

E3 Home Performance Services, LLC



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November 13, 2008

Wisconsin ENERGY STAR Homes Site Visit 3 Report – Testing and Certification

Builder: Timberlog Works, LLC

Homeowners: Hazelhurst, WI (#T00289)

This home meets all standards for certification in the Wisconsin ENERGY STAR Home program. Technical data from testing of this new home completed November 13, 2008 follows.

Building Airtightness:

Airtightness is measured by blower door testing and calculated with Tectite software.

- 904 CFM @ 50 pascals (pa) – this is the actual air leakage measured through blower door testing. 1994 CFM was the maximum allowable for WESH certification.
- .14 ACH (n) average, .18 ACH(n) winter, .09 ACH(n) summer. (“n” = natural) This is the number of air changes/hour (ACH) expected for this home under normal weather conditions, not including the effect of ventilation equipment, when doors and windows are closed. (Houses are naturally “leakier” in winter; however air leakage rates are constantly changing due to weather conditions, etc.)
- .11 CFM/sq ft shell area vs. maximum allowable by WESH of .25 CFM/sq ft. This is a good level of airtightness, below the average of .16 achieved by WESH builders throughout Wisconsin.

Ventilation

The ASHRAE recommended ventilation rate for this home is 64 CFM, 24 hours/day, or the equivalent volume of air exchanged on an intermittent basis. The ASHRAE number is a guideline, but is not a part of WESH standards (WESH only requires that a capacity of 41 CFM be installed for this home). Ventilation rates should be adjusted to meet the homeowner’s needs. The equipment installed in the home is capable of providing substantially more than the ASHRAE level of ventilation.

Bathroom exhaust fan air flow: Master bathroom: 93 CFM; fan is rated at 110 CFM
2nd floor bathroom: 100 CFM, fan is rated at 110 CFM
1st floor bathroom: 65 CFM, fan is rated at 80 CFM

Kitchen range hood air flow: 100 CFM on high. This is an estimate based on an interpolation of an airtightness graph, not measured airflow.

ERV: 70 CFM on high. This is also an estimate from the airtightness graph.

HERS (Home Energy Rating System) score: 56. HERS scores reflect the overall energy efficiency of the entire building in one number. This building’s HERS score is 24% better than the ENERGY STAR requirement of 80; each point of the HERS score indicates an overall efficiency change of one percent. (A score of zero is a home with no net imported energy.) HERS scores can be lowered by using higher efficiency space and water heating equipment, increasing insulation levels, using renewable energy sources, etc. HERS scores should not be compared between buildings, just used as a measurement of the specific home being modeled.

Final certification of the home as a Wisconsin ENERGY STAR home is issued by the program coordinators in Madison. When this home is certified, you should receive the portfolio within a few weeks time. The portfolio will include data as to how the home compares to other Wisconsin homes and a certification plaque to be installed on the main electrical panel.

Thanks very much for entering this home in the WESH program, and for your efforts in working towards its certification. I appreciate the opportunity of working with you.

This home qualifies for the Builder's tax credit. I will mail the certificate to you after WESH personnel certify the rating.

IR Scans

Attached infrared scans of this home were taken during blower door testing. Key to the scans:

1380	East wall of living room. Air leaks between t&g ceiling and sidewall SIP above beam.
1381	Peak of ceiling above living room, south end. Cold joints (4) between SIPs near peak.
1383	North end ceiling above stairs. Air leaks between t&g boards at gable end.
1384	Wall at top of stair landing past BR door, left (living room) side.
1385	2 nd floor east bedroom, east wall of dormer. Air leak at rafter over beam.
1386	2 nd floor east bedroom, west side, opposite side of 1384. Air leaks from cavity behind where multiple SIPs meet. Also leak at joint of rafter and wall, and at joints of t&g ceiling boards
1387	Above and to right of 1386. This area is framed, air leakage path uncertain.
1388	Peak of ceiling in bathroom.
1389	Loft closet north end adjacent to bathroom.
1391	2 nd floor west bedroom, east wall.
1393	Same area as 1380, taken from loft. After longer depressurization from blower door, leaks are more pronounced in infrared scan.
1394	Fireplace. Source of leak unknown, possibly from inside chase. Air streams out grille at top of fireplace.

1380

1381

1383

1384



Other areas where air leakage was detected but scans not presented were:

1. The wall common to the garage and laundry room.
2. Rim joists in the crawl space.
3. Along rim joist on the south end, west side under kitchen/dining room.

The range hood had lower than expected airflow. Some air is being recirculated into the kitchen through the grille on the top of the hood.