

North Carolina 2018 - R402.1.5 Total UA



Property
 , NC 27614
 Model: Aiken
 Community: NA

Organization
 Southern Energy Manager
 Justin Smith

Inspection Status
 Results are projected

Aiken base plan slab
 Template - A & G - Aiken base plan s

Builder
 A & G

Building UA

Elements	NC Reference	As Designed
Ceilings	54.8	56.4
Above-Grade Walls	201.7	169.7
Windows, Doors and Skylights	94.5	87.3
Slab Floor:	79.0	103.1
Framed Floors	15.1	17.7
Foundation Walls	0.0	0.0
Rim Joists	8.4	8.3
Overall UA (Design must be equal or lower):	453.5	442.5

Requirements

✓	402.1.5	Total UA alternative for insulation and fenestration
✓	402.3.2 Glazed Fenestration SHGC	Average SHGC: 0.27; Max SHGC: 0.30
✓	R402.4.2.2	Air Leakage Testing Air sealing is 4.80 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	Duct Insulation
✓	403.3.3	Duct Testing

Design exceeds requirements for North Carolina 2018 Prescriptive compliance by 2.4%.

Name: Justin Smith
 Organization: Southern Energy Management

Signature: Justin Smith
 Digitally signed: 10/8/19 at 3:28 PM

Ekotrope RATER - Version 3.1.1.2268

North Carolina 2018 Prescriptive 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.

Building Summary



SOUTHERN ENERGY
MANAGEMENT
ENERGY EFFICIENCY & SOLAR POWER

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General Building Information

Number Of Bedrooms	3
Number Of Floors	2
Conditioned Floor Area [sq. ft.]	2,452
Unconditioned, attached garage?	Yes
Conditioned Volume [cu. ft.]	25,196
Total Units in Building	1
Residence Type	Single family detached
Floor Number	-
Model	Aiken
Community	NA
Climate Zone	4A

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	163	On Grade	1	0	1,362.0 ft²	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	Thermal Break	Effective R-value
Uninsulated	Wood Frame / Other	No	0	0	0	No	0.00

Framed Floor

Name	Library Type	Carpet R	Floor Grade	Surface Area	Location
over garage	R-19, 16"OC G3 Carpet	0	Above Grade	322.0 ft²	Unconditioned, attached garage

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Framed Floor Library List

Name	Effective R-value
R-19, 16"OC G3 Carpet	18.202

Rim Joist

Name	Library Type	Surface Area	Location
1st floor ambient	R-19 G3, 16"OC	118.0 ft ²	Exposed Exterior
1st floor garage	R-19 G3, 16"OC	34.0 ft ²	Unconditioned, attached garage

Rim Joist Library List

Name	Effective Insulation R-value
R-19 G3, 16"OC	13.20

Wall

Name	Library Type	Surface Color	Surface Area	Location
1st floor ambient	R 19 Adv. Framing G3 16" O.C	Medium	1,163.0 ft ²	Exposed Exterior
1st floor garage	R 19 Adv. Framing G3 16" O.C	Medium	304.0 ft ²	Unconditioned, attached garage
2nd floor ambient	R 19 Adv. Framing G3 16" O.C	Medium	947.0 ft ²	Exposed Exterior
2nd floor attic	R 19 Adv. Framing G3 16" O.C	Medium	475.0 ft ²	Attic

Wall Library List

Name	Effective R-value
R 19 Adv. Framing G3 16" O.C	15.433

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Glazing

Name	Library Type	Wall Assignment	Foundation Wall Assignment	Overhang Depth	Overhang Ft To Top	Overhang Ft To Bottom	Orientation	Surface Area
front 2nd unshaded	35/27	2nd floor ambient		0	0	0	West	36.9 ft ²
front shaded	35/27	1st floor ambient		6	1	7	West	39.0 ft ²
left 2nd unshaded	35/27	2nd floor ambient		0	0	0	North	30.0 ft ²
left unshaded	35/27	1st floor ambient		0	0	0	North	8.0 ft ²
rear unshaded	35/27	1st floor ambient		0	0	0	East	63.0 ft ²
right 2nd unshaded	35/27	2nd floor ambient		0	0	0	South	30.0 ft ²
right unshaded	35/27	1st floor ambient		0	0	0	South	15.0 ft ²

