



DESIGN
STUDIO

“Green-Building” – Applications in affordable housing, and certifications

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A partnership between The Enterprise Foundation, The Enterprise Social Investment Corporation and the Natural Resources Defense Council

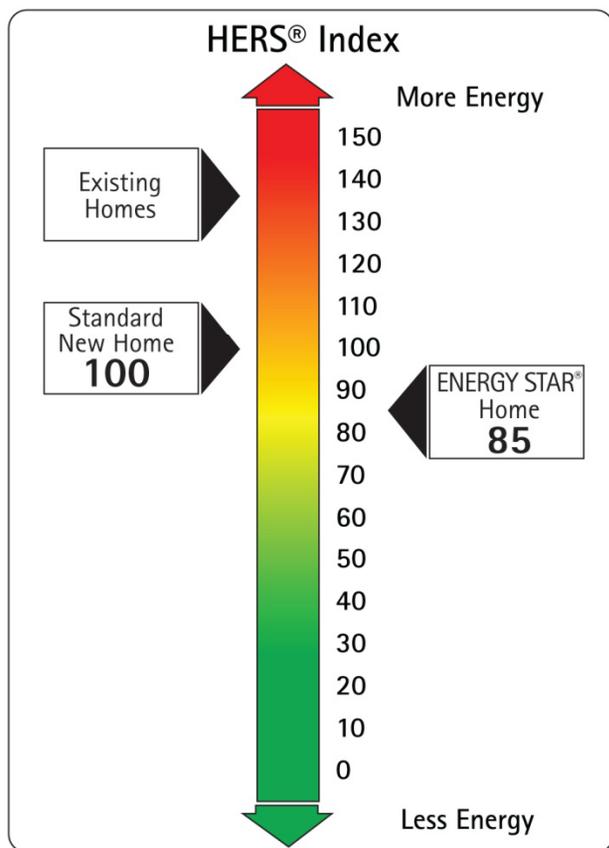


Certification	Sustainable Site Development	Water Efficiency	Energy Efficiency	Materials and Resource Efficiency	Indoor Air Quality	Neighborhood	Education
LEED	●	●	●	●	●	●	●
National Green Building Certification	●	●	●	●	●		●
EarthCraft	●	●	●	●	●		
Energy Star			●		●		
Green Communities	●	●	●	●	●	●	●



- 1 LEED for Homes – discounts available
- 2 \$200 / bldg for NAHB members. Increased costs for land development
- 3 Version 3 – discounts available
- 4 Random sampling to verify projects

Certification	Certification Cost	Third Party Certification	Level of Difficulty in Construction 1-easiest 5-most difficult	Level of Difficulty for Documentation 1-easiest 5-most difficult	Performance vs. Prescriptive Requirements
LEED	\$2,000 / unit ¹	YES	4	5	Performance
National Green Building Certification	\$500/ bldg ²	No ⁵	1	1	Prescriptive
EarthCraft	\$950 / unit – single family \$300 / unit – multi family	YES	1	2	Performance Prescriptive
Energy Star	\$600 / unit ^{3, 4} Multi family \$1,200 / unit Single family	YES	2	2	Prescriptive
Green Communities	Varies per TA	YES	3	3	Prescriptive



The HERS Index is a scoring system established by the Residential Energy Services Network (RESNET) in which a home built to the specifications of the HERS Reference Home (based on the 2006 International Energy Conservation Code) scores a HERS Index of 100, while a net zero energy home scores a HERS Index of 0. The lower a home's HERS Index, the more energy efficient it is in comparison to the HERS Reference Home.

Each 1-point decrease in the HERS Index corresponds to a 1% reduction in energy consumption compared to the HERS Reference Home. Thus a home with a HERS Index of 85 is 15% more energy efficient than the HERS Reference Home.

Roanoke and Lee Street Duplexes Average HERS Index: 72



Wilson Avenue Duplex Project HERS Index: 68



Cedar Hill Homes

Average HERS Index: 65



TEXT



Major Components of an ENERGY STAR home

- Shell
 - Systems
 - Loads
-

Shell

Wall



Roof



Foundation



Shell

Baseline Wall: 2x4 16" o.c., R-13 Batt with OSB sheathing



Improved Wall: 2x6 24" o.c., R-19
Blown Cellulose with OSB Sheathing

HERS Index: -4; 4% more efficient

Cost over baseline: \$0.35/sf; \$400

Savings to Investment Ratio: 5.2 (50 year life)

Estimated Annual Savings: \$41



Shell

Baseline Wall: 2x4 16" o.c., R-13 Batt with OSB sheathing

Improved Wall: 2x4 16" o.c., R-13 Blown Cellulose with 1" R-5.5 Structural Insulated Sheathing*

HERS Index: -4; 4% more efficient

Cost over baseline: \$2.25/lf; \$306

Savings to Investment Ratio: 7.7 (50 year life)

