

# North Carolina 2018 - Simulated Performance Alternative (N1105)

## Property

81 Barn Door Drive  
Lillington, NC 27546  
Model: 750

## Organization

Model Energy  
Andrew King

## Inspection Status

Results are projected

## Builder

Chesapeake - 750 base plan slab - ecoSelect  
750 plan Chesapeake Homes








**This report is based on a proposed design and does not confirm field enforcement of design elements.**

## Annual Energy Cost

Design	North Carolina 2018 Performance	As Designed
Heating	\$637	\$608
Cooling	\$258	\$244
Water Heating	\$331	\$331
Mechanical Ventilation	\$0	\$0
<b>SubTotal - Used to determine compliance</b>	<b>\$1,226</b>	<b>\$1,183</b>
Lights & Appliances w/out Ventilation	\$487	\$487
Onsite generation	\$0	\$0
<b>Total</b>	<b>\$1,713</b>	<b>\$1,670</b>

R405.3 Source Energy Exception: The proposed home uses 3.54 MBtu LESS source energy than the reference home.

## Requirements

	R405.3	Performance-based compliance passes by 3.7%	The proposed house meets the North Carolina 2018 Performance reference energy bill requirement by \$43.18 (3.54 MBtu).
	R402.4.2.2	Air Leakage Testing	Air sealing is 0.24 CFM50 / ft <sup>2</sup> Shell Area. It must not exceed 0.30 CFM50 / ft <sup>2</sup> Shell Area.
	R402.5	Area-weighted average fenestration SHGC	Area-weighted average fenestration SHGC is 0.28. The maximum allowed value is [No Limit].
	R402.5	Area-weighted average fenestration U-Factor	
	R404.1	Lighting Equipment	At least 75.0% of fixtures shall be high-efficacy lamps, currently 100.0% are high-efficacy.
	Mandatory Checklist	Mandatory code requirements that are not checked by Ekotrope must be met.	2015 IECC Mandatory Checklist must be checked as complete.
	R403.3.1	Duct Insulation	Duct insulation meets the requirements specified in North Carolina 2018 Code Section 403.3.1.

## Design exceeds requirements for North Carolina 2018 Performance compliance by 3.7%.

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 HARNETT County. 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: Andrew King  
Organization: Model Energy

Signature: \_\_\_\_\_  
Date: \_\_\_\_\_



## Ekotrope RATER - Version 4.1.2.3349

North Carolina 2018 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.

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## General Building Information

Number Of Bedrooms	4
Number Of Floors	1
Conditioned Floor Area [sq. ft.]	1,847
Has Electric Vehicle Ready Space	No
Unconditioned, attached garage?	Yes
Conditioned Volume [cu. ft.]	16,722
Total Units in Building	1
Residence Type	Single family detached
Number of Floors in Building	-
Floor Number	-
Model	750
Community	
RESNET/IECC 2006-2018 Climate Zone	4A
IECC 2021 Climate Zone	3A

## Foundation Wall

None Present

## Foundation Wall Library List

None Present

## Slab

Name	Library Type	Perimeter	Floor Grade	Carpet R	Exposed Masonry Area	Surface Area	Location	Enclosing
slab	Uninsulated	199	On Grade	1	0	1,847.0 ft <sup>2</sup>	Exposed Exterior	Conditioned Space

## Slab Library List

Name	Wall Construction Type	Slab Completely Insulated?	Underslab Insulation Width [ft]	Perimeter Insulation Depth [ft]	Perimeter Insulation R Value	Perimeter Insulation Is Exterior	Thermal Break	Effective R-value
Uninsulated	Wood Frame / Other	No	0	0	0	Yes	No	0.00

## Framed Floor

None Present

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## Framed Floor Library List

None Present

## Rim Joist

None Present

## Rim Joist Library List

None Present

## Wall

Name	Library Type	Surface Color	Surface Area	Location
1st floor ambient	R 15 Adv. Framing G1 16" O.C	Medium	1,512.0 ft <sup>2</sup>	Exposed Exterior
1st floor garage	R 15 Adv. Framing G1 16" O.C	Medium	279.0 ft <sup>2</sup>	Unconditioned, attached garage

