



**Homeowner  
Address  
Date**



**Prioritized Recommendations:**

1. Dense pack exterior sidewalls
2. Prime paint back side of existing siding
3. Air seal interior-wall-interface-with-exterior wall cavity possibly through siding removal
4. Sill box insulation

<p><b>Overview:</b> Excessive paint chipping is believed to be caused by unorthodox framing techniques where the interior wall cavities intersect with the exterior wall cavities. This, plus non-back-primed siding and slumping cavity insulation is allowing for excessive moisture build-up in the cavities and dew point formation on the exterior siding causing peeling paint.</p>	<p><b>Outline of Report Contents:</b></p> <ol style="list-style-type: none"> <li>1. Shell             <ol style="list-style-type: none"> <li>a. Air leakage, Sidewalls, &amp; Windows</li> <li>b. Attic</li> <li>c. Basement &amp; Foundation</li> <li>d. Fresh Air &amp; Moisture Management</li> </ol> </li> <li>2. Appliance Efficiency &amp; Performance             <ol style="list-style-type: none"> <li>a. Heating System</li> <li>b. Cooling System</li> <li>c. Electrical Savings Opportunities</li> <li>d. Carbon Monoxide Safety</li> <li>e. Indoor Environmental Hazards</li> </ol> </li> <li>3. Rewards and Follow up</li> </ol>
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**Please note that measures eligible for 2011 Focus on Energy Cash Back Rewards must be installed by December 31, 2011 and the follow-up visit must be completed by January 31, 2012.**

A Home Performance with ENERGY STAR® assessment was completed on this building. Recommendations are prioritized based on the following four factors: 1) safety, 2) durability, 3) comfort and 4) energy efficiency. The three forces that impact energy consumption and comfort include shell characteristics, appliance efficiency, and occupant behavior. The intent of this report is to summarize the major findings and recommendations of the shell analysis that included blower door testing, infrared scanning, visible insulation inspection, combustion safety checking, and ventilation fan flow testing. It is beyond the scope of this report to address all non-measurable facets of the house that affect total energy consumption. Please refer to the enclosed documents for additional suggestions that may apply to your situation.

**Referring Ally: Westring Construction**

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## 1. SHELL

### a. Air leakage, Sidewalls, & Windows

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.

The average house air leakage is around 2000 cfm50.

<b>Your home's air leakage:</b>	<b>2000 cfm50</b>
Your home's approximate volume:	14880 Cubic feet
Approximate number of hours for a natural air exchange:	3.7 hours (3 hours per natural air exchange is an average)
Relative leakiness:	<b>Tight</b> Air leakage reduction recommendation: 1% - 10%
Minimum air leakage level without continuous background ventilation:	1120 cfm50
Ventilation upgrade recommended:	No

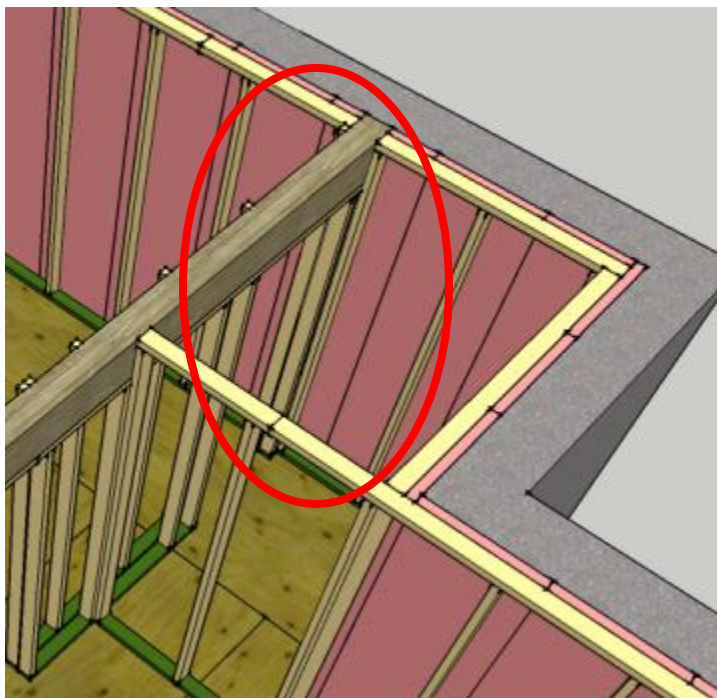
- i. Insulate the exterior sidewalls: Exterior Application: insulate the exterior sidewalls by temporary removal of the existing siding (wood lap) material. Dense pack all cavities by tube method.
  1. At the main floor bathroom note the tub cavity. Consider either filling the tub void with insulation or fully removing the siding to access the tub cavity and installing a solid barrier between the tub cavity and the exterior sidewall cavity. See photo below.





Approximate location of tub cavity.

