



1149 Settlemire Road
Lebanon, Ohio 45036
andy@moonlightdesignstudio.net
(513) 305-7712

May 12, 2018

Kevin and Dawn Perks
1309 Red Brick Road
Garner, NC 27529

RE: Final HERS Reports ; Home Energy Rating Certificates

Dear Kevin and Dawn,

I am happy to provide the following reports to you provided by Green Building Consulting (GBC). The reports attached show the final HERS score for your new home. A HERS score for a home is similar to a car's MPG rating. It gives homeowners an idea of how well their home perform when it comes to energy consumption based on overall design and on-site inspections. Your home is among the elite in your state when it comes to new construction. And by this, I applaud you for having the initiative to produce a truly high performing home. I have been humbled and honored to be a part of it and hope you enjoy the great comfort and low energy bills for years to come! Here is a recap of how your home tested compared to North Carolina's energy codes:

- HERS Index Score: **48**
- NC 2012 Performance Compliance: Exceeds compliance by **31.8%**.
- NC 2012 UA Compliance: Exceeds compliance by **23.5%**.
- NC 2018 Performance Compliance: Exceeds compliance by **32.2%**.
- Blower Door Test (Air Leakage): **0.83 ACH50**.

Please share a copy of these reports with the local building department and keep a copy for your records. Your home has been entered into the RESNET data base which is tapped into by realtors and home appraisers which helps determine the value of your home compared to others.

If there is anything more I can do for you, please don't hesitate to contact me. It has truly been a pleasure and I hope you enjoy your new home!

Best regards,

A handwritten signature in blue ink, appearing to read "Andy Roehl", is written over a light blue circular background.

Andy Roehl, Designer / LEED-AP

Enclosed:

- Home Energy Rating Certificate, Final Report, Certified
- NC 2012 Performance Compliance Report, Certified
- NC 2012 UA Compliance Report, Certified
- NC 2012 Energy Code Certificate, Certified
- NC 2012 Label
- NC 2018 Performance Compliance Report, Certified
- Air Leakage Report
- RESNET Home Energy Rating Standard Disclosure



Home Energy Rating Certificate

Final Report

Rating Date: 2019-05-08

Registry ID: 834319555

Ekotrope ID: ILVPwXVv



HERS® Index Score:

48

Your home's HERS score is a relative performance score. The lower the number, the more energy efficient the home. To learn more, visit www.hersindex.com

Annual Savings

\$1,875

*Relative to an average U.S. home

Home:

1309 Red Brick Road
Garner, NC 27529

Builder:

Moonlight Design Studio

Your Home's Estimated Energy Use:

	Use [MBtu]	Annual Cost
Heating	3.6	\$127
Cooling	3.9	\$138
Hot Water	7.8	\$274
Lights/Appliances	22.0	\$774
Service Charges		\$96
Generation (e.g. Solar)	0.0	\$0
Total:	37.3	\$1,408

This home meets or exceeds the criteria of the following:

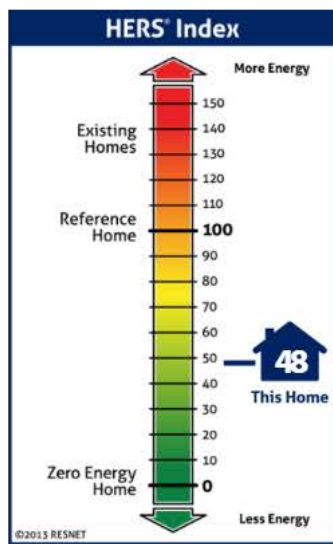
2018 International Energy Conservation Code
2015 International Energy Conservation Code
2012 International Energy Conservation Code
2009 International Energy Conservation Code
2006 International Energy Conservation Code

Rating Completed by:

Energy Rater: Karen Barras
RESNET ID: 1113567

Rating Company: Green Building Consulting
1401 Main St. Cincinnati, OH 45202
513.381.1470

