

# **ENERGY STAR® Home**Certification Report



For the dwellings located at:

100 Longview Road Carroll, NH



Fax: 603.656.0301

Telephone: 603.656.0336



1155 Elm Street, Suite 702 Manchester, New Hampshire 03101

Associates, Inc.

Phone: 603.656.0336

Fax: 866.611.3791

**Engineers and Consultants** 

## **ENERGY STAR® Homes**Certification Report

Date: October 9, 2015

To: Ben Southworth, Garland Mill Timberframe

**CC**: Michael Loughlin, Eversource

Project ID: GDS-PS-NH-ES-5465

Project Address: 100 Longview Road Carroll, New Hampshire

Congratulations...I have completed the energy performance review of this new home and have determined that the building meets the standards required to be labeled as an ENERGY STAR $^{\otimes}$  Home.

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™, has become the standard medium for determining a home's energy performance using the nationally recognized *Home Energy Ratings System* (HERS)¹. 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 standard new home would use, and a home with a HERS Index of 80 uses only 80% of the energy consumed by the standard new home. Therefore, a lower HERS Index represents a better home energy performance. The HERS Index produced for this home is 1.

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

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 20 years the blower door has become the standard method of measuring the air infiltration characteristics of a building.

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



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

It is important that you develop a strategy to properly ventilate this home for both indoor-air-quality and long term building durability (moisture) reasons. Current *American Society of Heating, Refrigeration, and Air-Conditioning Engineers, Inc.* (ASHRAE) national ventilation standards recommend that you provide a minimum ventilation rate of 55 cubic feet per minute (cfm) for 24 hours per day (per unit). (See attached Air Leakage Report but be aware the report is for the whole building). Some of this ventilation will be provided naturally through typical building leakage and occupants' use of egress and operable window, but most of it will be provided by the HVAC system which includes ventilation for indoor air quality.

#### Important:

- If you have, or will install combustion appliances in this home or have an adjoined garage, 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® Home and RESNET Home Energy Rating (HERS) certificate that can be filed with your other important documents. Also enclosed is an ENERGY STAR 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 the EPA'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. All concerns or complaints may also be directed to my attention and will be handled in a timely manner.

Very Sincerely,

**Bruce Bennett** 

Senior Project Manager

#### **ATTACHMENTS:**

- Air Leakage Report
- ENERGY STAR® Home Verification Summary
- EPA ENERGY STAR® Homes Certificate
- IECC 2009 Certificate
- RESNET Home Energy Rating Certificate
- HERC Home Performance
- RESNET Home Energy Rating Standard Disclosure
- RESNET Home Energy Rating Label
- EPA ENERGY STAR® Homes Label (to be attached to electrical box)





#### AIR LEAKAGE REPORT

Date: October 09, 2015 Rating No.: GDS-PS-NH-ES-5465

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

Owner's Name: Imre & Debbie Szauter Phone No.: (603) 656-0336

Property: 100 Longview Road Rater's Name: Joe Rando

Address: Carroll, NH
Builder's Name: Garland Mill Timberframes

Weather Site: St. Johnsbury, VT Rating Type: Confirmed

File Name: 100 Longview Drive - Final.blg Rating Date: September 9, 2015

#### Whole House Infiltration

	Diower door test		
	Heating	Cooling	
Natural ACH:	0.02	0.02	
ACH @ 50 Pascals:	0.37	0.37	
CFM @ 25 Pascals:	127	127	
CFM @ 50 Pascals:	199	199	
Eff. Leakage Area: [sq.in]	10.9	10.9	
Specific Leakage Area:	0.00002	0.00002	
ELA/100 sf shell: [sq.in]	0.19	0.19	

Rater's No.:

4348719

Blower door test

#### **Duct Leakage**

Leakage to Outside 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:		
Total Duct Leakage Units		
Total Duct Leakage:		

#### Ventilation

Mechanical:	Balanced	ASHRAE	
Sensible Recovery Eff. (%):	75.0	62.2-2010	
Total Recovery Eff. (%):	64.0		
Rate (cfm):	55	55	
Hours/Day:	24.0	24	
Fan Watts:	15.0		
Cooling Ventilation:	No Ventilation		

#### Regarding ASHRAE 62.2 Ventilation Compliance

The ASHRAE 62.2 flow rates shown above are the CONTINUOUS mechanical fresh air ventilation which will meet the 'whole-bu under that version of the standard. Both values incorporate any appropriate 'infiltration credit'. Intermittent mechanical ventilation flow rate is adjusted accordingly. For example, the runtime can be reduced to 12 hours per day using a doubled flow rate, as long ventilation at least once every 3 hours. For more detail, refer to the appropriate standard.



