

North Carolina 2018 - R402.1.5 Total UA



Property
 , NC 28376
 Model: Union

Organization
 Southern Energy Manager
 Justin Smith

Inspection Status
 Results are projected

Template - A & G - Union plan slab
 CZ4 - ecoSelect
 Union plan slab

Builder
 A & G

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	41.7	37.3
Above-Grade Walls	173.1	146.8
Windows, Doors and Skylights	112.3	98.4
Slab Floor:	69.5	90.2
Framed Floors	16.6	16.2
Foundation Walls	0.0	0.0
Rim Joists	8.1	8.0
Overall UA (Design must be equal or lower):	421.3	396.9

Requirements

✓	402.1.5	Total UA alternative compliance passes by 5.8%.
✓	402.3.2 Glazed Fenestration SHGC	Average SHGC: 0.20 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 5.8%.

Name: Justin Smith
 Organization: Southern Energy Management

Signature: Justin Smith
 Digitally signed: 3/9/21 at 9:41 AM

Ekotrope RATER - Version 3.2.3.2627

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	4
Number Of Floors	2
Conditioned Floor Area [sq. ft.]	2,365
Has Electric Vehicle Ready Space	No
Unconditioned, attached garage?	Yes
Conditioned Volume [cu. ft.]	21,476
Total Units in Building	1
Residence Type	Single family detached
Floor Number	-
Model	Union
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	146	On Grade	1	0	1,038.0 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

Name	Library Type	Carpet R	Floor Grade	Surface Area	Location
over garage	R-19, 16"OC G1 Carpet	0	Above Grade	353.0 ft²	Unconditioned, attached garage

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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	115.0 ft ²	Exposed Exterior
1st floor garage	R 19 G3, 16"OC	31.0 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	1,038.0 ft ²	Exposed Exterior
1st floor garage	R 19 Adv. Framing G3 16" O.C	Medium	276.0 ft ²	Unconditioned, attached garage
2nd floor ambient	R 19 Adv. Framing G3 16" O.C	Medium	1,080.0 ft ²	Exposed Exterior
2nd floor attic	R 19 Adv. Framing G3 16" O.C	Medium	175.0 ft ²	Attic

Wall Library List

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

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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	33/20	2nd floor ambient		Yes	0	0	0	Southwest	48.9 ft ²
front shaded	33/20	1st floor ambient		Yes	6	1	6.1	Southwest	27.5 ft ²
left 2nd unshaded	33/20	2nd floor ambient		Yes	0	0	0	Northwest	13.8 ft ²
left unshaded	33/20	1st floor ambient		Yes	0	0	0	Northwest	41.3 ft ²
rear 2nd unshaded	33/20	2nd floor ambient		Yes	0	0	0	Northeast	27.5 ft ²
rear unshaded	33/20	1st floor ambient		Yes	0	0	0	Northeast	71.4 ft ²
right 2nd unshaded	33/20	2nd floor ambient		Yes	0	0	0	Southeast	32.5 ft ²

Glazing Library List

Name	Shgc	U-factor
33/20	0.2	0.330

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
attic doors	Fiberglass R-5	2nd floor attic		0.9	0.75	Medium	20.0 ft ²	Exposed Exterior
front door	Fiberglass R-5	1st floor ambient		0.9	0.75	Medium	20.0 ft ²	Exposed Exterior
garage door	Fiberglass R-5	1st floor garage		0.9	0.75	Medium	18.0 ft ²	Exposed Exterior

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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 w/ Radiant Barrier	2,044.77	No	Dark	1,391.0 ft²	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
1718 CFM at 50 Pa	Blower-door tested	4

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

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Onsite Generation

None Present

Onsite Generation Library List

None Present

Solar Generation

None Present

Solar Generation Library List

None Present

Conditioning Equipment

Name	Library Type	Heating Percent Load	Cooling Percent Load	Hot Water Percent Load	Location
Water Heating	Z 50 gal. 0.91EF elec	0%	0%	100%	Unspecified
whole house heat pump	z 36k 14 seer 8.0hspf	100%	100%	0%	Unspecified

Equipment Type: Z 50 gal. 0.91EF elec

Equipment Type	Water Heater
Fuel Type	Electric
Distribution Type	Hydronic Delivery (Radiant)
Hot Water Efficiency	0.91 Energy Factor
Tank Capacity (gal.)	50
Hot Water Capacity [kBtu/h]	40
Recovery Efficiency	0.98

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Equipment Type: z 36k 14 seer 8.0hspf

Equipment Type	Air Source Heat Pump
Fuel Type	Electric
Distribution Type	Forced Air
Motor Type	PSC (Single Speed)
Heating Efficiency	8 HSPF
Heating Capacity [kBtu/h]	36
Use default Supplemental Heat	Yes
Cooling Efficiency	14 SEER
Cooling Capacity [kBtu/h]	36

Distribution System

Distribution Type	Forced Air
Heating Equipment	whole house heat pump
Cooling Equipment	whole house heat pump
Sq. Feet Served	2365
# Return Grilles	3
Supply Duct R Value	8
Return Duct R Value	8
Supply Duct Area [ft ²]	638.55
Return Duct Area [ft ²]	354.75
Leakage to Outdoors	94 CFM @ 25Pa (3.97 / 100 s.f.)
Total Leakage	94 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	70
Percent Return Area	70
Duct 2	
Duct Location	Conditioned Space
Percent Supply Area	30
Percent Return Area	30
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

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Water Distribution

Water Fixture Type	Standard
Use Default Hot Water Pipe Length	No
Hot Water Pipe Length [ft]	61
At Least R3 Pipe Insulation?	No
Hot Water Recirculation System?	No
Recirculation System Pipe Loop Length [ft]	10
Drain Water Heat Recovery?	No

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

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Notes

- updated JS 03/09/21
- uninsulated slab modeled
- wall insulation modeled to Grade 3
- confirm attic insulation and hvac specs
- ventilation modeled as none
- confirm cfl lighting %
- modeled to worst case orientation