

North Carolina 2018 - R402.1.5 Total UA



Property

Bunnlevel, NC 28323

Organization

Southern Energy Management
Justin Smith

Inspection Status

Results are projected

Template - OnSite Homes - Stedman Resi
Stedman Residence slab

Builder

OnSite Homes

This report is based on a proposed design and does not confirm field enforcement of design elements.

Building UA

| Elements | NC Reference | As Designed |
|--|--------------|--------------|
| Ceilings | 37.5 | 34.0 |
| Above-Grade Walls | 185.3 | 143.2 |
| Windows, Doors and Skylights | 86.1 | 80.4 |
| Slab Floor: | 74.8 | 97.3 |
| Framed Floors | 0.0 | 0.0 |
| Foundation Walls | 0.0 | 0.0 |
| Rim Joists | 8.7 | 7.0 |
| Overall UA (Design must be equal or lower): | 392.4 | 361.9 |

Requirements

| | | | |
|---|---------------------|---|---|
| ✓ | R402.1.5 | Total UA alternative compliance passes by 7.8%. | The proposed home meets the UA requirement by 7.8% |
| ✓ | R402.3.2 | Average SHGC: 0.27 Max SHGC: 0.30 | Average SHGC of 0.27 is greater than the maximum of 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 | Area-weighted average fenestration SHGC is 0.27. The maximum allowed value is [No Limit]. |
| ✓ | R402.5 | Area-weighted average fenestration U-Factor | |
| ✓ | R404.1 | Lighting Equipment | At least 75.0% of fixtures shall be high-efficacy lamps, currently 100.0% are high-efficacy. |
| ✓ | Mandatory Checklist | Mandatory code requirements that are not checked by Ekotrope must be met. | 2015 IECC Mandatory Checklist must be checked as complete. |
| ✓ | R403.3.1 | Duct Insulation | Duct insulation meets the requirements specified in North Carolina 2018 Code Section 403.3.1. |
| ✓ | 403.3.3 | Duct Testing | |

Design exceeds requirements for North Carolina 2018 Prescriptive compliance by 7.8%.

Name: Justin Smith
Organization: Southern Energy Management

Signature: *Justin Smith*
Digitally signed: 6/20/24 at 1:47 PM

Ekotrope RATER - Version 4.1.2.3422

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 | 4 |
| Number Of Floors | 2 |
| Conditioned Floor Area [sq. ft.] | 2,085 |
| Has Electric Vehicle Ready Space | No |
| Unconditioned, attached garage? | Yes |
| Conditioned Volume [cu. ft.] | 21,514 |
| Total Units in Building | 1 |
| Residence Type | Single family detached |
| Number of Floors in Building | - |
| Floor Number | - |
| Model | |
| Community | |
| RESNET/IECC 2006-2018 Climate Zone | 4A |
| IECC 2021 Climate Zone | 3A |

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 | 156 | On Grade | 1 | 0 | 1,177.0 ft ² | 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 | Perimeter Insulation Is Exterior | Thermal Break | Effective R-value |
|-------------|------------------------|----------------------------|---------------------------------|---------------------------------|------------------------------|----------------------------------|---------------|-------------------|
| Uninsulated | Wood Frame / Other | No | 0 | 0 | 0 | No | No | 0.00 |

Framed Floor

None Present

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MANAGEMENT**
ENERGY EFFICIENCY & SOLAR POWER

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Framed Floor Library List

None Present

Rim Joist

| Name | Library Type | Surface Area | Location |
|-------------------|----------------|-----------------------|--------------------------------|
| 1st floor ambient | R 19 G1, 16"OC | 121.0 ft ² | Exposed Exterior |
| 1st floor garage | R 19 G1, 16"OC | 35.0 ft ² | Unconditioned, attached garage |

Rim Joist Library List

| Name | Effective Insulation R-value |
|----------------|------------------------------|
| R 19 G1, 16"OC | 17.30 |

Wall

| Name | Library Type | Surface Color | Surface Area | Location |
|-------------------|--------------------|---------------|-------------------------|--------------------------------|
| 1st floor ambient | R 19 FG G1 16" O.C | Medium | 1,089.0 ft ² | Exposed Exterior |
| 1st floor garage | R 19 FG G1 16" O.C | Medium | 315.0 ft ² | Unconditioned, attached garage |
| 2nd floor ambient | R 19 FG G1 16" O.C | Medium | 964.0 ft ² | Exposed Exterior |
| 2nd floor attic | R 19 FG G1 16" O.C | Medium | 284.0 ft ² | Attic |