Heating:

Cooling:

Total:



68.8

72.8

4.0

15.1

12.1

27.2

#### 2005 EPACT ENERGY EFFICIENT HOME TAX CREDIT (13-001)

Date:	October 09, 2015	Rating No.:	GDS-PS-NH-ES-5465
Building Name:	Szauter Residence	Rating Org.:	GDS Associates, Inc.
Owner's Name:	Imre & Debbie Szauter	Phone No.:	(603) 656-0336
Property:	100 Longview Road	Rater's Name:	Joe Rando
Address:	Carroll, NH	Rater's No.:	4348719
Builder's Name:	Garland Mill Timberframes		
Weather Site:	St. Johnsbury, VT	Rating Type:	Confirmed
File Name:	100 Longview Drive - Final.blg	Rating Date:	September 9, 2015
Normalized, Mod	dified End-Use Loads (MMBtu/year)		Envelope Loads (MMBtu/year)
	2006 IECC		2006 IECC
	50% Target As Designed		90% Target As Designed

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 extended to December 31, 2014.

Heating:

Cooling:

Total:

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 2006 IECC 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 Appendix A of the RESNET Publication No. 13-001. 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: NA Slab: R-24.0 Edge, R-24.0 Under

Sealed Attic: NA Duct: NA

38.2

2.2

40.4

Vaulted Ceiling: R-57.0 Window: U-Value: 0.088, SHGC: 0.620

12.3

9.7

21.9

Above Grade Walls: R-38.0 Heating Air-source heat pump, Electric, 11.3 HSPF.

Foundation Walls: R-26.5 Cooling N/A

Exposed Floor: NA

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:	Joe Rando	Signature:	
Company:	GDS Associates, Inc.	Date:	September 9, 2015
Address:	1155 Elm Street, Suite 702, Manchester, NH 03101		





#### **ENERGY STAR VERSION 3 HOME VERIFICATION SUMMARY**

Joe Rando

Date: October 09, 2015 Rating No.: GDS-PS-NH-ES-5465
Property: 100 Longview Road Rating Org.: GDS Associates, Inc.

Carroll, NH Rater's Name:

Builder's Name: Garland Mill Timberframes Rater's ID: 4348719

Building Name: Szauter Residence Rating Date: September 9, 2015

Building Information Ratings

Conditioned Area (sq ft): 3205 **HERS Index:** 1 Conditioned Volume (cubic ft): 32416 HERS Index w/o PV: 32 Insulated Shell Area (sq ft): 5690 HERS Index Target (SAF Adjusted): 55 Number of Bedrooms: 2 HERS Index of Reference Design Home: 58 Housing Type: Single-family detached 0.95 Size Adjustment Factor:

Foundation Type: Conditioned basement

**Building Shell** 

Ceiling w/Attic: None Window/Wall Ratio: 0.14

Sealed Attic: None Window Type: U:0.088, SHGC:0.62\*

 Vaulted Ceiling:
 R57,CE1,16-16 C\* U=0.020
 Window U-Value:
 0.088

 Above Grade Walls:
 R38,EPS,10-16\* U=0.024
 Window SHGC:
 0.620

Found. Walls (Cond): R10,G1,4-16,16I R=26.5 Infiltration: Htg: 199 Clg: 199 CFM50

Found. Walls (Uncond): None Duct Leakage to Outside: NA Floors: None Total Duct Leakage: NA

Slab Floors: R24P,R24U,24W\* U=0.020

**Mechanical Systems** 

Heating Air-source heat pump, 21.6 kBtuh, 11.3 HSPF.

Water Heating Heat pump, Elec, 2.73 EF.
Programmable Thermostat: Heat=Yes; Cool=Yes

Ventilation System: Balanced: ERV, 55 cfm, 15.0 watts.

