AMERICAN HOME CONSULTANTS

focus on energy
Partnering with Wisconsin utilities

800.762.7077 focusonenergy.com

Home Performance with ENERGY STAR®

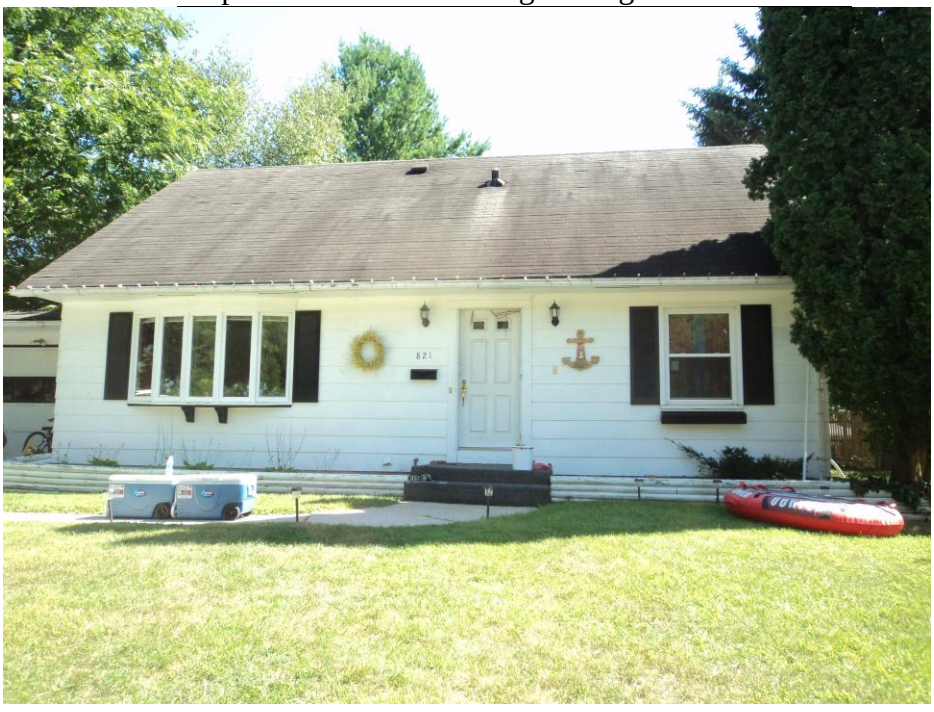
HOME PERFORMANCE WITH ENERGY STAR

Evaluation Report

Customer Information

Customer Name:	Sample Report 2				
Address of Building:	123 Johnson Street				
Mailing Address:	Same				
City:	Madison	State:	WI	Zip:	53704
Phone:	(608) 246-1234	Cell:			
Email:	americanconsultantsllc@yahoo.com				

Date of Evaluation:	12/05/11
Consultant Name:	Robert Runchey
Company Phone:	(608) 842-0023
Contractor:	Zip Coat Contact: George or Ingmar



Home Owner Concerns/Issues:

- Ice Dams
- Energy Efficiency

Summary and priority of Recommendations:

- Ensure carbon monoxide detectors are located in the hallway of the bedrooms and placed on each level of the home. Smoke detectors should also be installed in the hall near the bedrooms and one in each bedroom as dictated by the State of Wisconsin.
- Remove hardboard and glued ceiling tiles; replace with drywall, tape & joint compound
- Remove insulation from the attic crawl space; block & seal the floors and add closed cell spray foam; add spray foam to the back of the knee walls to R-28
- Seal all top plates and attic penetration using spray foam
- Air seal the attic hatch with weather stripping; insulate the back to R-20 using 2" foam board.
- Add weather stripping to the attic crawl space hatch doors and insulate accordingly
- Add cellulose insulation to the attic and attic crawl space (R-50) once the air sealing has been completed
- Add (2) triangle gable vents to each crawl space
- Remove fiberglass insulation from the sill boxes and seal with spray foam
- Replace bath fans with a 50 – 70 cfm rated energy star units and exhaust to the outside with insulted material
- Replace basement windows with energy star insulated sliders or glass block

General Observations & Comments:

The home was built in1964 and has been lived in by the current owners for 20 years. The windows are approximately 5 years old and the roof is scheduled to be replaced. The exterior doors (including the patio door) are fairly leaky and should be replaced.

