



**GDS Associates, Inc.**

Engineers and Consultants

**EPA ENERGY STAR® Homes  
Certification Report**



**Sponsored by**



For the property located at:  
703 Suncook Valley Highway, Epsom, NH

1181 Elm Street, Suite 205, Manchester, New Hampshire 03101

Telephone: 603.656.0336

[www.gdsassociates.com/services/rees.html](http://www.gdsassociates.com/services/rees.html)

Fax: 603.656.0301



1181 Elm Street, Suite 205  
Manchester, New Hampshire 03101

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## ENERGY STAR<sup>®</sup> Homes Certification Report A Program Sponsored by Unitil Corporation

Date: December 29, 2011  
To: Joe Harnois, Harber Construction  
CC: Ben Stephenson, UNITIL  
Project Name: 703 Suncook Valley Highway Project ID: GDS-UN-NH-ES-3313  
Project Address: 703 Suncook Valley Highway

**Congratulations...I have completed the energy performance review of this new home and have determined that it meets the standards required to be labeled as an ENERGY STAR<sup>®</sup> Home through Unitil's residential new construction program.**

As you review this report, please remember that the results are not a precise prediction of overall energy consumption or utility bills, but rather a guide to compare energy costs between a number of house configurations, similar to the "miles per gallon" guide for automobiles. The program includes numerous factors that can affect home energy usage such as weather patterns, number and living habits of the occupants, hot water usage, lights and appliance usage, thermostat settings, and certain details of construction. In a particular house, any of these factors can vary significantly from the assumptions made.

This home was evaluated using state of the art software used to rate home energy performance. The software, REM/Rate<sup>™</sup>, has become the standard medium for determining a home's energy performance using the nationally recognized *Home Energy Ratings System (HERS)*<sup>1</sup>. This software is also used as the basis for determining whether a home meets the minimum performance standards for the EPA ENERGY STAR Home label, federal energy tax credit qualification and compliance with various energy codes.

For each home modeled in the software an energy rating known as a HERS Index is produced. This HERS index will typically be a number between 0–100 and represents the energy usage as compared to a home of similar size and shape built to minimum energy code (reference home)<sup>2</sup>. For example, a home with a HERS index of 100 means that the home uses the same amount of energy (100%) that a home constructed to minimum energy code, and a home with a HERS Index of 80 uses only 80% of the energy consumed by the home built only to code. Therefore, a lower HERS Index represents a better home energy performance. The HERS Index produced for this home was 41.

### **Important Comments & Suggestions:**

This report is based on the stairwell, and floors as conditioned living space. A "Blower Door" diagnostic test was performed on this home to measure the level of air leakage and the number of times it expels and replaces its internal air volume. Over the past 10 years the blower door has

<sup>1</sup> The REM/Rate<sup>™</sup> software was developed by *Architectural Energy Corporation* of Boulder, Colorado.

<sup>2</sup> The reference home represents a home built to minimum energy code requirements based on International Energy Conservation Code

GDS Associates-Home Energy Ratings of New England is a RESNET-accredited Home Energy Rating Provider and is a registered EPA ENERGY STAR Partner



become the national and international standard method of evaluating and measuring the air infiltration characteristics of a dwelling. As a general rule, we use the *American Society of Heating, Refrigeration, and Air-Conditioning Engineers, Inc.* (ASHRAE) target measurement of 0.35 (or about 1/3) Natural Air Changes per Hour (ACH<sub>n</sub>) for a residential dwelling.

It is critically important that you develop a strategy to properly ventilate this home for both indoor-air-quality and long term building durability (moisture) reasons. Current ASHRAE national ventilation standards recommend that you operate the bathroom exhaust fan(s) at a minimum continuous rate of **57** cubic feet per minute (cfm) 24 hours per day. (See attached Air Leakage Report). Some of this ventilation will be provided naturally through typical building leakage and occupants use of egress and operable windows.

Important:

- If you have, or will install combustion appliances in this home, hard wired or plug-in carbon monoxide Alarms should be installed on each floor as per manufacturers instructions.
- The HVAC equipment specifications used in the REM/Rate model are based on the designed performance factors of that equipment. Any deviations in actual performance from those design specifications in your home are warranty issues that are the sole responsibility of your heating/cooling design and installation contractors.