Rating Provider: Green Building Consulting
1401 Main St. Cincinnati, OH 45202
513.381.1470



Home Feature Summary:

Home Type:	Single family detached
Model:	"Perks" Residence
Community:	N/A
Conditioned Floor Area:	2,173 sq. ft.
Number of Bedrooms:	4
Primary Heating System:	Ground Source Heat Pump • Electric • 4.8 COP
Primary Cooling System:	Ground Source Heat Pump • Electric • 24.1 EER
Primary Water Heating:	Water Heater • Electric • 0.93 Energy Factor
House Tightness:	471 CFM50 (0.83 ACH50)
Ventilation:	70.0 CFM • 50.0 Watts
Duct Leakage to Outside:	57 CFM25 (2.62 / 100 s.f.)
Above Grade Walls:	R-22
Ceiling:	Vaulted Roof, R-38 + Radiant Barrier
Window Type:	U-Value: 0.3, SHGC: 0.3
Foundation Walls:	N/A

Karen Barras

Karen Barras, Certified Energy Rater
Digitally signed: 5/10/19 at 1:34 PM

North Carolina 2012 Performance Compliance

**Property**

1309 Red Brick Road
Garner, NC 27529
Model: "Perks" Residence

Organization

Green Building Consulting
513-515-4281
Karen Barras

Inspection Status

2019-05-08
Rater ID (RTIN): 1113567
RESNET Registered
(Confirmed)

1309 Red Brick Rd - 5-8-19 [KB] (2019-05-08)
1309 Red Brick Rd - 5-8-19 [KB] (2019-05-08)

Builder

Moonlight Design Studio

Annual Energy Cost

Design	North Carolina 2012 Performance	As Designed
Heating	\$358	\$154
Cooling	\$268	\$183
Water Heating	\$283	\$283
SubTotal - Used to determine compliance	\$909	\$620
Lights & Appliances	\$628	\$648
Onsite generation	\$0	\$0
Total	\$1,537	\$1,268

Requirements

✓	405.3	Performance-based compliance passes by 31.8%
✓	R402.4.1.2	Air Leakage Testing Air sealing is 0.83 ACH at 50 Pa. It must not exceed 5.00 ACH at 50 Pa.
✓	402.5	Area-weighted average fenestration SHGC
✓	402.5	Area-weighted average fenestration U-Factor
✓	403.2.2	Duct Testing
✓	Mandatory Checklist	Mandatory code requirements that are not checked by Ekotrope must be met.
✓	R405.2	Duct Insulation

Design exceeds requirements for North Carolina 2012 Performance compliance by 31.8%.

As a 3rd party extension of the code jurisdiction utilizing these reports, I certify that this energy code compliance document has been created in accordance with the requirements of Chapter 4 of the adopted International Energy Conservation Code based on Climate Zone 4. If rating is Projected, I certify that the building design described herein is consistent with the building plans, specifications, and other calculations submitted with the permit application. If rating is Confirmed, I certify that the address referenced above has been inspected/tested and that the mandatory provisions of the IECC have been installed to meet or exceed the intent of the IECC or will be verified as such by another party.

Name: Karen Barras

Signature: Karen Barras

Organization: Green Building Consulting

Digitally signed: 5/10/19 at 1:34 PM

Ekotrope RATER - Version 3.1.1.2169

North Carolina 2012 Performance compliance results calculated using Ekotrope RATER's energy and code compliance algorithm, including appropriate amendments.
Ekotrope RATER is a RESNET Accredited HERS Rating Tool. All results are based on data entered by Ekotrope users.
Ekotrope disclaims all liability for the information shown on this report.