**Lights and Appliances** 

100.00 Clothes Dryer Fuel: Electric Percent Interior Lighting: Percent Garage Lighting: 100.00 Clothes Dryer EF: 3.01 665.00 Refrigerator (kWh/yr): Clothes Washer LER: 96.00 Dishwasher kWh/yr: 259.00 Clothes Washer Capacity: 3.81 225.00 Ceiling Fan (cfm/Watt): Range/Oven Fuel: Electric

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

# ENERGY STAR VERSION 3 HOME VERIFICATION SUMMARY Szauter Residence Page 2

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

HERS Index w/o PV <= HERS Index of Reference Design Home AND HERS Index <= HERS Index Target to comply.



## ENERGY STAR® CERTIFIED NEW HOME

Builder Name: **Garland Mill Timberframes** 

Permit Date/Number:

Home Address: 100 Longview Road

Carroll, NH

Rating Company: GDS Associates, Inc. Rater Identification Number: 4348719

Rating Date: September 9, 2015

Version: 3.0

#### Standard Features of an ENERGY STAR Certified New Home

Your ENERGY STAR certified new home has been designed, constructed, and independently verified to meet rigorous requirements for energy efficiency set by the U.S. Environmental Protection Agency (EPA), including:

#### Thermal Enclosure System

A complete thermal enclosure system that includes comprehensive air sealing, qualityinstalled insulation and high-performing windows to deliver improved comfort and



Air Infiltration Test: Htg: 199 Clg: 199 CFM50

Primary Insulation Levels:

FndWall: R-26.5 Ceiling: R-57.0 AGWall: R-38.0 Slab: R-24.0, R-24.0

Primary Window Efficiency: U-Value: 0.088, SHGC: 0.620



#### Water Management System

A comprehensive water management system to protect roofs, walls, and foundations.



Flashing, a drainage plane, and site grading to move water from the roof to the ground and then away from the home.

Water-resistant materials on below-grade walls and underneath slabs to reduce the potential for water entering into the home.

Management of moisture levels in building materials during construction.

#### Heating, Cooling, and Ventilation System

A high-efficiency heating, cooling system, and ventilation system that is designed and installed for optimal performance.

Total Duct Leakage:

NA

Duct Leakage to Outdoors:

Primary Heating (System Type • Fuel Type • Efficiency):

Air-source heat pump, Electric, 11.3 HSPF.

Primary Cooling (System Type • Fuel Type • Efficiency): None

#### **Energy Efficient** Lighting and Appliances

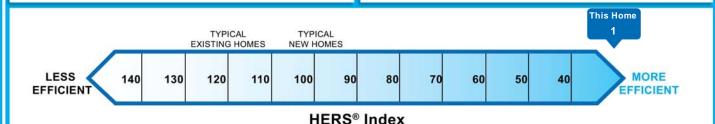
Energy efficient products to help reduce utility bills, while providing high-quality performance.



ENERGY STAR Qualified Lighting: 100%

**ENERGY STAR Qualified Appliances and Fans:** Refrigerators: 1 Dishwashers: 1 Ceiling Fans: 1 **Exhaust Fans: 0** 

Primary Water Heater (System Type • Fuel Type • Efficiency): Heat pump, Electric, 2.73 EF, 80.0 Gal.



The certificate provides a summary of the major energy efficiency and other construction features that contribute to this home eaming the ENERGY STAR, including its Home Energy Rating System(HERS) score, as determined through independent inspection and verification performed by a trained professional. The home Energy Rating System is a nationally-recognized uniform measurement of the energy efficiency of homes

Note that when a home contains multiple performance levels for a particular feature (e.g., window efficiency or insulation levels), the predominant value is shown. Also, homes may be certified to earn the ENERGY STAR using a sampling protocol, whereby one home is randomly selected from a set of homes for representative inspections and testing. In such cases, the features found in each home within the set are intended to meet or exceed the values presented on this certificate. The actual values for your home may diffet, but offer equivalent or better performance.

This certificate was printed using REM/Rate - Residential Energy Analysis and Rating Software v14.6.1. © 1985-2015 Noresco, Boulder, Colorado.

#### 100 Longview Road Carroll, NH

**Garland Mill Timberframes** 

GDS Associates, Inc.

