

Action Report

Property
Nichols
3257 N. 337th Ave.
Tonopah, AZ 85354

Organization
Best Energy Rating
480-824-8535
Michael Bestenlehner

HERS
Projected Rating
2018-04-03
Rater ID:5905566



Weather:Wickenburg, AZ
Nichols Residence
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The following table identifies and ranks energy use and cost by building component. A maximum of six components are shown. Current mechanical equipment is assumed for this analysis. To determine the impact of varying the equipment efficiency, change the equipment specified in the building file and perform the energy calculations again.

ANNUAL ENERGY PROFILE

Energy End-Use	Component	Consumption(MMBtu/yr)	Cost(\$/yr)
HEATING	Slab Floors	3.3	114
	Ceilings/Roofs	1.3	44
	Above Grade Walls	1.0	34
	Windows/Skylights	0.9	32
	Mechanical Ventilation	0.6	20
	Ducts	0.2	7
	Other	-1.2	-42
	Total	6.0	209
COOLING	Internal Gains	3.7	128
	Slab Floors	3.1	109
	Ceilings/Roofs	1.6	55
	Above Grade Walls	1.4	50
	Windows/Skylights	1.4	49
	Mechanical Ventilation	0.7	26
	Other	1.0	35
	Total	13.0	452
WATER HEATING	Water Heater	3.9	138
LIGHTS & APPLIANCES	Lights & Appliances	21.0	735

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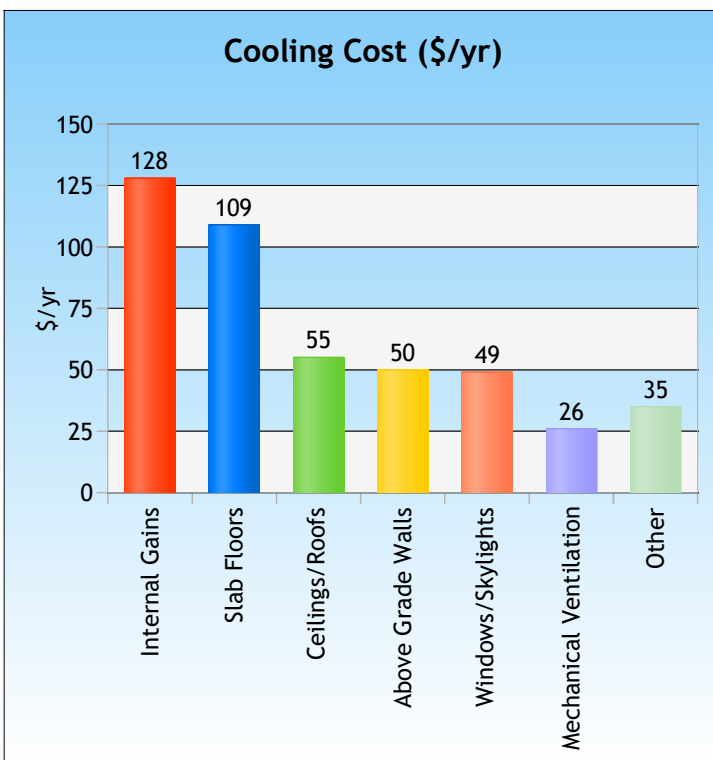
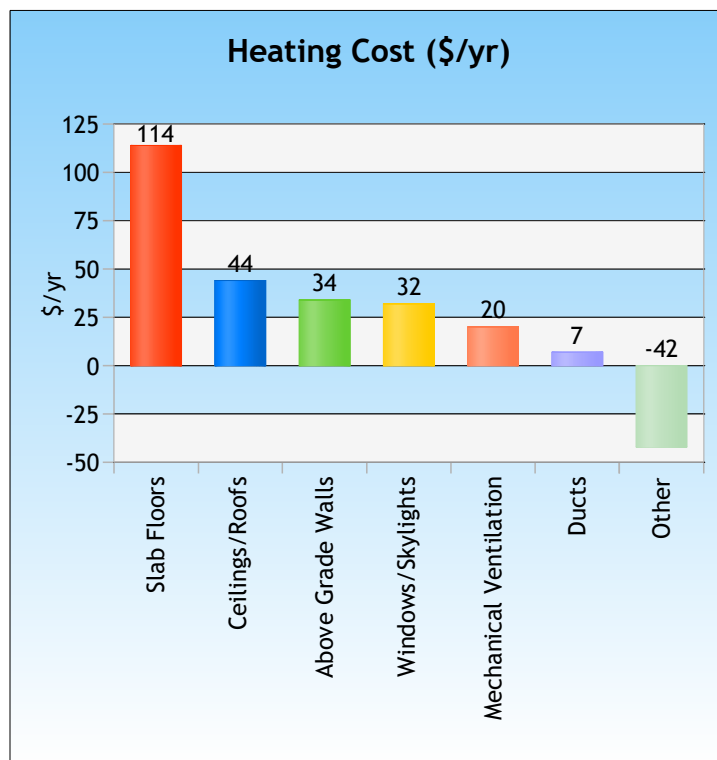
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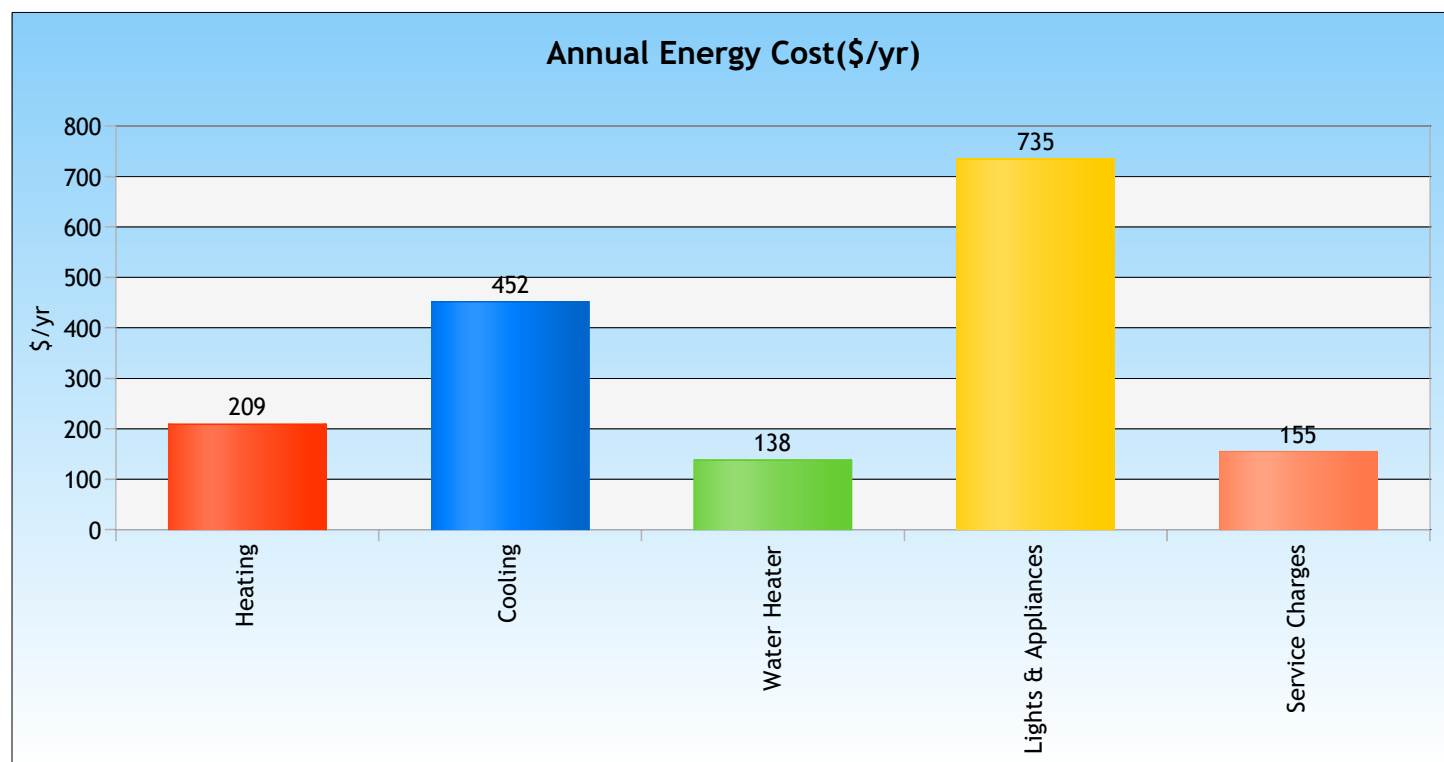
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Air Leakage

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Whole House Infiltration

Blower Door Test

	Heating	Cooling
Natural ACH	0.07	0.06
ACH @ 50 Pascals	1.77	1.77
CFM @ 25 Pascals	601	601
CFM @ 50 Pascals	943	943
Eff. Leakage Area (sq.in)	51.8	51.8
Specific Leakage Area	0.00015	0.00015
ELA/100 sf shell (sq.in)	0.69	0.69

Duct Leakage

Leakage to Outside Units

	Main
CFM @ 25 Pascals	80
CFM25 / CFMfan	0.0400
CFM25 / CFA	0.0335
CFM per Std 152	N/A
CFM per Std 152 / CFA	N/A
CFM @ 50 Pascals	126
Eff. Leakage Area (sq.in)	6.89
Thermal Efficiency	N/A
Total Duct Leakage Units	CFM25/CFA
Total Duct Leakage	0.0335

Ventilation

Mechanical	Exhaust Only	ASHRAE	ASHRAE
Sensible Recovery Eff. (%)	0.0	62.2-2010	62.2-2013
Total Recovery Eff. (%)	0.0		
Rate (cfm)	54	54	81
Hours/Day	24.0	24.0	24.0
Fan Watts	22.0		
Cooling Ventilation	Natural Ventilation		

ASHRAE 62.2 - Ventilation Requirements

The ASHRAE 62.2 flow rates shown above are the CONTINUOUS mechanical fresh air ventilation which will meet the 'whole-building' requirement under that version of the standard. Both values incorporate any appropriate 'infiltration credit'. Intermittent mechanical ventilation may be used if the flow rate is adjusted accordingly. For example, the runtime can be reduced to 12 hours per day using a doubled flow rate, as long as the system provides ventilation at least once every 3 hours. For more detail, refer to the appropriate standard.

