



## Home Performance Report



Jon, Haebig  
100 Essex Drive  
Chapel Hill, North Carolina

Report prepared by:

Nick Dioguardi  
nick@sundogssolutions.com  
919-338-1060

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## This Home Performance Report:

- Lists recommended energy efficiency improvements and their relative costs and projected savings;
- Prioritizes those improvements that pay back most quickly;
- Lists simple energy efficiency changes that the homeowner can make on their own;
- Explains each recommendation in detail and provides general information & resources about each category;
- Gives guidance on indoor air quality and other general home maintenance tips and homeowner behaviors that may affect the health, safety and integrity of the home.

Implementing the recommendations in this report will save you money, improve the air quality and safety of your home, make your home more comfortable and reduce your periodic maintenance costs. Should you choose to finance these home performance improvements, the energy savings realized may pay for the monthly cost of the improvements and often will generate a small positive cash flow from the start. It pays to save energy.

When it is time to sell your home, providing your prospective buyers with this detailed energy audit, and a list of actions taken, demonstrates to them that your home was well cared for. This gives you a competitive advantage over other similar homes in your market.

At Sundogs Solutions, Inc. we are constantly monitoring industry recognized sources for the latest and best information on products and methods used to reduce energy consumption in the home and improve indoor air quality and safety. Because so many factors, including seasonal climate fluctuations, homeowner behavior and utility rates may all influence the effectiveness and savings of any measure, it is impossible to guarantee savings. The estimates in this home performance report are drawn from many sources, including your utility bills, and present relative savings to help you make informed decisions.

Rather than mislead our customers with overly optimistic or exaggerated claims, Sundogs Solutions, Inc. seeks to inform customers on which home performance improvements will have the highest savings to cost ratio relative to each other in order to help you make the best possible decision for your circumstances.

# | Your house

**100 Essex Drive  
Chapel Hill, North Carolina**

Audit ID: 20110997  
 Audit date: July 8, 2011  
 Structure Type: Town Home  
 Date built: 1983  
 # bedrooms: 3  
 House size: 1,542 HSF  
 House Volume: 17,337CF  
 Heating fuel: Natural Gas  
 Cost of:  
     Gas: \$GROUP METERED/therm  
     Electricity: \$GROUP METERED kWh

**Measurements:**

Air Infiltration: 3100 CFM @50Pa (goal is approx. 1600CFM50)  
 BAS: 1739 CFM50 (minimum ventilation required)  
 Equivalent Leakage area: 170.2 in<sup>2</sup> (or a 13.01"x13.01" hole in your house)

**Utilities Cost:**

Electricity Usage: \$766.16 / year  
 26.2 kWh / day (ave. family of four 30-40)  
  
 Gas Consumption: \$328 / year  
 54.7 therms / month (ave family. of four 50-60)

**Table 1**

Feature	Modeled Energy Costs (\$)	Modeled Energy Consumption (MMBTU)	kWh	Modeled Annual Savings (\$)	Modeled Annual Savings (kWh)	Modeled Annual Savings (%)	Modeled Annual Savings MBTU (%)	Estimated Cost of Measure	Simple Payback (yrs)
Baseline (as is)	\$1,041	115	33,703	-	-	-	-	-	-
Air seal & insulate	\$921	94.9	27,812	\$120	5,891	11.5%	17.5%	\$1,625	13.5
Seal crawl space	\$978	108.1	31,681	\$63	2,022	6.1%	6.0%	\$3,717	59.0
Improve lighting	\$940	104.2	30,538	\$101	3,165	9.7%	9.4%	\$100	1.0
Duct Seal	\$919	95.7	28,047	\$122	5,656	11.7%	16.8%	\$1,020	8.4
All measures complete:	\$860	93.3	27,344	\$181	6,359	17.4%	18.9%	\$6,462	35.7
		<b>GOAL:</b>	<b>97.75</b>						

## | Customer Interview

- Mr. Haebig was very interested in the idea of energy savings for both footprint and cost reduction reasons.
- Mr. Smith and his constituents from Carol Woods were also interested in the prospect of completing audits/performing energy retrofits on additional units in the complex.
- Concerned about home comfort and durability of the home.

## | Improvement Opportunities

The following table summarizes the recommended home improvement projects available for your home and lists the estimated annual savings, costs and simple payback (cost divided by annual savings). Details for each improvement opportunity are provided in the recommendations section of this report.

Feature <sup>1</sup>	Recommendation	Estimated Annual Savings*	Estimated Cost	Payback (in years)
Lighting	Replace all light bulbs with CFLs where possible.	\$8/bulb	\$2 / bulb	3 months
Air Seal and Insulate Home	Air seal all accessible penetrations with mastic and 1-part foam. Insulate attic to R50	\$120.00	\$1,625.00	13.5 years
Seal Crawlspace	Seal crawlspace with a sheet of 8mm poly plastic and turn that space into a semi-conditioned area of the home.	\$63.00	\$3717.14	59.0 years
Duct Seal	Remove existing duct tape and properly connect and seal all ductwork in the crawlspace with tape, zip ties, and mastic.	\$122.00	\$1,050.00	8.4 years
	<b>Total</b>	<b>~\$475.00</b>	<b>\$6,462.14</b>	

Table 3

\*Savings are based on estimated efficiency gains relative to customer bills and the features implemented. While Sundogs Solutions, Inc. makes every effort to estimate projected savings as accurately as possible using the best available information, we make no guarantee as to the exact savings achieved by each or all of these measures.