September 9, 2015

Version 3.0

HERS Index: 1

# HOME CERTIFIED TO MEET THE PROVISIONS OF THE 2009 INTERNATIONAL ENERGY CONSERVATION CODE

This home built at

### 100 Longview Road, Carroll, NH

by Garland Mill Timberframes

#### exceeds the minimum requirements for the 2009 International Energy Conservation Code

September 9, 2015

Building	<b>Features</b>
----------	-----------------

Ceiling Flat:	NA	Duct Leakage to Outside:	NA
Sealed Attic:	NA	Total Duct Leakage:	NA
Vaulted Ceiling:	R-57.0	Infiltration:	Htg: 199 Clg: 199 CFM50
Above Grade Walls:	R-38.0	Window:	U-Value: 0.088, SHGC: 0.620
Foundation Walls:	R-26.5	Heating	Air-source heat pump, Electric, 11.3 HSPF
Exposed Floor:	NA	Cooling	N/A
Slab:	R-24.0 Edge, R-24.0 Under	Water Heating	Heat pump, Electric, 2.73 EF, 80.0 Gal.
Duct:	NA		

The organization below certifies that the proposed building design described herein is consistent with the building plans, specifications, and other calculations submitted with the permit application. The proposed building has been designed to meet the 2009 IECC requirements in compliance with Chapter 4 based on Climate Zone 6A and with all mandatory requirements.

Name:	Joe Rando	Signature:	
Organization:	GDS Associates, Inc.	Date:	October 09, 2015

The 2009 International Energy Conservation Code is a registered trademark of the International Code Council, Inc. ( "ICC").

No version of this software has been reviewed or approved by ICC or its affiliates.

REM/Rate - Residential Energy Analysis and Rating Software v14.6.1



# Home Energy Rating Certificate 100 Longview Road

Carroll, NH



## 5 Stars Plus Confirmed

#### **Uniform Energy Rating System**

#### Energy Efficient

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

HERS Index: 1

**General Information** 

Conditioned Area: 3205 sq. ft. HouseType: Single-family detached Conditioned Volume: 32416 cubic ft. Foundation: Conditioned basement

Bedrooms: 2

**Mechanical Systems Features** 

Heating: Air-source heat pump, Electric, 11.3 HSPF. Water Heating: Heat pump, Electric, 2.73 EF, 80.0 Gal.

Duct Leakage to Outside: NA

Ventilation System: Balanced: ERV, 55 cfm, 15.0 watts.

Programmable Thermostat: Heating: Yes Cooling: Yes

**Building Shell Features** 

Ceiling Flat: NA Slab: R-24.0 Edge, R-24.0 Under

Sealed Attic: NA Exposed Floor: NA

Vaulted Ceiling: R-57.0 Window Type: U-Value: 0.088, SHGC: 0.620
Above Grade Walls: R-38.0 Infiltration Rate: Htg: 199 Clg: 199 CFM50

Foundation Walls: R-26.5 Method: Blower door test

**Lights and Appliance Features** 

Percent Interior Lighting: 100.00 Range/Oven Fuel: Electric Percent Garage Lighting: 100.00 Clothes Dryer Fuel: Electric Refrigerator (kWh/yr): 665.00 Clothes Dryer EF: 3.01 Dishwasher (kWh/yr): 259.00 Ceiling Fan (cfm/Watt): 225.00

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

REM/Rate - Residential Energy Analysis and Rating Software v14.6.1

This information does not constitute any warranty of energy cost or savings.

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Registry ID: 029322052

Rating Number: GDS-PS-NH-ES-5465

Certified Energy Rater: Joe Rando

Rating Date: September 9, 2015
Rating Ordered For: Imre & Debbie Szauter

#### **Estimated Annual Energy Cost**

#### Confirmed

Use	MMBtu	Cost	Percent
Heating	9.8	\$485	700%
Cooling	0	\$0	0%
Hot Water	3.6	\$176	255%
Lights/Appliances	22.3	\$1107	1600%
Photovoltaics	-37.3	\$-1849	-2672%
Service Charges		\$150	217%
Total	1.5	\$69	100%

