

North Carolina 2018 - Simulated Performance Alternative (N1105)

Property
525 Cotton Rd
Fuquay Varina, NC 27526
Model: Custom

Organization
Model Energy
Andrew King

Inspection Status
Results are projected

MPI Foam - 525 Cotton Rd
525 Cotton Rd

Builder

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	\$801	\$684
Cooling	\$277	\$268
Water Heating	\$330	\$330
Mechanical Ventilation	\$0	\$0
SubTotal - Used to determine compliance	\$1,408	\$1,282
Lights & Appliances w/out Ventilation	\$747	\$747
Onsite generation	\$0	\$0
Total	\$2,155	\$2,029

R405.3 Source Energy Exception: The proposed home uses 13.6 MBtu LESS source energy than the reference home.

Requirements

✓	405.3	Performance-based compliance passes by 9.8%
✓	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
✓	R402.5	Area-weighted average fenestration U-Factor
✓	R404.1	Lighting Equipment Efficiency
✓	Mandatory Checklist	Mandatory code requirements that are not checked by Ekotrope must be met.
✓	R403.3.1	Duct Insulation

Design exceeds requirements for North Carolina 2018 Performance compliance by 9.8%.

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 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: _____ M



Ekotrope RATER - Version 4.0.1.2916

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	2
Conditioned Floor Area [sq. ft.]	3,268
Has Electric Vehicle Ready Space	No
Unconditioned, attached garage?	Yes
Conditioned Volume [cu. ft.]	44,465
Total Units in Building	1
Residence Type	Single family detached
Number of Floors in Building	-
Floor Number	-
Model	Custom
Community	
RESNET/IECC 2006 Climate Zone	4A
IECC 2021 Climate Zone	3A

Foundation Wall

Name	Library Type	Height Above Grade	Depth Below Grade	Perimeter	Location	Enclosing
crawl ambient	R 10 on block	3	1	231	Exposed Exterior	Conditioned CrawlSpace

Foundation Wall Library List

Name	Feet From Wall Top To Continuous Insulation Top	Feet From Wall Top To Continuous Insulation Bottom	Is Fully Insulated	Continuous R-value	Cavity R-value	Effective Insulation R-value
R 10 on block	N/A	N/A	Yes	10.00	N/A	N/A

Slab

Name	Library Type	Perimeter	Floor Grade	Carpet R	Exposed Masonry Area	Surface Area	Location	Enclosing
crawl floor	Uninsulated	231	Below Grade	1.75	0	2,026.0 ft²	Exposed Exterior	Conditioned CrawlSpace

Slab Library List

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

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Framed Floor

None Present

Framed Floor Library List

None Present

Rim Joist

Name	Library Type	Surface Area	Location
1st floor ambient	R 15 G1, 16"OC	119.0 ft ²	Exposed Exterior
1st floor garage	R 15 G1, 16"OC	38.0 ft ²	Unconditioned, attached garage
crawl ambient	R 13 G1, 16"OC	231.0 ft ²	Exposed Exterior

Rim Joist Library List

Name	Effective Insulation R-value
R 13 G1, 16"OC	12.00
R 15 G1, 16"OC	13.30

Wall

Name	Library Type	Surface Color	Surface Area	Location
1st floor ambient	R 15 FG G1 16" O.C	Medium	1,935.0 ft ²	Exposed Exterior
1st floor garage	R 15 FG G1 16" O.C	Medium	375.0 ft ²	Unconditioned, attached garage
2nd floor ambient	R 15 FG G1 16" O.C	Medium	1,073.0 ft ²	Exposed Exterior
gable walls	R 13 OC Spray Foam G1 16" O.C	Medium	50.0 ft ²	Exposed Exterior

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Wall Library List

Name	Effective R-value
R 13 OC Spray Foam G1 16" O.C	12.261
R 15 FG G1 16" O.C	13.155

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	35/30	2nd floor ambient		Yes	0	0	0	Northeast	64.8 ft²
front shaded	35/30	1st floor ambient		Yes	8	1	6	Northeast	48.4 ft²
front unshaded	35/30	1st floor ambient		Yes	0	0	0	Northeast	21.6 ft²
left 2nd unshaded	35/30	2nd floor ambient		Yes	0	0	0	Southeast	21.6 ft²
left unshaded	35/30	1st floor ambient		Yes	0	0	0	Southeast	27.5 ft²
rear 2nd unshaded	35/30	2nd floor ambient		Yes	0	0	0	Southwest	21.6 ft²
rear shaded	35/30	1st floor ambient		Yes	10	3	10	Southwest	107.9 ft²
right 2nd unshaded	35/30	2nd floor ambient		Yes	0	0	0	Northwest	21.6 ft²
right unshaded	35/30	1st floor ambient		Yes	0	0	0	Northwest	45.1 ft²