Past ice damming issues (as described by the home owner) along both the front and back of the home in recent years. No gas leaks found in the home

Incandescent bulbs should be replaced with compact florescent type or LED's. These types of lighting options last longer, burn cooler, and are require less energy. CFL can generally use up to 75% less energy than conventional incandescent bulbs

Natural gas consumption is higher as compared to the state average while electric usage is significantly higher

Combustion Safety:

- It is recommended that all homes have a functional & tested carbon monoxide detector(s) and smoke detectors.
- Power or direct vented furnaces and water heaters are a much safer. They typically incorporate fans to assist the venting of exhaust gases.
- The water heater passed the combustion safety standards set forth by the Home Performance with Energy Star® program.

Combustion safety testing is performed on all atmospherically vented combustion appliances (appliances that rely on natural forces to draft). The testing is conducted to measure the draft strength and amount of carbon monoxide produced under various conditions (for example, when exhaust fans are in operation). Combustion safety testing is important both before and after changes are made to ensure that carbon monoxide and moisture are not inadvertently entering the home. The furnace was not tested because its power vented to the outside.

*As we work to make the home more comfortable and affordable to live in, we're also making the building tighter. Often times, atmospherically vented water heaters and furnaces need to be replaced with alternate venting type models, such as a power vented units or on demand water heaters due to potential back drafting issues.

Appliance	**Status of Draft**	**Status of CO**
Furnace	N/A	27 parts per million (ppm) Passed
Water heater	-6.0 pascals (pa) Passed	21 parts per million (ppm) Passed

Consultant Recommendations/Comments:

Tamper proof carbon monoxide detector should be installed in the hallway near the bedrooms and one per level. Tamper proof smoke detectors should be installed in the hallway near the bedrooms and one in each bedroom

Building Air Tightness & Insulation:

The blower door measures the relative air-tightness of the home and helps to identify air-sealing opportunities.

- Air sealing can provide substantial energy savings and increased occupant comfort.
- Attic air leakage is the primary cause of ice damming and condensation on roof sheathing.
- **Insulation does not stop air leakage.** Air seal attic air leaks before insulating.

Existing attic insulation consists of fiberglass insulation estimated to have an R value of 19-23; wall insulation is estimated to be R-8.

The air leakage rate is 3650 cubic feet per minute (cfm) at a test pressure of 50 pascals. There is significant room for improvement.

The air leakage reduction goal is 35%. Targeted air sealing opportunities exist throughout the house.

CFM@50	Relative Leakiness	Air Sealing Recommended? (Yes/No)
3650	Fairly Leaky (10.8 ACH)	Yes

Consultant Recommendations/General Comments:

Seal all penetrations to the exterior with caulk. These are typically electrical, plumbing and venting pipes that penetrate the home from the exterior. Sealing these areas will also keep out basement moisture, rodents, and insects.

The second floor is particularly leaky and contributing to most of the air leakage and ice damming issues. (photo # 1,1b,1c,1d) The wall and ceiling material is made up of hard board and glue acoustic tile with open seams. This allows a great deal of warm air to enter the attic space. I recommend removing the existing material and replacing it with drywall to build an air tight barrier between the upper level conditioned space and the attic. If the air leakage is not properly repaired and a new roof is installed, ice damming can occur and may damage the new roof to the point of water entering the home, damage the new shingles, and promote moisture related problems.

Remove insulation from around interior/exterior top plates, chimney chase, plumbing wall, electrical penetrations, etc. and seal with closed cell spray foam. The knee wall insulation is installed with the face side to the attic crawl space; faced insulation should be installed with the faced side towards the conditioned space to keep moisture from entering the walls and causing moisture & condensation issues. (photo # 2) The bath fan exhaust is also vented into this space and will need to be vented to the outside to avoid moisture problems. (Replace with insulated material) Remove fiberglass batt insulation from the knee walls and air seal with closed cell spray foam to R-28.

