

North Carolina 2018 - R402.1.5 Total UA



Property

Fayetteville, NC 28376
 Model: Roosevelt slab
 Community: NA

Organization

Southern Energy Manager
 Sara Caliendo

Inspection Status

Results are projected

Roosevelt Plan-slab

Template - H & H - Fayetteville - Roo

Builder

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Building UA

Elements

	NC Reference	As Designed
Ceilings	58.5	55.1
Above-Grade Walls	222.5	194.2
Windows, Doors and Skylights	169.1	158.9
Slab Floor:	91.6	119.6
Framed Floors	14.8	14.8
Foundation Walls	0.0	0.0
Rim Joists	10.5	10.4
Overall UA (Design must be equal or lower):	567.0	553.0

Requirements

✓	402.1.5	Total UA alternative for insulation and fenestration
✓	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 2.5%.

Name: Sara Caliendo

Signature: Sara Caliendo

Organization: Southern Energy Management

Digitally signed: 10/1/19 at 2:16 PM

Ekotrope RATER - Version 3.1.0.2265

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.

Fuel Summary

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SOUTHERN ENERGY
MANAGEMENT
ENERGY EFFICIENCY & SOLAR POWER

Roosevelt Plan-slab

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Template - H & H - Fayetteville - Roosevelt

Annual Energy Cost

Electric	\$2,231
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Annual End-Use Cost

Heating	\$658
Cooling	\$234
Water Heating	\$325
Lights & Appliances	\$773
Onsite Generation	-\$0
Service Charges	\$240
Total	\$2,231

Annual End-Use Consumption

Heating [Electric kWh]	7,280.1
Cooling [Electric kWh]	2,438.2
Hot Water [Electric kWh]	3,519.8
Lights & Appliances [Electric kWh]	8,328.5
Total [Electric kWh]	21,566.6
Total Onsite Generation kWh	0.0

Peak Electric Consumption

Peak Winter kW	5.34
Peak Summer kW	3.22

Utility Rates

Electricity	Lumbee River EMC
Natural Gas	PSNC - Dominion 2019

Building Summary



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General Building Information

Number Of Bedrooms	5
Number Of Floors	2
Conditioned Floor Area [sq. ft.]	3,437
Unconditioned, attached garage?	Yes
Conditioned Volume [cu. ft.]	30,662
Total Units in Building	1
Residence Type	Single family detached
Floor Number	-
Model	Roosevelt slab
Community	NA
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	189	On Grade	1	0	1,583.0 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 G1 Carpet	0	Above Grade	315.0 ft²	Unconditioned, attached garage

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Framed Floor Library List

Name	Effective R-value
R-19 G1 Carpet	21.284

Rim Joist

Name	Library Type	Surface Area	Location
1st floor ambient	R-19 G3, 16"OC	151.0 ft ²	Exposed Exterior
1st floor garage	R-19 G3, 16"OC	38.0 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 FG G3 16" O.C	Medium	1,364.0 ft ²	Exposed Exterior
1st floor garage	R 19 FG G3 16" O.C	Medium	337.0 ft ²	Unconditioned, attached garage
2nd floor ambient	R 19 FG G3 16" O.C	Medium	1,356.0 ft ²	Exposed Exterior
2nd floor attic	R 19 FG G3 16" O.C	Medium	316.0 ft ²	Attic

Wall Library List

Name	Effective R-value
R 19 FG G3 16" O.C	14.878

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Glazing

Name	Library Type	Wall Assignment	Foundation Wall Assignment	Overhang Depth	Overhang Ft To Top	Overhang Ft To Bottom	Orientation	Surface Area
front 2nd unshaded	34/20	2nd floor ambient		0	0	0	East	57.0 ft ²
front shaded	34/20	1st floor ambient		6	2	9	East	53.0 ft ²
left 2nd unshaded	34/20	2nd floor ambient		0	0	0	South	30.0 ft ²
left unshaded	34/20	1st floor ambient		0	0	0	South	69.0 ft ²
rear 2nd unshaded	34/20	2nd floor ambient		0	0	0	West	102.0 ft ²
rear unshaded	34/20	1st floor ambient		0	0	0	West	90.0 ft ²
right 2nd unshaded	34/20	2nd floor ambient		0	0	0	North	29.0 ft ²
right unshaded	34/20	1st floor ambient		0	0	0	North	15.0 ft ²

