

North Carolina 2018 - R402.1.5 Total UA



Property

, NC 27546
 Model: Granville 2680
 Community: NA

Organization

Southern Energy Manager
 Justin Smith

Inspection Status

Results are projected

Builder

Caviness and Cates

CC 2680-CZ 4 slab

Template - Caviness & Cates - CC 26

Building UA

Elements	NC Reference	As Designed
Ceilings	49.7	44.5
Above-Grade Walls	179.8	146.1
Windows, Doors and Skylights	135.5	111.3
Slab Floor:	86.7	113.3
Framed Floors	4.7	4.7
Foundation Walls	0.0	0.0
Rim Joists	7.2	6.4
Overall UA (Design must be equal or lower):	463.6	426.3

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 8%.

Name: Justin Smith
 Organization: Southern Energy Management

Signature: Justin Smith
 Digitally signed: 1/16/20 at 11:43 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.

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.]	2,692
Unconditioned, attached garage?	Yes
Conditioned Volume [cu. ft.]	24,650
Total Units in Building	1
Residence Type	Single family detached
Floor Number	-
Model	Granville 2680
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	178	On Grade	1	0	1,557.0 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 G1 Carpet	0	Above Grade	101.0 ft²	Unconditioned, attached garage

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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	99.0 ft ²	Exposed Exterior
1st floor garage	R 19 G2, 16"OC	31.0 ft ²	Unconditioned, attached garage

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	1,327.0 ft ²	Exposed Exterior
1st floor garage	R 19 FG G2 16" O.C	Medium	275.0 ft ²	Unconditioned, attached garage
2nd floor ambient	R 19 FG G2 16" O.C	Medium	793.0 ft ²	Exposed Exterior
2nd floor attic	R 19 FG G2 16" O.C	Medium	327.0 ft ²	Attic

Wall Library List

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

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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	30/23	2nd floor ambient		0	0	0	East	27.0 ft ²
front shaded	30/23	1st floor ambient		5	1	6	East	47.0 ft ²
left unshaded	30/23	1st floor ambient		0	0	0	South	45.0 ft ²
rear 2nd unshaded	30/23	2nd floor ambient		0	0	0	West	45.0 ft ²
rear shaded	30/23	1st floor ambient		10	2	9	West	48.0 ft ²
rear unshaded	30/23	1st floor ambient		0	0	0	West	60.0 ft ²
right 2nd unshaded	30/23	2nd floor ambient		0	0	0	North	36.0 ft ²
right unshaded	30/23	1st floor ambient		0	0	0	North	31.0 ft ²

Glazing Library List

Name	Shgc	U-factor
30/23	0.23	0.300

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	2,437.26	No	Dark	1,658.0 ft²	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
1972 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	100	0	100	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 (1)	z 36k 13 Seer 7.7hspf	100%	100%	0%	Unspecified
Water Heating (2)	Z 50 gal. 0.91EF elec	0%	0%	100%	Unspecified

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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	2692
# Return Grilles	2
Supply Duct R Value	8
Return Duct R Value	8
Supply Duct Area [ft ²]	545.1
Return Duct Area [ft ²]	201.9
Leakage to Outdoors	107 CFM @ 25Pa (3.97 / 100 s.f.)
Total Leakage	107 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]	93
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	2.62
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 8/13/13 _____
updated JS 09/30/19

- slab insulation included
- confirm HVAC specs
- modeled to worst case orientation