Remove material from the attic crawl space floor; block & seal the floor with insulation stuffed into plastic bags and sealed with spray foam. (photo # 3) Remove fiberglass insulation from the attic floor and add 1-2" of spray foam and cellulose insulation to R-50.

Adding two part spray foam to the sloped ceiling while the roof is being replaced is recommended but is more expensive than fiberglass and cellulose insulation (photo # 4a,4b) but has up to twice the insulting value. (recommended minimal R value for this part of the country is R-49 or better) Add a triangle gable vent to each end of the attic crawl spaces for cross ventilation.

Air seal the attic hatch with weather stripping around the opening and secured with hook & eyelets for a proper seal. (photo # 5) Insulate the back to R-20 using 2" foam board and foil tape. Build a box around the hatch to contain the added insulation; add cellulose insulation to R-50 when all air sealing work has been completed.

Add weather stripping to the attic crawl space doors to prevent air leakage to the outside. (photo # 6) Remove any fiberglass batt insulation from the sill boxes. Create an effective air barrier by spray foaming along all lengths of the rim joists. Controlling excessive basement moisture can help prevent mold issues, and help control rodents and insect infiltration.

Consider replacing the original single pane glass metal basement windows with insulated sliders or pre-molded glass block with an awning insert for ventilation. Glass block units are not as energy efficient as replacement window but are a good option in keeping out moisture.

Moisture and Ventilation:

- Excess humidity can lead to condensation problems and mold growth.
- Exhaust fan use helps to maintain the home's relative humidity in a range that will tend to minimize moisture problems (35% or lower in winter).
- Higher quality fans are quieter and more energy efficient.
- Exhaust fans need to be vented to the exterior with straight, smooth, short duct runs. Ducts in unconditioned space should be insulated.
- Window dressings should be left partially open at night to allow warm air to circulate over the surface of the glass and all interior screens should be removed. This will reduce the amount of condensation build up on the windows.
- The existing ventilation strategy to bring in fresh air for the occupants of the home is a combination of exhaust fans and natural air infiltration.

Source Description	Measured Fan Flow (CFM)	Recommended Flow (CFM)	Vented to Exterior (Yes/No)
Upper Bathroom	33	50 – 70	Yes
Lower Bathroom	0	50 – 70	Yes

Managing Indoor Moisture Levels:

As we increase the comfort and energy efficiency, we will affect how well the home manages the moisture produced within the home. Monitoring relative humidity in the home is an important step in solving and preventing moisture-related problems. A complimentary digital hygrometer is available from the Home Performance with Energy Star® program for filling out a program survey

Wintertime guidelines for indoor relative humidity:

Outdoor Temperature	Relative Humidity
-20º F	15-20%
-10º F	20-25%
0º F	25-30%
10º F	30-35%
20º F	35-40%

Consultant Recommendations/Comments:

Make sure all gutters are kept clear of debris, downspouts are connected securely and rain water is directed away from the foundation. Any water up against the foundation will allow moisture transfer into the home. Operate the bathroom exhaust fans any time moisture is produced in the baths. Operating bathroom exhaust fans for longer hours will have a drying effect in the wintertime.

Monitor and learn to recognize relative humidity levels that are too dry for comfort or high enough to cause window condensation. A professionally installed, new fan typically exhausts between 50-70 cfm for smaller to average size bathrooms. Replace the exhaust fan in both bathrooms with 50 -70 cfm energy star rated unit and vent to the outside using insulated ducting material.

Energy star rated fans are recommended and should have a sone rating of 1.5 or less. (A $50.00 rebate per fan is available if purchasing energy star rated models which can be found on the Focus on Energy website, www.focusonenergy.com) Be sure to seal around the base of the fan with spray foam. Insulated venting should be used in the attic space to prevent condensation from entering the home.