## Wall Library List

Name	Effective R-value
R 15 Adv. Framing G1 16" O.C	13.771

## Glazing

Name	Library Type	Wall Assignment	Foundation Wall Assignment	Is Operable	Overhang Depth	Overhang Ft To Top	Overhang Ft To Bottom	Orientation	Surface Area
front unshaded	30/28	1st floor ambient		Yes	0	0	0	Southeast	15.0 ft <sup>2</sup>
left unshaded	30/28	1st floor ambient		Yes	0	0	0	Southwest	30.0 ft <sup>2</sup>
rear shaded	30/28	1st floor ambient		Yes	10	2	9	Northwest	30.0 ft <sup>2</sup>
rear unshaded	30/28	1st floor ambient		Yes	0	0	0	Northwest	60.0 ft <sup>2</sup>

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Name	Library Type	Wall Assignment	Foundation Wall Assignment	Is Operable	Overhang Depth	Overhang Ft To Top	Overhang Ft To Bottom	Orientation	Surface Area
right unshaded	30/28	1st floor ambient		Yes	0	0	0	Northeast	23.0 ft <sup>2</sup>

## Glazing Library List

Name	Shgc	U-factor
30/28	0.28	0.300

## Skylight

None Present

## Skylight Library List

None Present

## Opaque Door

Name	Library Type	Wall Assignment	Foundation Wall Assignment	Emittance	Solar Absorptance	Surface Color	Surface Area	Location
front entry	Fiberglass R-5	1st floor ambient		0.9	0.75	Medium	20.0 ft <sup>2</sup>	Exposed Exterior
garage entry	Fiberglass R-5	1st floor garage		0.9	0.75	Medium	20.0 ft <sup>2</sup>	Unconditioned, attached garage

## Opaque Door Library List

Name	Effective R-value
Fiberglass R-5	5.00

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## Roof Insulation

Name	Library Type	Attic Exterior Area [ft <sup>2</sup> ]	Clay or Concrete Roof Tiles	Surface Color	Surface Area	Location
attic	R 38 Attic BLOWN FG G1 2x10 24"OC NO Radiant	2,438.03	No	Dark	1,847.0 ft <sup>2</sup>	Attic

## Roof Insulation Library List

Name	Has Radiant Barrier	Effective R-value
R 38 Attic BLOWN FG G1 2x10 24"OC NO Radiant	No	37.074

## Whole House Infiltration

Infiltration	Measurement Type	Shelter Class
1338 CFM at 50 Pa	Blower-door tested	4

## Mechanical Ventilation

None Present

## Lighting

% Interior Fluorescent Lighting	% Interior LED Lighting	% Exterior Fluorescent Lighting	% Exterior LED Lighting	% Garage Fluorescent Lighting	% Garage LED Lighting
0	100	0	0	0	0

## Onsite Generation

None Present

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## Onsite Generation Library List

None Present

## Solar Generation

None Present

## Dehumidifier

None Present

## Dehumidifier Library List

None Present

## Whole House Fan

None Present

## Whole House Fan Library List

None Present

## Conditioning Equipment

Name	Library Type	Serial Number	Heating Percent Load	Cooling Percent Load	Hot Water Percent Load	Location
Water Heating	z 50 gal. 0.58 EF Gas		0%	0%	100%	Unconditioned Garage
whole house a/c	z 14 SEER A/C 3 ton		0%	100%	0%	Attic
whole house furnace	z 92 AFUE Gas Furn 64k		100%	0%	0%	Attic

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### Equipment Type: z 14 SEER A/C 3 ton

Equipment Type	Air Conditioner
Fuel Type	Electric
Distribution Type	Forced Air
Motor Type	PSC (Single Speed)
Heat Pump System Type	Unspecified
Cooling Efficiency	14 SEER
Cooling Capacity [kBtu/h]	36