Wall Library List

| Name | Effective R-value |
|--------------------|-------------------|
| R 19 FG G1 16" O.C | 16.805 |

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Glazing

| Name | Library Type | Wall Assignment | Foundation Wall Assignment | Is Operable | Overhang Depth | Overhang Ft To Top | Overhang Ft To Bottom | Orientation | Surface Area |
|--------------------|--------------|-------------------|----------------------------|-------------|----------------|--------------------|-----------------------|-------------|----------------------|
| front shaded | 35/27 | 1st floor ambient | | Yes | 6 | 2 | 9 | Southwest | 53.0 ft ² |
| left 2nd unshaded | 35/27 | 2nd floor ambient | | Yes | 0 | 0 | 0 | Northwest | 15.0 ft ² |
| left unshaded | 35/27 | 1st floor ambient | | Yes | 0 | 0 | 0 | Northwest | 30.0 ft ² |
| rear 2nd unshaded | 35/27 | 2nd floor ambient | | Yes | 0 | 0 | 0 | Northeast | 30.0 ft ² |
| rear shaded | 35/27 | 1st floor ambient | | Yes | 8 | 2 | 9 | Northeast | 27.0 ft ² |
| rear unshaded | 35/27 | 1st floor ambient | | Yes | 0 | 0 | 0 | Northeast | 38.0 ft ² |
| right 2nd unshaded | 35/27 | 2nd floor ambient | | Yes | 0 | 0 | 0 | Southeast | 15.0 ft ² |

Glazing Library List

| Name | Shgc | U-factor |
|-------|------|----------|
| 35/27 | 0.27 | 0.350 |

Skylight

None Present

Skylight Library List

None Present

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 ft ² | Exposed Exterior |
| garage entry | Fiberglass R-5 | 1st floor garage | | 0.9 | 0.75 | Medium | 18.0 ft ² | Unconditioned, attached garage |

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Opaque Door Library List

| Name | Effective U-factor |
|----------------|--------------------|
| Fiberglass R-5 | 0.200 |

Roof Insulation

| Name | Library Type | Attic Exterior Area [ft ²] | Clay or Concrete Roof Tiles | Surface Color | Surface Area | Location |
|-----------------|--|--|-----------------------------|---------------|-----------------------|--------------|
| ceiling flat | R 38 Attic BLOWN FG G1 2x6 16"OC NO Radiant | 1,387.68 | No | Dark | 944.0 ft ² | Attic |
| ceiling vaulted | R 38 Attic BATT FG G1 2x10 16"OC NO Radiant | 307.56 | No | Dark | 307.6 ft ² | Vaulted Roof |

Roof Insulation Library List

| Name | Has Radiant Barrier | Effective R-value |
|--|---------------------|-------------------|
| R 38 Attic BATT FG G1 2x10 16"OC NO Radiant | No | 33.917 |
| R 38 Attic BLOWN FG G1 2x6 16"OC NO Radiant | No | 37.887 |

Whole House Infiltration

| Infiltration | Measurement Type | Shelter Class |
|-------------------|--------------------|---------------|
| 1721 CFM at 50 Pa | Blower-door tested | 4 |

Mechanical Ventilation

| Ventilation Type | Ventilation Rate [ft ³ / Minute] | Operational hours per day | Fan Watts | Runs once every three hours | Energy Recovery Percent | Model Number | Manufacturer |
|------------------|---|---------------------------|-----------|-----------------------------|-------------------------|--------------|--------------|
| Air Cyclor | 153 CFM | 8 | 472 Watts | Yes | 0 | | |

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Lighting

| % Interior Fluorescent Lighting | % Interior LED Lighting | % Exterior Fluorescent Lighting | % Exterior LED Lighting | % Garage Fluorescent Lighting | % Garage LED Lighting |
|---------------------------------|-------------------------|---------------------------------|-------------------------|-------------------------------|-----------------------|
| 0 | 100 | 0 | 0 | 0 | 0 |

Onsite Generation

None Present

Onsite Generation Library List

None Present

Solar Generation

None Present

Dehumidifier

None Present

Dehumidifier Library List

None Present

Whole House Fan

None Present

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Whole House Fan Library List

None Present

Conditioning Equipment

| Name | Library Type | Serial Number | Heating Percent Load | Cooling Percent Load | Hot Water Percent Load | Location |
|-----------------------|----------------------------|---------------|----------------------|----------------------|------------------------|-------------|
| water heater | z 50 gal. 0.92 EF Elec | | 0% | 0% | 100% | Unspecified |
| whole house heat pump | z 36k 14.3 SEER2 7.5 HSPF2 | | 100% | 100% | 0% | Unspecified |