Glazing Library List

Name	Shgc	U-factor
35/30	0.3	0.350

Skylight

None Present

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Skylight Library List

None Present

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	48.0 ft²	Exposed Exterior
garage doors	Fiberglass R-5	1st floor garage		0.9	0.75	Medium	40.0 ft²	Unconditioned, attached garage
side door	Fiberglass R-5	1st floor ambient		0.9	0.75	Medium	20.0 ft²	Exposed Exterior

Opaque Door Library List

Name	Effective R-value
Fiberglass R-5	5.00

Roof Insulation

Name	Library Type	Attic Exterior Area [ft²]	Clay or Concrete Roof Tiles	Surface Color	Surface Area	Location
sealed attic	R 26 OC Attic SEALED G1 NO Radiant Barrier	2,978.22	No	Dark	2,978.2 ft²	Vaulted Roof

Roof Insulation Library List

Name	Has Radiant Barrier	Effective R-value
R 26 OC Attic SEALED G1 NO Radiant Barrier	No	23.695

Whole House Infiltration

Infiltration	Measurement Type	Shelter Class
1778 CFM at 50 Pa	Blower-door tested	4

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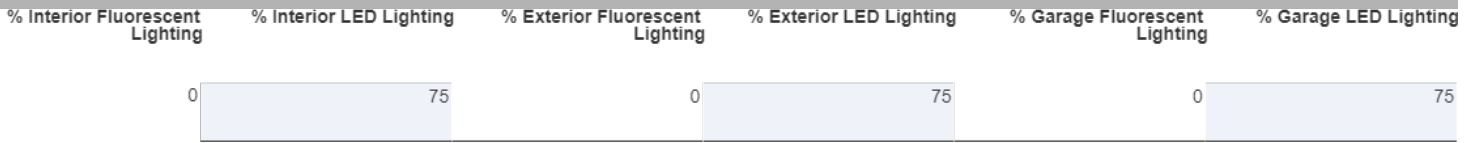
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Mechanical Ventilation

None Present

Lighting



Onsite Generation

None Present

Onsite Generation Library List

None Present

Solar Generation

None Present

Dehumidifier

None Present

Dehumidifier Library List

None Present

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Conditioning Equipment

Name	Library Type	Serial Number	Heating Percent Load	Cooling Percent Load	Hot Water Percent Load	Location
1st floor heat pump	z 36k 15 SEER 8.5hspf		62%	62%	0%	Unspecified
2nd floor heat pump	z 24k 15 SEER 8.5hspf		38%	38%	0%	Unspecified
Water Heater	Navien CR-210		0%	0%	100%	Unspecified

Equipment Type: Navien CR-210

Equipment Type	Residential Water Heater
Fuel Type	Natural Gas
Distribution Type	Hydronic Delivery (Radiant)
Hot Water Efficiency	0.95 Energy Factor
Tankless?	Yes

Equipment Type: z 24k 15 SEER 8.5hspf

Equipment Type	Air Source Heat Pump
Fuel Type	Electric
Distribution Type	Forced Air
Motor Type	PSC (Single Speed)
Heating Efficiency	8.5 HSPF
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	15 SEER
Cooling Capacity [kBtu/h]	24

Equipment Type: z 36k 15 SEER 8.5hspf

Equipment Type	Air Source Heat Pump
Fuel Type	Electric
Distribution Type	Forced Air
Motor Type	PSC (Single Speed)
Heating Efficiency	8.5 HSPF
Heating Capacity [kBtu/h]	36
Backup Fuel Type	Electric
Switchover Temperature [°F]	0
Backup Heating Efficiency	1 COP
Use default Supplemental Heat	Yes
Cooling Efficiency	15 SEER
Cooling Capacity [kBtu/h]	36

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Distribution System

Distribution Type	Forced Air
Heating Equipment	1st floor heat pump
Cooling Equipment	1st floor heat pump
Sq. Feet Served	2,026
# Return Grilles	2
Supply Duct R Value	8
Return Duct R Value	8
Supply Duct Area [ft ²]	547.02
Return Duct Area [ft ²]	202.6
Leakage to Outdoors	0 CFM @ 25Pa (0 / 100 ft ²)
Total Leakage	81 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

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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	1,242
# Return Grilles	2
Supply Duct R Value	8
Return Duct R Value	8
Supply Duct Area [ft ²]	335.34
Return Duct Area [ft ²]	124.2
Leakage to Outdoors	0 CFM @ 25Pa (0 / 100 ft ²)
Total Leakage	49 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]	115
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 Efficiency	0.66 EF
Dishwasher Size	Standard
Annual Gas Cost	\$33.12
Electric Rate	\$0.12/kWh
Gas Rate	\$1.09/Therm
Is Outside Conditioned Space	No

Appliances and Controls

Programmable thermostat?	Yes
Range/Oven Fuel	Electric
Convection Oven?	No
Induction Range?	No
Range/Oven Outside Conditioned Space?	No
Refrigerator Consumption	691 kWh/Year
Refrigerator Outside Conditioned Space?	No

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Notes

Initial inputs by __JS 05/19/22__

-confirm cfl lighting %