Estimated Annual Savings: \$47

*2x6 24" o.c. SIS 6% efficient, SIR: 4.7, Savings: \$66



Shell

Baseline Windows: 2006 IECC: U-factor < .40, SHGC < .60



Improved Windows: ENERGY STAR:
U-factor < .32, SHGC < .35

HERS Index: -4; 4% more efficient

Cost over baseline: \$50/ea (10 windows)

Savings to Investment Ratio: 0.75 (20 year life)

Estimated Annual Savings: \$19

(does not account for installation quality)

Product type: Vertical Slider

ENERGY PERFORMANCE RATINGS	
U-Factor (U.S./I-P)	Solar Heat Gain Coeff
0.34	0.33
ADDITIONAL PERFORMANCE RATINGS	
Visible Transmittance	Air Leakage (U.S./I-P)
0.55	0.01

Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining product performance. NFRC ratings are determined for a fixed set of environmental conditions and specific product size. NFRC does not recommend any product and does not warrant the suitability of product for any specific use. Consult manufacturer's literature for other product performance information. www.nfrc.org

Meets or exceeds M.E.C., C.E.C., & I.E.C.C. Air Infiltration Requirements

Shell

Baseline Attic Insulation: R-38



Improved Attic Insulation: R-50

HERS Index: -1; 1% more efficient

Cost over baseline: \$0.08/in/sf; \$323

Savings to Investment Ratio: 2.3 (50 year life)

Estimated Annual Savings: \$15



Shell

Baseline Slab: Un-insulated



Improved Slab: 1" R-5 rigid insulation at slab edge, 2" R-10 rigid insulation under 2'-0" perimeter of slab

HERS Index: -5; 5% more efficient

Cost over baseline: \$0.60/lf; \$200

Savings to Investment Ratio: 24.5 (50 year life)

Estimated Annual Savings: \$98

*complete underslab -9% efficient, SIR: 6.2, Savings: \$112



Systems

Baseline Mechanical System: 1.5 ton, 13 SEER, 8.5 HSPF electrical air source heat pump



Improved Mechanical System:
1.5 ton, 15.5 SEER, 9.5 HSPF

HERS Index: -3; 3% more efficient

Cost over baseline: \$400

Savings to Investment Ratio: 1.9 (15 year life)

Estimated Annual Savings: \$50

Systems

Baseline Thermostat: non-programmable

Improved Thermostat: programmable



HERS Index: -1; 1% more efficient

Cost over baseline: \$75

Savings to Investment Ratio: 30
(15 year life)

Estimated Annual Savings: \$150



Systems

Baseline Water Heater: 50gal .93 Energy Factor



Improved Water Heater: Hybrid with integral heat pump, 2.35 Energy Factor

HERS Index: -10; 10% more efficient

Cost over baseline: \$1,225

Savings to Investment Ratio: 2.3 (15 year life)

Estimated Annual Savings: \$192



Systems

Baseline Water Heater: 50gal .93 Energy Factor



Improved Water Heater: Solar Water Heating System

HERS Index: -14; 14% more efficient

Cost over baseline: \$6,500

Savings to Investment Ratio: 0.6 (15 year life)

Estimated Annual Savings: \$271



Systems

Baseline Duct Leakage: 5% floor area leakage to outside



Improved Duct Leakage: 0% floor area leakage to outside

HERS Index: -5; 5% more efficient

Cost over baseline: \$10

Savings to Investment Ratio: 405 (50 year life)

Estimated Annual Savings: \$81



Systems

Baseline Duct Location: Attic, exposed



Improved Duct Location: Within conditioned space or under attic insulation

HERS Index: -4; 4% more efficient

Cost over baseline: \$1 (design issue)

Savings to Investment Ratio: na

Estimated Annual Savings: \$47



Systems

Baseline Infiltration: 0.5cfm50 / sf of building envelope



Improved Infiltration: 0.25cfm50 / sf of building envelope

HERS Index: -5; 5% more efficient

Cost over baseline: \$100

Savings to Investment Ratio: 50.4 (50 year life)

Estimated Annual Savings: \$101



Loads

Baseline Appliances: Non-ENERGY STAR



Improved Appliances: ENERGY STAR

HERS Index: -1; 1% more efficient per appliance

Cost over baseline: \$60 each avg.

Savings to Investment Ratio: 3.0 (12 year life)

Estimated Annual Savings: \$15 avg.



Loads

Baseline Lighting: Non-ENERGY STAR, incandescent lamps



Improved Lighting: Compact Fluorescent lamps

HERS Index: -4; 4% more efficient

Cost over baseline: 2x \$ each; \$4

Savings to Investment Ratio: 8.0_(4 year life)

Estimated Annual Savings: \$8 each



7 Ingredients Required for Sustainable Performance and to get maximum benefit for your \$\$\$

1. Tight construction
2. Fresh air ventilation
3. Improved insulation
4. Right sized and installed HVAC
5. Pressure balancing
6. Interior moisture management
7. Combustion safety



