

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

Signature: Justin Smith

Organization: Southern Energy Management

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 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 | 2,437.26 | No | Dark | 1,658.0 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 |
|-------------------|--------------------|---------------|
| 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