Equipment Type: z 36k 14.3 SEER2 7.5 HSPF2

| | |
|-------------------------------|----------------------|
| Equipment Type | Air Source Heat Pump |
| Fuel Type | Electric |
| Distribution Type | Forced Air |
| Motor Type | ECM (Variable Speed) |
| Heat Pump System Type | Split System |
| Heating Efficiency | 7.5 HSPF2 |
| Heating Capacity [kBtu/h] | 36 |
| Backup Fuel Type | Electric |
| Switchover Temperature [°F] | 0 |
| Backup Heating Efficiency | 1 COP |
| Use default Supplemental Heat | Yes |
| Cooling Efficiency | 14.3 SEER2 |
| Cooling Capacity [kBtu/h] | 36 |

Equipment Type: z 50 gal. 0.92 EF Elec

| | |
|-----------------------------|-----------------------------|
| Equipment Type | Residential Water Heater |
| Fuel Type | Electric |
| Distribution Type | Hydronic Delivery (Radiant) |
| Hot Water Efficiency | 0.92 Energy Factor |
| Tank Capacity (gal.) | 50 |
| Hot Water Capacity [kBtu/h] | 40 |
| Recovery Efficiency | 0.98 |

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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 | 2,085 |
| # Return Grilles | 3 |
| Supply Duct R Value | 8 |
| Return Duct R Value | 8 |
| Supply Duct Area [ft ²] | 562.95 |
| Return Duct Area [ft ²] | 312.75 |
| Leakage to Outdoors | 83 CFM @ 25Pa (3.98 / 100 ft ²) |
| Total Leakage | 83 CFM25 |
| Total Leakage Duct Test Conditions | Post-Construction |
| Use Default Flow Rate | Yes |
| Duct 1 | |
| Duct Location | Attic (well vented) |
| Percent Supply Area | 100 |
| Percent Return Area | 100 |
| Duct 2 | |
| Duct Location | Conditioned Space |
| Percent Supply Area | 0 |
| Percent Return Area | 0 |
| 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 |

HVAC Grading

HVAC Grading Not Conducted

Ceiling Fan

Has Ceiling Fan No

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Water Distribution

| | |
|-----------------------------------|----------|
| Water Fixture Type | Standard |
| Use Default Hot Water Pipe Length | No |
| Hot Water Pipe Length [ft] | 85 |
| At Least R3 Pipe Insulation? | No |
| Hot Water Recirculation System? | No |
| Drain Water Heat Recovery? | No |

Clothes Dryer

| | |
|------------------------------|----------------|
| Cef | 3.01 |
| Fuel Type | Electric |
| Field Utilization | Timer Controls |
| Is Outside Conditioned Space | No |
| Clothes Dryer Available | Yes |
| Defaults Type | HERS Reference |

Clothes Washer

| | |
|------------------------------|--------------|
| Label Energy Rating | 153 kWh/Year |
| Annual Gas Cost | \$12.00 |
| Electric Rate | \$0.11/kWh |
| Gas Rate | \$1.22/Therm |
| Capacity | 3.31 |
| Imef | 2.1547 |
| Defaults Type | Custom |
| Load Type | Front-load |
| Loads Per Week | 6 |
| Is Outside Conditioned Space | No |
| Clothes Washer Available | Yes |

Dishwasher

| | |
|------------------------------|--------------|
| Dishwasher Defaults Type | Custom |
| Dishwasher Size | Standard |
| Dishwasher Efficiency | 270 kWh |
| Annual Gas Cost | \$22.23 |
| Electric Rate | \$0.12/kWh |
| Gas Rate | \$1.09/Therm |
| Is Outside Conditioned Space | No |
| Dishwasher Available | Yes |

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Appliances and Controls

| | |
|---|--------------|
| Thermostat Cooling Setpoint | *** 75.0 |
| Thermostat Heating Setpoint | *** 70.0 |
| Range/Oven Fuel | Electric |
| Convection Oven? | No |
| Induction Range? | No |
| Range/Oven Outside Conditioned Space? | No |
| Refrigerator Consumption | 538 kWh/Year |
| Refrigerator Outside Conditioned Space? | No |

Notes

- initial inputs - JS 06/20/2024
- confirm attic insulation and HVAC specs
- confirm ventilation, modeled as air cycler
- confirm cfl lighting %
- modeled to worst case orientation