North Carolina 2012 UA Compliance

**Property**

1309 Red Brick Road
Gamer, NC 27529
Model: "Perks" Residence

Organization

Green Building Consulting
513-515-4281
Karen Barras

Inspection Status

2019-05-08
Rater ID (RTIN): 1113567
RESNET Registered
(Confirmed)

1309 Red Brick Rd - 5-8-19 [KB] (2019-05-08)
1309 Red Brick Rd - 5-8-19 [KB] (2019-05-08)

Builder

Moonlight Design Studio

Building UA

Elements

	NC Reference	As Designed
Ceilings	70.4	59.0
Above-Grade Walls	177.6	120.8
Windows, Doors and Skylights	197.8	161.4
Slab Floor:	0.0	0.0
Framed Floors	0.0	0.0
Basement Walls	0.0	0.0
Rim Joists	0.0	0.0
Overall UA (Design must be equal or lower):	445.8	341.2

Requirements

✓	402.1.4	Total UA alternative for insulation and fenestration
✓	402.3.2 Glazed Fenestration SHGC	Average SHGC: 0.30; Max SHGC: 0.30
✓	R402.4.1.2	Air Leakage Testing Air sealing is 0.83 ACH at 50 Pa. It must not exceed 5.00 ACH at 50 Pa.
✓	402.5	Area-weighted average fenestration SHGC
✓	402.5	Area-weighted average fenestration U-Factor
✓	403.2.2	Duct Testing
✓	Mandatory Checklist	Mandatory code requirements that are not checked by Ekotrope must be met.
✓	404.1	Electrical Power and Lighting Systems

Design exceeds requirements for North Carolina 2012 Prescriptive compliance by 23.5%.

Name: Karen Barras

Signature: *Karen Barras*

Organization: Green Building Consulting

Digitally signed: 5/10/19 at 1:34 PM

Ekotrope RATER - Version 3.1.1.2169

North Carolina 2012 Prescriptive compliance results calculated using Ekotrope RATER's energy and code compliance algorithm, including appropriate amendments.
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1309 Red Brick Road

Garner, NC 27529

Builder: Moonlight Design Studio

Model: "Perks" Residence

**THIS HOME IS CERTIFIED TO MEET THE NORTH CAROLINA
2012 ENERGY CODE**

Building Features

Ceiling	Vaulted Roof, R-38 + Radiant Barrier	Duct	Supply R-0.0, Return R-0.0
Above Grade Walls	R-22	Duct Leakage to Outside	57.0 CFM @ 25Pa
Foundation Walls	N/A	Total Duct Leakage	665.0 CFM @ 25Pa
Framed Floor	N/A	Heating	Ground Source Heat Pump • Electric • 4.8 COP
Slab	N/A	Cooling	Ground Source Heat Pump • Electric • 24.1 EER
Infiltration	471 CFM50 (0.83 ACH50)	Water Heating	Water Heater • Electric • 0.93 Energy Factor
Window	U-Value: 0.3, SHGC: 0.3		

As a 3rd party extension of the code jurisdiction utilizing these reports, I certify that this energy code compliance document has been created in accordance with the requirements of Chapter 4 of the adopted International Energy Conservation Code based on Climate Zone 4. If rating is Projected, I certify that the building design described herein is consistent with the building plans, specifications, and other calculations submitted with the permit application. If rating is Confirmed, I certify that the address referenced above has been inspected/tested and that the mandatory provisions of the IECC have been installed to meet or exceed the intent of the IECC or will be verified as such by another party.

Name: Karen Barras
Organization: Green Building Consulting

Signature: Karen Barras
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Ekotrope RATER - Version 3.1.1.2169

North Carolina 2012 Certificate compliance results calculated using Ekotrope RATER's energy and code compliance algorithm, including appropriate amendments.
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North Carolina 2012 Label

1309 Red Brick Road

Model: "Perks" Residence

Ekotrope RATER - Version: 3.1.1.2169

HERS® Index Score: 48

Building Envelope Specs

Ceiling: R-38

Above Grade Walls: R-22

Foundation Walls: N/A

Exposed Floor: N/A

Slab: N/A

Infiltration: 471 CFM50 (0.83 ACH50)