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Property/Builder Information

Building Name	Nichols Residence
Owner's Name	Nichols
Property Address	3257 N. 337th Ave.
City, St, Zip	Tonopah, AZ 85354
Phone Number	

Builder's Name	
Phone Number	
Email Address	
Plan/Model Name	
Community/Development	
Permit Date/Number	

Organization Information

Organization Name	Best Energy Rating
Address	1066 E. Zesta Ln.
City, St, Zip	Gilbert, AZ 85297
Phone Number	480-824-8535
Website	www.bestenergyrating.com

Rating/RESNET Information

Provider ID	1998-176
Sample Set ID	00000000
Registry ID	
Rater's Name	Michael Bestenlehner
Rater's ID	5905566
Rater's Email	mbest@bestenergyrating.com
Rating Date	2018-04-03
Rating Type	Projected Rating
Reason for Rating	New Home
Rating Number	

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General Building Information

Area of Conditioned. Space(sq ft)	2388
Volume of Conditioned. Space	31938
Year Built	2018
Housing Type	Single-family detached
Level Type(Apartments Only)	None
Floors on or Above-Grade	1
Number of Bedrooms	3
Foundation Type	Slab
Enclosed Crawl Space Type	N/A
Number of Stories Including Conditioned Basement	1
Thermal Boundary Location	N/A

Slab Floor Information

Name	Library Entry	Area(sq ft)	Depth Below Grade(ft)	Full Perimeter(ft)	Exposed Perimeter(ft)	On-Grade Perimeter(ft)
SOG	Uninsulated Tile	2388	0.0	269	269	269

Slab Floor Library List

Slab Floor: Uninsulated Tile

Slab Covering	Tile
Perimeter Insulation (R-Value)	0.0
Perimeter Insulation Depth (ft)	0.0
Under-Slab Insulation (R-Value)	0.0
Under-Slab Insulation Width (ft)	0.0
Slab Insulation Grade	1
Radiant Slab	No
Note	

Above-Grade Wall

Name	Library Entry	Location	Exterior Color	Area(sq ft)	Uo Value
PB Full Foam Core	Perfect Block Full	Cond -> ambient	Light	592.00	0.031
PB Open Cncrt Core	Perfect Block Open	Cond -> ambient	Light	1776.40	0.070
Framed Celestry	R-19, R-4 Cont. G1	Cond -> ambient	Medium	380.00	0.047
Framed Truss Ext	R-19, R-4 Cont. G1	Sealed Attic -> ambient	Medium	266.70	0.047

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Above-Grade Wall

Name	Library Entry	Location	Exterior Color	Area(sq ft)	Uo Value
Garage	R-19 Grade 1	Sealed Attic -> ambient	Medium	352.30	0.059
Knee/Patios	R-19 Grade 1	Sealed Attic -> ambient	Medium	318.10	0.059

Above-Grade Wall Library List

Above-Grade Wall: Perfect Block Full

Information From Quick Fill Screen

Wall Construction Type	Insulated Concrete Form
Continuous Insulation (R-Value)	30.0
Frame Cavity Insulation (R-Value)	0.0
Frame Cavity Insulation Thickness (in)	0.0
Frame Cavity Insulation Grade	1
Stud Size (w x d, in)	0.0 x 0.0
Stud Spacing (in o.c.)	10.0
Framing Factor - (default)	0.1363
Gypsum Thickness (in)	0.5

Note

Above-Grade Wall: Perfect Block Open

Information From Quick Fill Screen

Wall Construction Type	Insulated Concrete Form
Continuous Insulation (R-Value)	12.0
Frame Cavity Insulation (R-Value)	0.0
Frame Cavity Insulation Thickness (in)	0.0
Frame Cavity Insulation Grade	1
Stud Size (w x d, in)	0.0 x 0.0
Stud Spacing (in o.c.)	10.0
Framing Factor - (default)	0.1363
Gypsum Thickness (in)	0.5

Note

Above-Grade Wall: R-19, R-4 Cont. G1

Information From Quick Fill Screen

Wall Construction Type	Standard Wood Frame
Continuous Insulation (R-Value)	4.0

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Above-Grade Wall Library List

Frame Cavity Insulation (R-Value)	19.0
Frame Cavity Insulation Thickness (in)	5.5
Frame Cavity Insulation Grade	1
Stud Size (w x d, in)	1.5 x 5.5
Stud Spacing (in o.c.)	16.0
Framing Factor - (default)	0.2300
Gypsum Thickness (in)	0.5
Note	

Above-Grade Wall: R-19 Grade 1

Information From Quick Fill Screen

Wall Construction Type	Standard Wood Frame
Continuous Insulation (R-Value)	0.0
Frame Cavity Insulation (R-Value)	19.0
Frame Cavity Insulation Thickness (in)	5.5
Frame Cavity Insulation Grade	1
Stud Size (w x d, in)	1.5 x 5.5
Stud Spacing (in o.c.)	24.0
Framing Factor - (default)	0.1988
Gypsum Thickness (in)	0.5
Note	

Window Information

Name	Wall Assignment	Orient	U-Value	SHGC	Area (sqft)	Overhang			Interior		Adjacent	
						Depth (ft)	To Top (ft)	To Btm (ft)	Winter Shading	Summer Shading	Winter Shading	Summer Shading
Front 4x6x2	AGWall 2	Northwes	0.370	0.230	48.00	13.0	2.0	8.0	0.85	0.70	Some	Some
Front 2x8	AGWall 2	Northwes	0.370	0.230	16.00	26.8	2.0	10.0	0.85	0.70	Complete	Complete
Front 3x7	AGWall 2	Northwes	0.520	0.250	16.00	26.8	2.5	9.5	0.85	0.70	Complete	Complete
Front 4x6	AGWall 2	Northwes	0.370	0.230	24.00	18.0	2.0	8.0	0.85	0.70	Most	Most
Right 4x6	AGWall 2	Southwes	0.370	0.230	24.00	0.0	0.0	0.0	0.85	0.70	None	None
Right 3x5	AGWall 2	Southwes	0.370	0.230	15.00	5.0	2.0	8.0	0.85	0.70	Some	Some
Right 2x6.5	AGWall 2	Southwes	0.240	0.180	13.00	10.0	3.0	9.5	0.85	0.70	Some	Some
Back 1x1x3	AGWall 2	Southeast	0.370	0.230	3.00	0.0	0.0	0.0	0.85	0.70	Some	Some
Back 3x5	AGWall 2	Southeast	0.370	0.230	15.00	11.5	2.0	7.0	0.85	0.70	Most	Most

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Window Information

Name	Wall Assignment	Orient	U-Value	SHGC	Area (sqft)	Overhang			Interior		Adjacent	
						Depth (ft)	To Top (ft)	To Btm (ft)	Winter Shading	Summer Shading	Winter Shading	Summer Shading
Back 3x5	AGWall 2	South	0.370	0.230	15.00	13.0	2.0	7.0	0.85	0.70	Most	Most
Back 2x6.5x2	AGWall 2	Southeast	0.370	0.230	23.00	15.5	2.5	9.0	0.85	0.70	Most	Most
Left 1x1x3	AGWall 2	Northeast	0.370	0.230	3.00	0.0	0.0	0.0	0.85	0.70	None	None
Front Clt 1.5x1.5x2	AGWall 2	Northwes	0.370	0.230	4.50	0.0	0.0	0.0	0.85	0.70	None	None
Right Clt 1.5x1.5x3	AGWall 2	Southwes	0.370	0.230	6.80	0.0	0.0	0.0	0.85	0.70	None	None
Left Clt 1.5x1.5x3	AGWall 2	Northeast	0.370	0.230	6.80	0.0	0.0	0.0	0.85	0.70	None	None
Back Clt 1.5x1.5x2	AGWall 2	Southeast	0.370	0.230	4.50	0.0	0.0	0.0	0.85	0.70	None	None

Door Information

Name	Library Entry	Wall Assignment	Opaque Area(sq ft)	Uo Value	R-Value of Opaque Area	Storm Door
Garage	1-3/4 Wd solid core	AGWall 5	24.0	0.329	2.1	No
Front	2-1/4 Wd solid core	AGWall 2	11.0	0.268	2.8	No
Patio	1-3/4 Wd solid core	AGWall 2	33.0	0.329	2.1	No

Roof Information

Name	Library Entry	Ceiling Area(sq ft)	Roof Area(sq ft)	Exterior Color	Radiant Barrier	Type	Uo Value	Cement or Clay Tiles	Roof Tile Ventilation
Flat Roof	R23 Fm Dk R7 Fm Rf	2388.00	2390.00	Reflective	No	Sealed Attic	0.032	No	No

Roof Library List

Ceiling: R23 Fm Dk R7 Fm Rf

Information From Quick Fill Screen

Continous Insulation (R-Value)	17.0
Cavity Insulation (R-Value)	13.0
Cavity Insulation Thickness (in)	3.5
Cavity Insulation Grade	1

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Roof Library List

Gypsum Thickness (in)	0.500
Bottom Chord/Rafter Size(w x h, in)	1.5 x 3.5
Bottom Chord/Rafter Spacing (in o.c.)	24.0
Framing Factor - (default)	0.1100
Ceiling Type	Sealed Attic
Note	

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Mechanical Equipment

Number of Mechanical Systems	2
Heating SetPoint(F)	70.00
Heating Setback Thermostat	Present
Cooling SetPoint(F)	75.00
Cooling Setup Thermostat	Present

DHW: 50 gal. 0.95EF Elec

Water Heater Type	Conventional
Fuel Type	Electric
Energy Factor	0.95
Recovery Efficiency	0.98
Water Tank Size (gallons)	50
Extra Tank Insulation (R-Value)	0.0
Note	
Number Of Units	1
Location	Garage or open crawl space
Performance Adjustment	100
Percent Load Served	100

ASHP: 60k 17.5seer 9.5hspf

Fuel Type	Electric
Heating Seasonal Efficiency	9.50 HSPF
Compressor Heating Output Capacity at 17F (kBtuh)	36.6
Compressor Heating Output Capacity at 47F (kBtuh)	60.0
Electric Resistance Backup Capacity (kW)	0
Cooling Output Capacity (kBtuh)	60.0
Cooling Seasonal Efficiency	17.50 SEER
Desuperheater	No
Note	
Number Of Units	1
Location	Conditioned area
Performance Adjustment	100
Percent Heating Load Served	100

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Mechanical Equipment

Percent Cooling Load Served	100
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DHW Efficiencies