Enclosed please find your official ENERGY STAR New Home certificate that can be framed or filed with your other important documents. Also enclosed is an ENERGY STAR New Home peel-and-stick label that should be attached in a permanent location of the home such as the cover to the electrical panel.

Thank You for participating in Unitil's ENERGY STAR Homes program and for using *GDS Associates, Inc.* as your Home Energy Rating Provider and ENERGY STAR Homes Partner. Please feel free to contact me with any questions.

Very Sincerely,



Bruce Bennett  
Project Manager, Residential Energy Efficiency

**ATTACHMENTS:**

- Air Leakage Report
- ENERGY STAR® Home Verification Summary
- EPA ENERGY STAR® Homes Certificate
- RESNET Home Energy Rating – Standard Disclosure
- EPA ENERGY STAR® Homes Label (to be attached to electrical panel)



GDS Associates, Inc.  
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## AIR LEAKAGE REPORT

Date:	December 29, 2011	Rating No.:	GDS-UN-NH-ES-3313
Building Name:	Harnois Residence	Rating Org.:	GDS Associates, Inc.
Owner's Name:	Gert Harnois	Phone No.:	603.656.0336
Property:	703 Suncook Valley Highway	Rater's Name:	Bruce Bennett
Address:	Epsom, NH 03234	Rater's No.:	GDS-001
Builder's Name:	Harber Construction		
Weather Site:	Concord, NH	Rating Type:	Verified Condition
File Name:	703 Suncook Valley-FINAL.blg	Rating Date:	December 29, 2011

Whole House Infiltration	Blower door test	
	<i>Heating</i>	<i>Cooling</i>
Natural ACH:	0.06	0.04
ACH @ 50 Pascals:	1.02	1.02
CFM @ 25 Pascals:	386	386
CFM @ 50 Pascals:	605	605
Eff. Leakage Area: [sq.in]	33.2	33.2
Specific Leakage Area:	0.00007	0.00007
ELA/100 sf shell: [sq.in]	0.48	0.48

Total Duct Leakage to Outside	Duct Leakage Units
	CFM @ 25 Pascals:
	CFM25 / CFMfan:
	CFM25 / CFA:
	CFM per Std 152:
	CFM per Std 152 / CFA:
	CFM @ 50 Pascals:
	Eff. Leakage Area: [sq.in]
	Thermal Efficiency:

Ventilation	Mechanical:	Balanced
	Sensible Recovery Eff. (%):	60.0
	Total Recovery Eff. (%):	50.0
	Rate (cfm):	160
	Hours/Day:	24.0
	Fan Watts:	94.0
	Cooling Ventilation:	Whole House Fan

### ASHRAE 62.2 - 2010 Ventilation Requirements

For this home to comply with ASHRAE Standard 62.2 - 2010 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings, a minimum of 57 cfm of mechanical ventilation must be provided continuously, 24 hours per day. Alternatively, an intermittently operating mechanical ventilation system may be used if the ventilation rate is adjusted accordingly. For example, a 115 cfm mechanical ventilation system would need to operate 12 hours per day, as long as the system operates to provide required average ventilation once each hour.

### REM/Rate - Residential Energy Analysis and Rating Software v12.95

This information does not constitute any warranty of energy cost or savings.  
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GDS Associates, Inc.  
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2005 EPACT ENERGY EFFICIENT HOME TAX CREDIT

Date: December 29, 2011 Rating No.: GDS-UN-NH-ES-3313

Building Name: Harnois Residence Rating Org.: GDS Associates, Inc.

Owner's Name: Gert Harnois Phone No.: 603.656.0336

Property: 703 Suncook Valley Highway Rater's Name: Bruce Bennett

Address: Epsom, NH 03234 Rater's No.: GDS-001

Builder's Name: Harber Construction

Weather Site: Concord, NH Rating Type: Verified Condition

File Name: 703 Suncook Valley-FINAL.blg Rating Date: December 29, 2011

Normalized, Modified End-Use Loads (MMBtu/year)

	2004 IECC	
	50% Target	As Designed
Heating:	39.6	22.2
Cooling:	11.6	3.2
Total:	51.1	25.4

Envelope Loads (MMBtu/year)

