

North Carolina 2018 - R402.1.5 Total UA



Property
 , NC 27546
 Model: Buttercup

Organization
 Southern Energy Manager
 Justin Smith

Inspection Status
 Results are projected

Garman Homes - Buttercup 1456
 plan - CZ 4 slab - ecoSelect
 Buttercup plan

Builder
 Garman 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	22.7	21.5
Above-Grade Walls	139.6	131.6
Windows, Doors and Skylights	80.7	65.2
Slab Floor:	54.2	70.2
Framed Floors	0.0	0.0
Foundation Walls	0.0	0.0
Rim Joists	6.2	6.1
Overall UA (Design must be equal or lower):	303.4	294.6

Requirements

✓	R402.1.5	Total UA alternative compliance passes by 2.9%. The proposed home meets the UA requirement by 2.9%
✓	402.3.2	Average SHGC: 0.30 Max SHGC: 0.30 Average SHGC of 0.30 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 0.3. 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 2.9%.

Name: Justin Smith
 Organization: Southern Energy Management

Signature: Justin Smith
 Digitally signed: 9/26/22 at 9:56 AM

Ekotrope RATER - Version 4.0.1.2996

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

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General Building Information

Number Of Bedrooms	3
Number Of Floors	2
Conditioned Floor Area [sq. ft.]	1,456
Has Electric Vehicle Ready Space	No
Unconditioned, attached garage?	Yes
Conditioned Volume [cu. ft.]	13,839
Total Units in Building	1
Residence Type	Single family detached
Number of Floors in Building	-
Floor Number	-
Model	Buttercup
Community	
RESNET/IECC 2006 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	115	On Grade	1	0	755.0 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

None Present

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Framed Floor Library List

None Present

Rim Joist

Name	Library Type	Surface Area	Location
1st floor ambient	R 15 G1, 16"OC	88.0 ft ²	Exposed Exterior
1st floor garage	R 15 G1, 16"OC	24.0 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	819.0 ft ²	Exposed Exterior
1st floor garage	R 15 Adv. Framing G1 16" O.C	Medium	216.0 ft ²	Unconditioned, attached garage
2nd floor ambient	R 15 Adv. Framing G1 16" O.C	Medium	1,008.0 ft ²	Exposed Exterior

Wall Library List

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

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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 2nd unshaded	30/30	2nd floor ambient		Yes	0	0	0	West	30.0 ft²
front shaded	30/30	1st floor ambient		Yes	6	1	7	West	27.6 ft²
front unshaded	30/30	1st floor ambient		Yes	0	0	0	West	25.0 ft²
left 2nd unshaded	30/30	2nd floor ambient		Yes	0	0	0	North	16.0 ft²
left unshaded	30/30	1st floor ambient		Yes	0	0	0	North	8.0 ft²
rear 2nd unshaded	30/30	2nd floor ambient		Yes	0	0	0	East	30.0 ft²
rear unshaded	30/30	1st floor ambient		Yes	0	0	0	East	54.0 ft²

Glazing Library List

Name	Shgc	U-factor
30/30	0.3	0.300

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 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	20.0 ft²	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 [ft²]	Clay or Concrete Roof Tiles	Surface Color	Surface Area	Location
attic	R 38 Attic BLOWN FG G1 2x10 24"OC NO Radiant Barrier	1,238.2	No	Dark	755.0 ft²	Attic

Roof Insulation Library List

Name	Has Radiant Barrier	Effective R-value
R 38 Attic BLOWN FG G1 2x10 24"OC NO Radiant Barrier	No	35.115

Whole House Infiltration

Infiltration	Measurement Type	Shelter Class
1107 CFM at 50 Pa	Blower-door tested	4

Mechanical Ventilation

Ventilation Type	Ventilation Rate [ft³ / Minute]	Operational hours per day	Fan Watts	Runs once every three hours	Energy Recovery Percent	Model Number	Manufacturer
Exhaust Only	136 CFM	8	47.6 Watts (Default)	Yes	0		

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

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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

Whole House Fan Library List

None Present

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Conditioning Equipment

Name	Library Type	Serial Number	Heating Percent Load	Cooling Percent Load	Hot Water Percent Load	Location
Water Heater	RL94e (NG)		0%	0%	100%	Unconditioned Garage
whole house a/c	z 14 SEER A/C 3 ton		0%	100%	0%	Attic
whole house furnace	z 93 AFUE Gas Furn 48k		100%	0%	0%	Attic

Equipment Type: RL94e (NG)

Equipment Type	Residential Water Heater
Fuel Type	Natural Gas
Distribution Type	Hydronic Delivery (Radiant)
Hot Water Efficiency	0.81 Energy Factor
Tankless?	Yes

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)
Cooling Efficiency	14 SEER
Cooling Capacity [kBtu/h]	36

Equipment Type: z 93 AFUE Gas Furn 48k

Equipment Type	Furnace
Fuel Type	Natural Gas
Distribution Type	Forced Air
Motor Type	PSC (Single Speed)
Heating Efficiency	93 AFUE
Heating Capacity [kBtu/h]	48
Use default EAE	No
EAE [kWh]	411

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Distribution System

Distribution Type	Forced Air
Heating Equipment	whole house furnace
Cooling Equipment	whole house a/c
Sq. Feet Served	1,456
# Return Grilles	2
Supply Duct R Value	8
Return Duct R Value	8
Supply Duct Area [ft ²]	393.12
Return Duct Area [ft ²]	145.6
Leakage to Outdoors	58 CFM @ 25Pa (3.98 / 100 ft ²)
Total Leakage	58 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]	58
At Least R3 Pipe Insulation?	No
Hot Water Recirculation System?	No
Recirculation System Pipe Loop Length [ft]	170
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 Efficiency	270 kWh
Dishwasher Size	Standard
Annual Gas Cost	\$22.23
Electric Rate	\$0.12/kWh
Gas Rate	\$1.09/Therm
Is Outside Conditioned Space	No

Appliances and Controls

Programmable thermostat?	Yes
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

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Notes

Initial inputs by __AT 5/4/2022__

- confirm window specs
- ventilation modeled as exhaust, confirm this is accurate
- confirm cfl lighting percentage
- modeled to worst case orientation