All bath faucets & showers <= 2gpm	false
All DHW pipes fully insulated >= R-3	false
Recirculation type	None (standard system)
Farthest fixture to DHW heater	0
Pipelength for longest DHW run (Sum)	10
DWHR unit present?	false

DHW Diagnostics

dhwGpd	29.90
dishwasherGpd	2.21
clothesWasherHotWaterGPD	-0.08
EDeff	0.86
ewaste	10.23
tmains	79.60
dwHrWhInletTempAdj	0.00
pumpConsKwh	0.00
pumpConsMmbtu	0.00

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Duct Systems

Name	Main
Conditioned Floor Area(sq ft)	2388.0
# of Returns	3
Heating System	60k 17.5seer 9.5hspf
Cooling System	60k 17.5seer 9.5hspf
Supply Duct Surface Area(sq ft)	483.6
Return Duct Surface Area(sq ft)	268.7
Duct Leakage	
Qualitative Assessment	Not Applicable
Duct Leakage to Outside	
Supply+Return	80.00 CFM @ 25 Pascals
Supply Only	Not Applicable
Return Only	Not Applicable
Total Duct Leakage	80.00 CFM @ 25 Pascals
Duct Tightness Test	Postconstruction Test

Type	Location	Percent Location	R-Value
Supply	Conditioned space	100.0	6.0
Return	Conditioned space	100.0	6.0

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Infiltration and Mechanical Ventilation

Whole House Infiltration

Measurement Type	Blower door test
Heating Season Infiltration Value	943 CFM @ 50 Pascals
Cooling Season Infiltration Value	943 CFM @ 50 Pascals
Shelter Class	2
Code Verification	Tested

Mechanical Ventilation for IAQ

Type	Exhaust Only
Rate(cfm)	54
Sensible Recovery Efficiency(%)	0.00
Total Recovery Efficiency(%)	0.00
Hours per Day	24.0
Fan Power (watts)	22.00
ECM Fan Motor	false

Ventilation Strategy for Cooling

Cooling Season Ventilation	Natural Ventilation
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Lights and Appliances

Rating/RESNET audit

Ceiling Fan CFM / Watt	0.00
Refrigerator kWh/yr	691
Refrigerator Location	Conditioned
Range/Oven Fuel Type	Electric
Induction Range	No
Convection Oven	No

Dishwasher

Energy Factor	0.76
Dishwasher kWh/yr	0
Place Setting Capacity	12

Clothes Dryer

Fuel Type	Electric
Location	Conditioned
Moisture Sensing	Yes
Energy Factor	3.01
Gas Energy Factor	2.67

Clothes Washer

Location	Conditioned
LER (kWh/yr)	96
MEF	3.410
Capacity (CU.Ft)	3.810
Electricity Rate	0.11
Gas Rate	1.22
Annual Gas Cost	11.00

Qualifying Light Fixtures

Interior CFLs %	75.0
Interior Fluorescent %	0.0
Exterior Lights %	60.0
Garage Lights %	100.0

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Mandatory Requirements

IECC Requirements

Verified IECC 04	false
Verified IECC 06	true
Verified IECC 09	true
Verified IECC 12	true
Verified IECC 15	true
Verified NY-ECCC 2010	false
Verified IECC MI	false

Seek Certification For: None

ENERGY STAR Version 3 Checklist

Thermal Enclosure Checklist	false
HVAC System Quality Installation Contractor Checklist	false
HVAC System Quality Installation Rater Checklist	false
Water Management System Builder Checklist	false

ENERGY STAR Version 3 Appliances

	Exist	Amount
Refrigerators	false	0
Ceiling Fans	false	0
Exhaust Fans	false	0
Dishwashers	false	0

ENERGY STAR Version 3 Basements

Basement Wall Area 50% Below Grad:	false
Basement Floor Area	0.00
2009 IECC Prescriptive Requirements for ENERGY STAR v3.0	false
Slab Insulation Exemption:	false

Indoor airPlus Verification Checklist	false
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DOE Zero Energy Ready Home

Home Builder ID Number

Mandatory Requirements

Verified Fenestration	false
Verified Insulation	false
Verified Duct Location	false
Verified Appliance	false
Verified Lighting	false
Verified Fan Efficiency	false
Verified Water Efficiency	false
Verified EPA Indoor airPLUS	false
Verified Renewable Energy Ready Solar Electric	false

Optional Home Builder Commitments for Recognition

Certified under the EPA WaterSense for New Homes Program	No
Certified under the IBHS fortified for Safer Living Program	No
Followed the DOE Zero Energy Ready Home Quality Management Guidelines	No
The buyer of this home signed a waiver giving DOE Zero Energy Ready Home access to utility bill data for one year.	No

Active Solar

System Type	None
Collector Loop Type	None
Collector Type	None
Collector Orientation	None
Area(sq ft)	0.0
Tilt(degrees)	0.0
Volume(cu ft/gal)	0.0

Notes

HERS Only
Faces NW

Component Loads

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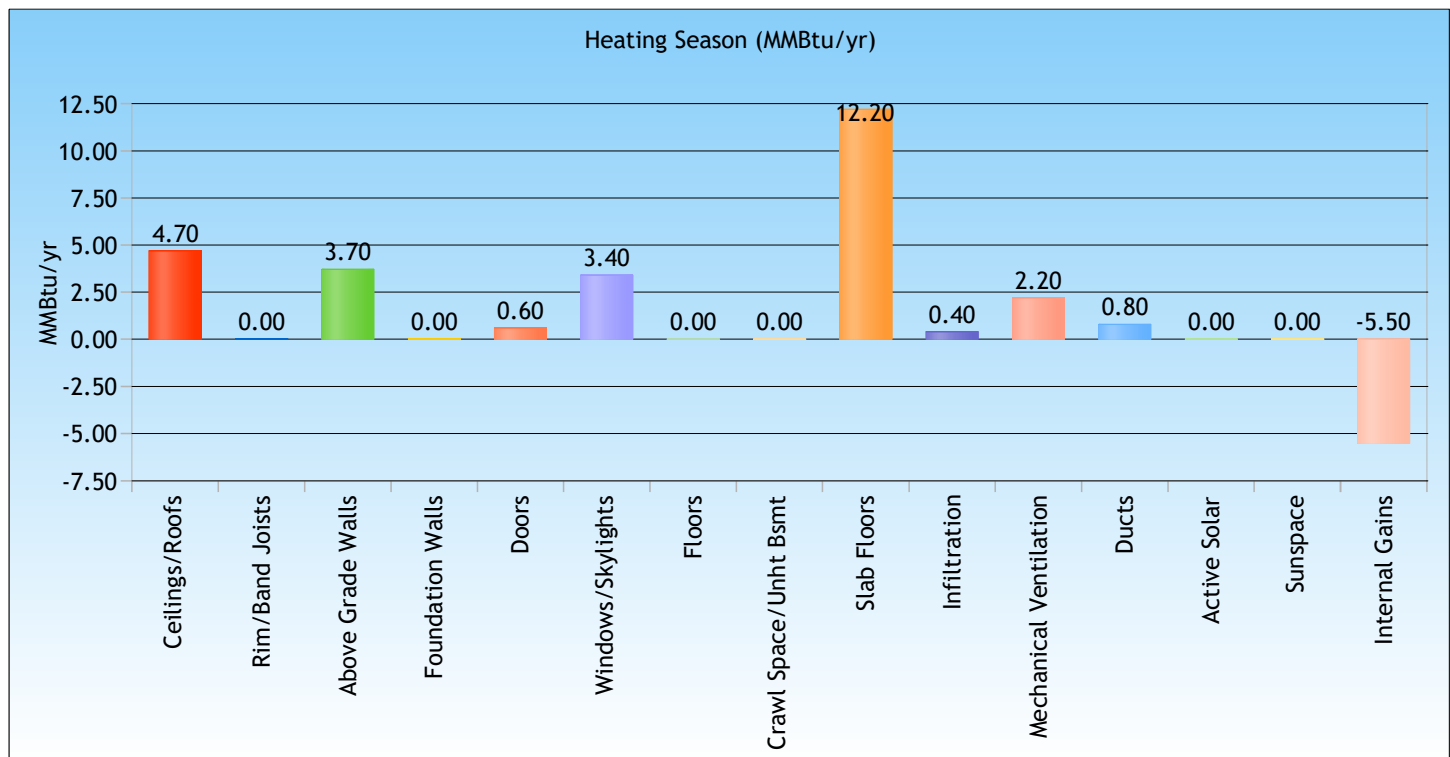
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Nichols Residence
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Heating Season

MMBtu/yr

Ceilings/Roofs	4.7
Rim/Band Joists	0.0
Above Grade Walls	3.7
Foundation Walls	0.0
Doors	0.6
Windows/Skylights	3.4
Floors	0.0
Crawl Space/Unht Bsmt	0.0
Slab Floors	12.2
Infiltration	0.4
Mechanical Ventilation	2.2
Ducts	0.8
Active Solar	0.0
Sunspace	0.0
Internal Gains	-5.5
Total	22.5