I recommend installing a timer switch which will allow the fan to run longer without having to be attended. (15 to 20 minutes is recommended)

Mechanical Equipment:

- Mechanical equipment efficiency, size and condition can impact home energy consumption.
- Replacing mechanical equipment that is inefficient or in poor condition with properly sized, energy efficient equipment, often provides significant savings
- Setting back the thermostat by 5 degrees for an 8 hour period saves approximately 1%.
- Furnace rated Annual Fuel Utilization Efficiency (AFUE) is 90% or greater and the estimated age of the unit is 1-5 years
- Water heater usually last between 10-15 years. Yours is dated form 1996.
- Volume dampers may exist in each supply branch run near the main supply plenum. Adjusting the amount of air supplied to each room at this point is more effective at increasing comfort than at individual room registers. Label each duct run according to the room it services.
    - These dampers will give a greater amount of flexibility in determining which sections of the house receive the greatest amount of airflow.
    - These dampers should only be adjusted slightly at first and secured in place after each adjustment.

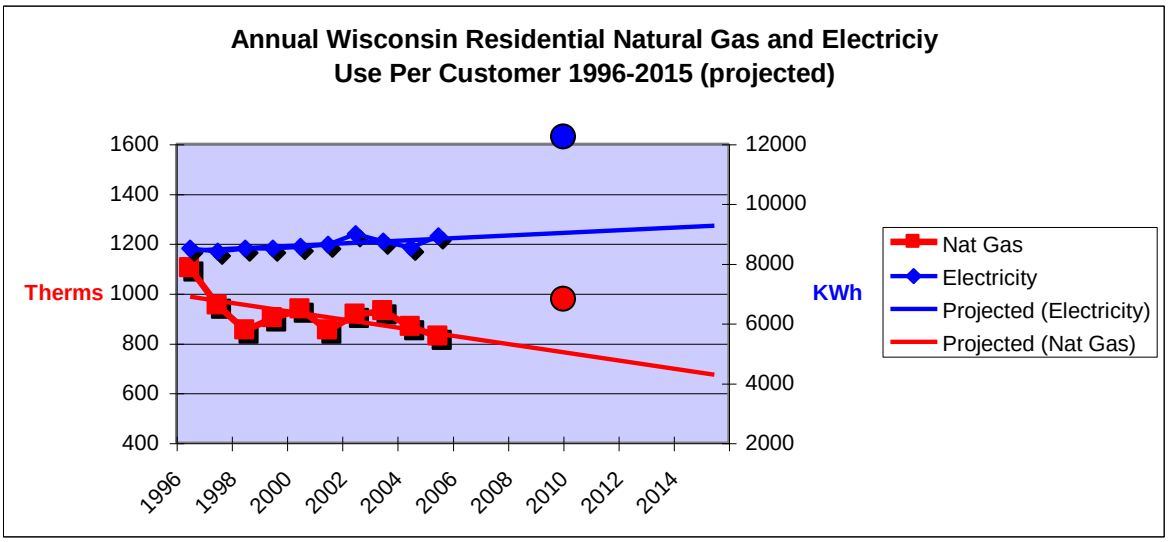
Consultant Recommendation/Comments:

Have the furnace and cleaned and tuned each year by an HVAV professional. Inspect and replace the furnace filter as needed.

Average Energy Use and Cost for
821 Wheeler Road, Madison

	Meter: Gas	Therms	Cost	Number of Days in Billing Period	Heating
1	High:	187 therms	$176	31 days	Yes
	Low:	17 therms	$23	29 days	
	Monthly Average:	**80 therms**	**$78**	**Last 12 months**	

	Meter: Electric	Kilowatt Hours	Cost	Number of Days in Billing Period	Heating
1	High:	1823 kWh	$266	32 days	No
	Low:	902 kWh	$127	29 days	
	Monthly Average:	**1223 kWh**	**$175**	**Last 12 months**	



Indicates your gas use for the last 12 months of 960 therms
Indicates your electricity use for the last 12 months of 14676 kwh

Air Quality and Other Environmental Considerations:

If you have not already done so, testing your home for radon is highly recommended. For more information please visit: http://www.epa.gov/radon/pubs/citguide.html#riskcharts

To learn more about Green House Gas (GHG) emissions visit the websites below.

- http://epa.gov/cleanenergy/energy-resources/calculator.html
- http://www.clearwater.org/carbon.html

Rewards and Follow-up:

Depending on which improvements you choose to complete, you may be eligible for a number of program rewards. Be sure to keep itemized invoices and receipts for any improvements you make. I will need to attach a copy of these to your reward from. Once the work is completed I will return, at no additional charge, to complete a post-improvement inspection and to fill out the reward paperwork.