	2004 IECC	
	90% Target	As Designed
Heating:	71.2	36.9
Cooling:	20.8	4.0
Total:	92.0	41.0

**This home MEETS the requirements for the residential energy efficiency tax credits under Section 1332, Credit for Construction of New Energy Efficient Homes, of the Energy Policy Act of 2005.**

As demonstrated above, this dwelling unit has a projected level of annual heating and cooling energy consumption that is at least 50% below the annual level of heating cooling energy consumption of a reference dwelling in the same climate zone, and the building envelope components improvements alone account for at least 10% of those savings. The projected heating and cooling energy savings above have been calculated in the manner prescribed in Section 2.02 of Notice 2006-27 of the Internal Revenue Service. Field inspections of the dwelling unit performed by the undersigned eligible certifier during and after the completion of construction have confirmed that all features of the home affecting such heating and cooling energy consumption comply with the design specifications provided to the undersigned certifier.

**Building Features**

Ceiling Flat: R-29 Slab: R-21.5 Edge, R-8.0 Under

Vaulted Ceiling: R-29 Duct: NA

Above Grade Walls: R-22, R-28 Window: U-Value = 0.290, SHGC = 0.280

Foundation Walls: R-22.0 Heating: Fuel-fired hydronic distribution, Propane, 95.0 AFUE.

Exposed Floor: NA Cooling: N/A

**Under penalties of perjury, I declare that I have examined this certification, including accompanying documents, and to the best of my knowledge and belief, the facts presented in support of this certification are true, correct, and complete.**

Name: Bruce Bennett Signature: \_\_\_\_\_

Company: GDS Associates, Inc. Date: December 29, 2011

Address: 1181 Elm Street Suite 205, Manchester, NH 03101

REM/Rate - Residential Energy Analysis and Rating Software v12.95

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ENERGY STAR VERSION 2 HOME REPORT

Date:	December 29, 2011	Rating No.:	GDS-UN-NH-ES-3313
Building Name:	Harnois Residence	Rating Org.:	GDS Associates, Inc.
Owner's Name:	Gert Harnois	Phone No.:	603.656.0336
Property:	703 Suncook Valley Highway	Rater's Name:	Bruce Bennett
Address:	Epsom, NH 03234	Rater's No.:	GDS-001
Builder's Name:	Harber Construction		
Weather Site:	Concord, NH	Rating Type:	Verified Condition
File Name:	703 Suncook Valley-FINAL.blg	Rating Date:	December 29, 2011

Normalized, Modified End-Use Loads (MMBtu/year)

	ENERGY STAR	As Designed
Heating:	67.3	22.2
Cooling:	19.7	3.2
Water heating:	9.0	3.8
Lighting & Appliances:	34.4	34.3
Total:	130.3	63.5
<b>HERS Index:</b>	<b>85</b>	<b>41</b>

ENERGY STAR Mandatory Requirements

<input checked="" type="checkbox"/> Thermal Bypass Inspection Checklist	<input checked="" type="checkbox"/> ENERGY STAR Products
<input checked="" type="checkbox"/> Ductwork Requirements	<input checked="" type="checkbox"/> ENERGY STAR Scoring Exceptions

**This home MEETS OR EXCEEDS the energy efficiency requirements for designation as an EPA ENERGY STAR Qualified Home.**

Pollution Prevented

Type of Emissions	Reduction
Carbon Dioxide (CO2) - tons/yr	6.9
Sulfur Dioxide (SO2) - lbs/yr	17.5
Nitrogen Oxides (NOx) - lbs/yr	17.2

Energy Cost Savings (\$/year)

Heating:	\$2793
Cooling:	\$409
Water Heating:	\$197
Lights & Appliances:	\$373
Total:	\$3773

The energy savings and pollution prevented are calculated by comparing the Rated Home to the Reference Home as defined in the "Mortgage Industry National Home Energy Rating Systems Standards" as promulgated by the Residential Energy Services Network (RESNET). In accordance with these guidelines, building inputs affecting setpoints, infiltration rates, window shading and the existence of mechanical systems may have been changed prior to calculating loads.