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Component Loads

Property
Nichols
3257 N. 337th Ave.
Tonopah, AZ 85354

Organization
Best Energy Rating
480-824-8535
Michael Bestenlehner

HERS
Projected Rating
2018-04-03
ID:5905566



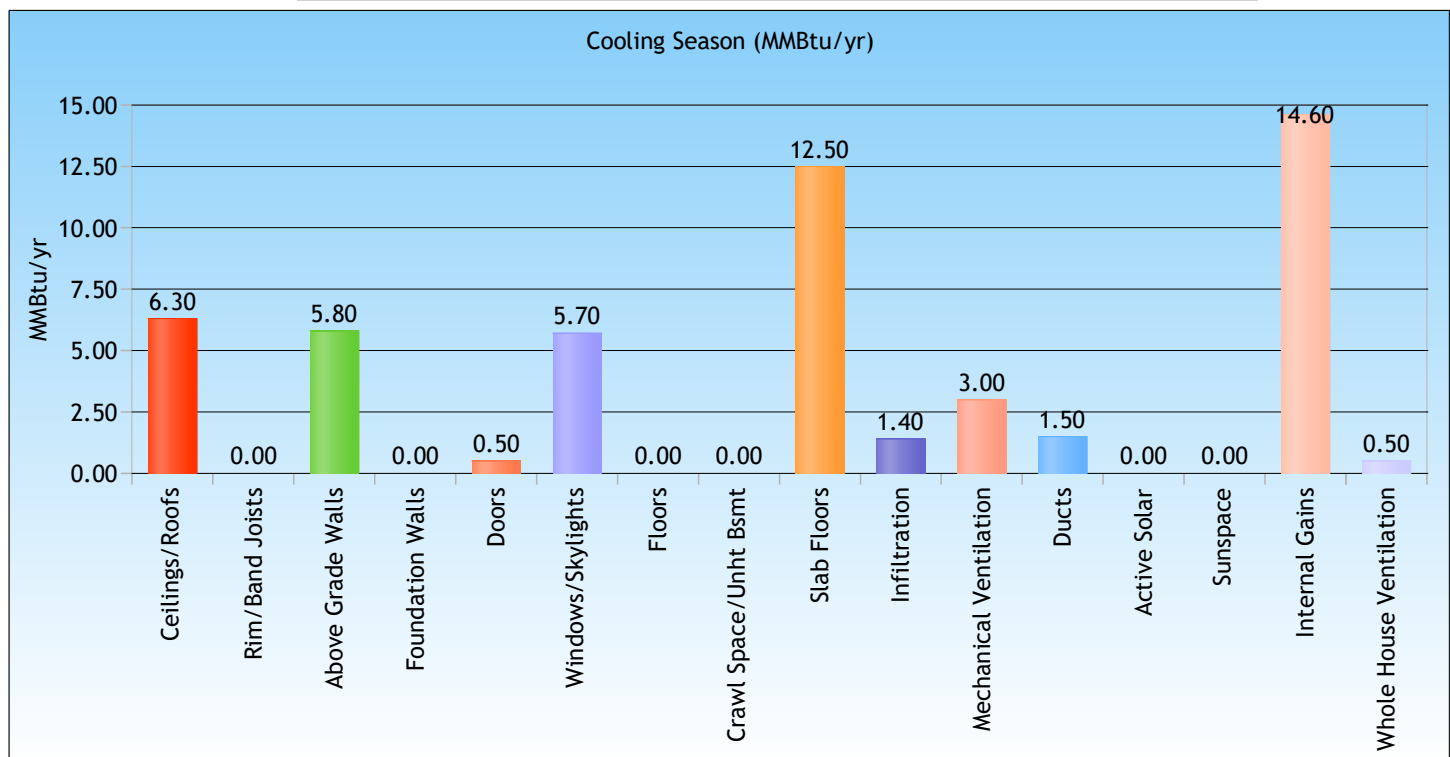
Weather: Wickenburg, AZ
Nichols Residence
Nichols Residence.blg

Builder

Cooling Season

MMBtu/yr

Ceilings/Roofs	6.3
Rim/Band Joists	0.0
Above Grade Walls	5.8
Foundation Walls	0.0
Doors	0.5
Windows/Skylights	5.7
Floors	0.0
Crawl Space/Unht Bsmt	-0.0
Slab Floors	12.5
Infiltration	1.4
Mechanical Ventilation	3.0
Ducts	1.5
Active Solar	0.0
Sunspace	0.0
Internal Gains	14.6
Whole House Ventilation	0.5
Total	51.7



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Component Consumption

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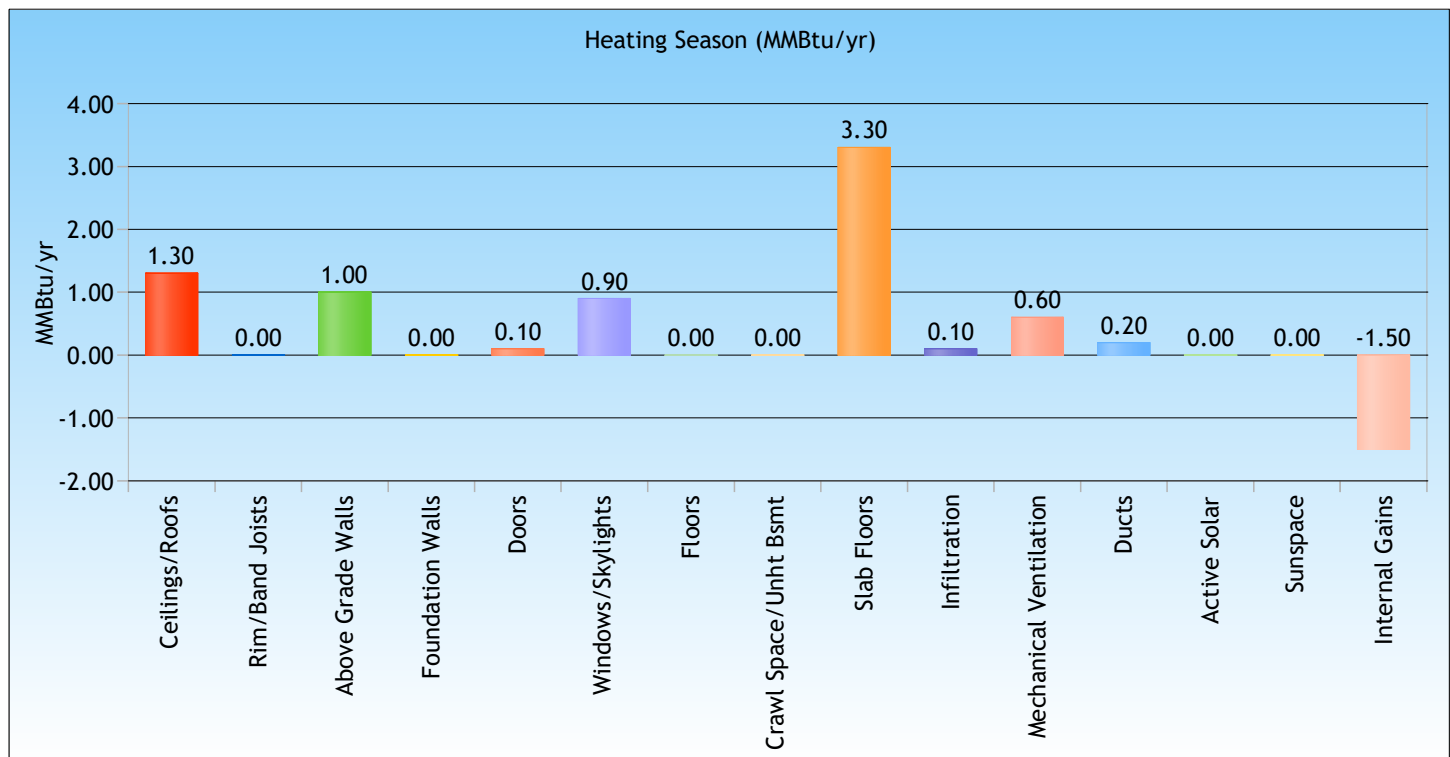
Weather: Wickenburg, AZ
Nichols Residence
Nichols Residence.blg

Builder

Heating Season

MMBtu/yr

Ceilings/Roofs	1.3
Rim/Band Joists	0.0
Above Grade Walls	1.0
Foundation Walls	0.0
Doors	0.1
Windows/Skylights	0.9
Floors	0.0
Crawl Space/Unht Bsmt	0.0
Slab Floors	3.3
Infiltration	0.1
Mechanical Ventilation	0.6
Ducts	0.2
Active Solar	0.0
Sunspace	0.0
Internal Gains	-1.5
Total	6.0



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Component Consumption

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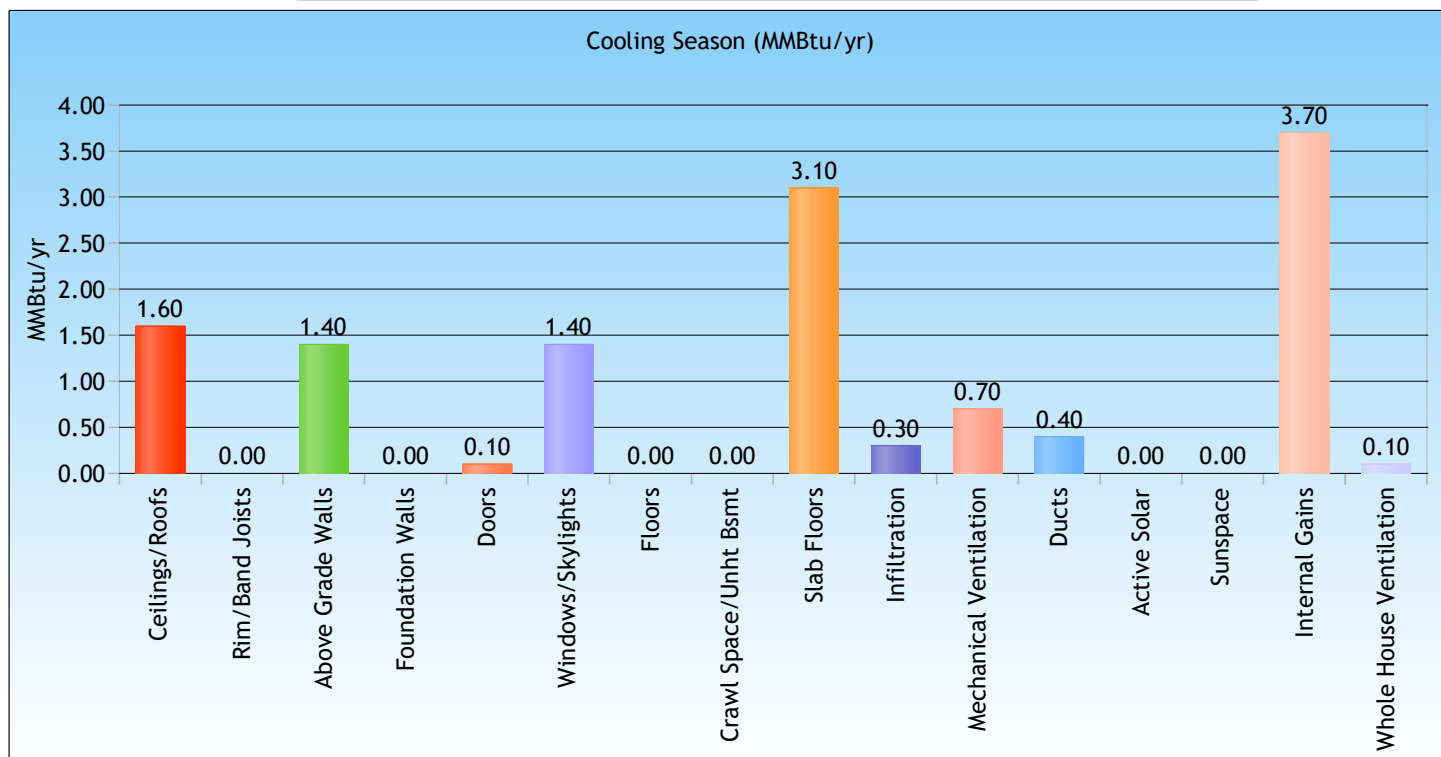
Weather: Wickenburg, AZ
Nichols Residence
Nichols Residence.blg