Please contact me if I can assist further with recommendations made in this report.

Robert Runchey
American Home Consultants LLC
7818 Big Sky Drive
Madison Wi. 53719
(608) 842-0023
americanhomeconsultantsllc.com

AMERICAN HOME CONSULTANTS

focus on energy
The power is within you.

Potential Cash-Back Rewards from Wisconsin's Focus on Energy Program:

A post test and receipts are required to be eligible for Focus on Energy cash-back rewards. Be sure to call me at 608-842-0023 to schedule a second visit, at no cost, to provide a post inspection.

Please note that Cash-Back Rewards and availability are subject to change at the discretion of Focus on Energy. Cash back rewards for the residential program can be found on the Focus website: www.focusonenergy.com

Photo # 1a
Remove hardboard material and replace drywall

Photo # 1b
Air leakage evident through open seams in sloped walls and ceiling

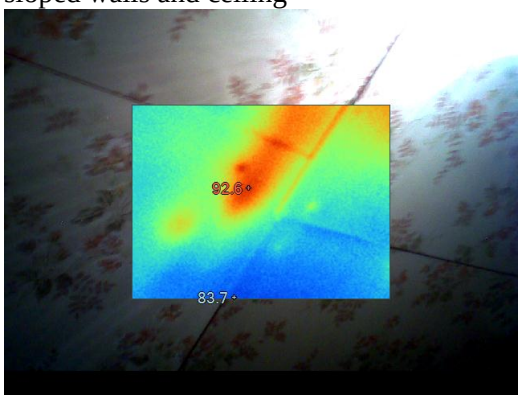


Photo # 1c
Infrared image of air leakage over the top of the stairwell

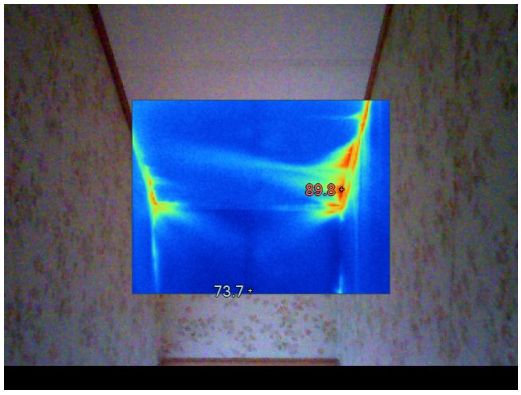


Photo # 1d

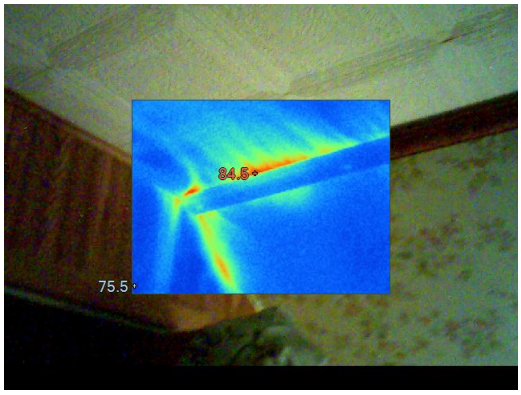


Photo # 2
Remove existing batt insulation and air seal with closed cell spray foam. Replace bath fan material with insulted type and vent to the outside

Photo # 3
Block & seal open attic crawl space floor with insulation stuffed into plastic bags and sealed with spray foam

Photo #4a
Add closed cell spray foam to the sloped ceiling when the roof is to be replaced

Photo # 4b
Infrared image of air leakage from leaky top plates on the exterior wall

