

# North Carolina 2018 - R402.1.5 Total UA



**Property**  
 , NC 27546  
 Model: Cardinal

**Organization**  
 Southern Energy Manager  
 Justin Smith

**Inspection Status**  
 Results are projected

Template - A & G - Cardinal plan  
 slab CZ 4 - ecoSelect  
 Cardinal plan slab

**Builder**  
 A & G

## Building UA

Elements	NC Reference	As Designed
Ceilings	39.7	35.5
Above-Grade Walls	166.2	129.2
Windows, Doors and Skylights	101.5	95.8
Slab Floor:	61.0	79.1
Framed Floors	19.2	19.2
Foundation Walls	0.0	0.0
Rim Joists	7.1	5.7
<b>Overall UA (Design must be equal or lower):</b>	<b>394.7</b>	<b>364.5</b>

## Requirements

✓	402.1.5	Total UA alternative compliance passes by 7.7%.
✓	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 7.7%.**

Name: Justin Smith

Signature: Justin Smith

Organization: Southern Energy Management

Digitally signed: 3/20/20 at 3:27 PM

### Ekotrope RATER - Version 3.2.3.2389

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	4
Number Of Floors	2
Conditioned Floor Area [sq. ft.]	2,235
Unconditioned, attached garage?	Yes
Conditioned Volume [cu. ft.]	19,706
Total Units in Building	1
Residence Type	Single family detached
Floor Number	-
Model	Cardinal
Community	
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	128	On Grade	1	0	913.0 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	21.0 ft <sup>2</sup>	Exposed Exterior
over garage	R-19, 16"OC G1 Carpet	0	Above Grade	388.0 ft <sup>2</sup>	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 G1, 16"OC	103.0 ft <sup>2</sup>	Exposed Exterior
1st floor garage	R 19 G1, 16"OC	25.0 ft <sup>2</sup>	Unconditioned, attached garage

## Rim Joist Library List

Name	Effective Insulation R-value
R 19 G1, 16"OC	17.30

## Wall

Name	Library Type	Surface Color	Surface Area	Location
1st floor ambient	R 19 Adv. Framing G2 16" O.C	Medium	928.0 ft <sup>2</sup>	Exposed Exterior
1st floor garage	R 19 Adv. Framing G2 16" O.C	Medium	224.0 ft <sup>2</sup>	Unconditioned, attached garage
2nd floor ambient	R 19 Adv. Framing G2 16" O.C	Medium	1,296.0 ft <sup>2</sup>	Exposed Exterior

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## Wall Library List

Name	Effective R-value
R 19 Adv. Framing G2 16" O.C	16.703

## 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	East	75.0 ft <sup>2</sup>
front shaded	35/27	1st floor ambient		6	1	7	East	39.0 ft <sup>2</sup>
left 2nd unshaded	35/27	2nd floor ambient		0	0	0	South	15.0 ft <sup>2</sup>
rear 2nd unshaded	35/27	2nd floor ambient		0	0	0	West	30.0 ft <sup>2</sup>
rear unshaded	35/27	1st floor ambient		0	0	0	West	66.0 ft <sup>2</sup>
right 2nd unshaded	35/27	2nd floor ambient		0	0	0	North	12.0 ft <sup>2</sup>
right unshaded	35/27	1st floor ambient		0	0	0	North	15.0 ft <sup>2</sup>

## 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
front door	Fiberglass R-5	1st floor ambient		0.9	0.75	Medium	20.0 ft <sup>2</sup>	Exposed Exterior
garage door	Fiberglass R-5	1st floor garage		0.9	0.75	Medium	18.0 ft <sup>2</sup>	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	1,943.34		No	Dark	1,322.0 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 w/ Radiant Barrier	Yes	37.246

## Whole House Infiltration

Infiltration	Measurement Type	Shelter Class
1576 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	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
Water Heating	Z 50 gal. 0.91EF elec	0%	0%	100%	Unspecified
whole house heat pump	z 36k 14 seer 8.2hspf	100%	100%	0%	Unspecified

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## Equipment Type: Z 50 gal. 0.91EF elec

Fuel Type	Electric
Distribution Type	Hydronic Delivery (Radiant)
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 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]	36
Use default Supplemental Heat	Yes
Cooling Efficiency	14 SEER
Cooling Capacity [kBtu/h]	36

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## Distribution System

Distribution Type	Forced Air
Heating Equipment	whole house heat pump
Cooling Equipment	whole house heat pump
Sq. Feet Served	2235
# Return Grilles	3
Supply Duct R Value	8
Return Duct R Value	8
Supply Duct Area [ft <sup>2</sup> ]	603.45
Return Duct Area [ft <sup>2</sup> ]	335.25
Leakage to Outdoors	89 CFM @ 25Pa (3.98 / 100 s.f.)
Total Leakage	89 CFM25
Total Leakage Duct Test Conditions	Post-Construction
Use Default Flow Rate	Yes
Duct 1	
Duct Location	Attic (well vented, radiant barrier)
Percent Supply Area	70
Percent Return Area	70
Duct 2	
Duct Location	Conditioned Space
Percent Supply Area	30
Percent Return Area	30
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

## Water Distribution

Water Fixture Type	Standard
Use Default Hot Water Pipe Length	No
Hot Water Pipe Length [ft]	69
At Least R3 Pipe Insulation?	No
Hot Water Recirculation System?	No
Recirculation System Pipe Loop Length [ft]	10
Drain Water Heat Recovery?	No



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## 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 03/20/20
- uninsulated slab modeled
- wall insulation modeled to Grade 3
- confirm attic insulation and hvac specs
- ventilation modeled as none
- confirm cfl lighting %
- modeled to worst case orientation