Builder

Cooling Season

MMBtu/yr

Ceilings/Roofs	1.6
Rim/Band Joists	0.0
Above Grade Walls	1.4
Foundation Walls	0.0
Doors	0.1
Windows/Skylights	1.4
Floors	0.0
Crawl Space/Unht Bsmt	-0.0
Slab Floors	3.1
Infiltration	0.3
Mechanical Ventilation	0.7
Ducts	0.4
Active Solar	0.0
Sunspace	0.0
Internal Gains	3.7
Whole House Ventilation	0.1
Total	13.0



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Component Design Loads

Property
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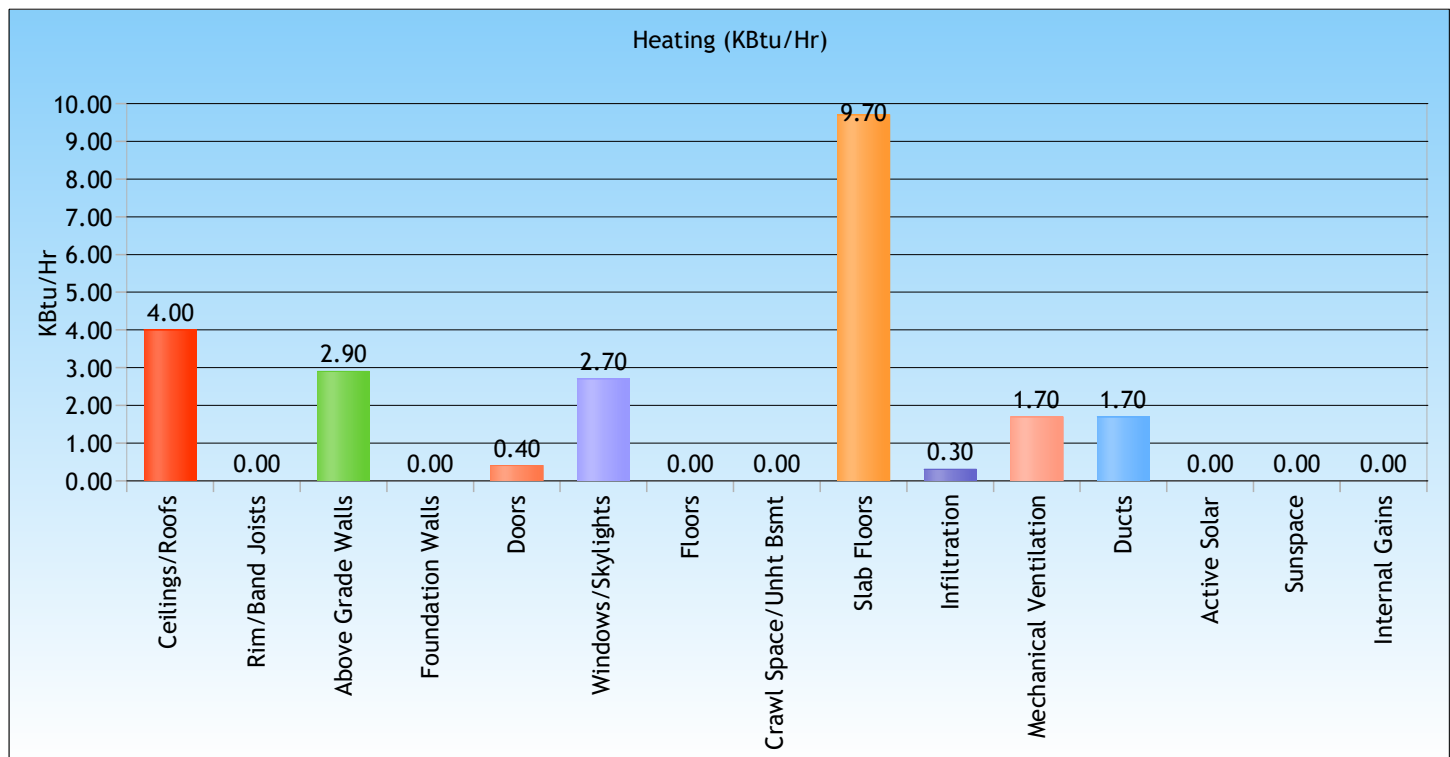
Weather: Wickenburg, AZ
Nichols Residence
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Builder

Heating

kBtu/hr

Ceilings/Roofs	4.0
Rim/Band Joists	0.0
Above Grade Walls	2.9
Foundation Walls	0.0
Doors	0.4
Windows/Skylights	2.7
Floors	0.0
Crawl Space/Unht Bsmt	0.0
Slab Floors	9.7
Infiltration	0.3
Mechanical Ventilation	1.7
Ducts	1.7
Active Solar	0.0
Sunspace	0.0
Internal Gains	0.0
Total	23.3



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Component Design Loads

Property
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Tonopah, AZ 85354

Organization
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Michael Bestenlehner

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2018-04-03
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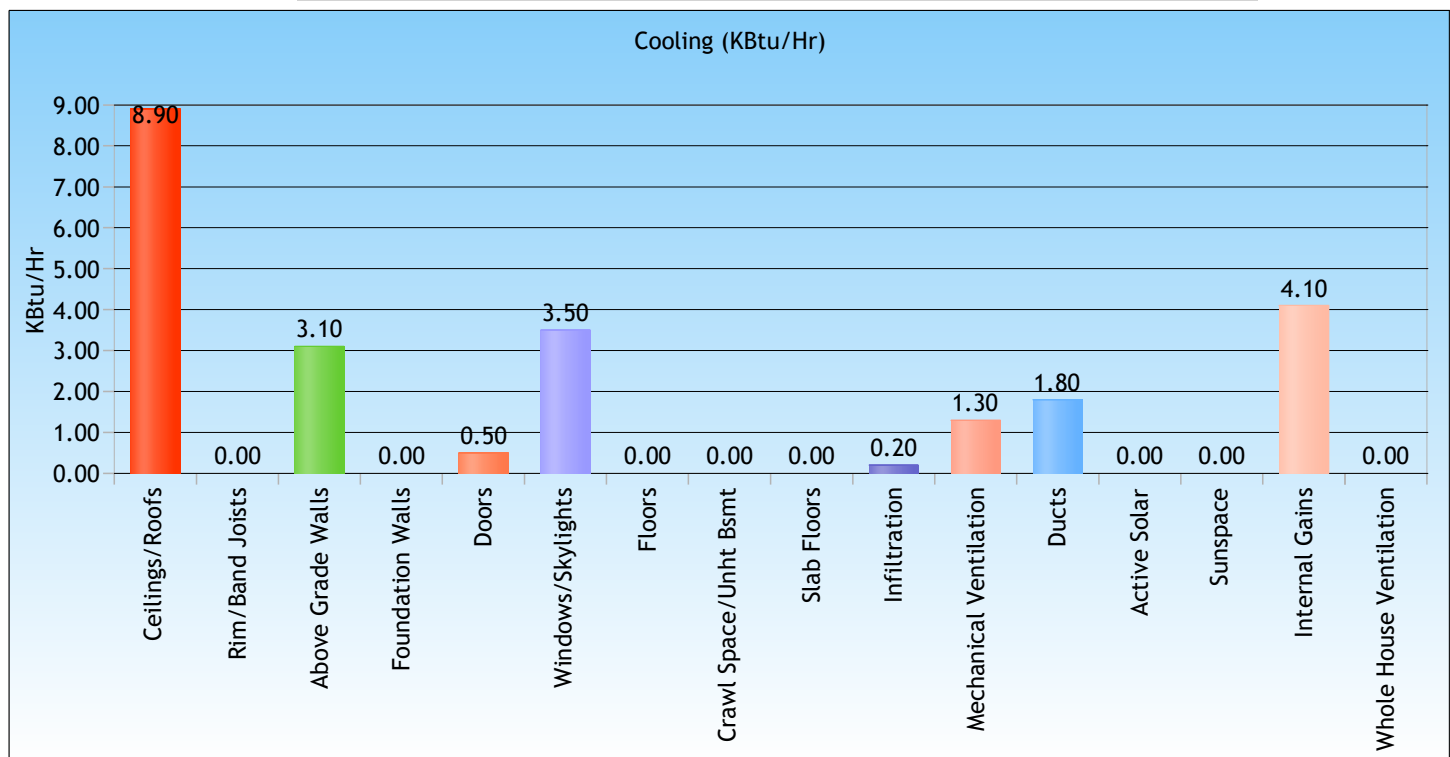
Weather: Wickenburg, AZ
Nichols Residence
Nichols Residence.blg

Builder

Cooling

kBtu/hr

Ceilings/Roofs	8.9
Rim/Band Joists	0.0
Above Grade Walls	3.1
Foundation Walls	0.0
Doors	0.5
Windows/Skylights	3.5
Floors	0.0
Crawl Space/Unht Bsmt	0.0
Slab Floors	0.0
Infiltration	0.2
Mechanical Ventilation	1.3
Ducts	1.8
Active Solar	0.0
Sunspace	0.0
Internal Gains	4.1
Whole House Ventilation	0.0
Total	23.5



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Energy Cost and Features

Property
Nichols
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Tonopah, AZ 85354

Organization
Best Energy Rating
480-824-8535
Michael Bestenlehner

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Projected Rating
2018-04-03
Rater ID:5905566



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Builder

Annual Energy Costs	\$/yr
Heating	209
Cooling	452
Water Heating	138
Lights & Appliances	735
Photovoltaics	-0
Service Charges	155
Total	1689
Average Monthly(\$/Month)	141

Energy Features

Ceiling w/Attic	None
Sealed Attic	R23 Fm Dk R7 Fm Rf U=0.032
Vaulted Ceiling	None
Above Grade Wall	Perfect Block Open U=0.070
Foundation Walls (Cond)	None
Foundation Walls (Uncond)	None
Doors	1-3/4 Wd solid core U=0.329
Windows	2012 Vinyl U=0.370
Floors	None
Slab Floors	Uninsulated Tile U=0.642
Infiltration	Htg: 943 Clg: 943 CFM50
Infiltration Measure	Blower door test
Mechanical Ventilation	Exhaust Only: 54 cfm, 22.0 watts.
Interior Mass	None
Mechanical Equipment 1	Water Heating: Conventional, Elec, 0.95 EF.
Mechanical Equipment 2	ASHP: Htg: 60.0 kBtuh, 9.5 HSPF. Clg: 60.0 kBtuh, 17.5 SEER.
Programmable Thermostat	Heat=Yes; Cool=Yes
Ducts	R-6.0Conditioned space
Duct Leakage to Outside	80.00 CFM @ 25 Pascals
Total Duct Leakage	80.00 CFM @ 25 Pascals
Lights/Appliances	Rating Tab
Active Solar	None

Note: Where feature level varies in home, the dominate value is shown.