### Equipment Type: z 50 gal. 0.58 EF Gas

Equipment Type	Residential Water Heater
Fuel Type	Natural Gas
Distribution Type	Hydronic Delivery (Radiant)
Hot Water Efficiency	0.58 Energy Factor
Tank Capacity (gal.)	50
Hot Water Capacity [kBtu/h]	40
Recovery Efficiency	0.76

### Equipment Type: z 92 AFUE Gas Furn 64k

Equipment Type	Furnace
Fuel Type	Natural Gas
Distribution Type	Forced Air
Motor Type	PSC (Single Speed)
Heating Efficiency	92 AFUE
Heating Capacity [kBtu/h]	64
Use default EAE	No
EAE [kWh]	591

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## Distribution System

Distribution Type	Forced Air
Heating Equipment	whole house furnace
Cooling Equipment	whole house a/c
Sq. Feet Served	1,847
# Return Grilles	3
Supply Duct R Value	8
Return Duct R Value	8
Supply Duct Area [ft <sup>2</sup> ]	498.69
Return Duct Area [ft <sup>2</sup> ]	277.05
Leakage to Outdoors	73 CFM @ 25Pa (3.95 / 100 ft <sup>2</sup> )
Total Leakage	73 CFM25
Total Leakage Duct Test Conditions	Post-Construction
Use Default Flow Rate	Yes
Duct 1	
Duct Location	Attic (well vented)
Percent Supply Area	100
Percent Return Area	100
Duct 2	
Duct Location	Conditioned Space
Percent Supply Area	0
Percent Return Area	0
Duct 3	
Duct Location	Conditioned Space
Percent Supply Area	0
Percent Return Area	0
Duct 4	
Duct Location	Conditioned Space
Percent Supply Area	0
Percent Return Area	0
Duct 5	
Duct Location	Conditioned Space
Percent Supply Area	0
Percent Return Area	0
Duct 6	
Duct Location	Conditioned Space
Percent Supply Area	0
Percent Return Area	0

## HVAC Grading

HVAC Grading Not Conducted

## Ceiling Fan

Has Ceiling Fan	No
Cfm Per Watt	100



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## Water Distribution

Water Fixture Type	Standard
Use Default Hot Water Pipe Length	No
Hot Water Pipe Length [ft]	100
At Least R3 Pipe Insulation?	No
Hot Water Recirculation System?	No
Recirculation System Pipe Loop Length [ft]	20
Drain Water Heat Recovery?	No

## Clothes Dryer

Cef	3.01
Fuel Type	Electric
Field Utilization	Timer Controls
Is Outside Conditioned Space	No
Clothes Dryer Available	Yes
Defaults Type	HERS Reference

## Clothes Washer

Label Energy Rating	153 kWh/Year
Annual Gas Cost	\$12.00
Electric Rate	\$0.11/kWh
Gas Rate	\$1.22/Therm
Capacity	3.31
Imef	2.1547
Defaults Type	Custom
Load Type	Front-load
Loads Per Week	6
Is Outside Conditioned Space	No
Clothes Washer Available	Yes

## Dishwasher

Dishwasher Defaults Type	Custom
Dishwasher Size	Standard
Dishwasher Efficiency	270 kWh
Annual Gas Cost	\$22.23
Electric Rate	\$0.12/kWh
Gas Rate	\$1.09/Therm
Is Outside Conditioned Space	No
Dishwasher Available	Yes

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## Appliances and Controls

Thermostat Cooling Setpoint	*** 75.0
Thermostat Heating Setpoint	*** 70.0
Range/Oven Fuel	Electric
Convection Oven?	No
Induction Range?	No
Range/Oven Outside Conditioned Space?	No
Refrigerator Consumption	538 kWh/Year
Refrigerator Outside Conditioned Space?	No

## Notes

updated inputs by - AT 8/11/2022

- confirm window specs
- confirm if radiant barrier installed, modeled as yes
- confirm HVAC specs
- confirm ventilation entry, modeled as none
- confirm cfl lighting %
- modeled to worst case orientation