



## Steps To **GREEN** Homes

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Date

Customer name  
Address

Dear Customer,

Thank you for requesting an energy audit. This is the first step toward lowering your utility costs and creating a smaller carbon footprint. Please read through our many observations and recommendations, also refer to the photos emailed or attached to further assist with the understanding of the energy efficiency analysis.

Your home was found to have **54%** air-exchange rate in one hour. The recommended air-exchange rate for a home, with-out assistance from a mechanical air-balancing system, is **35%**. Many air-leak improvements may be made prior to the necessity of an air-balancing system.

### General Summary

- Undefined building envelope
- Excessive air-leakage at all 4-floors
- Unbalanced HVAC duct distribution
- Inefficient furnace

**The following is a list of areas found throughout your home causing various energy losses, along with our recommended improvements to aid in achieving a more energy efficient home.**

1. Basement has air-leaks at mud-sills and rim & band joists
  - Recommend – instillation of 2" High Density insulation (moisture concerns)
2. Air-Handlers and ducting have air-leaks
  - Recommend – Apply aluminum tape and/or duct-mastic to gaps/visible joints at all metal ducts (Followed by Duct Blaster test)
  - Recommend – R-8 duct insulation installation after air-sealing is completed
3. The existing oil fired open combustion furnace (combustion air drawn from within the home) is 18 years old and running at 60% to 70% efficiency.
  - Recommend – learning about the many options of heating equipment on the market. The simplest option is to install a new sealed combustion furnace (combustion air drawn from outside of house) with efficiency ratings of 82% or higher. Air-to-air heat source pump is another option especially if solar PV panels are installed at your home.
4. Thermostats throughout house where not programmable
  - Recommend – installation of (5/2 - 4 - temperature setting per day) programmable thermostats
5. Over W/D in basement - a large air-leak was found in the holes where pipes enter foundation and crawlspace connects.
  - Recommend –seal off appropriately (spray foam & ridged insulation hatch)
6. Storage area of basement has no insulation in ceiling – this is an incomplete building/thermal envelope
  - Recommend – instillation of 2" High Density insulation (moisture concerns)
7. All baseboards have excessive air-leaks at bottom edge to flooring juncture
  - Recommend – 1<sup>st</sup> floor - spray-foam band/ribbon subfloor connection (basement), caulk floor/base juncture and install molding where needed
  - Recommend – 2<sup>nd</sup> and 3<sup>rd</sup> floors - most areas can be caulked, some may need molding
8. Most outlets/switches through out house have air-leaks
  - Install foam gaskets behind switch plates
9. Dutch door has air-leak at seams between upper and lower slab
  - Recommend – install weather strip
  - Recommend – install storm panel in storm door
10. Most old widow casings have air-leaks above heads (visible cracks, infrared photo)
  - Recommend – caulking
11. No damper in fireplace creating large heat loss through convection
  - Recommend – installation of new damper

12. Predominate amount of casement windows are missing sash-lock levers, this inhibits the ability to lock these windows air-tight
  - Recommend –install clips and lock windows
13. Old windows (9) with ropes/window weights are uninsulated at the perimeter of the jamb to rough opening (2" of space) and have air-leaks
  - Recommend – Remove casing and weight assembly, install spray foam in 2" cavity, reinstall casing and install jamb liners for sash operation
14. All bath exhaust fans on 2<sup>nd</sup> floor have inadequate back-flow dampers – large air-leaks found allowing cold air to settle into baths when fans are not running.
  - Recommend – Installation of new roof mount terminations w/back-flow damper or install back-flow damper in duct if access is gained
15. M. Bath fan has an exhaust air-flow of only 17CFM all other exhaust fans tested out from 56 to 85CFM (normal)
  - Recommend – investigate M. Bath fan ducting, possible crushed pipe or to many elbows/distance and make proper repairs.
16. 2<sup>nd</sup> floor HVAC ducting is very unbalanced, dumping most of the conditioned air (heating or cooling) into the Blue room and adjacent bathroom.
  - Recommend – Research if dampers have been installed and adjust
  - Recommend – baffle installation in blue room and adjacent bedroom
  - Access to installed duct work is very difficult, making corrections to this duct system is key to achieve more even heating/cooling on second floor
17. 2<sup>nd</sup> floor bay window ceilings have no insulation (infrared scan)
  - Recommend – Cut 2" hole in ceiling or roofing to gain access to cavity and inject dense pack cellulose insulation
18. Infrared camera shows air-leaks into M. Bed & Bath ceilings – air is traveling into ceiling cavities through perimeter soffit, this is called wind washing. The 3<sup>rd</sup> floor soffit is also leaking, allowing air into ceilings above 2<sup>nd</sup> flr bed and knee walls of 3<sup>rd</sup> floor living space.
  - Recommend – caulk/refasten any obvious gaps at exterior trim
  - Recommend – Annual install and removal of soffit baffle (design is very important for form, function and durability)
19. M. Bed & Bath recessed light fixture all have large air-leaks
  - Recommend – air-tight LED fixture that will swap out these cans to make air-tight seal and work on current line-voltage
  - Depending upon the wiring and dimmer interest CFL cans are available
20. Behind stacked W/D in 2<sup>nd</sup> flr laundry room - air-leak
  - Recommend –ridged insulation install accompanied by spray foam and sheet rock repairs
21. 2<sup>nd</sup> floor bedroom head-casing over French door has air-leak
  - Recommend – Caulking
22. 3<sup>rd</sup> floor exterior door and window head-casings have air-leaks (visible cracks)
  - Recommend – Caulking

