

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
Overall UA (Design must be equal or lower):	394.7	364.5

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
 Organization: Southern Energy Management

Signature: Justin Smith
 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

Property
. NC 27546
Model: Cardinal

Organization
Southern Energy Management
Justin Smith

Inspection Status
Results are projected

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

Builder
A & G

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

Building Summary



Property
 , NC 27546
 Model: Cardinal

Organization
 Southern Energy Management
 Justin Smith

Inspection Status
 Results are projected

SOUTHERN ENERGY
MANAGEMENT
 ENERGY EFFICIENCY & SOLAR POWER

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

Builder
 A & G

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 ²	Exposed Exterior
over garage	R-19, 16"OC G1 Carpet	0	Above Grade	388.0 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 G1, 16"OC	103.0 ft ²	Exposed Exterior
1st floor garage	R 19 G1, 16"OC	25.0 ft ²	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 ²	Exposed Exterior
1st floor garage	R 19 Adv. Framing G2 16" O.C	Medium	224.0 ft ²	Unconditioned, attached garage
2nd floor ambient	R 19 Adv. Framing G2 16" O.C	Medium	1,296.0 ft ²	Exposed Exterior

Building Summary



Property
 , NC 27546
 Model: Cardinal

Organization
 Southern Energy Management
 Justin Smith

Inspection Status
 Results are projected

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

Builder
 A & G

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

Building Summary



Property
 , NC 27546
 Model: Cardinal

Organization
 Southern Energy Management
 Justin Smith

Inspection Status
 Results are projected

**SOUTHERN ENERGY
 MANAGEMENT**
 ENERGY EFFICIENCY & SOLAR POWER

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

Builder
 A & G

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 ²	Exposed Exterior
garage door	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	1,943.34		No	Dark	1,322.0 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

Whole House Infiltration

Infiltration	Measurement Type	Shelter Class
1576 CFM at 50 Pa	Blower-door tested	4

Mechanical Ventilation

None Present

Building Summary



Property
 , NC 27546
 Model: Cardinal

Organization
 Southern Energy Management
 Justin Smith

Inspection Status
 Results are projected

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

Builder
 A & G

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

Building Summary

Property
NC 27546
Model: Cardinal

Organization
Southern Energy Management
Justin Smith

Inspection Status
Results are projected



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

Builder
A & G

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

Building Summary

Property
 , NC 27546
 Model: Cardinal

Organization
 Southern Energy Management
 Justin Smith

Inspection Status
 Results are projected



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

Builder
 A & G

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 ²]	603.45
Return Duct Area [ft ²]	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

Building Summary



Property
NC 27546
Model: Cardinal

Organization
Southern Energy Management
Justin Smith

Inspection Status
Results are projected

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

Builder
A & G

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