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Energy Cost and Features

Property

Nichols
3257 N. 337th Ave.
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Organization

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480-824-8535
Michael Bestenlehner

HERS

Projected Rating
2018-04-03
Rater ID:5905566



Weather:Wickenburg, AZ
Nichols Residence
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Builder

Energy Features

Photovoltaics	0.00
Sunspace	No

Note: Where feature level varies in home, the dominate value is shown.

Fuel Summary

Property

Nichols
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Tonopah, AZ 85354

Organization

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Projected Rating
2018-04-03
Rater ID:5905566



Weather: Wickenburg, AZ
Nichols Residence
Nichols Residence.blg

Builder

Annual Energy Cost \$/yr

Electric	1534
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Annual End-Use Cost \$/yr

Heating	209
Cooling	452
Water Heating	138
Lights & Appliances	735
Photovoltaics	-0
Service Charge	155
Total	1689

Annual End-Use Consumption

Heating (kWh)	1758
Cooling (kWh)	3795
Water Heating (kWh)	1157
Lights & Appliances (kWh)	6153
Total (kWh)	12862

Annual Energy Demands kW

Heating	6.2
Cooling	1.6
Water Heating (Winter Peak)	0.2
Water Heating (Summer Peak)	0.2
Lights & Appliances (Winter Peak)	0.7
Lights & Appliances (Summer Peak)	0.9
Total Winter Peak	7.0
Total Summer Peak	2.7

Utility Rates

Electricity	2016APS by aps 7-16
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Performance Report

Property
Nichols
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Tonopah, AZ 85354

Organization
Best Energy Rating
480-824-8535
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Projected Rating
2018-04-03
Rater ID:5905566



Weather:Wickenburg, AZ
Nichols Residence
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Builder

Annual Load	MMBtu/yr
Heating	22.5
Cooling	51.7
Water Heating	4.5
Water Heating w/out Tank Loss	4.1

Annual Consumption	MMBtu/yr
Heating	6.0
Cooling	13.0
Water Heating	3.9
Lights & Appliances	21.0
Photovoltaics	-0.0
Total	43.9

Annual Energy Cost	\$/yr
Heating	209
Cooling	452
Water Heating	138
Lights & Appliances	735
Photovoltaics	-0
Service Charges	155
Total	1689

Design Loads	kBtu/hr
Space Heating	23.3
Space Cooling	23.5

Utility Rates

Electricity	2016APS by aps 7-16
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Performance Report

Property

Nichols
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Organization

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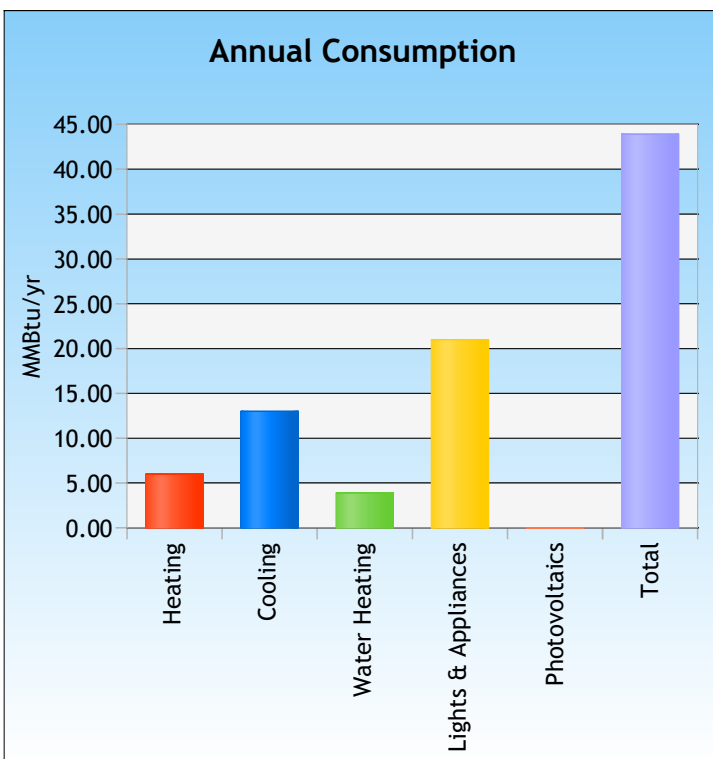
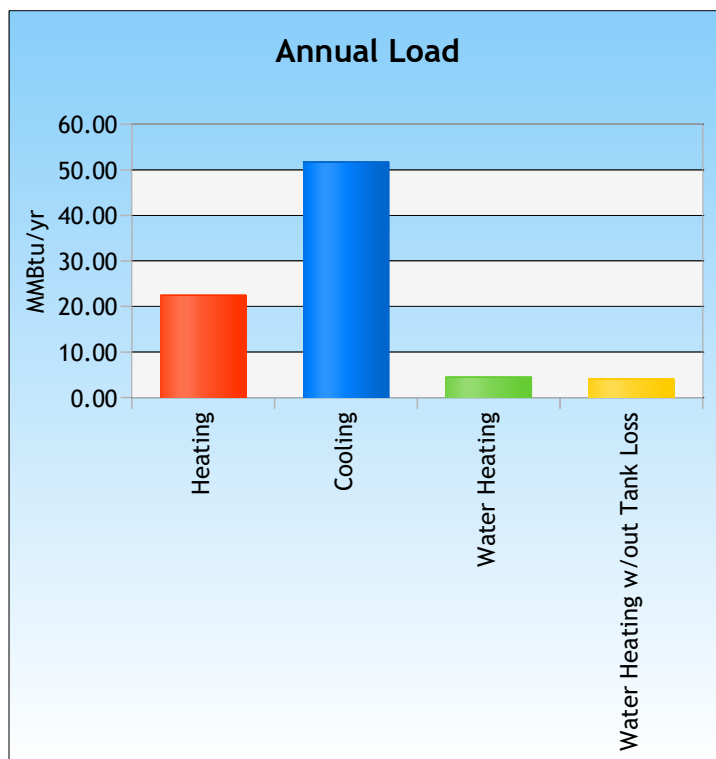
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Projected Rating
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Rater ID:5905566



Weather: Wickenburg, AZ
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Builder



Performance Report

Property

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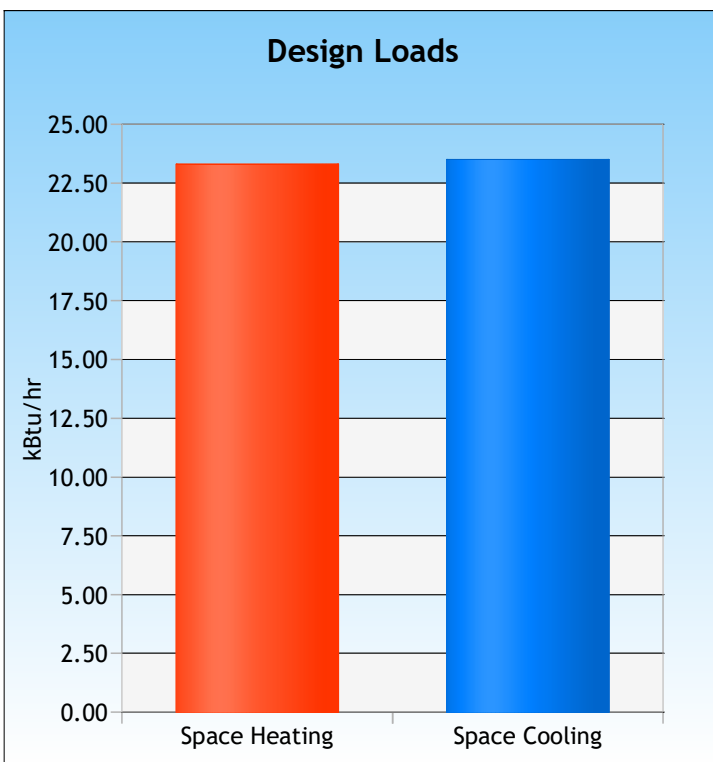
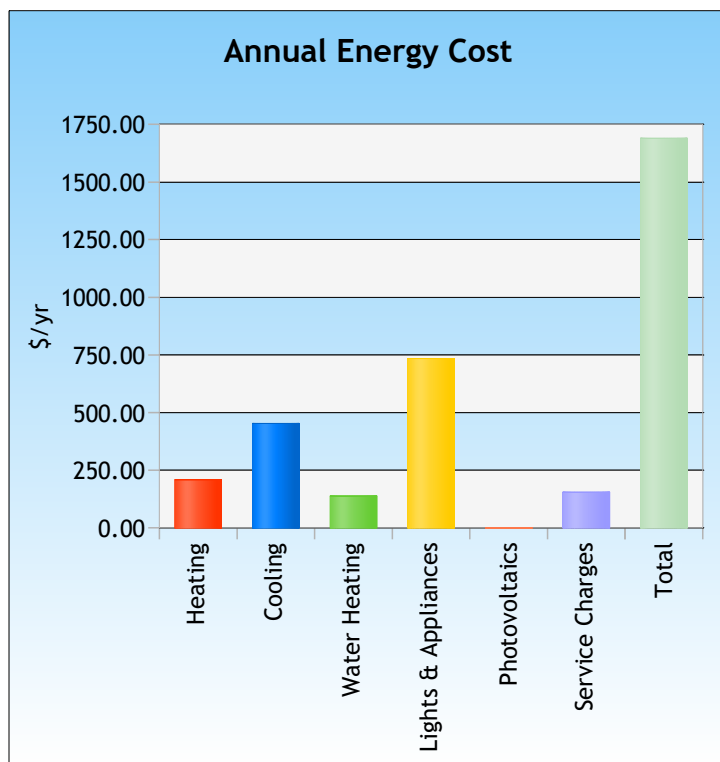
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Rater ID:5905566



