

North Carolina 2018 - R402.1.5 Total UA



Property
 , NC 27546
 Model: Prelude

Organization
 Southern Energy Manager
 Sara Caliendo

Inspection Status
 Results are projected

Prelude plan slab
 Template - H & H Homes - Fayettevil

Builder
 H&H Homes

Building UA

| Elements | NC Reference | As Designed |
|--|--------------|--------------|
| Ceilings | 43.4 | 38.8 |
| Above-Grade Walls | 178.9 | 156.1 |
| Windows, Doors and Skylights | 130.3 | 124.6 |
| Slab Floor: | 74.5 | 96.5 |
| Framed Floors | 19.1 | 22.3 |
| Foundation Walls | 0.0 | 0.0 |
| Rim Joists | 8.8 | 6.6 |
| Overall UA (Design must be equal or lower): | 455.0 | 444.9 |

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 2.2%.

Name: Sara Caliendo

Signature: *Sara Caliendo*

Organization: Southern Energy Management

Digitally signed: 10/1/19 at 3:08 PM

Ekotrope RATER - Version 3.1.0.2265

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.

Fuel Summary



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

Prelude plan slab
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Annual Energy Cost

| | |
|----------|---------|
| Electric | \$1,975 |
|----------|---------|

Annual End-Use Cost

| | |
|---------------------|---------|
| Heating | \$605 |
| Cooling | \$219 |
| Water Heating | \$289 |
| Lights & Appliances | \$693 |
| Onsite Generation | -\$0 |
| Service Charges | \$168 |
| Total | \$1,975 |

Annual End-Use Consumption

| | |
|------------------------------------|----------|
| Heating [Electric kWh] | 5,817.3 |
| Cooling [Electric kWh] | 2,050.6 |
| Hot Water [Electric kWh] | 2,751.3 |
| Lights & Appliances [Electric kWh] | 6,575.0 |
| Total [Electric kWh] | 17,194.3 |
| Total Onsite Generation kWh | 0.0 |

Peak Electric Consumption

| | |
|----------------|------|
| Peak Winter kW | 4.28 |
| Peak Summer kW | 2.56 |

Utility Rates

| | |
|-------------|----------------------|
| Electricity | Duke-Progress 2019 |
| Natural Gas | PSNC - Dominion 2019 |

Building Summary



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General Building Information

| | |
|----------------------------------|------------------------|
| Number Of Bedrooms | 4 |
| Number Of Floors | 2 |
| Conditioned Floor Area [sq. ft.] | 2,435 |
| Unconditioned, attached garage? | No |
| Conditioned Volume [cu. ft.] | 21,560 |
| Total Units in Building | 1 |
| Residence Type | Single family detached |
| Floor Number | - |
| Model | Prelude |
| 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 | 158 | On Grade | 1 | 0 | 1,040.0 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 |

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Framed Floor

| Name | Library Type | Carpet R | Floor Grade | Surface Area | Location |
|--------------|-------------------------|----------|-------------|-----------------------|--------------------------------|
| over ambient | R-19, 16"OC G3 Hardwood | 0 | Above Grade | 12.0 ft ² | Exposed Exterior |
| over garage | R-19, 16"OC G3 Carpet | 0 | Above Grade | 394.0 ft ² | Unconditioned, attached garage |

Framed Floor Library List

| Name | Effective R-value |
|-------------------------|-------------------|
| R-19, 16"OC G3 Carpet | 18.202 |
| R-19, 16"OC G3 Hardwood | 17.37 |

Rim Joist

| Name | Library Type | Surface Area | Location |
|-------------------|--------------|-----------------------|--------------------------------|
| 1st floor ambient | R 19.0 | 122.0 ft ² | Exposed Exterior |
| 1st floor garage | R 19.0 | 36.0 ft ² | Unconditioned, attached garage |

Rim Joist Library List

| Name | Effective Insulation R-value |
|--------|------------------------------|
| R 19.0 | 19.00 |

Wall

| Name | Library Type | Surface Color | Surface Area | Location |
|-------------------|--------------------|---------------|-------------------------|--------------------------------|
| 1st floor ambient | R 19 FG G3 16" O.C | Medium | 1,099.0 ft ² | Exposed Exterior |
| 1st floor garage | R 19 FG G3 16" O.C | Medium | 324.0 ft ² | Unconditioned, attached garage |
| 2nd floor ambient | R 19 FG G3 16" O.C | Medium | 1,272.0 ft ² | Exposed Exterior |

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Wall Library List

| Name | Effective R-value |
|--------------------|-------------------|
| R 19 FG G3 16" O.C | 14.878 |

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 | West | 60.0 ft² |
| front unshaded | 35/27 | 1st floor ambient | | 0 | 0 | 0 | West | 30.0 ft² |
| left 2nd unshaded | 35/27 | 2nd floor ambient | | 0 | 0 | 0 | North | 45.0 ft² |
| left unshaded | 35/27 | 1st floor ambient | | 0 | 0 | 0 | North | 15.0 ft² |
| rear 2nd unshaded | 35/27 | 2nd floor ambient | | 0 | 0 | 0 | East | 38.0 ft² |
| rear unshaded | 35/27 | 1st floor ambient | | 0 | 0 | 0 | East | 100.2 ft² |
| right 2nd unshaded | 35/27 | 2nd floor ambient | | 0 | 0 | 0 | South | 46.0 ft² |

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 door | Fiberglass R-5 | 1st floor ambient | | 0.9 | 0.75 | Medium | 20.0 ft² | Exposed Exterior |
| garage door | 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 | 1,446 | | No | Dark | 1,446.0 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 |
|-------------------|--------------------|---------------|
| 1724 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 |
|-----------------------|-----------------------|----------------------|----------------------|------------------------|-------------|
| Water Heating | Z 50 gal. 0.91EF elec | 0% | 0% | 100% | Unspecified |
| whole house heat pump | z 36k 14 seer 8.0hspf | 100% | 100% | 0% | 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 14 seer 8.0hspf

| | |
|---------------------------|--------------------|
| Fuel Type | Electric |
| Distribution Type | Forced Air |
| Motor Type | PSC (Single Speed) |
| Heating Efficiency | 8 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 | 2435 |
| # Return Grilles | 4 |
| Supply Duct R Value | 8 |
| Return Duct R Value | 8 |
| Supply Duct Area [ft ²] | 657.45 |
| Return Duct Area [ft ²] | 487 |
| Leakage to Outdoors | 97 CFM25 (3.98 / 100 s.f.) |
| Total Leakage | 97 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] | 65 |
| At Least R3 Pipe Insulation? | No |
| Hot Water Recirculation System? | No |
| Recirculation System Pipe Loop Length [ft] | 10 |
| 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 | 2.155 |

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 | 700 kWh/Year |

Notes

- updated JS 01/29/18
- insulated 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