## This home meets or exceeds the minimum criteria for all of the following: EPA ENERGY STAR Version 3 Home

**GDS Associates Inc** 

1155 Elm Street, #702 Manchester, NH 03101 603,656,0336

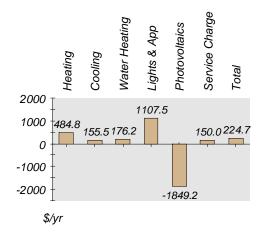


### HOME PERFORMANCE WITH ENERGY STAR

**ENERGY RATING CERTIFICATE** 



Estimated Annual Energy Cost



Address: 100 Longview Road

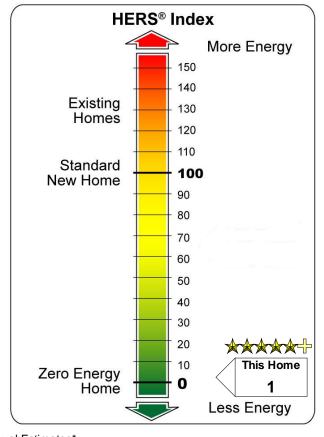
Carroll, NH

House Type Single-family detached

Cond. Area: 3205 sq. ft.

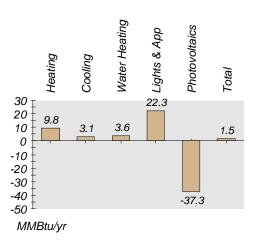
Rating No.: GDS-PS-NH-ES-5465 Issue Date: October 09, 2015

Certification Verified





**Estimated Annual Energy Consumption** 



Annual Estimates\*:

Electric(kWh): 449 C02 emissions(Tons): 0 Annual Savings\*\*: \$7765

\* Based on standard operating condition

\*\* Based on a HERS 130 Index Home

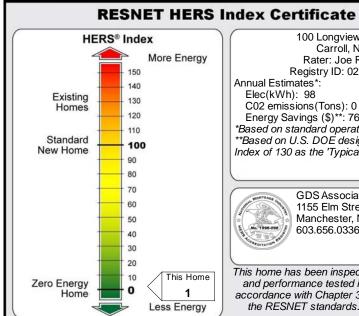
**GDS Associates Inc** 

1155 Elm Street, #702

Certified Rater: Joe Rando
Rater ID: 4348719
Registry ID: 029322052

Rating Date: September 9, 2015





100 Longview Road Carroll, NH Rater: Joe Rando Registry ID: 029322052
Annual Estimates\*:

Elec(kWh): 98

C02 emissions(Tons): 0
Energy Savings (\$)\*\*: 7680
\*Based on standard operating conditions
\*\*Based on U.S. DOE designation of a HERS Index of 130 as the 'Typical Existing Home'



GDS Associates Inc 1155 Elm Street, #702 Manchester, NH 03101 603.656.0336

This home has been inspected and performance tested in accordance with Chapter 3 of the RESNET standards.



## RESNET HOME ENERGY RATING Standard Disclosure

or nome located at: 100 Longview Road				
ity: Carroll		State:	NH	
X The Rater or the Rater's employer is receiving	j a fee for providi	ng the rating on this ho	ome.	
In addition to the rating, the Rater or Rater's en	mployer has also	provided the following	g consulting serv	rices for this
home:				
A. Mechanical system design				
B. Moisture control or indoor air quality o	consulting			
C. Performance testing and/or commission	oning other than	required for the rating	itself	
D. Training for sales or construction pers	sonnel			
E. Other (specify below)				
X 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 payme	ents on this home		
X C. An employee, contractor or consultan	t of the electric a	nd/or natural gas utility	serving this hor	ne
The Rater or Rater's employer is a supplier or	installer of produ	ucts, which may include	e:	
	Installed in t	his home by: OR	Is in the busin	ess of:
HVAC systems	Rater	Employer	Rater	Employer
Thermal insulation systems	Rater	Employer	Rater	Employer
Air sealing of envelope or duct systems	Rater	Employer	Rater	Employer
Windows or window shading systems	Rater	Employer	Rater	Employer
Energy efficient appliances	Rater	Employer	Rater	Employer
Construction (builder, developer, construction contractor, etc.)	Rater	Employer	Rater	Employer
Other (specify below):	Rater	Employer	Rater	Employer
ttest that the above information is true and correct to the rating quality control provisions of the Mortgage Industrial Energy Services Network (RESNET). The nontained in Chapter One 4.C.8. of the standard and are e Home Energy Rating Standard Disclosure for this he	ustry National Ho ational rating qu e posted at http://	me Energy Rating Star ality control provisions resnet.us/standards/RE	ndard as set forth of the rating star ESNET_Mortgag	n by the ndard are
e Rando		43	348719	
ter's Printed Name		Ce	ertification #	
		O	ctober 09, 2015	
iter's Signature			ate	