Weather: Wickenburg, AZ
Nichols Residence
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Builder



Performance Factors

Property
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Weather:Wickenburg, AZ
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Builder

Normalized Loads

Heating	2.51
Cooling	2.69

Btu/sf shell area/DD

Normalized Consumption

Heating	2.5
Cooling	5.4
Water Heating	1.7
Lighting	2.1
Appliances	6.7
Photovoltaics	-0.0
Total w/o PV	18.4
Total	18.4

kBtu/sf floor area/yr

Normalized Consumption

Heating	2.1
Cooling	2.1

Btu/sf floor area/DD

Normalized Costs

Heating	0.088
Cooling	0.189
Water Heating	0.058
Lighting	0.074
Appliances	0.233
Photovoltaics	-0.000
Total	0.643

\$/sf floor area/yr

Normalized Design Loads

Heating	0.0026
Cooling	0.0012

Btuh/sf shell area/DD

Normalization Factors

Floor Area	2388
Shell Area	7526
Heating Degree Days (B65)	1191
Cooling Degree Days (B74)	2551

Source Energy & Emissions

Property

Nichols
3257 N. 337th Ave.
Tonopah, AZ 85354

Organization

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480-824-8535
Michael Bestenlehner

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2018-04-03
Rater ID:5905566



Weather:Wickenburg, AZ
Nichols Residence
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Builder

Source Energy Consumption (MMBtu/year)

	All Electric Reference Home	As Designed	Difference	% Difference
Heating	25.3	13.3	-12.1	-47.7%
Cooling	81.7	27.9	-53.9	-65.9%
WaterHeating	18.7	10.7	-8.0	-42.9%
LightsAppliances	73.6	57.6	-16.0	-21.7%
Photovoltaics	0.0	0.0		
Total	199.3	109.4	-90.0	-45.1%

Total Emissions

Type of Emissions	All Electric Reference Home	As Designed	Difference	% Difference
Carbon Dioxide (CO2) - tons/year	11.7	6.4	-5.3	-45.1%
Sulfur Dioxide (SO2) - lbs/year	14.1	7.7	-6.3	-45.1%
Nitrogen Oxides (NOx) - lbs/year	25.7	14.1	-11.6	-45.1%

Emissions By End-Use

(All Electric Reference Home versus As Designed)

	CO2-tons/yr		SO2-lbs/yr		NOx-lbs/yr	
	Reference	Design	Reference	Design	Reference	Design
Heating	1.5	0.8	1.8	0.9	3.3	1.7
Cooling	4.8	1.6	5.8	2.0	10.5	3.6
WaterHeating	1.1	0.6	1.3	0.8	2.4	1.4
LightsAppliances	4.3	3.4	5.2	4.1	9.5	7.4
Photovoltaics	0.0	0.0	0.0	0.0	0.0	0.0

The energy and emission values are calculated by comparing the Rated Home to an all-electric version of the Reference Home as defined in the 'Mortgage Industry National Home Energy Rating Systems Standards' as promulgated by the Residential Energy Services Network (RESNET). Site-to-source multipliers and air emission data were taken from the US EPA eGRID2012 database.

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2012 IECC Building UA Compliance

Property

Nichols
3257 N. 337th Ave.
Tonopah, AZ 85354

Organization

Best Energy Rating
480-824-8535
Michael Bestenlehner

HERS

Projected Rating
2018-04-03
Rater ID:5905566



Weather: Wickenburg, AZ
Nichols Residence
Nichols Residence.blg

Builder

Elements

Insulation Levels

	2012 IECC	As Designed
Shell UA Check		
Ceilings:	71.7	77.3
Above-Grade Walls:	31.2	18.0
Above-Grade Mass Walls:	344.3	123.6
Windows and Doors:	112.6	102.4
Slab Floor:	172.5	172.5
Overall UA (Design must be equal or lower):	732.3	493.8

Mandatory Requirements

Shell UA Check	PASSES
Duct Insulation R-Value Check (per Section 403.2.1)	PASSES
Window U-Value and SHGC Check (per Section 402.5)	PASSES
Home Infiltration (Section 402.4.1.2)	PASSES
Duct Leakage (Section 403.2.2)	PASSES
Mechanical Ventilation (Section 403.6)	PASSES
Mechanical Ventilation Fan Efficacy (Section 403.5.1)	PASSES
Mandatory Requirements Check Box (2012 IECC)	PASSES

This home **MEETS** the overall thermal performance requirements and verifications of the International Energy Conservation Code based on a climate zone of 2B. (Section 402, International Energy Conservation Code, 2012 edition.) In fact, this home surpasses the requirements by 32.6%.

Name	Michael Bestenlehner
Organization	Best Energy Rating

Signature	
Date	4 April 2018

2012 IECC Energy Cost Compliance



Property
Nichols
3257 N. 337th Ave.
Tonopah, AZ 85354

Organization
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480-824-8535
Michael Bestenlehner

HERS
Projected Rating
2018-04-03
Rater ID:5905566

Weather:Wickenburg, AZ
Nichols Residence
Nichols Residence.blg

Builder

Annual Energy Cost

\$/yr

	2012 IECC	As Designed
Heating	235	229
Cooling	634	504
Water Heating	274	274
SubTotal - Used to Determine Compliance	1143	1008
Lights & Appliances	737	735
Photovoltaics	-0	-0
Service Charge	155	155
Total	2035	1897

Mandatory Requirements

Annual Energy Cost Check	PASSES
Duct Insulation R-Value Check (per Section 405.2)	PASSES
Window U-Value and SHGC Check (per Section 402.5)	PASSES
Home Infiltration (Section 402.4.1.2)	PASSES
Duct Leakage (Section 403.2.2)	PASSES
Mechanical Ventilation (Section 403.6)	PASSES
Mechanical Ventilation Fan Efficacy (Section 403.5.1)	PASSES
Mandatory Requirements Check Box (2012 IECC)	PASSES

This home **MEETS** the annual energy cost requirements of Section 405 of the 2012 International Energy Conservation Code based on a climate zone of 2B. In fact, this home surpasses the requirements by 11.9%.

Name | Michael Bestenlehner
Organization | Best Energy Rating

Signature |
Date | 4 April 2018

In accordance with IECC, building inputs, such as setpoints, infiltration rates, and window shading may have been changed prior to calculating annual energy cost. Furthermore, the standard reference design HVAC system efficiencies are set equal to those in the design home as specified in the 2012 IECC. These standards are subject to change, and software updates should be obtained periodically to ensure the compliance calculations reflect current federal minimum standards.

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HOME CERTIFIED TO MEET THE PROVISIONS OF THE 2012 INTERNATIONAL ENERGY CONSERVATION CODE

This home built at
3257 N. 337th Ave., Tonopah, AZ
by
exceeds the minimum requirements for the 2012 International
Energy Conservation Code

Building Features

Ceiling Flat	NA	Duct	NA
Sealed Attic:	R-30.0	Duct Leakage to Outside:	80.00 CFM @ 25 Pascals
Vaulted Ceiling	NA	Total Duct Leakage:	80.00 CFM @ 25 Pascals
Above Grade Walls	R-12.0	Infiltration:	Htg: 943 Clg: 943 CFM50
Foundation Walls	NA	Window	U-Value: 0.370, SHGC: 0.230
Exposed Floor	NA	Air-Source HP	Electric, Htg: 9.5 HSPF. Clg: 17.5 SEER.
Slab	R-0.0 Edge, R-0.0 Under	Water Heating	Conventional, Electric, 0.95 EF, 50.0 Gal.

The organization below certifies that the proposed building design described herein is consistent with the building plans, specifications, and other calculations submitted with the permit application. The proposed building has been designed to meet the 2012 IECC requirements in compliance with Chapter 4 based on Climate Zone 2B and with all mandatory requirements.

Name Michael Bestenlehner
Organization Best Energy Rating

Signature
Date April 04, 2018

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No version of this software has been reviewed or approved by ICC or its affiliates.
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2015 IECC Building UA Compliance

Property

Nichols
3257 N. 337th Ave.
Tonopah, AZ 85354

Organization

Best Energy Rating
480-824-8535
Michael Bestenlehner

HERS

Projected Rating
2018-04-03
Rater ID:5905566



Weather: Wickenburg, AZ
Nichols Residence
Nichols Residence.blg

Builder

Elements

Insulation Levels

	2015 IECC	As Designed
Shell UA Check		
Ceilings:	71.7	77.3
Above-Grade Walls:	31.9	18.0
Above-Grade Mass Walls:	344.3	123.6
Windows and Doors:	112.6	102.4
Slab Floor:	172.5	172.5
Overall UA (Design must be equal or lower):	733.1	493.8

Mandatory Requirements

Shell UA Check	PASSES
Duct Insulation R-Value Check (per Section 403.3.1)	PASSES
Window U-Value and SHGC Check (per Section 402.5)	PASSES
Home Infiltration (Section 402.4.1.2)	PASSES
Duct Testing (Section 403.3.3)	PASSES
Mechanical Ventilation (Section 403.6)	PASSES
Mechanical Ventilation Fan Efficacy (Section 403.6.1)	PASSES
Mandatory Requirements Check Box (2015 IECC)	PASSES

This home **MEETS** the overall thermal performance requirements and verifications of the International Energy Conservation Code based on a climate zone of 2B. (Section 402, International Energy Conservation Code, 2015 edition.) In fact, this home surpasses the requirements by 32.6%.

Name	Michael Bestenlehner
Organization	Best Energy Rating

Signature	
Date	4 April 2018

2015 IECC Energy Cost Compliance



Property
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Michael Bestenlehner

HERS
Projected Rating
2018-04-03
Rater ID:5905566

Weather:Wickenburg, AZ
Nichols Residence
Nichols Residence.blg

Builder

Annual Energy Cost

\$/yr

	2015 IECC	As Designed
Heating	237	229
Cooling	637	504
Water Heating	274	274
SubTotal - Used to Determine Compliance	1148	1008
Lights & Appliances	737	735
Photovoltaics	-0	-0
Service Charge	155	155
Total	2040	1897

Mandatory Requirements

Annual Energy Cost Check	PASSES
Duct Insulation R-Value Check (per Section 405.2)	PASSES
Window U-Value and SHGC Check (per Section 402.5)	PASSES
Home Infiltration (Section 402.4.1.2)	PASSES
Duct Testing (Section 403.3.3)	PASSES
Mechanical Ventilation (Section 403.6)	PASSES
Mechanical Ventilation Fan Efficacy (Section 403.6.1)	PASSES
Mandatory Requirements Check Box (2015 IECC)	PASSES

This home **MEETS** the annual energy cost requirements of Section 405 of the 2015 International Energy Conservation Code based on a climate zone of 2B. In fact, this home surpasses the requirements by 12.2%.