23. 3<sup>rd</sup> floor access panel into attic has air-leak
- Recommend – construct new plywood door with 4" ridged insulation attached to panel and install with weather-stripping
24. Attic fiber glass insulation was found to be poorly installed and is R-25 (low).
- Recommend –after performing HVAC duct repairs/adjustments - install 4" of open blown cellulose insulation on flat ceilings. Over all HVAC ducts install 8" of cellulose and lay one layer of foil-faced bubble wrap over cellulose.
25. The orientation of your home and roof slope lends to the opportunity utilizing solar PV panels (electricity) and/or solar hot water panels
- Recommend – Discussions about your habits, interests and clarity of the current incentives and tax credits available for these Renewable Energy's.

A blower door was used to depressurize the home, calculations where made from 3,256 CFM at -50Pa. The total air-leakage found is equal to an 18"x18" opening in your exterior wall. An infrared camera was used to assist in finding air-leaks, temperature differential 18F(outside to inside) was 50 to 68 deg. F

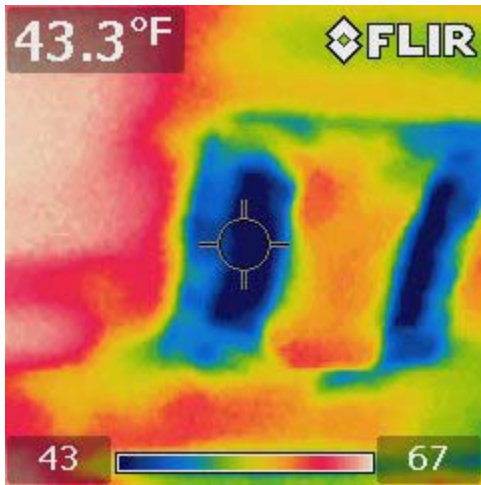
We also recommend installing as many CFL or LED bulbs as possible to reduce your electrical demands, and carefully select a high efficiency Energy Star appliances when the time comes to upgrade.

Please call with any questions regarding this audit, or for our services to help with the recommended improvements at your home.

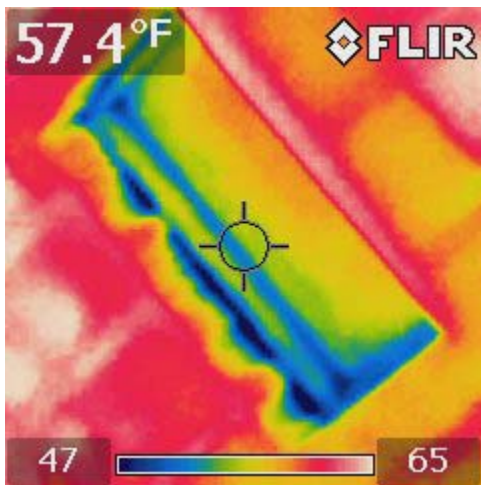
Thanks for your business,

Adam T. Hayes

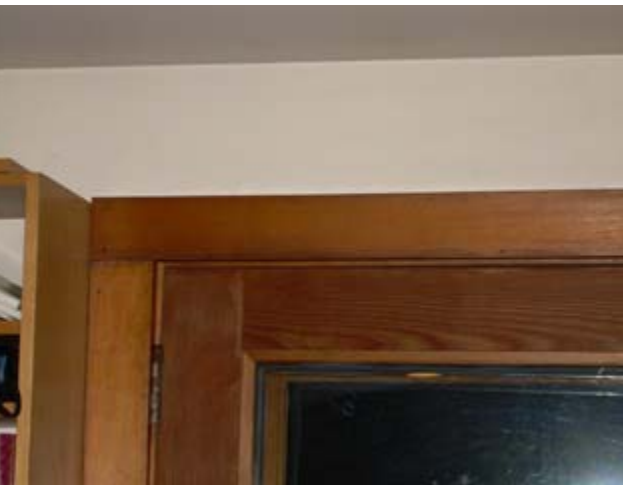
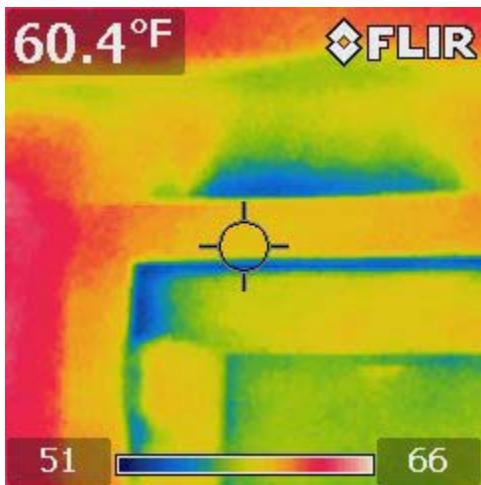
## Infrared Scans with Photographs



