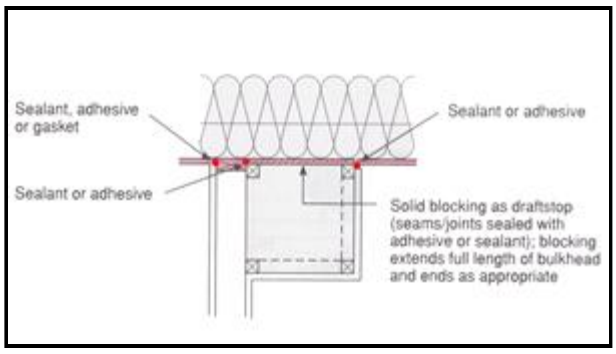
Repair or Replace

The top of the soffit should be covered with foam board and sealed to the framing and drywall to create a continuous air tight sealing, the air barrier between the conditioned second floor and the unconditioned attic.

Recommend having a qualified contractor insulate, and air seal the soffit.



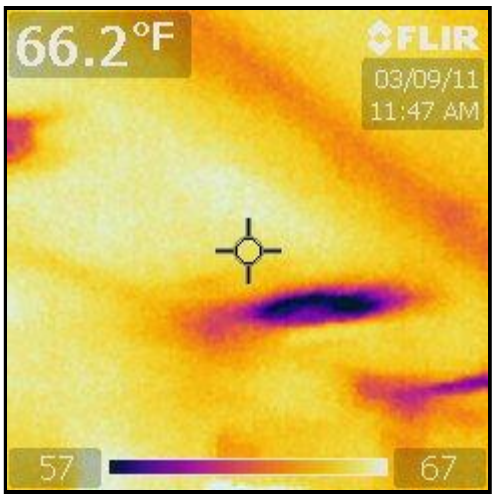
6.2 Picture 1 Soffit Air Leakage



6.2 Picture 2 Soffit Sealed at Top

6.2 Picture 3 Unsealed/Uninsulated Soffit

6.2 Picture 4 Open Soffit



6.2 Picture 5 Can Lights in Soffit

6.3 Thermal bypasses (between floors)

Repair or Replace

The stud cavity serving as a chase for the bathroom plumbing is a major air by-pass from the attic to the basement allowing cold air to fall and warm air to escape. Recommend the opening around the pipes be sealed with foam board and 1-part foam where the pipes pass into the attic.

6.3 Picture 1 Basement Plumbing Penetration

6.3 Picture 2 Basement Plumbing

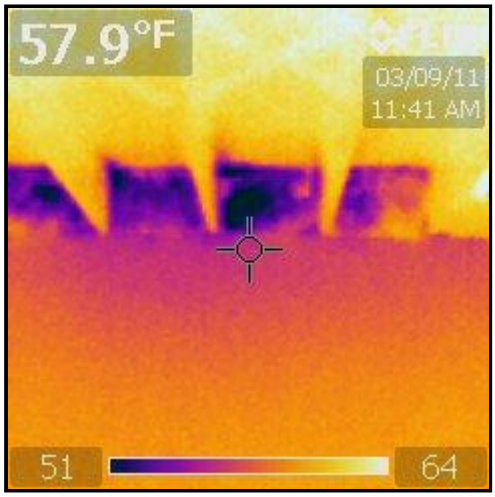
6.4 Rim Joist insulation and air sealing perimeter of floor system

Repair or Replace

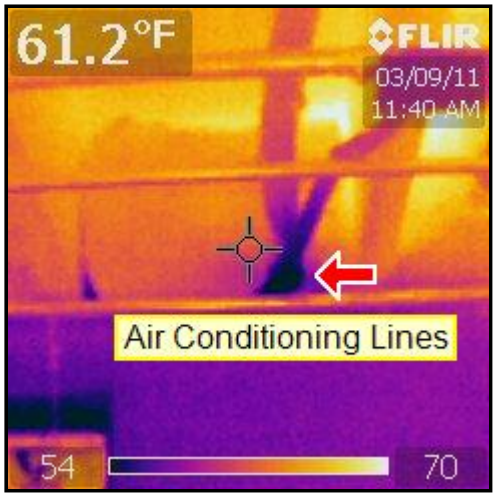
Recommend sealing the exterior rim joists of the home with 1" foam board should be cut to fit between the floor, foundation, and joists and sealed with 1-part foam.

