

North Carolina 2018 - R402.1.5 Total UA



SOUTHERN ENERGY
MANAGEMENT
ENERGY EFFICIENCY & SOLAR POWER

Property
, NC 27546
Model: CC 2652
Community: NA

Organization
Southern Energy Manager
Justin Smith

Inspection Status
Results are projected

CC 2652 finished 3rd floor-CZ 4 slab
Template - Caviness & Cates - CC 2652

Builder
Caviness and Cates

Building UA

Elements	NC Reference	As Designed
Ceilings	44.1	39.5
Above-Grade Walls	218.7	177.8
Windows, Doors and Skylights	106.4	86.4
Slab Floor:	63.9	83.0
Framed Floors	23.7	23.7
Foundation Walls	0.0	0.0
Rim Joists	8.8	7.8
Overall UA (Design must be equal or lower):	465.6	418.2

Requirements

✓	402.1.5	Total UA alternative for insulation and fenestration
✓	402.3.2 Glazed Fenestration SHGC	Average SHGC: 0.23 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 10.2%.

Name: Justin Smith
Organization: Southern Energy Management

Signature: Justin Smith
Digitally signed: 1/16/20 at 11:45 AM

Ekotrope RATER - Version 3.2.3.2336

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.

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General Building Information

Number Of Bedrooms	4
Number Of Floors	3
Conditioned Floor Area [sq. ft.]	2,652
Unconditioned, attached garage?	Yes
Conditioned Volume [cu. ft.]	23,148
Total Units in Building	1
Residence Type	Single family detached
Floor Number	-
Model	CC 2652
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	134	On Grade	1	0	966.0 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

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Framed Floor

Name	Library Type	Carpet R	Floor Grade	Surface Area	Location
over ambient	R-19, 16"OC G1 Carpet	0	Above Grade	42.0 ft ²	Exposed Exterior
over garage	R-19, 16"OC G1 Carpet	0	Above Grade	462.0 ft ²	Unconditioned, attached garage

Framed Floor Library List

Name	Effective R-value
R-19, 16"OC G1 Carpet	21.284

Rim Joist

Name	Library Type	Surface Area	Location
1st floor ambient	R 19 G2, 16"OC	112.0 ft ²	Exposed Exterior
1st floor garage	R 19 G2, 16"OC	22.0 ft ²	Unconditioned, attached garage
2nd floor ambient	R 19 G2, 16"OC	25.0 ft ²	Exposed Exterior

Rim Joist Library List

Name	Effective Insulation R-value
R 19 G2, 16"OC	15.40

Wall

Name	Library Type	Surface Color	Surface Area	Location
1st floor ambient	R 19 FG G2 16" O.C	Medium	1,008.0 ft ²	Exposed Exterior
1st floor garage	R 19 FG G2 16" O.C	Medium	198.0 ft ²	Unconditioned, attached garage
2nd floor ambient	R 19 FG G2 16" O.C	Medium	951.0 ft ²	Exposed Exterior

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Name	Library Type	Surface Color	Surface Area	Location
2nd floor attic	R 19 FG G2 16" O.C	Medium	265.0 ft ²	Attic
3rd floor ambient	R 19 FG G2 16" O.C	Medium	200.0 ft ²	Exposed Exterior
3rd floor attic	R 19 FG G2 16" O.C	Medium	522.0 ft ²	Attic

Wall Library List

Name	Effective R-value
R 19 FG G2 16" O.C	15.977

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	30/23	2nd floor ambient		0	0	0	East	75.0 ft ²
front shaded	30/23	1st floor ambient		6	1	9	East	47.0 ft ²
left 2nd unshaded	30/23	2nd floor ambient		0	0	0	South	15.0 ft ²
left 3rd unshaded	30/23	3rd floor ambient		0	0	0	South	15.0 ft ²
rear 2nd unshaded	30/23	2nd floor ambient		0	0	0	West	6.0 ft ²
rear unshaded	30/23	1st floor ambient		0	0	0	West	30.0 ft ²
right 2nd unshaded	30/23	2nd floor ambient		0	0	0	North	16.0 ft ²
right 3rd unshaded	30/23	3rd floor ambient		0	0	0	North	15.0 ft ²
right shaded	30/23	1st floor ambient		12	2	9	North	36.9 ft ²

Glazing Library List

Name	Shgc	U-factor
30/23	0.23	0.300

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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
attic doors	Fiberglass R-5	3rd floor attic		0.9	0.75	Medium	10.0 ft ²	Exposed Exterior
front entry	Fiberglass R-5	1st floor ambient		0.9	0.75	Medium	20.0 ft ²	Exposed Exterior
garage entry	Fiberglass R-5	1st floor garage		0.9	0.75	Medium	18.0 ft ²	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	2,160.9		No	Dark	1,470.0 ft ²	Attic

Roof Insulation Library List

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

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Whole House Infiltration

Infiltration	Measurement Type	Shelter Class
1851 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	75	0	0	0	0

Onsite Generation

None Present

Onsite Generation Library List

None Present

Solar Generation

None Present

Solar Generation Library List

None Present

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Conditioning Equipment

Name	Library Type	Heating Percent Load	Cooling Percent Load	Hot Water Percent Load	Location
Air-source heat pump (1)	z 36k 13 Seer 7.7hspf	100%	100%	0%	Unspecified
Water Heating (2)	Z 50 gal. 0.91EF elec	0%	0%	100%	Unspecified

Equipment Type: Z 50 gal. 0.91EF elec

Fuel Type	Electric
Distribution Type	Hydronic Delivery
Hot Water Efficiency	0.91 Energy Factor
Tank Capacity (gal.)	50
Hot Water Capacity [kBtu/h]	40
Recovery Efficiency	0.98

Equipment Type: z 36k 13 Seer 7.7hspf

Fuel Type	Electric
Distribution Type	Forced Air Ductless
Motor Type	PSC (Single Speed)
Heating Efficiency	7.7 HSPF
Heating Capacity [kBtu/h]	22
Cooling Efficiency	13 SEER
Cooling Capacity [kBtu/h]	36

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Distribution System

Distribution Type	Forced Air
Heating Equipment	Air-source heat pump (1)
Cooling Equipment	Air-source heat pump (1)
Sq. Feet Served	2652
# Return Grilles	4
Supply Duct R Value	8
Return Duct R Value	8
Supply Duct Area [ft ²]	537
Return Duct Area [ft ²]	397.8
Leakage to Outdoors	106 CFM @ 25Pa (4 / 100 s.f.)
Total Leakage	106 CFM25
Total Leakage Duct Test Conditions	Post-Construction
Use Default Flow Rate	Yes
Duct 1	
Duct Location	Conditioned Space
Percent Supply Area	25
Percent Return Area	25
Duct 2	
Duct Location	Attic (well vented, radiant barrier)
Percent Supply Area	75
Percent Return Area	75
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]	89
At Least R3 Pipe Insulation?	No
Hot Water Recirculation System?	No
Recirculation System Pipe Loop Length [ft]	30
Drain Water Heat Recovery?	No

Clothes Dryer

Fuel Type	Electric
Cef	2.62
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	2.155

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	691 kWh/Year

Notes

Initial Inputs _____ JS 7/3/13 _____
updated JS 09/30/19

- confirm HVAC specs
- modeled to worst case orientation