<sup>1</sup>Insulation is only effective when placed against an effective air-barrier. Accordingly, Sundogs Solutions, Inc. will not insulate attics without the accompanying air sealing. We can air seal thermal bypasses without added insulation if the customer wishes and it is appropriate.

## | Recommendations

The major factors affecting the comfort of your home and your energy use are: air infiltration, insulation levels, moisture issues in crawl space, and duct leakage. The chart below is based on the savings from table 3 and shows which improvements will save the most money and energy in your house.

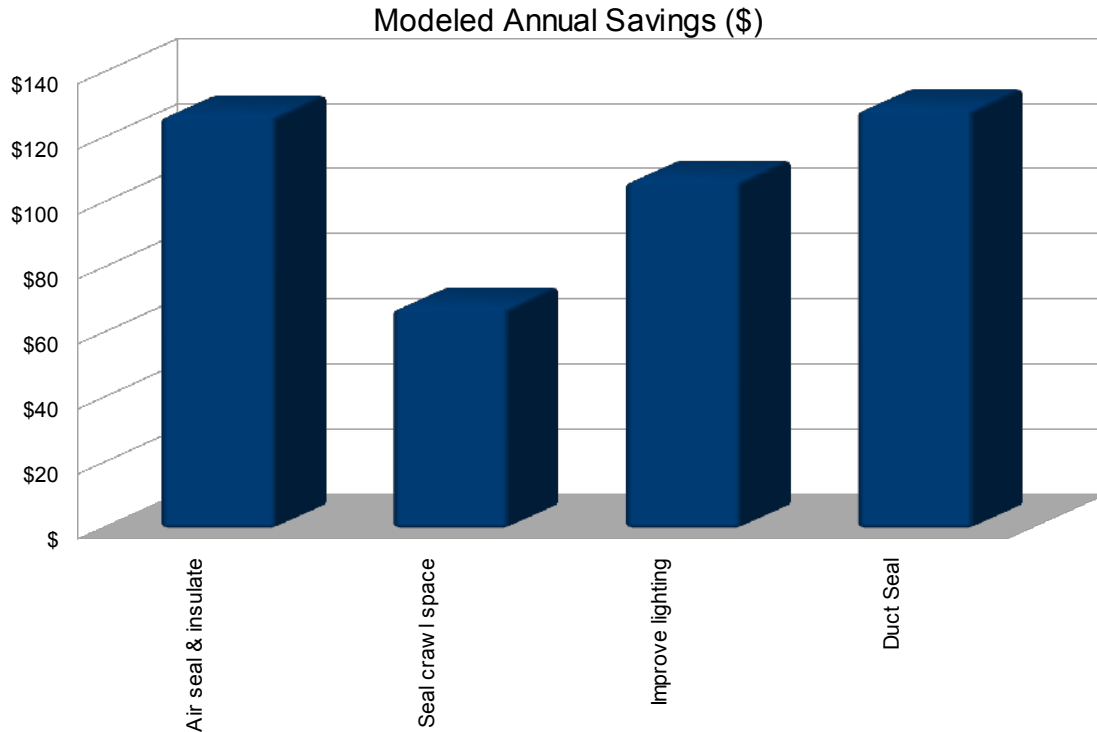


Figure 1

### Lighting

**Replace all light bulbs with CFLs or LEDs where possible.** Lighting represents the simplest and most cost effective energy savings upgrade for most. Don't wait for your old incandescent lights to burn out before you replace them. These older light bulbs consume so much more electricity and cost so little to purchase, that while it may seem wasteful, you are spending significantly more money and putting more carbon and CO<sub>2</sub> in the atmosphere while waiting to change them out than you would if you simply disposed of them immediately. Therefore, we highly recommend that you identify all light fixtures throughout the house both inside and out where incandescent light bulbs can be replaced with CFLs. Pay careful attention to the type of light emitted by the package selected (warm / white / daylight) whether or not the light fixture requires a CFL of a certain length or size and whether or not the light fixture is equipped with a dimmer which requires a "dimmable" CFL. Look for Energy Star labeled CFLs to ensure quality and longer life. Projections below are per incandescent light replaced.

## Background

Traditional incandescent light bulbs, work by running an electrical current through a resistant metal filament which generates a tremendous amount of heat and some light. These are among the most inefficient devices for generating light, with an average efficiency of approximately 10%, that is to say 90% of the electricity consumed by an incandescent light bulb is emitted as heat. This is why these lights are often referred to as “small heaters that produce some light”.

