

North Carolina 2018 - R402.1.5 Total UA



Property
 , NC 27546
 Model: Avery

Organization
 Southern Energy Manager
 Justin Smith

Inspection Status
 Results are projected

Template - OnSite Homes - Avery
 2150 plan slab - CZ 4 - ecoSelect
 Avery plan 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	36.8	32.9
Above-Grade Walls	163.9	139.0
Windows, Doors and Skylights	88.8	83.1
Slab Floor:	66.5	86.0
Framed Floors	14.2	13.9
Foundation Walls	0.0	0.0
Rim Joists	7.8	7.7
Overall UA (Design must be equal or lower):	378.0	362.6

Requirements

✓	402.1.5	Total UA alternative compliance passes by 4.1%.
✓	402.3.2 Glazed Fenestration SHGC	Average SHGC: 0.27 Max SHGC: 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
✓	R402.5	Area-weighted average fenestration U-Factor
✓	R404.1	Lighting Equipment Efficiency
✓	Mandatory Checklist	Mandatory code requirements that are not checked by Ekotrope must be met.
✓	R403.3	Duct Insulation
✓	403.3.3	Duct Testing

Design exceeds requirements for North Carolina 2018 Prescriptive compliance by 4.1%.

Name: Justin Smith
 Organization: Southern Energy Management

Signature: *Justin Smith*
 Digitally signed: 4/14/21 at 4:02 PM

Ekotrope RATER - Version 3.2.3.2653

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.

Energy Code Inspection Checklist



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General Building Information

Conditioned Area (sq ft)	2,150
Conditioned Volume (cubic ft)	20,168
Insulated Shell Area (sq ft)	4,976

The building energy model in Ekotrope reflects the building assemblies and energy features listed below. Sometimes energy features will change in the field from what has been modeled. The inspection process should identify any changes and ensure that the home continues to meet the applicable energy code.

Slab



Name: slab(924 s.f., 141 ft. exterior perimeter)
R-0 perimeter insulation, R-0 under slab insulation.

Framed Floor



Name: over garage (288 s.f.)
R-0 continuous insulation, R-19 cavity insulation
Insulation Grade: I



Name: over ambient (14 s.f.)
R-0 continuous insulation, R-19 cavity insulation
Insulation Grade: I

Foundation Wall

None Present

Above Grade Wall



Name: 1st floor ambient (955 s.f.)
R-0 continuous insulation, R-19 cavity insulation
Insulation Grade: III



Name: 1st floor garage (314 s.f.)
R-0 continuous insulation, R-19 cavity insulation
Insulation Grade: III

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Name: 2nd floor ambient (962 s.f.)
R-0 continuous insulation, R-19 cavity insulation
Insulation Grade: III

Name: 2nd floor attic (152 s.f.)
R-0 continuous insulation, R-19 cavity insulation
Insulation Grade: III

Rim Joist

Name: 1st floor garage (35 s.f.)
R: 13.20

Name: 1st floor ambient (106 s.f.)
R: 13.20

Ceiling / Roof

Name: Attic (1,226 s.f.)
R-13 continuous insulation, R-25 cavity insulation
Insulation Grade: I

Opaque Door

Name: front entry (20 s.f.)
U: 0.200

Name: garage entry (18 s.f.)
U: 0.200

Glazing

Name: front shaded (30 s.f.), U: 0.350, SHGC: 0.27, Orientation: SOUTH_EAST

Name: front 2nd unshaded (27 s.f.), U: 0.350, SHGC: 0.27, Orientation: SOUTH_EAST

Name: left 2nd unshaded (27 s.f.), U: 0.350, SHGC: 0.27, Orientation: SOUTH_WEST

Name: right unshaded (8 s.f.), U: 0.350, SHGC: 0.27, Orientation: NORTH_EAST

Energy Code Inspection Checklist



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Name: right 2nd unshaded (13.5 s.f.), U: 0.350, SHGC: 0.27, Orientation: NORTH_EAST

Name: rear unshaded (75.3 s.f.), U: 0.350, SHGC: 0.27, Orientation: NORTH_WEST

Name: rear 2nd unshaded (35 s.f.), U: 0.350, SHGC: 0.27, Orientation: NORTH_WEST

Skylight

None Present

Mechanical Ventilation

None Present

Mechanical Equipment

whole house heat pump • Electric • 100% Heating Load @ 8.2 HSPF, 100% Cooling Load @ 14 SEER

Water Heating • Natural Gas • 100% Hot Water Load @ 0.59 Energy Factor

Air Leakage Control

Test Status: Blower-door tested
House is air-sealed as to achieve 1,613 CFM50 (4.80 ACH50) or less at final blower-door test.