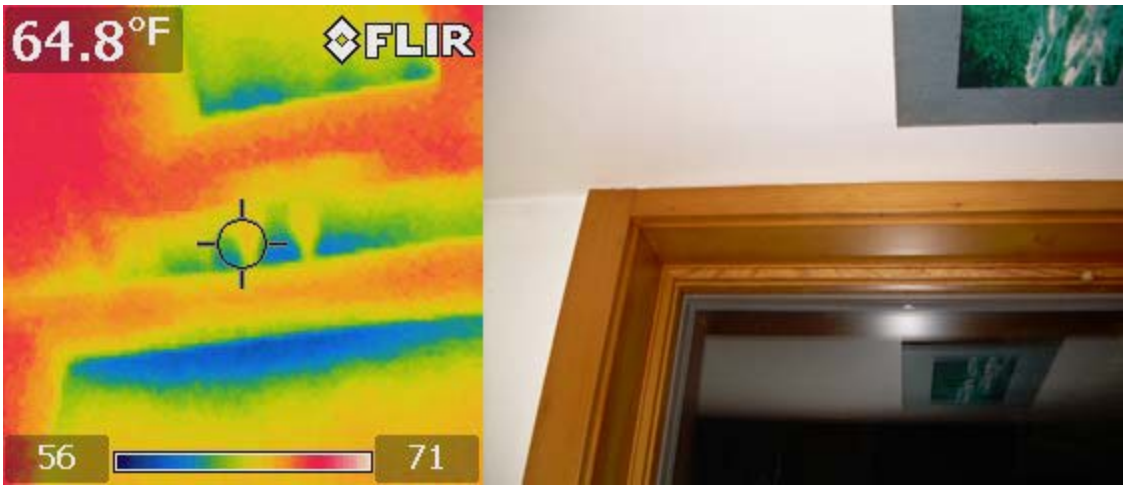
Ceiling Vent



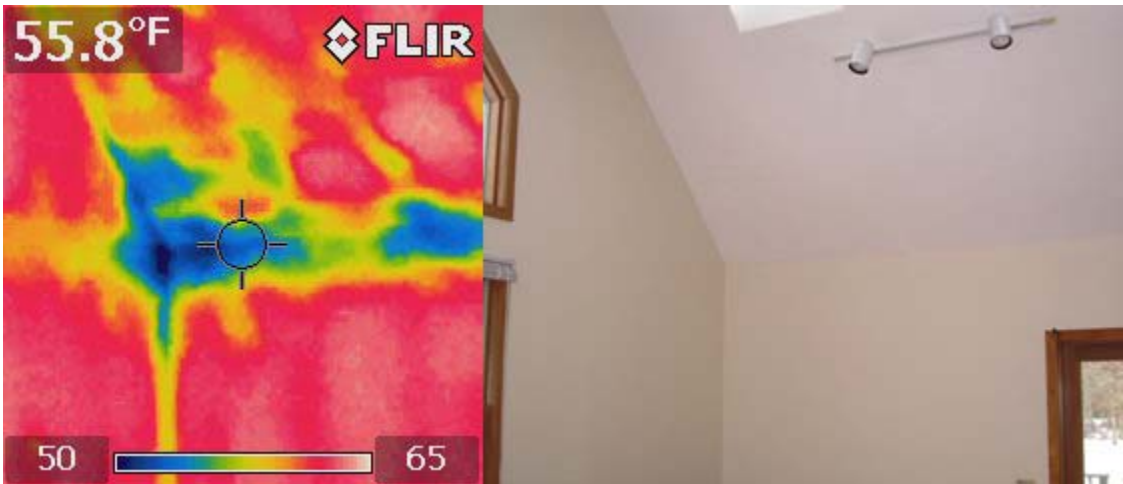
Skylight



Door Trim



Window Trim



Vaulted Wall