Fortunately we now have more efficient alternatives called CFLs or Compact Fluorescent Lights. Over the last decade there have been significant advances made in the quality of the light and durability of the bulbs. CFLs produce light by sending an electrical current through a gas which then excites the coating on the glass tube which in turn emits visible light. Overall CFLs are 75% more efficient than incandescents. Care must be taken when selecting a CFL to ensure the right quality of light and type of CFLs (.e.g. dimmable) are selected for the particular application. CFLs contain very small amounts of mercury (an average of 4 milligrams in each bulb) and should be disposed of according to your local regulations. Even though CFLs contain a small amount of mercury that could ultimately end up in the environment, that amount is *significantly* less than the amount of mercury avoided from power plants as a result of the energy savings. In fact, a Popular Mechanics article dated from 2007, calculated that even if the mercury contained in the CFL were to escape to the atmosphere, an incandescent light would still contribute 4.65mg more of mercury in the environment than an equivalent 75W CFL over the life of each bulb.

See the Energy Star website for more information on CFLs: [http://www.energystar.gov/index.cfm?fuseaction=find\\_a\\_product.showProductGroup&pgw\\_code=LB](http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=LB)

While LED lights (Light Emitting Diode) show a lot of promise and will most likely be the lighting choice of the future, currently the quality of the light emitted and the cost are such that they are not yet practical for the general consumer. With laboratory tests showing efficiencies as high as twice that of CFLs and virtually no heat output, we will see cost effective consumer light options in short order.



## Air Sealing + Insulation

Insulation Levels: Ceiling R30 | Walls R13 | Kneewalls R13 | Floors R19

**Seal attic air leaks and thermal bypasses into the living space and insulate to a minimum of R38.** Your attic represents the single largest point of energy loss in your house currently. Your existing insulation is <R30, while current building code is R38. Attics are subject to the highest extremes in temperature and this is an area you should always focus your improvements on first.

In order for insulation to work properly, air sealing all leaks from your house to your attic must first be completed.

Whole attic fan is an uninsulated passage to the summer and winter extreme temperatures of the attic.

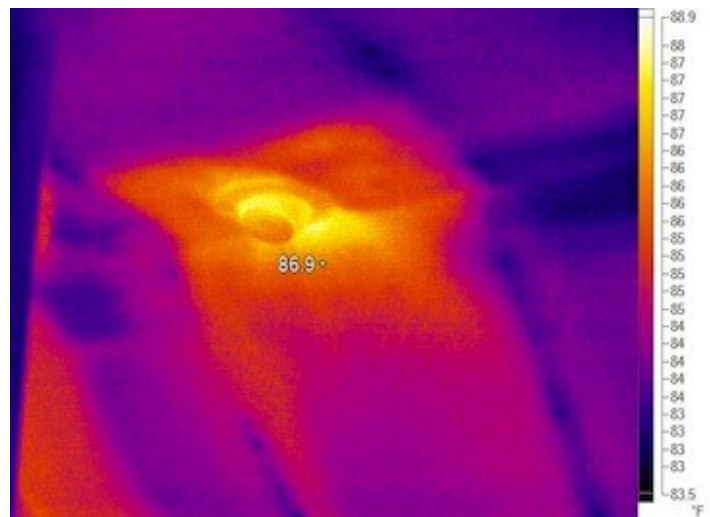
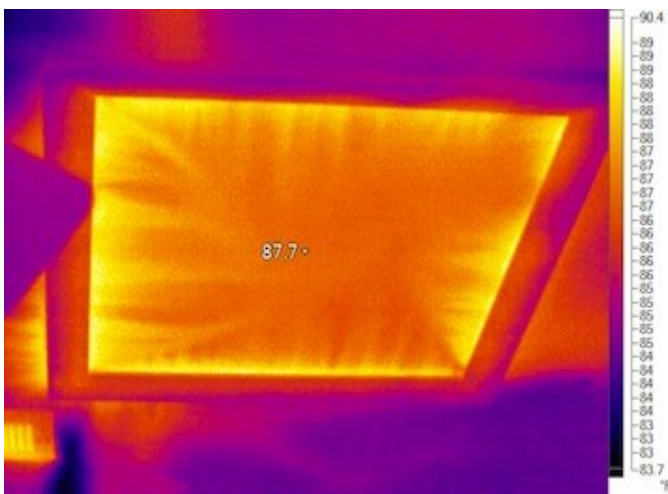
Unsealed and uninsulated flue chase leading to the attic. Significant potential for air sealing by capping this chase.



Visible Light Images of Thermal Bypasses

Attic hatches are notoriously leaky openings to the unconditioned space in your attic.