- ii. Interior sidewall interface with exterior wall cavities:
  - 1. Given the likely absent back-primed siding, it may be very reasonable to remove the siding to install back priming. Note that the labor to remove, paint, and reinstall existing siding may make installation with new, back-primed siding reasonable. Whenever the siding has been removed, also take the next step to remove sheathing from those areas where the interior walls intersect the exterior walls to expose the union. Air seal any open cavities with 2" applied spray foam or rigid sheet goods. See diagram below.
  - 2. Note that if this theory is correct then it should apply to all areas where interior walls intersect exterior walls which is mostly true. However the inverse should be true as well but the garage sidewall is also chipping without intersecting interior walls or access to house moisture.



This is an example of a framing detail (generalized – not from your house) showing what I believe to be an absent back-plate).

3. Note that a one-point moisture inspection below the kitchen sink indicated a dry cavity and dry building materials.
- iii. Windows: no recommendations for change at this time.



**b. Attic**

Location	Current Insulation	Recommended Insulation
Main attic	R50	Good

- i. No recommendations for air sealing or insulation upgrades.
- ii. Attic ventilation:
  - 1. No recommendations for attic ventilation change.

Soffit venting present?	Yes	
Gable venting present?		No
Vent chutes visible in the attic?	Yes	

**c. Basement & Foundation**

- i. Sill Box Insulation w/two part foam: Insulate the accessible open sill box cavities with a minimum 1" thick sprayed on two part urethane foam insulation. An alternate strategy is to install 2" rigid foam into the vertical box sills, followed by a bead of expanding spray foam around the perimeter of the rigid material. The intent of these measures is to simultaneously air seal and insulate the box sills.
- ii. Note that this is of lower priority given the homeowner's current satisfaction with the comfort and the fact that the sill boxes are not especially leaky.

**d. Fresh Air & Moisture Management**

Location	Measured flow	Pass / Fail
Master	83 cfm	Good

- i. The old bath fan termination was left in the soffit overhang and is neither operable nor required. Consider complete removal if the soffit is rebuilt or resurfaced.





- ii. Ensure 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.
- iii. Operate the bathroom exhaust fans for at least 20 minutes after showering or bathing. Increased exhaust fan operation generally dries the air during the winter. Use a hygrometer to monitor and recognize relative humidity levels that are too dry for comfort or high enough to cause window condensation.

Wintertime guidelines for indoor relative humidity:

Outdoor Temperature	Indoor Relative Humidity
-20 F	15%-20% (very dry)
-10 F	20%-25% (very dry)
0 F	25%-30% (dry)
10 F	30%-35% (low normal)
20F	35%+ (normal)

## 2. APPLIANCE EFFICIENCY & PERFORMANCE

### a. Heating system

SSE (Measured Steady State Efficiency)	90%
Furnace filter status?	Clean
Air leaks present?	No
Volume dampers present in the basement?	Yes
Fresh air intake branch present?	No
Programmable setback thermostat installed?	Yes
Gas leaks detected at accessible pipe unions?	No



- i. Water Heater Pipe Insulation: insulate the first six feet of the hot and cold water pipes at the water heater with R-2 pipe insulation. All fittings to be insulated. All seams and joints to be taped/sealed closed with stapling).
- ii. Use the duct dampers to adjust the amount of air supplied to each room. Duct dampers are more effective than individual room registers for increasing comfort than at individual room registers. Label each duct run according to the room it services.
- iii. Be sure to replace the furnace filter on a regular basis.
- iv. Consistently setting back the thermostat by 5 degrees for an 8 hour period typically saves approximately 1% on your monthly heating cost.

**b. Cooling System**

- i. No recommendations.

**c. Electrical Savings Opportunities**

- i. Consider replacing at least 5 incandescent lightbulbs in high traffic areas with compact fluorescent bulbs. CFLs use approximately 75% less energy to illuminate the space. CFL technology has greatly evolved over the years and now provides good quality lighting at competitive purchase costs.

**d. Combustion and Carbon Monoxide Safety**

Appliance	Draft status Pascals (pa)	Carbon monoxide concentration parts per million (ppm)
Water heater	-2.5 Pass	23 Pass
Heating system	NA	45 Pass
Gas Oven / Range	NA	NA

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.





- i. The water heater passes combustion safety standards set forth by the Home Performance with ENERGY STAR® program.
- ii. A follow-up combustion safety test should be performed on the water heater after any air sealing and insulation work is completed.
- iii. Test and set the water heater temperature to a maximum 120°F.
- iv. Purchase and install carbon monoxide detectors. Locate one on each level with a bedroom.

**e. Indoor Environmental Hazards**

- i. The potential exists that lead paint is used within the home as well as on the exterior siding.
- ii. The attached garage is a common source of carbon monoxide. It is important not to let the car idle in the garage or to allow air pathways to remain open between the house and the garage.
- iii. 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>
- iv. To purchase a radon kit call Wisconsin Radiological Laboratories at 608-244-4646.

**3. REWARDS AND FOLLOW-UP**

Depending on which improvements you choose to complete, you may be eligible for a number of Cash-Back Rewards from Focus on Energy (see enclosed rewards summary). Be sure to keep invoices and receipts for any improvements you make. I will need to attach a copy of these to your reward form. 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. Cash-Back Rewards are subject to the discretion of Focus on Energy and are not guaranteed.

If there is anything I can do to be of assistance to you in proceeding with making the recommended improvements, please don't hesitate to call.

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