Glazing Library List

Name	Shgc	U-factor
35/27	0.27	0.350

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
attic door	Fiberglass R-5	2nd floor attic		0.9	0.75	Medium	10.0 ft²	Exposed Exterior
front entry	Fiberglass R-5	1st floor ambient		0.9	0.75	Medium	20.0 ft²	Exposed Exterior
garage entry	Fiberglass R-5	1st floor garage		0.9	0.75	Medium	18.0 ft²	Exposed Exterior

Opaque Door Library List

Name	Effective U-factor
Fiberglass R-5	0.200

Roof Insulation

Name	Library Type	Attic Exterior Area [s.f.]	Clay or Concrete Roof Tiles	Surface Color	Surface Area	Location
Attic	R-38 Attic BLOWN FG G1 2x10 24"OC w/ Radiant Barrier	1,162.8	No	Dark	969.0 ft²	Attic
Attic vaulted	R-30 Attic FG VAULTED G1 2x10 w/ Radiant Barrier	858	No	Dark	858.0 ft²	Vaulted Roof

Roof Insulation Library List

Name	Has Radiant Barrier	Effective R-value
R-30 Attic FG VAULTED G1 2x10 w/ Radiant Barrier	Yes	28.227
R-38 Attic BLOWN FG G1 2x10 24"OC w/ Radiant Barrier	Yes	37.246

Whole House Infiltration

Infiltration	Measurement Type	Shelter Class
2015 CFM at 50 Pa	Blower-door tested	4

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Mechanical Ventilation

None Present

Lighting

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

Onsite Generation

None Present

Onsite Generation Library List

None Present

Solar Generation

None Present

Solar Generation Library List

None Present

Conditioning Equipment

Name	Library Type	Heating Percent Load	Cooling Percent Load	Hot Water Percent Load	Location
Air-source heat pump	z 48k 14 Seer 8.2hspf	100%	100%	0%	Unspecified
Water Heating	Z 50 gal. 0.59EF Gas	0%	0%	100%	Unspecified

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Equipment Type: Z 50 gal. 0.59EF Gas

Fuel Type	Natural Gas
Distribution Type	Hydronic Delivery
Hot Water Efficiency	0.59 Energy Factor
Tank Capacity (gal.)	50
Hot Water Capacity [kBtu/h]	40
Recovery Efficiency	0.76

Equipment Type: z 48k 14 Seer 8.2hspf

Fuel Type	Electric
Distribution Type	Forced Air
Motor Type	PSC (Single Speed)
Heating Efficiency	8.2 HSPF
Heating Capacity [kBtu/h]	48
Cooling Efficiency	14 SEER
Cooling Capacity [kBtu/h]	48

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Distribution System

Distribution Type	Forced Air
Heating Equipment	Air-source heat pump
Cooling Equipment	Air-source heat pump
Sq. Feet Served	2452
# Return Grilles	4
Supply Duct R Value	8
Return Duct R Value	8
Supply Duct Area [ft ²]	496.5
Return Duct Area [ft ²]	367.8
Leakage to Outdoors	98 CFM25 (4 / 100 s.f.)
Total Leakage	98 CFM25
Total Leakage Duct Test Conditions	Post-Construction
Use Default Flow Rate	Yes
Duct 1	
Duct Location	Conditioned Space
Percent Supply Area	30
Percent Return Area	30
Duct 2	
Duct Location	Attic (well vented, radiant barrier)
Percent Supply Area	70
Percent Return Area	70
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

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]	90
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

Fuel Type	Electric
Cef	2.617
Field Utilization	Timer Controls

Clothes Washer

Label Energy Rating	151 kWh/Year
Electric Rate	\$0.11/kWh
Annual Gas Cost	\$12.00
Gas Rate	\$1.22/Therm
Capacity	3.31
Imef	2.15474

Appliances and Controls

Programmable thermostat?	Yes
Dishwasher Size	Standard
Dishwasher Efficiency	0.65 EF
Range/Oven Fuel	Electric
Convection Oven?	No
Induction Range?	No
Refrigerator Consumption	700 kWh/Year

Notes

- updated JS 10/08/19
- confirm attic insulation and hvac specs
- ventilation modeled as none
- confirm cfl lighting %
- modeled to worst case orientation