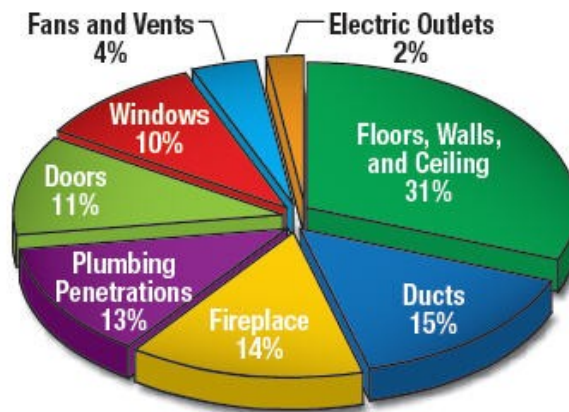
Overhead lighting showing significant signs of air leakage on the top floor of your home.



Thermal Images of Thermal Bypasses

## Background

A thermal bypass is a pathway that allows unconditioned air to “bypass” insulation (the thermal barrier) and carry heat, moisture or cold air into the conditioned or “living” space. In older homes and newer homes which were not built with energy efficiency in mind, we often see these bypasses in the form of recessed light fixtures, unsealed wall and ceiling joints, unsealed attic access covers, vent pipes and ventilation registers. The net effect is that unwanted air is allowed to enter the living space through these cracks in the “building envelope” and require that the house systems work harder to maintain a comfortable climate. While some of these bypasses are difficult to locate and correct, most can be accessed from the attic and crawl space

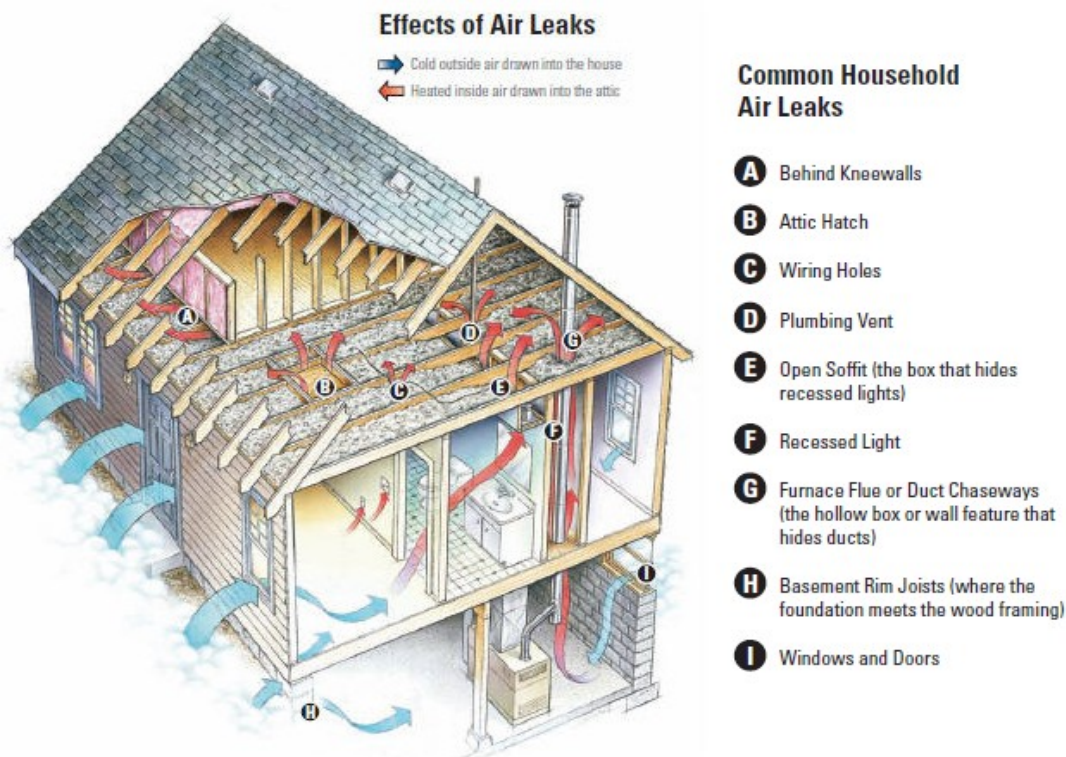


### How Does the Air Escape?

Air infiltrates into and out of your home through every hole and crack. About one-third of this air infiltrates through openings in your ceilings, walls, and floors.

Source: US Department of Energy

Figure 2



Source: US Department of Energy



## Heating & Cooling Appliances

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We recommend servicing your heating and cooling equipment annually. This residence has an 80% efficient furnace coupled with a 3 Ton 13 seer air conditioning unit that is installed on the exterior of the home. After a thorough inspection, with our natural gas detector, there was no sign of natural gas leakage on your property.

## Chimney & Fireplace

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**Install a fireplace flue pillow inside.** A significant amount of air is infiltrating and exfiltrating from the chimney and fireplaces in the building. These can be limited during use with the installation of a chimney cap and can be eliminated entirely during periods when the fireplace is not in use by the installation of a fireplace pillow which seals the flue area entirely.

### Background

Fireplaces are notoriously inefficient appliances, with most fireplaces which we commonly see in homes achieving less than a 10% efficiency level. Without the use of inserts and without creating a sealed combustion chamber supplied with outside combustion air it is virtually impossible to heat a home efficiently using a wood burning fireplace.