REM/Rate - Residential Energy Analysis and Rating Software v12.95

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GDS Associates, Inc.  
Engineers and Consultants

ENERGY STAR VERSION 2 HOME VERIFICATION SUMMARY

Date:	December 29, 2011	Rating No.:	GDS-UN-NH-ES-3313
Building Name:	Harnois Residence	Rating Org.:	GDS Associates, Inc.
Owner's Name:	Gert Harnois	Phone No.:	603.656.0336
Property:	703 Suncook Valley Highway	Rater's Name:	Bruce Bennett
Address:	Epsom, NH 03234	Rater's No.:	GDS-001
Builder's Name:	Harber Construction		
Weather Site:	Concord, NH	Rating Type:	Verified Condition
File Name:	703 Suncook Valley-FINAL.blg	Rating Date:	December 29, 2011

**Building Information**

Conditioned Area (sq ft):	3481	Housing Type:	Single-family detached
Conditioned Volume (cubic ft):	35450	Foundation Type:	Conditioned basement
Insulated Shell Area (sq ft):	6854	HERS Index:	41 *****+
Number of Bedrooms:	2		

**Building Shell**

Ceiling w/Attic:	R28, EPS, 4-24 U=0.033	Window/Wall Ratio:	0.14
Vaulted Ceiling:	R28, EPS, 4-24, C U=0.032	Window Type:	U:0.29, SHGC:0.28
Above Grade Walls:	R22, ICF U=0.042	Window U-Value:	0.290
Found. Walls (Cond):	R22, ICF R=22.0	Window SHGC:	0.280
Found. Walls (Uncond):	None	Infiltration:	Htg: 605 Clg: 605 CFM50
Frame Floors:	None	Measured Duct Leakage:	0.00 CFM25
Slab Floors:	R21P, R10U, 24W, R U=0.031	Leakage to Outside:	0.00 CFM

**Mechanical Systems**

Heating: Fuel-fired hydronic distribution, 80.0 kBtuh, 95.0 AFUE.  
 Water Heating: Integrated, Prop, 0.86 EF.  
 Programmable Thermostat: Heat=Yes; Cool=Yes

Note: Where feature level varies in home, the dominant value is shown.

**This home MEETS OR EXCEEDS the EPA's requirements for an ENERGY STAR Home.**

703 Suncook Valley Highway  
Epsom, NH

Harber Construction

GDS Associates, Inc.

December 29, 2011

Version 2.0

HERS Index: 41





## An ENERGY STAR<sup>®</sup> Version 2 Qualified Home

This home built at

### 703 Suncook Valley Highway, Epsom, NH 03234

by Harber Construction

has been verified by GDS Associates, Inc., an independent professional or organization,  
to meet or exceed strict energy efficiency guidelines  
set by the U.S. Environmental Protection Agency.

HERS Index: 41

December 29, 2011

[www.energystar.gov](http://www.energystar.gov)

A handwritten signature in black ink that reads "Sam Rashkin".

Sam Rashkin  
National Director  
ENERGY STAR for Homes



GDS Associates, Inc.  
Engineers and Consultants

# Home Energy Rating Certificate

703 Suncook Valley Highway  
Epsom, NH 03234



**5 Stars Plus  
Verified Condition**

## Uniform Energy Rating System

1 Star	1 Star Plus	2 Stars	2 Stars Plus	3 Stars	3 Stars Plus	4 Stars	4 Stars Plus	5 Stars	5 Stars Plus
500-401	400-301	300-251	250-201	200-151	150-101	100-91	90-86	85-71	70 or Less

## Energy Efficient

HERS Index: **41**

### General Information

Conditioned Area: 3481 sq. ft.      HouseType: Single-family detached  
Conditioned Volume: 35450 cubic ft.      Foundation: Conditioned basement  
Bedrooms: 2

### Mechanical Systems Features

Heating: Fuel-fired hydronic distribution, Propane, 95.0 AFUE.  
Water Heating: Integrated, Propane, 0.86 EF, 40.0 Gal.