Glazing Library List

Name	Shgc	U-factor
34/20	0.2	0.340

Skylight

None Present

Skylight Library List

None Present

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Opaque Door

Name	Library Type	Wall Assignment	Foundation Wall Assignment	Emittance	Solar Absorbance	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	Exposed Exterior

Opaque Door Library List

Name	Effective U-factor
Fiberglass R-5	0.200

Roof Insulation

Name	Library Type	Attic Exterior Area [s.f.]	Clay or Concrete Roof Tiles	Surface Color	Surface Area	Location
Attic	R-38 Attic BLOWN FG G1 2x10 24"OC w/ Radiant Barrier	1,960.8	No	Dark	1,634.0 ft²	Attic
Attic vaulted	R-30 Attic FG VAULTED G1 2x10 w/ Radiant Barrier	317	No	Dark	317.0 ft²	Vaulted Roof

Roof Insulation Library List

Name	Has Radiant Barrier	Effective R-value
R-30 Attic FG VAULTED G1 2x10 w/ Radiant Barrier	Yes	28.227
R-38 Attic BLOWN FG G1 2x10 24"OC w/ Radiant Barrier	Yes	37.246

Whole House Infiltration

Infiltration	Measurement Type	Shelter Class
2452 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
75	0	0	0	0	0

Onsite Generation

None Present

Onsite Generation Library List

None Present

Solar Generation

None Present

Solar Generation Library List

None Present

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Conditioning Equipment

Name	Library Type	Heating Percent Load	Cooling Percent Load	Hot Water Percent Load	Location
Air-source heat pump (1)	z 30k 14 Seer 8.2hspf	50%	50%	0%	Unspecified
Air-source heat pump (2)	z 30k 14 Seer 8.2hspf	50%	50%	0%	Unspecified
Water Heating	Z 50 gal. 0.91EF elec	0%	0%	100%	Unspecified

Equipment Type: Z 50 gal. 0.91EF elec

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

Equipment Type: z 30k 14 Seer 8.2hspf

Fuel Type	Electric
Distribution Type	Forced Air
Motor Type	PSC (Single Speed)
Heating Efficiency	8.2 HSPF
Heating Capacity [kBtu/h]	30
Cooling Efficiency	14 SEER
Cooling Capacity [kBtu/h]	30

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Distribution System

Distribution Type	Forced Air
Heating Equipment	Air-source heat pump (1)
Cooling Equipment	Air-source heat pump (1)
Sq. Feet Served	1583
# Return Grilles	2
Supply Duct R Value	8
Return Duct R Value	8
Supply Duct Area [ft ²]	427.41
Return Duct Area [ft ²]	158.3
Leakage to Outdoors	64 CFM25 (4.04 / 100 s.f.)
Total Leakage	64 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

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Distribution System

Distribution Type	Forced Air
Heating Equipment	Air-source heat pump (2)
Cooling Equipment	Air-source heat pump (2)
Sq. Feet Served	1854
# Return Grilles	2
Supply Duct R Value	8
Return Duct R Value	8
Supply Duct Area [ft ²]	500.58
Return Duct Area [ft ²]	185.4
Leakage to Outdoors	74 CFM25 (3.99 / 100 s.f.)
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

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]	111
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

Fuel Type	Electric
Cef	2.617
Field Utilization	Timer Controls

Clothes Washer

Label Energy Rating	151 kWh/Year
Electric Rate	\$0.11/kWh
Annual Gas Cost	\$12.00
Gas Rate	\$1.22/Therm
Capacity	3.31
Imef	2.15474

Appliances and Controls

Programmable thermostat?	Yes
Dishwasher Size	Standard
Dishwasher Efficiency	0.65 EF
Range/Oven Fuel	Electric
Convection Oven?	No
Induction Range?	No
Refrigerator Consumption	709 kWh/Year

Notes

- initial form completed by JS 06/22/18
- confirm insulation values and hvac specs
- modeled to worst case orientation