There exist however fireplaces and fireplace inserts to modify existing fireplaces which can achieve extremely high efficiency levels. Most people however use a fireplace for the experience and atmosphere and not for functional heating of an area. In this case, most users are not concerned with efficiency. However, these same fireplaces often do little to seal the flue when not in use and are an ever present source of air leaks in a building. Using a device such as a chimney pillow will effectively seal off the flue of a fireplace when not in use and eliminate this air leak while remaining easily removable when needed.

A fireplace cap is another way to reduce the drafts associate with open hearth fireplaces and limit the damage and dangers of having debris or animals enter the chimney. By placing a cap on the top of the chimney, you will lower the acceleration of cold air down the unused chimney into the fireplace by effectively placing a physical barrier perpendicular to the chimney. Care must be taken to ensure the cap will not deteriorate over time and that the grill openings are large enough to not become clogged with creosote during frequent use.

## Thermostats

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**Replace all thermostats with programmable thermostats and ensure they are properly programmed and appropriate for the system you have installed.** The building has non-programmable digital thermostats installed. Installing and programming thermostats to reduce heating and cooling requirements during periods when the building is not in use will save you money and will not affect the comfort of the buildings' occupants.

### Background

Heating and cooling represents the single largest energy expenditure for most buildings. Additionally, few buildings are utilized 24 hrs. per day, 7 days per week. In these cases, there is an opportunity to save energy by reducing the heating or cooling needs during the period when the building is not occupied.

The use of programmable thermostats allows you to automatically have the heating and cooling system scale back while the building is unoccupied and then gradually return to more comfortable levels just before it is reoccupied. The US Department of Energy estimates that you can save from 5-10% of your annual heating and cooling costs by installing programmable thermostats alone.

## Duct Sealing and HVAC Performance

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**Seal all duct runs.** All accessible duct runs should be sealed both at the register and any junction point with duct mastic. Your registers were on average around 3.5pa difference from the rest of the home meaning that they are in need of sealing along the run. The register in the back bedroom on the first floor was reading 12.0pa which was found to be noticeably leaking into the crawl space.

Leaky register in the first floor back bedroom. Noticeable connection to the crawl space.

Duct disconnected in the crawl space. Similar quality noticed on other connections in the crawl space.



## Background

When an HVAC system is designed for a home, it is designed with an expectation of air flow consistent with the ducts and duct work installed. Closing some registers or keeping bedroom doors closed causes the system to perform sub-optimally. It is important to ensure all air ducts are unobstructed and that air put into a space is able to make its way back to the return air intake. This ensures equalized pressure throughout the house and heating & cooling system. If living conditions require that certain doors remain closed while the system is running (e.g. a baby's room while they are napping), a jump-duct, door undercuts or other such means of creating an escape path for the air should be employed.

When ducts are poorly sealed, air escapes from the duct work to areas outside of the original design parameters. Unsealed ducts alone can account for up to a 20% loss in efficiency of your heating and cooling systems. You are literally heating and cooling outside air with a leaky system. More alarming still, is the fact that your home, always seeking to equalize the pressure inside may be drawing in damp, moldy air into your house from the crawl space or hot dusty air from your attic or even carbon monoxide from the garage or improperly vented furnace.

New homes are required by code to have all ducts sealed with mastic and zip ties. Unfortunately the majority of the existing houses' ducts were not sealed this way. While leaky ducts are a common problem which can lead to high energy bills, they are usually easily improved.

To determine whether a duct system is leaky or not, a technician uses a pressure pan to test the difference in pressure between the house and the duct run being tested. In a perfectly sealed duct, the pressure difference should be "0 Pa". Anything greater than a "0.5 Pa" difference is considered leaky and merits attention.

## Water Heater

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**Your current water heater was installed in 2002 and is an 89% efficiency heater.** Always ensure that the water temp is set at 120F, beyond this temperature, you are heating the water more than necessary and you increase your chances of getting scalded. When it comes time to install a new water heater (**typical lifespan of a water heater is 10-15 years**), consider solar hot water, the payback is very good when you can take advantage of tax credits. These systems are proven reliable and are considered an asset (save you money) rather than a liability (always cost you money).

## Background

Water heaters are a major source of energy consumption in a home, with a lot of wasted energy in "standby" losses. Typical homes require hot water in the morning and evening, but little to no hot water is used during the day. This is why solar systems are such an effective option. A properly sized solar hot water system will use less than 20% of the energy of an electric or gas system, using the hot sun during the day to heat up the water and store it in the tank. Solar hot water collectors (solar panels) are extremely efficient and the solar hot water tanks typically have the highest insulation values. Solar hot water has a typical payback of 5-10 years, depending on usage and type of heating system used. Savings

are greater when replacing an electric hot water tank vs. a gas fired water heater and savings are greater when more hot water is used rather than less.

For a number of reasons, we do not recommend “on-demand” or tank-less water heaters. These systems are expensive to purchase and install, typically waste a lot of water before heated water arrives at the desired location and require additional gas line work to install. There are circumstances in which this may be a viable alternative, however for most customers, we recommend either replacing the water heater with the highest efficiency model available (either gas or electric) or ideally, if the situation permits, installing a solar thermal system.

