

North Carolina 2018 - R402.1.5 Total UA



Property
 Fayetteville, NC 28301
 Model: Florence
 Community: NA

Organization
 Southern Energy Manager
 Sara Caliendo

Inspection Status
 Results are projected

Florence base plan slab
 Template - H & H - Fayetteville - Flor

Builder
 H&H Homes

Building UA

| Elements | NC Reference | As Designed |
|--|--------------|--------------|
| Ceilings | 55.7 | 53.5 |
| Above-Grade Walls | 203.4 | 171.1 |
| Windows, Doors and Skylights | 109.9 | 98.6 |
| Slab Floor: | 81.7 | 106.7 |
| Framed Floors | 16.1 | 18.8 |
| Foundation Walls | 0.0 | 0.0 |
| Rim Joists | 9.3 | 9.2 |
| Overall UA (Design must be equal or lower): | 476.1 | 457.9 |

Requirements

| | | |
|---|----------------------------------|---|
| ✓ | 402.1.5 | Total UA alternative for insulation and fenestration |
| ✓ | 402.3.2 Glazed Fenestration SHGC | Average SHGC: 0.20; 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 3.8%.

Name: Sara Caliendo

Signature: *Sara Caliendo*

Organization: Southern Energy Management

Digitally signed: 8/22/19 at 3:46 PM

Ekotrope RATER - Version 3.1.1.2237

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
Fayetteville, NC 28301
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General Building Information

| | |
|----------------------------------|------------------------|
| Number Of Bedrooms | 4 |
| Number Of Floors | 2 |
| Conditioned Floor Area [sq. ft.] | 3,212 |
| Unconditioned, attached garage? | Yes |
| Conditioned Volume [cu. ft.] | 28,586 |
| Total Units in Building | 1 |
| Residence Type | Single family detached |
| Floor Number | - |
| Model | Florence |
| 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 | 168 | On Grade | 1 | 0 | 1,445.0 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 | 342.0 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 | 133.0 ft² | Exposed Exterior |
| 1st floor garage | R-19 G3, 16"OC | 35.0 ft² | 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 | 1,199.0 ft² | Exposed Exterior |
| 1st floor garage | R 19 Adv. Framing G3 16" O.C | Medium | 313.0 ft² | Unconditioned, attached garage |
| 2nd floor ambient | R 19 Adv. Framing G3 16" O.C | Medium | 1,236.0 ft² | Exposed Exterior |
| 2nd floor attic | R 19 Adv. Framing G3 16" O.C | Medium | 207.0 ft² | Attic |

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 | 33/20 | 2nd floor ambient | | 0 | 0 | 0 | East | 36.9 ft ² |
| front shaded | 33/20 | 1st floor ambient | | 6 | 1 | 7 | East | 39.0 ft ² |
| left 2nd unshaded | 33/20 | 2nd floor ambient | | 0 | 0 | 0 | South | 36.0 ft ² |
| left unshaded | 33/20 | 1st floor ambient | | 0 | 0 | 0 | South | 3.0 ft ² |
| rear 2nd unshaded | 33/20 | 2nd floor ambient | | 0 | 0 | 0 | West | 38.0 ft ² |
| rear unshaded | 33/20 | 1st floor ambient | | 0 | 0 | 0 | West | 63.0 ft ² |
| right 2nd unshaded | 33/20 | 2nd floor ambient | | 0 | 0 | 0 | North | 30.0 ft ² |
| right unshaded | 33/20 | 1st floor ambient | | 0 | 0 | 0 | North | 30.0 ft ² |

Glazing Library List

| Name | Shgc | U-factor |
|-------|------|----------|
| 33/20 | 0.2 | 0.330 |

Skylight

None Present

Skylight Library List

None Present

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Opaque Door

| Name | Library Type | Wall Assignment | Foundation Wall Assignment | Emittance | Solar Absorbance | 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 NO Radiant Barrier | 1,725.6 | No | Dark | 1,438.0 ft² | Attic |
| Attic vaulted | R-30 Attic FG VAULTED G1 2x10 w/ Radiant Barrier | 419 | No | Dark | 419.0 ft² | Vaulted Roof |

Roof Insulation Library List

| Name | Has Radiant Barrier | Effective R-value |
|--|---------------------|-------------------|
| R-30 Attic FG VAULTED G1 2x10 w/ Radiant Barrier | Yes | 28.227 |
| R-38 Attic BLOWN FG G1 2x10 24"OC NO Radiant Barrier | No | 37.246 |

Whole House Infiltration

| Infiltration | Measurement Type | Shelter Class |
|-------------------|--------------------|---------------|
| 2286 CFM at 50 Pa | Blower-door tested | 4 |

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Mechanical Ventilation

None Present

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 |
|-----------------------|-----------------------|----------------------|----------------------|------------------------|-------------|
| Water Heating | Z 50 gal. 0.59EF Gas | 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. 0.59EF 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 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 |
| 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 | 3212 |
| # Return Grilles | 4 |
| Supply Duct R Value | 8 |
| Return Duct R Value | 8 |
| Supply Duct Area [ft ²] | 867.24 |
| Return Duct Area [ft ²] | 642.4 |
| Leakage to Outdoors | 128 CFM25 (3.99 / 100 s.f.) |
| Total Leakage | 128 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 |

Water Distribution

| | |
|--|----------|
| Water Fixture Type | Standard |
| Use Default Hot Water Pipe Length | No |
| Hot Water Pipe Length [ft] | 100 |
| At Least R3 Pipe Insulation? | No |
| Hot Water Recirculation System? | No |
| Recirculation System Pipe Loop Length [ft] | 20 |
| 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 7/25/18
- confirm attic insulation and hvac specs
- ventilation modeled as none
- confirm cfl lighting %
- modeled to worst case orientation