Duct Leakage to Outside: NA  
Ventilation System: Balanced: ERV, 160 cfm, 94.0 watts.  
Programmable Thermostat: Heating: Yes      Cooling: Yes

### Building Shell Features

Ceiling Flat: R-29      Exposed Floor: NA  
Vaulted Ceiling: R-29      Window Type: U:0.29, SHGC:0.28  
Above Grade Walls: R-22, R-28      **Infiltration:**  
Foundation Walls: R-22.0      Rate: Htg: 605 Clg: 605 CFM50  
Slab: R-21.5 Edge, R-8.0 Under      Method: Blower door test

### Lights and Appliance Features

Percent Fluorescent Pin-Based: 30.00      Clothes Dryer Fuel: Propane  
Percent Fluorescent CFL: 70.00      Range/Oven Fuel: Propane  
Refrigerator (kWh/yr): 403.00      Ceiling Fan (cfm/Watt): 114.00  
Dishwasher Energy Factor: 0.69

The Home Energy Rating Standard Disclosure for this home is available from the rating provider.

**REM/Rate - Residential Energy Analysis and Rating Software v12.95**

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Rating Number: **GDS-UN-NH-ES-3313**

Certified Energy Rater: Bruce Bennett

Rating Date: December 29, 2011

Rating Ordered For: Gert Harnois

## Estimated Annual Energy Cost

Verified Condition

Use	MMBtu	Cost	Percent
Heating	39.1	\$1291	36%
Cooling	0	\$0	0%
Hot Water	12.1	\$396	11%
Lights/Appliances	34.3	\$1870	52%
Photovoltaics	-0.0	\$-0	-0%
Service Charges		\$21	1%
<b>Total</b>		<b>\$3578</b>	<b>100%</b>

**This home meets or exceeds the minimum  
criteria for all of the following:**

**GDS Associates, Inc**  
1181 Elm Street, #205  
Manchester, NH 03101  
603.656.0336  
603.656.0301



# RESNET HOME ENERGY RATING Standard Disclosure

**For home located at:** 703 Suncook Valley Highway

**City:** Epsom

**State:** NH

1.  The Rater or the Rater's employer is receiving a fee for providing the rating on this home.
2.  In addition to the rating, the Rater or Rater's employer has also provided the following consulting services for this home:
- A. Mechanical system design
  - B. Moisture control or indoor air quality consulting
  - C. Performance testing and/or commissioning other than required for the rating itself
  - D. Training for sales or construction personnel
  - E. Other (specify below)

3.  The Rater or Rater's employer is:
- A. The seller of this home or their agent
  - B. The mortgagor for some portion of the financed payments on this home
  - C. An employee, contractor or consultant of the electric and/or natural gas utility serving this home

4.  The Rater or Rater's employer is a supplier or installer of products, which may include:

	Installed in this home by:		OR	Is in the business of:	
HVAC systems	<input type="checkbox"/> Rater	<input type="checkbox"/> Employer		<input type="checkbox"/> Rater	<input type="checkbox"/> Employer
Thermal insulation systems	<input type="checkbox"/> Rater	<input type="checkbox"/> Employer		<input type="checkbox"/> Rater	<input type="checkbox"/> Employer
Air sealing of envelope or duct systems	<input type="checkbox"/> Rater	<input type="checkbox"/> Employer		<input type="checkbox"/> Rater	<input type="checkbox"/> Employer
Windows or window shading systems	<input type="checkbox"/> Rater	<input type="checkbox"/> Employer		<input type="checkbox"/> Rater	<input type="checkbox"/> Employer
Energy efficient appliances	<input type="checkbox"/> Rater	<input type="checkbox"/> Employer		<input type="checkbox"/> Rater	<input type="checkbox"/> Employer
Construction (builder, developer, construction contractor, etc.)	<input type="checkbox"/> Rater	<input type="checkbox"/> Employer		<input type="checkbox"/> Rater	<input type="checkbox"/> Employer
Other (specify below):	<input type="checkbox"/> Rater	<input type="checkbox"/> Employer		<input type="checkbox"/> Rater	<input type="checkbox"/> Employer

I attest that the above information is true and correct to the best of my knowledge. As a Rater or Rating Provider I abide by the rating quality control provisions of the Mortgage Industry National Home Energy Rating Standard as set forth by the Residential Energy Services Network (RESNET). The national rating quality control provisions of the rating standard are contained in Chapter One 4.C.8 of the standard and are posted at <http://www.natresnet.org/accred/standards.pdf>. This home may have been verified under the provisions of Chapter Six, Section 603, "Technical Requirements for Sampling" of the Standard.

Bruce Bennett

Rater's Printed Name

GDS-001

Certification #

December 29, 2011

Date

Rater's Signature