## Sealed Crawl Space

**Clear all old insulation, water heater, old plastic flooring and debris from crawl space, install and seal vapor barrier at walls and floor, install insulation at walls and seal floor penetrations (electrical chases, plumbing, vents, etc.). Install a moisture monitoring system and unidirectional conditioning vent.** Fumes and vapors from items stored in the crawl space often find their way into the living space. It is best to store as few of these items as possible in the crawl space. Additionally, moisture levels in the crawl space were observed at 70% which is outside of the target of 45%-50%. Achieving proper humidity control is virtually impossible however with a vented crawl space. Where possible and practical, we recommend sealing crawl spaces. Sealed crawl spaces have been found to increase the energy efficiency of a home by as much as 15-20% and have a substantial impact on the comfort of the home owners and the indoor air quality of the living area by eliminating the conditions needed for mold growth and putting the thermal boundary of the dwelling at the outer walls rather than the floors of the house.

What a sealed crawl space looks like



Walls are insulated rather than the floor, reinforced vapor barrier is permanently installed against the walls and covering all the floor surfaces



Piers are wrapped and sealed with the vapor barrier and all accessible floor penetrations are sealed

## Background



Ideally, in our warm and humid southern climate, crawl spaces would be sealed or “closed” and conditioned. In most cases this makes the most sense, specifically when significant moisture and condensation issues are present. Unfortunately, most homes today have “vented” crawl spaces which allow unconditioned moist or humid air to enter the space and come in contact with cool duct surfaces which can lead to substantial condensation and water buildup in the crawl space. This can in turn lead to mold growth, expensive repairs and potential health issues.

When the state of an existing crawl space has deteriorated to the point where new insulation and vapor barrier is required or moisture levels are uncontrollably high we recommend sealing the crawl space. Clients have enjoyed significantly improved comfort and air quality in their homes as well as a noticeable reduction in their heating and cooling bills when we have sealed their crawl spaces.

See the following case study for more details on the benefits of “sealed” or “closed” crawl spaces: [http://www.advancedenergy.org/buildings/knowledge\\_library/crawl\\_spaces/pdfs/Closed%20Crawl%20Spaces%20Do%20Double%20Duty.pdf](http://www.advancedenergy.org/buildings/knowledge_library/crawl_spaces/pdfs/Closed%20Crawl%20Spaces%20Do%20Double%20Duty.pdf)

## Windows & Doors

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**Replace older leaky windows when the time is right.** Most windows and doors observed were functioning and in good condition. There were instances of exterior windows in the first floor back bedroom with a moderate gap, allowing conditioned air to exit the home and crawlspace doors that could use weather stripping.

### Background

If your windows are old and leaky, it may be time to replace them with energy-efficient models or boost their efficiency with weather-stripping and storm windows. It is almost never cost-effective to replace windows just to save energy. According to EnergyStar.gov, replacing windows will save 7 to 24 percent of your heating and air-conditioning bills, but the larger savings would be associated with replacing single-glazed windows. However, if you are replacing windows for other reasons anyway, in many areas the additional cost of Energy Star–rated replacement windows is very modest, perhaps \$15 per window. This upgrade would be cost-effective—and increase your comfort to boot.

## Additional Energy Efficiency, IAQ & Home Performance Measures

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### House Ventilation / Spot Ventilation

Bathroom spot ventilation fans were functioning up to standards. The upstairs fan was moving 35 CFM of air to the outside of the home.

### Water Efficiency

Every 1,000 gallons of water you can save per month translates into about \$90 dollars in savings per year, said otherwise, dinner for two. With a few behavioral changes, saving water can be very easy.

- Turn off the tap when brushing your teeth.
- Take showers instead of baths.
- Take back to back showers with other occupants to avoid water waste while waiting for warm water to arrive at the shower location.
- Replace all faucets in the house with low flow faucets or insert aerators.
- Install a high efficiency low flow shower head in the most often used shower.
- Collect laundry in order to do full loads only.
- Periodically test all toilets for leaks with free test kits found at your local hardware store.
- Consider upgrading your older toilets or most often used toilet with newer low flow and ultra low flow toilets (<1.2gpf).
- Fix all leaking fixtures immediately.
- Consider installing a recirculating pump which brings hot water to your farthest most often used location without wasting cold water.

### **Plants and Surrounding Vegetation**

Vegetation should be cut back to allow a minimum of two feet of clearance around the house. This helps cut down trapped moisture by improving airflow around the structure. When cutting back vegetation pay close attention to the shade currently provided so that you don't remove too much leading to more solar heat gain on the structure.

### **Drainage**

There are **several down spouts** which are plugged with debris and overflow too closely to the foundation of the house. All down spout and roof drainage should be terminated at least 5 feet from the foundation and sloped away from the house. Significant moisture can enter the home from improperly drained gutters and this has been observed in your crawlspace. Often this can be easily remedied by using non-perforated corrugated pipe found at your local home improvement store for less than \$10. It is also important to ensure that your gutters remain free of debris and should be cleaned at least once per year after all of the leaves have fallen.