6.4 Picture 1 Air Sealed Rim Joist

6.4 Picture 2 Exposed Rim Joist



6.4 Picture 3 Insulated, but Unsealed

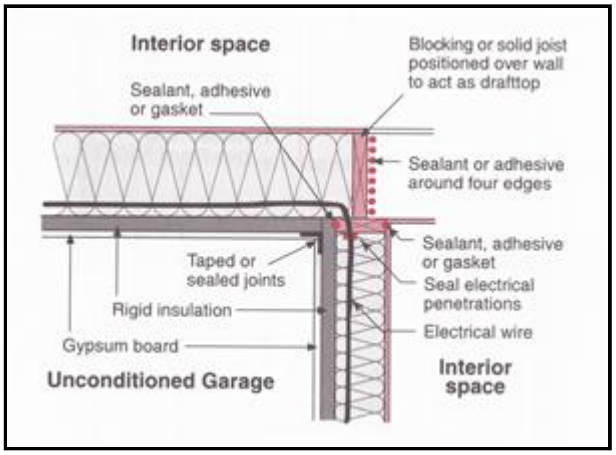


6.4 Picture 4 Air Conditioning Lines

6.5 Attached Garage air sealing (Firewall, Combustibles, and VOCs)

Repair or Replace

The wall that separates the garage from inside the home is important to prevent the air in the garage which may contain pollutants, chemicals etc. from entering the home. All wall penetrations should be sealed with a fire rated spray foam or caulk. Good garage door seals are critical for keeping harmful exhaust, chemical fumes and VOCs from entering the home from the garage. Replace and maintain as necessary.

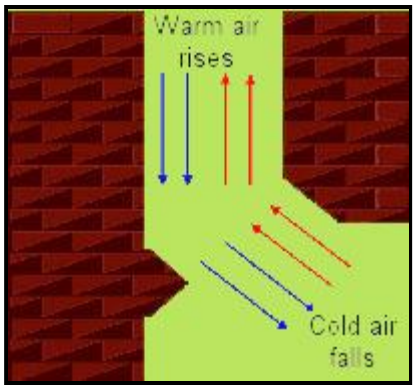


6.5 Picture 1

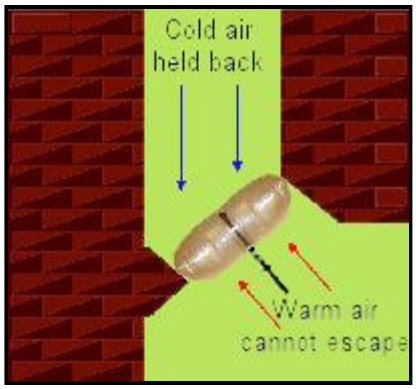
6.6 Chimney Balloon

Inspected

If the chimney is not used very often it is recommended that a chimney balloon be installed. The damper flue, currently in your chimney, does not seal off the opening completely. By installing a chimney balloon you are creating a tighter seal in which less air flow will be lost.



6.6 Picture 1 Before



6.6 Picture 2 After

6.7 Windows: Air leakage, seals and caulking

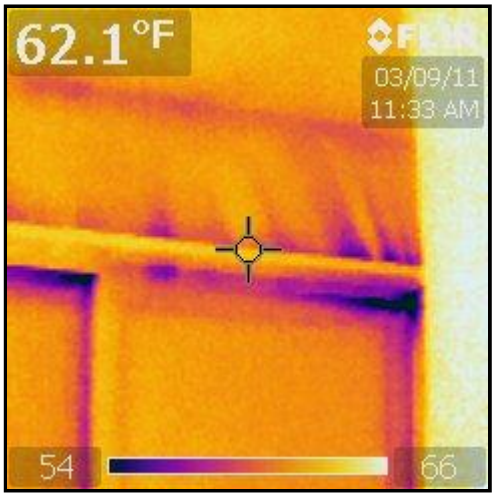
Inspected

Minor air leakage was detected around the casing of the window frames. Recommend sealing these gaps with a clear, high quality, paintable caulk.