Duct Insulation: R-0

Duct Leakage: 57 CFM @ 25Pa

Window & Door Specs

U-Value: 0.3, SHGC: 0.3

Door: R-7

Mechanical Equipment Specs

Heating: Ground Source Heat Pump • Electric •
4.8 COP

Cooling: Ground Source Heat Pump • Electric •
24.1 EER

Hot Water: Water Heater • Electric • 0.93 Energy
Factor

Builder or Design Professional

Signature: _____



North Carolina 2018 Performance Compliance

**Property**

1309 Red Brick Road
Garner, NC 27529
Model: "Perks" Residence

Organization

Green Building Consulting
513-515-4281
Karen Barras

Inspection Status

2019-05-08
Rater ID (RTIN): 1113567
RESNET Registered
(Confirmed)

1309 Red Brick Rd - 5-8-19 [KB] (2019-05-08)
1309 Red Brick Rd - 5-8-19 [KB] (2019-05-08)

Builder

Moonlight Design Studio

Annual Energy Cost

Design	North Carolina 2018 Performance	As Designed
Heating	\$405	\$155
Cooling	\$263	\$179
Water Heating	\$283	\$283
Mechanical Ventilation	\$23	\$44
SubTotal - Used to determine compliance	\$975	\$661
Lights & Appliances w/out Ventilation	\$604	\$604
Onsite generation	\$0	\$0
Total	\$1,579	\$1,265

Requirements

✓	405.3	Performance-based compliance passes by 32.2%
✓	R402.4.2.2	Air Leakage Testing Air sealing is 0.83 ACH at 50 Pa. It must not exceed 5.00 ACH at 50 Pa.
✓	R402.5	Area-weighted average fenestration SHGC
✓	R402.5	Area-weighted average fenestration U-Factor
✓	R404	Lighting Equipment Efficiency
✓	Mandatory Checklist	Mandatory code requirements that are not checked by Ekotrope must be met.
✓	R403.3	Duct Insulation

Design exceeds requirements for North Carolina 2018 Performance compliance by 32.2%.

As a 3rd party extension of the code jurisdiction utilizing these reports, I certify that this energy code compliance document has been created in accordance with the requirements of Chapter 4 of the adopted International Energy Conservation Code based on Climate Zone 4. If rating is Projected, I certify that the building design described herein is consistent with the building plans, specifications, and other calculations submitted with the permit application. If rating is Confirmed, I certify that the address referenced above has been inspected/tested and that the mandatory provisions of the IECC have been installed to meet or exceed the intent of the IECC or will be verified as such by another party.

Name: Karen Barras

Organization: Green Building Consulting

Signature: Karen Barras

Digitally signed: 5/10/19 at 1:34 PM

Ekotrope RATER - Version 3.1.1.2169

North Carolina 2018 Performance compliance results calculated using Ekotrope RATER's energy and code compliance algorithm, including appropriate amendments.
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Air Leakage Report



Property

1309 Red Brick Road
Garner, NC 27529
Model: "Perks" Residence

Organization

Green Building Consulting
513-515-4281
Karen Barras

Inspection Status

2019-05-08
Rater ID (RTIN): 1113567
RESNET Registered
(Confirmed)

1309 Red Brick Rd - 5-8-19 [KB] (2019-05-08)
1309 Red Brick Rd - 5-8-19 [KB] (2019-05-08)

Builder

Moonlight Design Studio

General Information

Conditioned Floor Area [sq. ft.]	2,173
Infiltration Volume [cu. ft.]	33,954
Number of Bedrooms	4

Air Leakage

Measured Infiltration	471 CFM50 (0.83 ACH50)
ACH50 (Calculated)	0.83
ELA [sq. in.] (Calculated)	25.91
ELA per 100 s.f. Shell Area (Calculated)	0.496
CFM50 (Calculated)	471
CFM50 / s.f. Shell Area (Calculated)	0.090