### **Dryer Vents and Dryer Maintenance**

Dryer performance is directly tied to the ease with which it is able to exhaust moist air. By periodically cleaning out the dryer vent, vacuuming accessible areas of the dryer and cleaning out the lint trap at every use, you will ensure that the dryer runs only as long as required. Periodic servicing & cleaning of the dryer not only improves the performance of the dryer and thus lowers your energy bills, it also reduces the risk of a lint fire. Most appliance stores offer this as a service. Additionally rather than using the "Timed Dry" setting, use the **moisture level controls** so the dryer will automatically shut off when the clothes have reach the desired dryness.

## Carbon Monoxide Risks

This building contains a combustion appliance attached to the crawl space which under some conditions may vent carbon monoxide into the conditioned space. We recommend the installation of a simple carbon monoxide meter in the upstairs hallway near the top of the stairs and another unit in the office farthest away from the stairs.

Carbon Monoxide is a colorless, odorless gas that is responsible for thousands of death every year in the United States. At high concentrations, CO can kill you in minutes. More often, CO is present at lower levels which can adversely affect your health as well. Learn to recognize the symptoms of carbon monoxide poisoning: At moderate levels, you can get severe headaches, become dizzy, mentally confused, nauseated, or faint. You can even die if these levels persist for a long time. Low levels can cause shortness of breath, mild nausea, and mild headaches, and may have longer term effects on your health. Since many of these symptoms are similar to those of the flu, food poisoning, or other illnesses, you may not think that CO poisoning could be the cause.

When choosing a carbon monoxide detector, make sure that it has been certified by the Underwriter's Laboratories (UL Certification).

## Solar potential

Your current unshaded solar area is moderate to poor which indicates reduced solar potential. **There are other town homes in your development that may have potential if the property caretakers are interested.** Depending on your interests and budget, we recommend starting with Solar Thermal (solar hot water) as it is the most cost effective use of solar energy currently. Once all other energy saving measures have been put in place, Photovoltaic panels (solar electric panels) are the next step.

## | Next Steps



At Sundogs Solutions, Inc, we are committed to offering superior customer service and quality workmanship with every interaction. As such we are proud to be participating in the “Home Performance with Energy Star” program and we understand that our success depends on our customers’ satisfaction so we do not consider the job complete until our customers are satisfied with the end result. We also recognize that our customers have a broad range of skills and comfort levels and may elect to do all, some or none of the work themselves. We will gladly work with customers to formulate a plan that is tailored to suit their specific needs and timeline.

The estimates provided in this report are valid for 30 days from the date of the report. Call us (919-338-1060) or email us ([info@sundogssolutions.com](mailto:info@sundogssolutions.com)) at your convenience to schedule the work.

### Financing

When it comes to energy related home improvements, financing makes a lot of sense. Often the savings from energy improvements will offset the cost of financing the improvements and when the loan is paid off, the savings go entirely to you. Below is a table that illustrates this by using an example of suggested retrofits and energy savings against a 5 year loan at 7%. Please note that the table below is for illustrative purposes only and will depend on the actual terms of the loan and actual energy savings gained.

	Year										Total
	1	2	3	4	5	6	7	8	9	10	
<b>Energy Savings</b>	\$ 828	\$ 828	\$ 828	\$ 828	\$ 828	\$ 828	\$ 828	\$ 828	\$ 828	\$ 828	\$ 8,280
<b>Loan Payment</b>	\$ (788)	\$ (788)	\$ (788)	\$ (788)	\$ (788)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ (3,938)
<b>Cumulative Cash Flow</b>	\$ 40	\$ 81	\$ 121	\$ 161	\$ 202	\$ 1,030	\$ 1,858	\$ 2,686	\$ 3,514	\$ 4,342	\$ 4,342

**Financing Energy Savings - \$3,315 for 5 years at 7%\***

Table 4

### Tax Credits & Other Rebates

Through the end of 2011, the federal government is offering a 10% tax credit up to a maximum of \$500 for eligible energy improvement projects. Refer to the following site for more information: [http://www.energystar.gov/index.cfm?c=tax\\_credits.tx\\_index](http://www.energystar.gov/index.cfm?c=tax_credits.tx_index) and consult your tax professional for your specific tax circumstances.

