

North Carolina 2018 - Simulated Performance Alternative (N1105)

Property

20 Warner Hill Ct
Fuquay Varina, NC 27526
Model: Custom

Organization

Model Energy
Andrew King

Inspection Status

Results are projected

Builder

MPI Foam - 20 Warner Hill Ct
20 Warner Hill Ct








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	\$775	\$688
Cooling	\$354	\$358
Water Heating	\$324	\$324
Mechanical Ventilation	\$0	\$0
SubTotal - Used to determine compliance	\$1,453	\$1,371
Lights & Appliances w/out Ventilation	\$627	\$627
Onsite generation	\$0	\$0
Total	\$2,080	\$1,998

R405.3 Source Energy Exception: The proposed home uses 8.83 MBtu LESS source energy than the reference home.

Requirements

	R405.3	Performance-based compliance passes by 5.7%	The proposed house meets the North Carolina 2018 Performance reference energy bill requirement by \$82.28 (8.83 MBtu).
	R402.4.2.2	Air Leakage Testing	Air sealing is 2.40 ACH at 50 Pa. It must not exceed 5.00 ACH at 50 Pa.
	R402.5	Area-weighted average fenestration SHGC	Area-weighted average fenestration SHGC is 0.27. 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 75.0% 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 5.7%.

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 WAKE 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 4.1.2.3343

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	3
Number Of Floors	2
Conditioned Floor Area [sq. ft.]	2,675
Has Electric Vehicle Ready Space	No
Unconditioned, attached garage?	Yes
Conditioned Volume [cu. ft.]	31,095
Total Units in Building	1
Residence Type	Single family detached
Number of Floors in Building	-
Floor Number	-
Model	Custom
Community	
RESNET/IECC 2006-2018 Climate Zone	4A
IECC 2021 Climate Zone	3A

Foundation Wall

None Present

Foundation Wall Library List

None Present

Slab

None Present

Slab Library List

None Present

Framed Floor

Name	Library Type	Carpet R	Floor Grade	Surface Area	Location
over garage	R 19, 16"OC G1 Carpet	0	Above Grade	377.0 ft ²	Unconditioned, attached garage
over vented crawl	R 19, 16"OC G1 Hardwood	0	Above Grade	1,486.0 ft ²	Vented Crawl

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Framed Floor Library List

Name	Effective R-value
R 19, 16"OC G1 Carpet	19.567
R 19, 16"OC G1 Hardwood	18.155

Rim Joist

Name	Library Type	Surface Area	Location
1st floor ambient	R 13 G1 foam, 16"OC	73.0 ft ²	Exposed Exterior
1st floor garage	R 13 G1 foam, 16"OC	19.0 ft ²	Unconditioned, attached garage

Rim Joist Library List

Name	Effective Insulation R-value
R 13 G1 foam, 16"OC	13.00

Wall

Name	Library Type	Surface Color	Surface Area	Location
1st floor ambient	R 13 OC Spray Foam G1 16" O.C	Medium	1,341.0 ft ²	Exposed Exterior
1st floor garage	R 13 OC Spray Foam G1 16" O.C	Medium	261.0 ft ²	Unconditioned, attached garage
2nd floor ambient	R 13 OC Spray Foam G1 16" O.C	Medium	840.0 ft ²	Exposed Exterior
gable walls	R 13 OC Spray Foam G1 16" O.C	Medium	160.0 ft ²	Exposed Exterior

Wall Library List

Name	Effective R-value
R 13 OC Spray Foam G1 16" O.C	12.261

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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 2nd unshaded	30/27	2nd floor ambient		Yes	0	0	0	Southeast	74.5 ft ²
front shaded	30/27	1st floor ambient		Yes	6	2	9	Southeast	24.4 ft ²
left 2nd unshaded	30/27	2nd floor ambient		Yes	0	0	0	Southwest	21.4 ft ²
left shaded	30/27	1st floor ambient		Yes	20	2	9	Southwest	20.8 ft ²
left unshaded	30/27	1st floor ambient		Yes	0	0	0	Southwest	50.4 ft ²
rear shaded	30/27	1st floor ambient		Yes	12	1	9	Northwest	89.7 ft ²
rear unshaded	30/27	1st floor ambient		Yes	0	0	0	Northwest	84.2 ft ²
right 2nd unshaded	30/27	2nd floor ambient		Yes	0	0	0	Northeast	68.9 ft ²
right unshaded	30/27	1st floor ambient		Yes	0	0	0	Northeast	47.1 ft ²

Glazing Library List

Name	Shgc	U-factor
30/27	0.27	0.300

Skylight

None Present

Skylight Library List

None Present

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Opaque Door

Name	Library Type	Wall Assignment	Foundation Wall Assignment	Emittance	Solar Absorptance	Surface Color	Surface Area	Location
front door	Fiberglass R-5	1st floor ambient		0.9	0.75	Medium	21.0 ft ²	Exposed Exterior
garage door	Fiberglass R-5	1st floor garage		0.9	0.75	Medium	18.0 ft ²	Unconditioned, attached garage