6.8 Exterior doors: Air leakage, weather stripping and seals

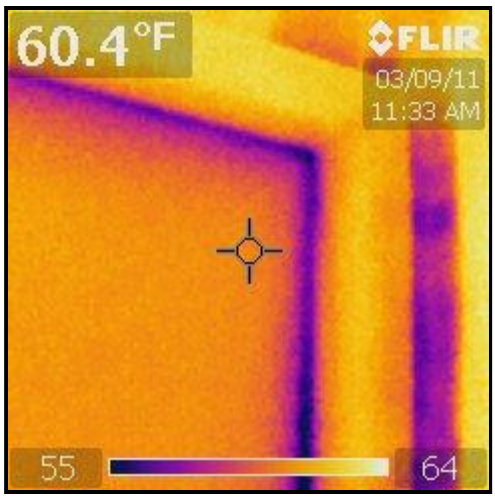
Repair or Replace

(1) The back porch sliding doors are a significant source of air leakage, around the casing, threshold, and between the glass panes where they slide along the track guide. All sides of the door should be air sealed with a clear, paintable caulk and the weather strip between the sliding panels should be adjusted or replaced to make a tighter seal.

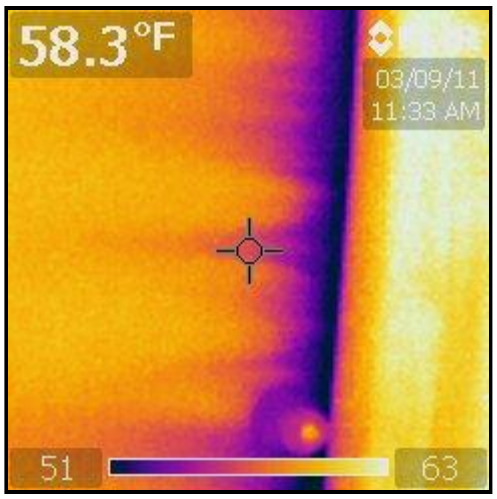


6.8 Picture 1 Sliding Doors

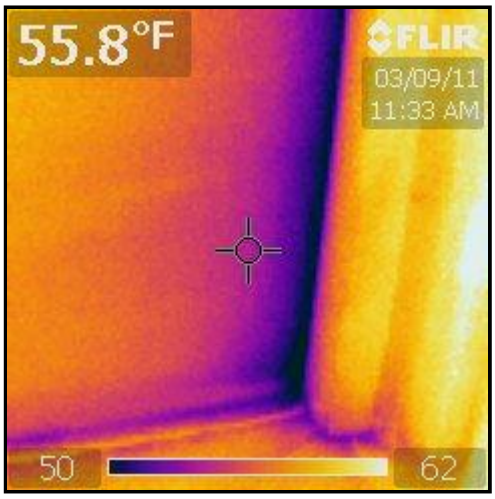
(2) The garage door should also have weather strip and door sweep installed.



6.8 Picture 2 Garage Door (top)



6.8 Picture 3 Garage Door (middle)



6.8 Picture 4 Garage Door (bottom)

6.9 Seal and insulate wall switch and outlet boxes

Inspected

Moderate leakage was detected from switches & outlets and may be eliminated by air sealing electrical penetrations in the attics. Should any leaks remain, they may be sealed at the outside fixture or by caulking the electrical box to the drywall and installing foam pads before replacing the wall plates.

7. Thermal Layer

Styles & Materials

Attic Insulation/Effective R-Value:
Blown
Fiberglass
R 5-10

Floor System Insulation R-Value:
NONE

Window Types:
Single pane
Casement
Fixed Frame
Wood

Exterior Entry Doors (non-glass portion):
Wood solid core 1 3/4" R- Value 3.03

Glass Doors (part of windows):
Sliding Glass Doors

Items

7.0 Recommended additional attic insulation

Repair or Replace

The attic currently has about an R-8 and should be increased to at least an R-38, the current code minimum. Recommend the attic be insulated to an a more cost effective R 50-60 with blown cellulose (settles to an air-impermeable mass - unlike fiber glass), **only after air sealing and attic ventilation** issues have been completed.

7.0 Picture 1 Insufficient Insulation

7.1 Window condition/integrity

Inspected

Windows are in fine working order. Minor air sealing around the casings can reduce air leakage.

Insight Property Services, Inc

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