There are additional credits and rebates available to home owners from various communities and utilities. Make sure to check the national database for energy efficiency rebates <http://www.dsireusa.org>



## | Glossary

- Air Infiltration:** Air infiltration, or leakage (exfiltration), occurs when outside air enters a house uncontrollably through cracks and openings. Properly air sealing such cracks and openings in your home can significantly reduce heating and cooling costs, improve building durability, and create a healthier indoor environment.
- BAS:** (Building Airflow Standard) is a calculated value which defines the minimum required air flow in a building to maintain a healthy living environment. In older homes which are not built to specific energy standards, air naturally enters and escapes through “holes” in the building. Through energy efficiency measure it is possible to seal enough of these “holes” to create unhealthy and “stale” environments. The BAS serves as a guideline to ensure that enough fresh air enters a home to create a healthy environment. Beyond a certain threshold, mechanical ventilation must be introduced into a building.
- CFL** (Compact Fluorescent): CFLs produce light differently than incandescent bulbs. In an incandescent, electric current runs through a wire filament and heats the filament until it starts to glow. In a CFL, an electric current is driven through a tube containing argon and a small amount of mercury vapor. This generates invisible ultraviolet light that excites a fluorescent coating (called phosphor) on the inside of the tube, which then emits visible light. CFLs need a little more energy when they are first turned on, but once the electricity starts moving, use about 75 percent less energy than incandescent bulbs. A CFL’s ballast helps “kick start” the CFL and then regulates the current once the electricity starts flowing.
- CFM:** Cubic Feet per Minute is a measure of air flow into a house. In energy work with buildings, this is typically measured using a large calibrated fan which creates a standardized pressure difference between the house and the outside, typically 50 Pascals.
- CO:** Carbon Monoxide is a colorless, odorless and tasteless gas which is lighter than air. It is highly toxic to humans and animals in higher quantities. In a home, CO is produced as a by-product of incomplete combustion. Combustion appliances such as a gas water heater, gas furnace, gas stove, gas fireplace all burn fossil fuels and product light, heat, water vapor and CO. Highly efficient and properly tuned appliances will produce little to no CO (5-15ppm). Simplified, CO is dangerous because it binds to your body’s red blood cells when inhaled and prevents these cells from carrying oxygen through your body. Low level of CO in a house may be expressed as flu-like symptoms and are often incorrectly diagnosed. CO can be easily monitored through the use of simple CO detectors. When properly functioning, CO should be vented outside of the house through vent pipes or similar exhaust systems. Vent-less appliances are never a good idea and should be removed as soon as possible when present in a home.
- Deduction:** A tax deduction differs from a “credit” in that tax payers only derive benefits (lower taxes) from a portion of the expense and in some cases none at all depending on your tax situation.
- EQLA** (Equivalent Leakage Area): Is an approximated measurement of the total areas of leakage in a home, calculated by flow rate with a calibrated fan. Said differently, if you added up all the holes in your house and combined them into a single space, it would add up to this measure.
- LED** (Light Emitting Diode): LEDs are small light sources that become illuminated by the movement of electrons through a semiconductor material. LED lighting is more efficient, durable, versatile and longer lasting than incandescent and fluorescent lighting. LEDs emit light in a specific direction, whereas an incandescent or fluorescent bulb emits light — and heat — in all directions. LED lighting uses both light and energy more efficiently.
- Pa** (Pascal): the Pascal is perhaps best known from meteorological barometric pressure reports. This is a measure of pressure that building analysts use to test the leakiness of structure and ducts. This is also used to understand building dynamics by isolating areas of a structure and measuring pressure differences between different zones.
- Pressure Pan:** Is a small box like device that is used to determine generally how leaky ducts are. While it cannot determine exact leak rates, it is a quick and accurate way of determining the integrity of a duct run.
- Rebate:** Tax “rebates”, differ from tax “credits” in that “rebates” are applied immediately to the cost of a project, lowering the initial cash outlay for customers.

- Simple Payback:** is a simple method of calculating the period of time required to recoup the initial investment through lower utility bills or maintenance costs. It is measured by dividing the total cost of implementation by the savings gained through the implementation.
- Spillage:** Refers to the exhaust fumes which “spill” out of the vent stack during initial start up of an atmospherically vented appliance such as a water heater. This is typical at start up but should stop within the first minute, after the hot gases traveling up the vent pipe have sufficiently risen to create a proper draft.
- Steady State:** Refers to a measurement taken when an appliance is warmed up and operating in “steady state” mode, typically 1 minute after it has been turned on.
- Tax Credit:** A dollar-for-dollar reduction in the tax payment required from a person. This is better than a “deduction” in that you benefit from the entire eligible amount. In effect “prepaying” your taxes through energy retrofit projects. In the case of the Federal Tax Credits for Consumer Energy Efficiency 30% of eligible measure are credited up to a maximum of \$1,500. The measures covered by this credit have very specific requirements which can be found at [http://www.energystar.gov/index.cfm?c=tax\\_credits.tx\\_index](http://www.energystar.gov/index.cfm?c=tax_credits.tx_index)
- Thermal bypass:** Thermal bypass, or movement of heat around or through insulation, frequently occurs due to missing air barriers or gaps between the air barrier and insulation. Reducing thermal bypasses are important as they can lead to comfort issues as well as higher utility bills.
- Therm:** (thm) [Commercial unit](#) of heat. One therm [equals](#) 100,000 Btu or about 97 [cubic feet](#) of [natural gas](#), or about 29.3 [kilowatt hours](#) (kWh) of [energy](#).