Opaque Door Library List

Name	Effective R-value
Fiberglass R-5	5.00

Roof Insulation

Name	Library Type	Attic Exterior Area [ft ²]	Clay or Concrete Roof Tiles	Surface Color	Surface Area	Location
sealed attic	R 26 OC Attic SEALED G1 NO Radiant Barrier 2x8	2,738.61	No	Dark	2,738.6 ft ²	Vaulted Roof

Roof Insulation Library List

Name	Has Radiant Barrier	Effective R-value
R 26 OC Attic SEALED G1 NO Radiant Barrier 2x8	No	23.83

Whole House Infiltration

Infiltration	Measurement Type	Shelter Class
1243 CFM at 50 Pa	Blower-door tested	4

Mechanical Ventilation

None Present

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Lighting

% Interior Fluorescent Lighting	% Interior LED Lighting	% Exterior Fluorescent Lighting	% Exterior LED Lighting	% Garage Fluorescent Lighting	% Garage LED Lighting
0	75	0	75	0	75

Onsite Generation

None Present

Onsite Generation Library List

None Present

Solar Generation

None Present

Dehumidifier

None Present

Dehumidifier Library List

None Present

Whole House Fan

None Present

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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
1st floor heat pump	z 30k 14.3 SEER2 7.5 HSPF2		56%	56%	0%	Unspecified
2nd floor heat pump	z 24k 14.3 SEER2 7.5 HSPF2		44%	44%	0%	Unspecified
Water Heater	z 50 gal. 0.92 EF Elec		0%	0%	100%	Unspecified

Equipment Type: z 24k 14.3 SEER2 7.5 HSPF2

Equipment Type	Air Source Heat Pump
Fuel Type	Electric
Distribution Type	Forced Air
Motor Type	ECM (Variable Speed)
Heat Pump System Type	Split System
Heating Efficiency	7.5 HSPF2
Heating Capacity [kBtu/h]	24
Backup Fuel Type	Electric
Switchover Temperature [°F]	0
Backup Heating Efficiency	1 COP
Use default Supplemental Heat	Yes
Cooling Efficiency	14.3 SEER2
Cooling Capacity [kBtu/h]	24

Equipment Type: z 30k 14.3 SEER2 7.5 HSPF2

Equipment Type	Air Source Heat Pump
Fuel Type	Electric
Distribution Type	Forced Air
Motor Type	ECM (Variable Speed)
Heat Pump System Type	Split System
Heating Efficiency	7.5 HSPF2
Heating Capacity [kBtu/h]	30
Backup Fuel Type	Electric
Switchover Temperature [°F]	0
Backup Heating Efficiency	1 COP
Use default Supplemental Heat	Yes
Cooling Efficiency	14.3 SEER2
Cooling Capacity [kBtu/h]	30

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Equipment Type: z 50 gal. 0.92 EF Elec

Equipment Type	Residential Water Heater
Fuel Type	Electric
Distribution Type	Hydronic Delivery (Radiant)
Hot Water Efficiency	0.92 Energy Factor
Tank Capacity (gal.)	50
Hot Water Capacity [kBtu/h]	40
Recovery Efficiency	0.98

Distribution System

Distribution Type	Forced Air
Heating Equipment	1st floor heat pump
Cooling Equipment	1st floor heat pump
Sq. Feet Served	1,486
# Return Grilles	2
Supply Duct R Value	8
Return Duct R Value	8
Supply Duct Area [ft ²]	401.22
Return Duct Area [ft ²]	148.6
Leakage to Outdoors	59 CFM @ 25Pa (3.97 / 100 ft ²)
Total Leakage	59 CFM25
Total Leakage Duct Test Conditions	Post-Construction
Use Default Flow Rate	Yes
Duct 1	
Duct Location	Crawlspace (vented, insulated floor only)
Percent Supply Area	100
Percent Return Area	100
Duct 2	
Duct Location	Basement (insulated basement ceiling)
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

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Distribution System

Distribution Type	Forced Air
Heating Equipment	2nd floor heat pump
Cooling Equipment	2nd floor heat pump
Sq. Feet Served	1,189
# Return Grilles	2
Supply Duct R Value	8
Return Duct R Value	8
Supply Duct Area [ft ²]	321.03
Return Duct Area [ft ²]	118.9
Leakage to Outdoors	0 CFM @ 25Pa (0 / 100 ft ²)
Total Leakage	47 CFM25
Total Leakage Duct Test Conditions	Post-Construction
Use Default Flow Rate	Yes
Duct 1	
Duct Location	Conditioned Space
Percent Supply Area	100
Percent Return Area	100
Duct 2	
Duct Location	Basement (insulated basement ceiling)
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	Yes
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]	93
At Least R3 Pipe Insulation?	No
Hot Water Recirculation System?	No
Recirculation System Pipe Loop Length [ft]	170
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	151 kWh/Year
Annual Gas Cost	\$12.00
Electric Rate	\$0.11/kWh
Gas Rate	\$1.22/Therm
Capacity	3.31
Imef	2.15473684
Defaults Type	High Efficiency
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	0.66 EF
Annual Gas Cost	\$33.12
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

Programmable thermostat?	Yes
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

Initial inputs by __JS 02/22/24__

-confirm cfl lighting %