

North Carolina 2018 - R402.1.5 Total UA



Property
 , NC 27614
 Model: Hampton
 Community: NA

Organization
 Southern Energy Manager
 Justin Smith

Inspection Status
 Results are projected

Hampton base plan slab
 Template - A & G - Hampton base plk

Builder
 A & G

Building UA

| Elements | NC Reference | As Designed |
|--|--------------|--------------|
| Ceilings | 33.4 | 29.9 |
| Above-Grade Walls | 156.5 | 131.7 |
| Windows, Doors and Skylights | 97.7 | 92.0 |
| Slab Floor: | 74.6 | 95.8 |
| Framed Floors | 11.7 | 13.7 |
| Foundation Walls | 0.0 | 0.0 |
| Rim Joists | 7.6 | 7.5 |
| Overall UA (Design must be equal or lower): | 381.5 | 370.6 |

Requirements

| | | |
|---|----------------------------------|--|
| ✓ | 402.1.5 | Total UA alternative for insulation and fenestration |
| ✓ | 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 2.9%.

Name: Justin Smith
 Organization: Southern Energy Management

Signature: Justin Smith
 Digitally signed: 10/10/19 at 2:16 PM

Ekotrope RATER - Version 3.1.1.2271

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 | 3 |
| Number Of Floors | 2 |
| Conditioned Floor Area [sq. ft.] | 1,981 |
| Unconditioned, attached garage? | Yes |
| Conditioned Volume [cu. ft.] | 17,580 |
| Total Units in Building | 1 |
| Residence Type | Single family detached |
| Floor Number | - |
| Model | Hampton |
| 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 | 163 | On Grade | 1 | 0 | 866.0 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 G3 Carpet | 0 | Above Grade | 249.0 ft² | Unconditioned, attached garage |

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Framed Floor Library List

| Name | Effective R-value |
|-----------------------|-------------------|
| R-19, 16"OC G3 Carpet | 18.202 |

Rim Joist

| Name | Library Type | Surface Area | Location |
|-------------------|----------------|-----------------------|--------------------------------|
| 1st floor ambient | R-19 G3, 16"OC | 103.0 ft ² | Exposed Exterior |
| 1st floor garage | R-19 G3, 16"OC | 33.0 ft ² | Unconditioned, attached garage |

Rim Joist Library List

| Name | Effective Insulation R-value |
|----------------|------------------------------|
| R-19 G3, 16"OC | 13.20 |

Wall

| Name | Library Type | Surface Color | Surface Area | Location |
|-------------------|------------------------------|---------------|-------------------------|--------------------------------|
| 1st floor ambient | R 19 Adv. Framing G3 16" O.C | Medium | 930.0 ft ² | Exposed Exterior |
| 1st floor garage | R 19 Adv. Framing G3 16" O.C | Medium | 294.0 ft ² | Unconditioned, attached garage |
| 2nd floor ambient | R 19 Adv. Framing G3 16" O.C | Medium | 1,088.0 ft ² | Exposed Exterior |

Wall Library List

| Name | Effective R-value |
|------------------------------|-------------------|
| R 19 Adv. Framing G3 16" O.C | 15.433 |

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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 | 35/27 | 2nd floor ambient | | 0 | 0 | 0 | Southeast | 41.3 ft ² |
| front shaded | 35/27 | 1st floor ambient | | 5 | 1 | 5 | Southeast | 18.4 ft ² |
| left 2nd unshaded | 35/27 | 2nd floor ambient | | 0 | 0 | 0 | Southwest | 19.8 ft ² |
| left unshaded | 35/27 | 1st floor ambient | | 0 | 0 | 0 | Southwest | 27.5 ft ² |
| rear 2nd unshaded | 35/27 | 2nd floor ambient | | 0 | 0 | 0 | Northwest | 41.3 ft ² |
| rear unshaded | 35/27 | 1st floor ambient | | 0 | 0 | 0 | Northwest | 45.5 ft ² |
| right 2nd unshaded | 35/27 | 2nd floor ambient | | 0 | 0 | 0 | Northeast | 19.8 ft ² |
| right unshaded | 35/27 | 1st floor ambient | | 0 | 0 | 0 | Northeast | 27.5 ft ² |

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 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 | 1,639.05 | No | Dark | 1,115.0 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 |
|-------------------|--------------------|---------------|
| 1406 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 |
|---------------------------------|-------------------------|---------------------------------|-------------------------|-------------------------------|-----------------------|
| 75 | 0 | 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 |
|----------------------|-----------------------|----------------------|----------------------|------------------------|-------------|
| Air-source heat pump | z 48k 14 Seer 8.2hspf | 100% | 100% | 0% | Unspecified |
| Water Heating | Z 50 gal. 0.59EF Gas | 0% | 0% | 100% | Unspecified |

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Equipment Type: Z 50 gal. 0.59EF Gas

| | |
|-----------------------------|--------------------|
| Fuel Type | Natural Gas |
| Distribution Type | Hydronic Delivery |
| Hot Water Efficiency | 0.59 Energy Factor |
| Tank Capacity (gal.) | 50 |
| Hot Water Capacity [kBtu/h] | 40 |
| Recovery Efficiency | 0.76 |

Equipment Type: z 48k 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] | 48 |
| Cooling Efficiency | 14 SEER |
| Cooling Capacity [kBtu/h] | 48 |

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Distribution System

| | |
|-------------------------------------|--------------------------------------|
| Distribution Type | Forced Air |
| Heating Equipment | Air-source heat pump |
| Cooling Equipment | Air-source heat pump |
| Sq. Feet Served | 1981 |
| # Return Grilles | 3 |
| Supply Duct R Value | 8 |
| Return Duct R Value | 8 |
| Supply Duct Area [ft ²] | 534.87 |
| Return Duct Area [ft ²] | 297.15 |
| Leakage to Outdoors | 79 CFM @ 25Pa (3.99 / 100 s.f.) |
| Total Leakage | 79 CFM25 |
| Total Leakage Duct Test Conditions | Post-Construction |
| Use Default Flow Rate | Yes |
| Duct 1 | |
| Duct Location | Conditioned Space |
| Percent Supply Area | 30 |
| Percent Return Area | 30 |
| Duct 2 | |
| Duct Location | Attic (well vented, radiant barrier) |
| Percent Supply Area | 70 |
| Percent Return Area | 70 |
| 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] | 68 |
| 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 | 2.617 |
| 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 10/10/19
- 9 ft ceilings 1st floor, 8 ft ceilings 2nd floor
- confirm attic insulation and hvac specs
- ventilation modeled as none
- confirm cfl lighting %
- modeled to worst case orientation