

North Carolina 2018 - R402.1.5 Total UA



Property

330 John Stark Drive
Fuquay-Varina, NC 27526
Model: 149.2115 slab
Community: Birchwood Grove

Organization

Southern Energy Manager
Justin Smith

Inspection Status

Results are projected

Builder

KB Home - North Carolina

330 John Stark Drive KB
149.2115 base plan slab

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	63.2	60.0
Above-Grade Walls	116.1	109.5
Windows, Doors and Skylights	93.9	88.2
Slab Floor:	108.9	112.5
Framed Floors	0.0	0.0
Foundation Walls	0.0	0.0
Rim Joists	0.0	0.0
Overall UA (Design must be equal or lower):	382.1	370.2

Requirements

✓	R402.1.5	Total UA alternative compliance passes by 3.1%. The proposed home meets the UA requirement by 3.1%
✓	402.3.2	Average SHGC: 0.22 Max SHGC: 0.30 Average SHGC of 0.22 is greater than the maximum of 0.30.
✓	R402.4.2.2	Air Leakage Testing Air sealing is 0.23 CFM50 / ft ² Shell Area. It must not exceed 0.30 CFM50 / ft ² Shell Area.
✓	R402.5	Area-weighted average fenestration SHGC Area-weighted average fenestration SHGC is 0.22. 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 3.1%.

Name: Justin Smith
Organization: Southern Energy Management

Signature: Justin Smith
Digitally signed: 11/17/22 at 10:50 AM

Ekotrope RATER - Version 4.0.2.3034

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	1
Conditioned Floor Area [sq. ft.]	2,106
Has Electric Vehicle Ready Space	No
Unconditioned, attached garage?	Yes
Conditioned Volume [cu. ft.]	16,848
Total Units in Building	1
Residence Type	Single family detached
Number of Floors in Building	-
Floor Number	-
Model	149.2115 slab
Community	Birchwood Grove
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 insulated	R 10 Perimeter	198	On Grade	1	0	1,896.0 ft²	Exposed Exterior	Conditioned Space
slab uninsulated	Uninsulated	24	On Grade	1	0	210.0 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
R 10 Perimeter	Wood Frame / Other	No	0	2	10	No	0.00
Uninsulated	Wood Frame / Other	No	0	0	0	No	0.00

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Framed Floor

None Present

Framed Floor Library List

None Present

Rim Joist

None Present

Rim Joist Library List

None Present

Wall

Name	Library Type	Surface Color	Surface Area	Location
1st floor ambient	R 15 Adv. Framing G1 16" O.C	Medium	1,472.0 ft ²	Exposed Exterior
1st floor garage	R 15 Adv. Framing G1 16" O.C	Medium	304.0 ft ²	Unconditioned, attached garage

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 shaded	35/22	1st floor ambient		Yes	6	1	3	Southwest	8.0 ft ²

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Name	Library Type	Wall Assignment	Foundation Wall Assignment	Is Operable	Overhang Depth	Overhang Ft To Top	Overhang Ft To Bottom	Orientation	Surface Area
front unshaded	35/22	1st floor ambient		Yes	0	0	0	Southwest	15.0 ft²
left unshaded	35/22	1st floor ambient		Yes	0	0	0	Northwest	45.0 ft²
rear unshaded	35/22	1st floor ambient		Yes	0	0	0	Northeast	124.2 ft²
right unshaded	35/22	1st floor ambient		Yes	0	0	0	Southeast	38.0 ft²

Glazing Library List

Name	Shgc	U-factor
35/22	0.22	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 ft²	Exposed Exterior
garage entry	Fiberglass R-5	1st floor garage		0.9	0.75	Medium	18.0 ft²	Unconditioned, attached garage

Opaque Door Library List

Name	Effective U-factor
Fiberglass R-5	0.200

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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 Barrier	2,927	No	Dark	2,106.0 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 Barrier	Yes	35.115

Whole House Infiltration

Infiltration	Measurement Type	Shelter Class
1348 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 w/ Supp. Fan	178 CFM	8	472 Watts	Yes	0		

Lighting

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

Onsite Generation

None Present

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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

Conditioning Equipment

Name	Library Type	Serial Number	Heating Percent Load	Cooling Percent Load	Hot Water Percent Load	Location
Water Heating	EN650DORT (E)		0%	0%	100%	Unspecified
furnace	z 92 AFUE Gas Furn 64k		100%	0%	0%	Unspecified
whole house a/c	z 14 SEER A/C 3 ton		0%	100%	0%	Unspecified

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Equipment Type: EN650DORT (E)

Equipment Type	Residential Water Heater
Fuel Type	Electric
Distribution Type	Hydronic Delivery (Radiant)
Hot Water Efficiency	0.93 UEF
Tank Capacity (gal.)	50
Hot Water Capacity [kBtu/h]	15.4
Recovery Efficiency	0.98

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 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

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Distribution System

Distribution Type	Forced Air
Heating Equipment	furnace
Cooling Equipment	whole house a/c
Sq. Feet Served	2,106
# Return Grilles	2
Supply Duct R Value	8
Return Duct R Value	8
Supply Duct Area [ft ²]	568.62
Return Duct Area [ft ²]	210.6
Leakage to Outdoors	74 CFM @ 25Pa (3.51 / 100 ft ²)
Total Leakage	74 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	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
Cfm Per Watt	100

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Water Distribution

Water Fixture Type	Low-flow
Use Default Hot Water Pipe Length	No
Hot Water Pipe Length [ft]	111
At Least R3 Pipe Insulation?	Yes
Hot Water Recirculation System?	No
Recirculation System Pipe Loop Length [ft]	10
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

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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 1/6/16__
Updated by __JP 7.25.18__
Updated by __JStap 6.20.19__
Updated __AT 6/18/2020__
Updated by __MS 06/20/22__

- **8 ft ceiling height on first floor model, make sure it's not optional 9' ceilings**
- R 19 floors modeled
- confirm HVAC specs
- confirm water heater specs
- modeled to worst case orientation
- all window options included
- confirm ventilation entry, modeled as exhaust