Infiltration Requirements for IECC in Climate Zone 4

2009 IECC Infiltration limit for the design home is 7 ACH50.

2012 IECC Infiltration limit for the design home is 3 ACH50.

2015 IECC Infiltration limit for the design home is 3 ACH50.

2018 IECC Infiltration limit for the design home is 3 ACH50.

Duct Leakage

Duct System 1

NOT entirely within conditioned space, testing required

Leakage to Outside specified as: 86 CFM @ 25Pa (4 / 100 ft²)

Total Leakage specified as: 86 CFM @ 25Pa (Post-Construction)

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Duct Leakage Code Requirements for IECC

2009 IECC:

Postconstruction Leakage Test: Duct Leakage to Outdoors ≤ 8 CFM25 / 100 sq ft CFA.

Rough in Test with AHU: Total Duct Leakage ≤ 6 CFM25 / 100 sq ft CFA.

Rough in Test without AHU: Total Duct Leakage ≤ 4 CFM25 / 100 sq ft CFA.

2012 IECC Mandatory, 2015 and 2018 IECC Prescriptive Paths:

Postconstruction Leakage Test: Total Duct Leakage ≤ 4 CFM25 / 100 sq ft CFA.

Rough in Test with AHU: Total Duct Leakage ≤ 4 CFM25 / 100 sq ft CFA.

Rough in Test without AHU: Total Duct Leakage ≤ 3 CFM25 / 100 sq ft CFA.

2015 and 2018 IECC Performance Paths (Cost Compliance):

Leakage testing is required UNLESS all ducts and air handlers are located entirely within the thermal envelope.

There is no pass/fail threshold for duct leakage on the performance path.

Project Notes

-updated JS 04/14/21

-confirm attic insulation and hvac specs

-ventilation modeled as none

-confirm cfl lighting %

-modeled to worst case orientation

Building Summary



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General Building Information

Number Of Bedrooms	3
Number Of Floors	2
Conditioned Floor Area [sq. ft.]	2,150
Has Electric Vehicle Ready Space	No
Unconditioned, attached garage?	Yes
Conditioned Volume [cu. ft.]	20,168
Total Units in Building	1
Residence Type	Single family detached
Floor Number	-
Model	Avery
Community	
Climate Zone	4A

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	141	On Grade	1	0	924.0 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

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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	14.0 ft ²	Exposed Exterior
over garage	R-19, 16"OC G1 Carpet	0	Above Grade	288.0 ft ²	Unconditioned, attached garage

Framed Floor Library List

Name	Effective R-value
R-19, 16"OC G1 Carpet	21.798

Rim Joist

Name	Library Type	Surface Area	Location
1st floor ambient	R 19 G3, 16"OC	106.0 ft ²	Exposed Exterior
1st floor garage	R 19 G3, 16"OC	35.0 ft ²	Unconditioned, attached garage

Rim Joist Library List

Name	Effective Insulation R-value
R 19 G3, 16"OC	13.20

Wall

Name	Library Type	Surface Color	Surface Area	Location
1st floor ambient	R 19 Adv. Framing G3 16" O.C	Medium	955.0 ft ²	Exposed Exterior
1st floor garage	R 19 Adv. Framing G3 16" O.C	Medium	314.0 ft ²	Unconditioned, attached garage
2nd floor ambient	R 19 Adv. Framing G3 16" O.C	Medium	962.0 ft ²	Exposed Exterior
2nd floor attic	R 19 Adv. Framing G3 16" O.C	Medium	152.0 ft ²	Attic

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Wall Library List

Name	Effective R-value
R 19 Adv. Framing G3 16" O.C	15.319

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	Southeast	27.0 ft²
front shaded	35/27	1st floor ambient		Yes	5	1	6	Southeast	30.0 ft²
left 2nd unshaded	35/27	2nd floor ambient		Yes	0	0	0	Southwest	27.0 ft²
rear 2nd unshaded	35/27	2nd floor ambient		Yes	0	0	0	Northwest	35.0 ft²
rear unshaded	35/27	1st floor ambient		Yes	0	0	0	Northwest	75.3 ft²
right 2nd unshaded	35/27	2nd floor ambient		Yes	0	0	0	Northeast	13.5 ft²
right unshaded	35/27	1st floor ambient		Yes	0	0	0	Northeast	8.0 ft²