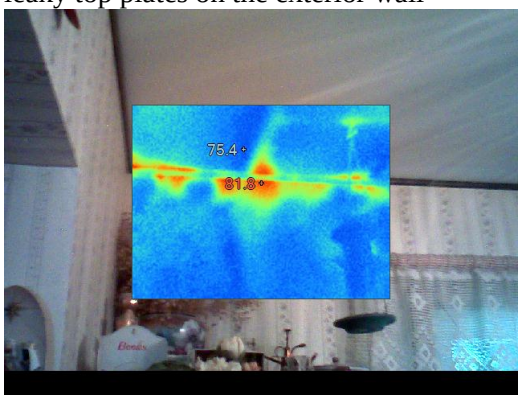


Photo # 5
Add weather stripping and ridged foam board to the back of the attic hatch

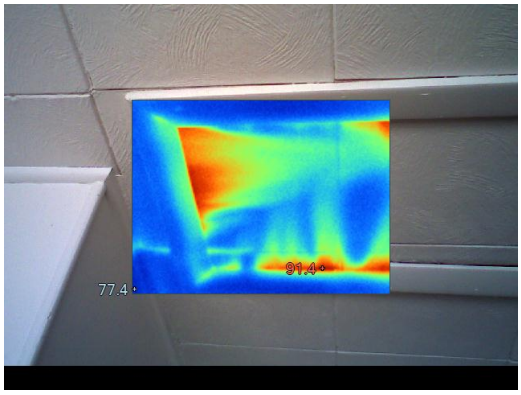


Photo #6
Air seal the crawl space doors with weather stripping

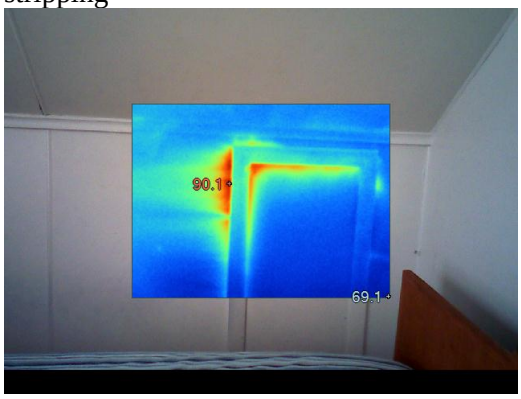
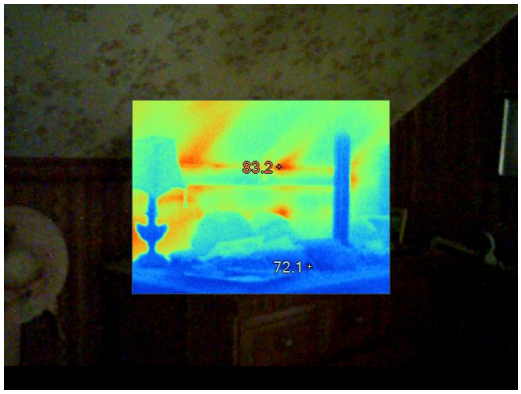


