

North Carolina 2018 - R402.1.5 Total UA



Property

15 Barn Door Drive
Lillington, NC 27546
Model: 628 slab

Organization

Southern Energy Management
Justin Smith

Inspection Status

Results are projected

Chesapeake - 628 base plan slab -
ecoSelect
628 base plan slab

Builder

Chesapeake 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	52.7	47.4
Above-Grade Walls	190.0	179.1
Windows, Doors and Skylights	160.3	131.6
Slab Floor:	82.1	106.8
Framed Floors	21.2	23.0
Foundation Walls	0.0	0.0
Rim Joists	9.5	9.3
Overall UA (Design must be equal or lower):	515.8	497.2

Requirements

✓	R402.1.5	Total UA alternative compliance passes by 3.6%.	The proposed home meets the UA requirement by 3.6%
✓	402.3.2	Average SHGC: 0.28 Max SHGC: 0.30	Average SHGC of 0.28 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 0.28. 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 3.6%.

Name: Justin Smith

Signature: Justin Smith

Organization: Southern Energy Management

Digitally signed: 12/14/23 at 12:26 PM

Ekotrope RATER - Version 4.1.2.3299

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.
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Building Summary



SOUTHERN ENERGY
MANAGEMENT
ENERGY EFFICIENCY & SOLAR POWER

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General Building Information

Number Of Bedrooms	5
Number Of Floors	2
Conditioned Floor Area [sq. ft.]	3,016
Has Electric Vehicle Ready Space	No
Unconditioned, attached garage?	Yes
Conditioned Volume [cu. ft.]	26,744
Total Units in Building	1
Residence Type	Single family detached
Number of Floors in Building	-
Floor Number	-
Model	628 slab
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	171	On Grade	1	0	1,308.0 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	Yes	No	0.00

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Framed Floor

Name	Library Type	Carpet R	Floor Grade	Surface Area	Location
over garage	R 19, 16"OC G1 Carpet	0	Above Grade	450.0 ft ²	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 15 G1, 16"OC	128.0 ft ²	Exposed Exterior
1st floor garage	R 15 G1, 16"OC	43.0 ft ²	Unconditioned, attached garage

Rim Joist Library List

Name	Effective Insulation R-value
R 15 G1, 16"OC	13.30

Wall

Name	Library Type	Surface Color	Surface Area	Location
1st floor ambient	R 15 Adv. Framing G1 16" O.C	Medium	1,150.0 ft ²	Exposed Exterior
1st floor garage	R 15 Adv. Framing G1 16" O.C	Medium	389.0 ft ²	Unconditioned, attached garage
2nd floor ambient	R 15 Adv. Framing G1 16" O.C	Medium	1,368.0 ft ²	Exposed Exterior

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Wall Library List

Name	Effective R-value
R 15 Adv. Framing G1 16" O.C.	13.771

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	30/28	2nd floor ambient		Yes	0	0	0	East	105.0 ft ²
front shaded	30/28	1st floor ambient		Yes	7	1	7	East	57.0 ft ²
left 2nd unshaded	30/28	2nd floor ambient		Yes	0	0	0	South	16.0 ft ²
left unshaded	30/28	1st floor ambient		Yes	0	0	0	South	18.0 ft ²
rear 2nd unshaded	30/28	2nd floor ambient		Yes	0	0	0	West	61.0 ft ²
rear unshaded	30/28	1st floor ambient		Yes	0	0	0	West	95.1 ft ²
right 2nd unshaded	30/28	2nd floor ambient		Yes	0	0	0	North	30.0 ft ²
right unshaded	30/28	1st floor ambient		Yes	0	0	0	North	18.0 ft ²

Glazing Library List

Name	Shgc	U-factor
30/28	0.28	0.300

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
attic door	Fiberglass R-5			0.9	0.75	Medium	18.0 ft ²	Exposed Exterior
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	20.0 ft ²	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 ²]	Clay or Concrete Roof Tiles	Surface Color	Surface Area	Location
attic	R 38 Attic BLOWN FG G1 2x10 24"OC w/ Radiant	2,584.26	No	Dark	1,758.0 ft ²	Attic

Roof Insulation Library List

Name	Has Radiant Barrier	Effective R-value
R 38 Attic BLOWN FG G1 2x10 24"OC w/ Radiant	Yes	37.074

Whole House Infiltration

Infiltration	Measurement Type	Shelter Class
2139 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
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

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Whole House Fan

None Present

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. 0.58 EF Gas		0%	0%	100%	Unspecified
whole house a/c	z 14 SEER A/C 3 ton		0%	100%	0%	Unspecified
whole house furnace	z 92 AFUE Gas Furn 64k		100%	0%	0%	Unspecified

Equipment Type: z 14 SEER A/C 3 ton

Equipment Type	Air Conditioner
Fuel Type	Electric
Distribution Type	Forced Air
Motor Type	PSC (Single Speed)
Heat Pump System Type	Unspecified
Cooling Efficiency	14 SEER
Cooling Capacity [kBtu/h]	36

Equipment Type: z 50 gal. 0.58 EF Gas

Equipment Type	Residential Water Heater
Fuel Type	Natural Gas
Distribution Type	Hydronic Delivery (Radiant)
Hot Water Efficiency	0.58 Energy Factor
Tank Capacity (gal.)	50
Hot Water Capacity [kBtu/h]	40
Recovery Efficiency	0.76

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Equipment Type: z 92 AFUE Gas Furn 64k

Equipment Type	Furnace
Fuel Type	Natural Gas
Distribution Type	Forced Air
Motor Type	PSC (Single Speed)
Heating Efficiency	92 AFUE
Heating Capacity [kBtu/h]	64
Use default EAE	No
EAE [kWh]	591

Distribution System

Distribution Type	Forced Air
Heating Equipment	whole house furnace
Cooling Equipment	whole house a/c
Sq. Feet Served	3,016
# Return Grilles	4
Supply Duct R Value	8
Return Duct R Value	8
Supply Duct Area [ft ²]	814.32
Return Duct Area [ft ²]	603.2
Leakage to Outdoors	120 CFM @ 25Pa (3.98 / 100 ft ²)
Total Leakage	120 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

HVAC Grading

HVAC Grading Not Conducted

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Ceiling Fan

Has Ceiling Fan	No
Cfm Per Watt	100

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
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	*** 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 by - JS 09/04/19
updated JS 09/29/23

- **no slab insulation modeled**
- confirm window specs
- confirm if radiant barrier installed, modeled as yes
- confirm HVAC specs
- confirm ventilation entry, modeled as none
- confirm cfl lighting %
- modeled to worst case orientation