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

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 Barrier	1,802.22		No	Dark	1,226.0 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	37.246

Whole House Infiltration

Infiltration	Measurement Type	Shelter Class
1613 CFM at 50 Pa	Blower-door tested	4

Mechanical Ventilation

None Present

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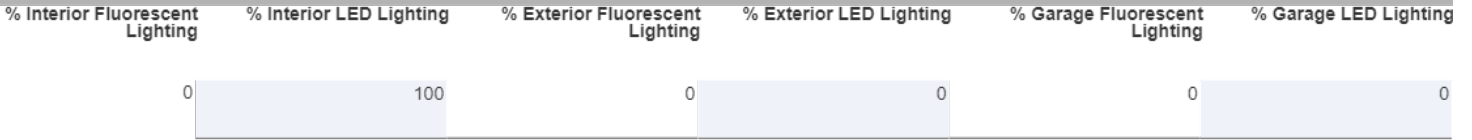
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Lighting



Onsite Generation

None Present

Onsite Generation Library List

None Present

Solar Generation

None Present

Solar Generation Library List

None Present

Dehumidifier

None Present

Dehumidifier Library List

None Present

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Conditioning Equipment

Name	Library Type	Heating Percent Load	Cooling Percent Load	Hot Water Percent Load	Location
Water Heating	Z 50 gal. 0.59EF Gas	0%	0%	100%	Unspecified
whole house heat pump	z 36k 14 seer 8.2hspf	100%	100%	0%	Unspecified

Equipment Type: Z 50 gal. 0.59EF Gas

Equipment Type	Water Heater
Fuel Type	Natural Gas
Distribution Type	Hydronic Delivery (Radiant)
Hot Water Efficiency	0.59 Energy Factor
Tank Capacity (gal.)	50
Hot Water Capacity [kBtu/h]	40
Recovery Efficiency	0.76

Equipment Type: z 36k 14 seer 8.2hspf

Equipment Type	Air Source Heat Pump
Fuel Type	Electric
Distribution Type	Forced Air
Motor Type	PSC (Single Speed)
Heating Efficiency	8.2 HSPF
Heating Capacity [kBtu/h]	36
Use default Supplemental Heat	Yes
Cooling Efficiency	14 SEER
Cooling Capacity [kBtu/h]	36

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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	2150
# Return Grilles	3
Supply Duct R Value	8
Return Duct R Value	8
Supply Duct Area [ft ²]	580.5
Return Duct Area [ft ²]	322.5
Leakage to Outdoors	86 CFM @ 25Pa (4 / 100 ft ²)
Total Leakage	86 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

Ceiling Fan

Has Ceiling Fan	Yes
Cfm Per Watt	100

Water Distribution

Water Fixture Type	Standard
Use Default Hot Water Pipe Length	No
Hot Water Pipe Length [ft]	70
At Least R3 Pipe Insulation?	No
Hot Water Recirculation System?	No
Recirculation System Pipe Loop Length [ft]	20
Drain Water Heat Recovery?	No

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Clothes Dryer

Cef	2.6173913
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
Is Outside Conditioned Space	No
Clothes Washer Available	Yes

Dishwasher

Dishwasher Efficiency	270 kWh
Dishwasher Size	Standard
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

Notes

- updated JS 04/14/21
- confirm attic insulation and hvac specs
- ventilation modeled as none
- confirm cfl lighting %
- modeled to worst case orientation

Builder Affidavit

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Important Notice to Builder

Builder affirms in this affidavit that all building characteristics described in the Building Summary Report accurately reflect this New Home. Builder agrees to allow the Home Energy Rating System (HERS) Provider and/or Rater to verify building characteristics of this New Home fully at the HERS Rater/Provider's discretion. The HERS Provider and Rater do not create or imply any duty or obligations to Builder or any subsequent owner. Builder is responsible for taking any actions necessary to protect Builder's interest. There is no guarantee or warranty whatsoever expressed or implied from the HERS Provider or Rater.

HERS® Index Score:71

Builder Name: OnSite Homes

Builder Signature: _____

Name: Justin Smith
Organization: Southern Energy Management

Signature: *Justin Smith*
Digitally signed: 4/14/21 at 4:02 PM