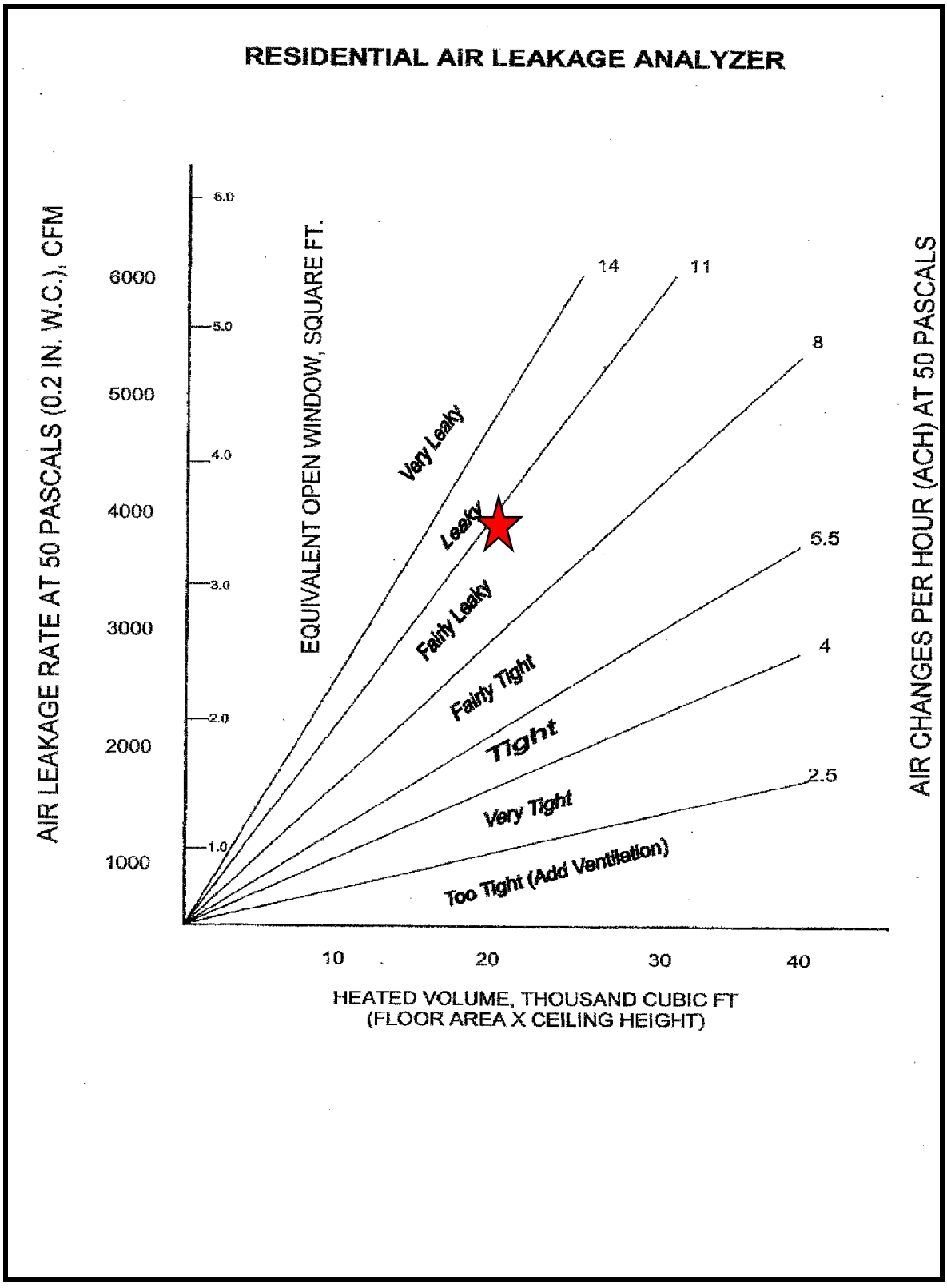
Photo # 7
Replace basement windows with insulated sliders or glass block & insert

Additional Photos:

Add closed cell spray foam & blocking to the crawl space floors

Aditional photo of air leakage from the knee wall





Disclaimer

This report was prepared by Robert Runchey and is written specifically with reference to the aforementioned property. Energy assessments performed by American Home Consultants is an evaluation of the entire building regardless of specific areas of concern. Recommendations made in the final report are based on findings during the evaluation process. The completion of recommendations provided in this report is solely up to the building owner.

The findings presented in this report are based on a walk-through audit of the house and may or may not have included diagnostic testing. Additional input may have been provided by the homeowner. The recommendations included in this report are estimates based on knowledge, training, experience and industry standards. Although every effort was made for accuracy in this process the information supplied within this report does not constitute any warrantee of energy costs or savings or building performance.

In some cases, open cavity inspections may be needed to determine if moisture has penetrated into the internal structure of the building. Mold testing should be performed whenever suspected or present in the home.

All work performed must be performed in full compliance with all applicable state and local laws and regulations. Contractors performing work under certain trades must have all applicable and necessary licensure within the state or local jurisdiction where the property is located.

Although American Home Consultants LLC can assist with contractor referrals, and to the best of our abilities, identify contractors that are qualified to perform home performance contracting work, we make no warrantee, expressed or implied, and are not responsible for the work performed by any contractors.

Any contractors conducting home performance contracting (including insulation and air-sealing) should have a strong understanding of building science and whole-house energy performance. It is strongly advised that any contractor submitting a proposal to conduct home performance contracting has certification or evidence of this thorough understanding of these competencies.