

# North Carolina 2018 - R402.1.5 Total UA



SOUTHERN ENERGY  
MANAGEMENT  
ENERGY EFFICIENCY & SOLAR POWER

## Property

, NC 27546  
Model: Trenton  
Community: NA

## Organization

Southern Energy Management  
Justin Smith

## Inspection Status

Results are projected

## Builder

Template - Onsite Homes - Trenton 2300 l  
Trenton Plan 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	40.5	35.7
Above-Grade Walls	173.0	133.7
Windows, Doors and Skylights	95.5	89.8
Slab Floor:	67.5	87.4
Framed Floors	18.9	20.5
Foundation Walls	0.0	0.0
Rim Joists	7.9	6.4
<b>Overall UA (Design must be equal or lower):</b>	<b>403.3</b>	<b>373.5</b>

## Requirements

✓	R402.1.5	Total UA alternative compliance passes by 7.4%.	The proposed home meets the UA requirement by 7.4%
✓	402.3.2	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 7.4%.**

Name: Justin Smith  
Organization: Southern Energy Management

Signature: Justin Smith  
Digitally signed: 1/19/24 at 11:04 AM

## Ekotrope RATER - Version 4.1.2.3320

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.]	2,300
Has Electric Vehicle Ready Space	No
Unconditioned, attached garage?	Yes
Conditioned Volume [cu. ft.]	20,298
Total Units in Building	1
Residence Type	Single family detached
Number of Floors in Building	-
Floor Number	-
Model	Trenton
Community	NA
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	143	On Grade	1	0	949.0 ft <sup>2</sup>	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	Yes	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 G1 Carpet	0	Above Grade	11.0 ft <sup>2</sup>	Exposed Exterior
over garage	R 19, 16"OC G1 Carpet	0	Above Grade	391.0 ft <sup>2</sup>	Unconditioned, attached garage

## Framed Floor Library List

Name	Effective R-value
R 19, 16"OC G1 Carpet	19.567

## Rim Joist

Name	Library Type	Surface Area	Location
1st floor ambient	R 19 G1, 16"OC	108.0 ft <sup>2</sup>	Exposed Exterior
1st floor garage	R 19 G1, 16"OC	35.0 ft <sup>2</sup>	Exposed Exterior

## 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	969.0 ft <sup>2</sup>	Exposed Exterior
1st floor garage	R 19 FG G1 16" O.C	Medium	318.0 ft <sup>2</sup>	Unconditioned, attached garage
2nd floor ambient	R 19 FG G1 16" O.C	Medium	1,232.0 ft <sup>2</sup>	Exposed Exterior

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

## 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 2nd unshaded	35/27	2nd floor ambient		Yes	0	0	0	West	54.0 ft <sup>2</sup>
front shaded	35/27	1st floor ambient		Yes	6	1	7	West	22.0 ft <sup>2</sup>
left 2nd unshaded	35/27	2nd floor ambient		Yes	0	0	0	North	15.0 ft <sup>2</sup>
left unshaded	35/27	1st floor ambient		Yes	0	0	0	North	18.0 ft <sup>2</sup>
rear 2nd unshaded	35/27	2nd floor ambient		Yes	0	0	0	East	45.0 ft <sup>2</sup>
rear unshaded	35/27	1st floor ambient		Yes	0	0	0	East	72.8 ft <sup>2</sup>
right 2nd unshaded	35/27	2nd floor ambient		Yes	0	0	0	South	8.0 ft <sup>2</sup>

## 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 ft <sup>2</sup>	Exposed Exterior
garage entry	Fiberglass R-5	1st floor garage		0.9	0.75	Medium	18.0 ft <sup>2</sup>	Unconditioned, attached garage

## Opaque Door Library List

Name	Effective U-factor
Fiberglass R-5	0.200

## Roof Insulation

Name	Library Type	Attic Exterior Area [ft <sup>2</sup> ]	Clay or Concrete Roof Tiles	Surface Color	Surface Area	Location
Attic	R 38 Attic BLOWN FG G1 2x6 16"OC NO Radiant	1,985.97	No	Dark	1,351.0 ft <sup>2</sup>	Attic

## Roof Insulation Library List

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

## Whole House Infiltration

Infiltration	Measurement Type	Shelter Class
1623 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	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 Heating	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	2,300
# Return Grilles	3
Supply Duct R Value	8
Return Duct R Value	8
Supply Duct Area [ft <sup>2</sup> ]	621
Return Duct Area [ft <sup>2</sup> ]	345
Leakage to Outdoors	92 CFM @ 25Pa (4 / 100 ft <sup>2</sup> )
Total Leakage	92 CFM25
Total Leakage Duct Test Conditions	Post-Construction
Use Default Flow Rate	Yes
Duct 1	
Duct Location	Attic (well vented)
Percent Supply Area	60
Percent Return Area	60
Duct 2	
Duct Location	Conditioned Space
Percent Supply Area	40
Percent Return Area	40
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
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]	88
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

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	ENERGY STAR Standard
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	*** 72.0
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 form completed by JS 01/19/24
- confirm insulation values and hvac specs
- confirm cfl lighting %
- modeled to worst case orientation