Duct Leakage

	System 1
Leakage to Outdoors [CFM @ 25 Pa]	57.0
Leakage to Outdoors [CFM25 / 100 s.f.]	2.6
Leakage to Outdoors [CFM25 / CFA]	0.026
Total Leakage Test Type	Post-Construction
Total Leakage [CFM @ 25 Pa]	665.0
Total Leakage [CFM25 / 100 s.f.]	30.6
Total Leakage [CFM25 / CFA]	0.306

Mechanical Ventilation

Rate [CFM]	70.0
Hours per day	24.0
Fan Watts	50.0
Recovery Efficiency %	69.0
Runs at least once every 3 hrs?	true
Average Rate [CFM]	70.0
2010 ASHRAE 62.2 Req. Cont. Ventilation	59.2
2013 ASHRAE 62.2 Req. Cont. Ventilation	92.1

RESNET HOME ENERGY RATING Standard Disclosure



For home(s) located at: 1309 Red Brick Road, Garner, NC

Check the applicable disclosure(s) in accordance with the instructions on the reverse of this page:

- ☒ 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 the 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)

- ☐ 3. The Rater or the 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:

Products	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
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): <input type="text"/>	<input type="checkbox"/> Rater	<input type="checkbox"/> Employer	<input type="checkbox"/> Rater	<input type="checkbox"/> Employer

- ☐ 5. This home has been verified under the provisions of Chapter 6, Section 603 "Technical Requirements for Sampling" of the Mortgage Industry National Home Energy Rating Standard as set forth by the Residential Energy Services Network (RESNET). Rater Certification #: 1113567

Name: Karen Barras

Organization: Green Building Consulting

Signature: Karen Barras

Digitally signed: 5/10/19 at 1:34 PM

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://resnet.us/standards/RESNET_Mortgage_Industry_National_HERS_Standards.pdf

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

Home Energy Rating Certificate

Final Report

HERS® Index Score:

48

Your home's HERS score is a relative performance score. The lower the number, the more energy efficient the home. To learn more, visit www.hersindex.com

Annual Savings

\$1,875

*Relative to an average U.S. home

Home:

#GarnerModernCraftsman
Garner, NC 27529

Builder:

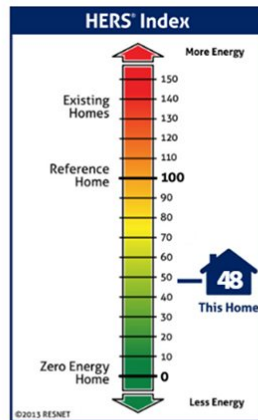
Moonlight Design Studio

Your Home's Estimated Energy Use:

	Use [MBtu]	Annual Cost
Heating	3.6	\$127
Cooling	3.9	\$138
Hot Water	7.8	\$274
Lights/Appliances	22.0	\$774
Service Charges		\$96
Generation (e.g. Solar)	0.0	\$0
Total:	37.3	\$1,408

This home meets or exceeds the criteria of the following:

2018 International Energy Conservation Code
2015 International Energy Conservation Code
2012 International Energy Conservation Code
2009 International Energy Conservation Code
2006 International Energy Conservation Code



Home Feature Summary:

Home Type:	Single family detached
Model:	#GarnerModernCraftsman
Community:	N/A
Conditioned Floor Area:	2,173 sq. ft.
Number of Bedrooms:	4
Primary Heating System:	Ground Source Heat Pump • Electric • 4.8 COP
Primary Cooling System:	Ground Source Heat Pump • Electric • 24.1 EER
Primary Water Heating:	Water Heater • Electric • 0.93 Energy Factor
House Tightness:	471 CFM50 (0.83 ACH50)
Ventilation:	70.0 CFM • 50.0 Watts
Duct Leakage to Outside:	57 CFM25 (2.62 / 100 s.f.)
Above Grade Walls:	R-22
Ceiling:	Vaulted Roof, R-38 + Radiant Barrier
Window Type:	U-Value: 0.3, SHGC: 0.3
Foundation Walls:	N/A