Name | Michael Bestenlehner
Organization | Best Energy Rating

Signature |
Date | 4 April 2018

In accordance with IECC, building inputs, such as setpoints, infiltration rates, and window shading may have been changed prior to calculating annual energy cost. Furthermore, the standard reference design HVAC system efficiencies are set equal to those in the design home as specified in the 2015 IECC. These standards are subject to change, and software updates should be obtained periodically to ensure the compliance calculations reflect current federal minimum standards.

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HOME CERTIFIED TO MEET THE PROVISIONS OF THE 2015 INTERNATIONAL ENERGY CONSERVATION CODE

This home built at
3257 N. 337th Ave., Tonopah, AZ
by
exceeds the minimum requirements for the 2015 International
Energy Conservation Code

Building Features

Ceiling Flat	NA	Duct	NA
Sealed Attic:	R-30.0	Duct Leakage to Outside:	80.00 CFM @ 25 Pascals
Vaulted Ceiling	NA	Total Duct Leakage:	80.00 CFM @ 25 Pascals
Above Grade Walls	R-12.0	Infiltration:	Htg: 943 Clg: 943 CFM50
Foundation Walls	NA	Window	U-Value: 0.370, SHGC: 0.230
Exposed Floor	NA	Air-Source HP	Electric, Htg: 9.5 HSPF. Clg: 17.5 SEER.
Slab	R-0.0 Edge, R-0.0 Under	Water Heating	Conventional, Electric, 0.95 EF, 50.0 Gal.

The organization below certifies that the proposed building design described herein is consistent with the building plans, specifications, and other calculations submitted with the permit application. The proposed building has been designed to meet the 2015 IECC requirements in compliance with Chapter 4 based on Climate Zone 2B and with all mandatory requirements.

Name Michael Bestenlehner
Organization Best Energy Rating

Signature
Date April 04, 2018

The 2015 International Energy Conservation Code is a registered trademark of the International Code Council, Inc. ("ICC").
No version of this software has been reviewed or approved by ICC or its affiliates.
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2015 IECC R-406 Projected Energy Rating Index Report

Property

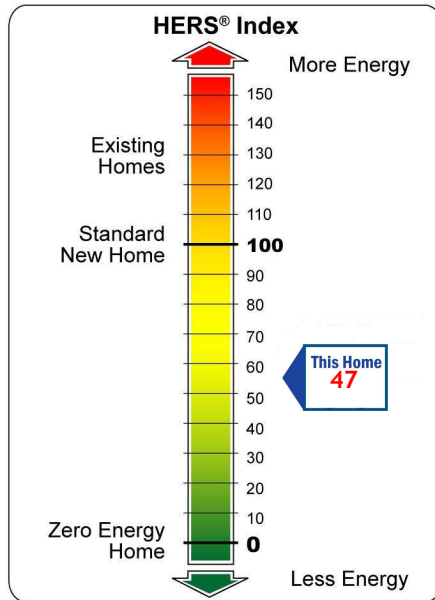
Builder:
Address: 3257 N. 337th Ave.
Tonopah, AZ 85354

Organization

Company: Best Energy Rating
Phone: 480-824-8535
Rater: Michael Bestenlehner

Energy Rating Index Information

Projected Rating
Rater ID: 5905566
Date Rated: 2018-04-03



Estimated Annual Energy Consumption*

	Rated Home Calculated Energy Use (MBTU)	Rated Home Cost (\$/yr)
Heating	4.9	171
Cooling	10.3	360
Water Heating	3.9	138
Lights & Appliances	21.3	746
Photovoltaics	-0.0	-0
Total	40.5	1571

*Based on standard operating conditions

ERI with PV: 47

ERI without PV 47

Annual Estimates

Electric(kWh):	11867	CO2 Emissions(Tons):	6
		Energy Savings (\$)**:	1164

**Based on the 2015 IECC Energy Rating Index Reference Design Home

Maximum Energy Rating Index: 52

This Home's Energy Rating Index: 47

PASS

This home MEETS the Energy Rating Index Score requirements of Section 406 of the 2015 International Energy Conservation Code based on a climate zone of 2B. In addition to the Energy Rating Index other mandatory measures must be met. (See Mandatory Requirements on second page.)

Name | Michael Bestenlehner
Organization | Best Energy Rating

Signature |
Date | 4 April 2018

Provider Data and Seal

Michael Bestenlehner
Best Energy Rating & Consulting
1066 E. Zesta Lane
Gilbert, AZ 85297
480-824-8535
mbest@bestenergyrating.com



To determine if a provider is properly accredited go to : www.resnet.us/professional/programs/search_directory

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2015 IECC R-406 Projected Energy Rating Index Report

Climate Zone 2B		Mandatory Requirements - Requires Field Confirmation
Provision Number	Topic	Compliance Decision
2009 IECC Table 402.1.1 or 402.1.3	Building thermal envelope minimum insulation levels and maximum fenestration U-factor and SHGC	PASS
R401.3	Post a permanent certificate listing the level of efficiencies installed in the house	Certificate required for CO
R402.4	Envelope air leakage maximum leakage rate	(5 ACH50 for CZ1-2) PASS
R402.4.1/Table R402.4.1.1	Comply with air sealing and insulation requirements in Table R402.4.1.1	Checklist required for CO
R402.4.4	Rooms containing fuel-burning appliances	_____ *
R402.5	Maximum fenestration U-factor and SHGC	PASS
R403.1.2	Heat pump controls	_____ *
R405.2	Ducts outside of conditioned space to be insulated to a minimum of R-6	PASS
R403.3.2	Duct sealing on all ducts	_____ *
R403.3.3	Duct testing for ducts in unconditioned space	N/A
R403.3.5	Building cavities not used as ducts	_____ *
R403.5.1	Heated water circulation and temperature maintenance systems comply	_____ *
R403.5.3	Hot water pipe insulated to R-3	FAIL
R403.6	Mechanical ventilation meeting the requirements of the IRC or IMC. Outdoor air and exhaust dampers installed	_____ *
R403.7	ACCA Manual J and S conducted for all heating and cooling systems	ACCA Forms Required for permit
R403.8	Systems serving multiple dwelling units to meet the mechanical requirements of the IECC commercial	Does Not Apply
R403.9	Snow melt and ice system controls installed where applicable	_____ *
R403.10	Pools and permanent spa energy consumption meet requirements for heaters, time clocks and covers	_____ *
R403.11	Portable spas meet the requirements of APSP-14	_____ *
R404.1	High efficacy lights installed in 75% of permanently installed fixtures	FAIL

*Rater has verified that all systems are in compliance with IECC rules.

Home Energy Rating Certificate

Property

Nichols Residence
Nichols
3257 N. 337th Ave.
Tonopah, AZ 85354

HERS

Rating Type: Projected Rating
Rating Date: 2018-04-03
Registry ID:

Certified Energy Rater: Michael Bestenlehner
Rating Number:



Best Energy Rating
and Consulting

Projected Rating: Based on Plans - Field Confirmation Required.

HERS Index: 47

Efficient Home Comparison: 53% Better

General Information

Conditioned Area	2388 sq. ft.	House Type	Single-family detached
Conditioned Volume	31938 cubic ft.	Foundation	Slab
Bedrooms	3		

Mechanical Systems Features

Water Heating:	Conventional, Electric, 0.95 EF, 50.0 Gal.
Air-source heat pump:	Electric, Htg: 9.5 HSPF. Clg: 17.5 SEER.
Duct Leakage to Outside	80.00 CFM25.
Ventilation System	Exhaust Only: 54 cfm, 22.0 watts.
Programmable Thermostat	Heat=Yes; Cool=Yes

Building Shell Features

Ceiling Flat	NA	Slab	R-0.0 Edge, R-0.0 Under
Sealed Attic	R-30.0	Exposed Floor	NA
Vaulted Ceiling	NA	Window Type	U-Value: 0.370, SHGC: 0.230
Above Grade Walls	R-12.0	Infiltration Rate	Htg: 943 Clg: 943 CFM50
Foundation Walls	NA	Method	Blower door test

Lights and Appliance Features

Percent Interior Lighting	75.00	Range/Oven Fuel	Electric
Percent Garage Lighting	100.00	Clothes Dryer Fuel	Electric
Refrigerator (kWh/yr)	691	Clothes Dryer EF	3.01
Dishwasher Energy Factor	0.76	Ceiling Fan (cfm/Watt)	0.00

Estimated Annual Energy Cost

Use	MMBtu	Cost	Percent
Heating	4.9	\$171	11%
Cooling	10.3	\$360	23%
Hot Water	3.9	\$138	9%
Lights/Appliances	21.3	\$746	47%
Photovoltaics	-0.0	\$-0	-0%
Service Charges		\$155	10%
Total	40.5	\$1571	100%

Criteria

This home meets or exceeds the minimum criteria for the following:
2006 International Energy Conservation Code
2009 International Energy Conservation Code
2012 International Energy Conservation Code

Michael Bestenlehner
Best Energy Rating & Consulting
1066 E. Zesta Lane
Gilbert, AZ 85297
480-824-8535
mbest@bestenergyrating.com

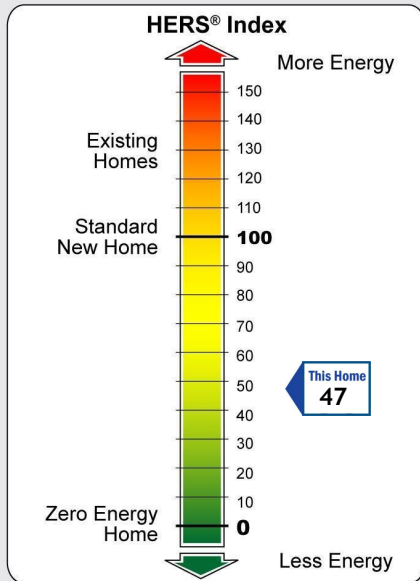
Certified Energy Rater: _____



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RESNET HERS Index Certificate



Projected Rating: Based on Plans - Field Confirmation Required.

Annual Estimates:

Elec(kWh): 11867

CO2 emissions(Tons): 6

Energy Savings (\$)**: 1938

*Based on standard operating conditions

**Based on U.S. DOE designation of a HERS Index of 130 as the 'Typical Existing Home'

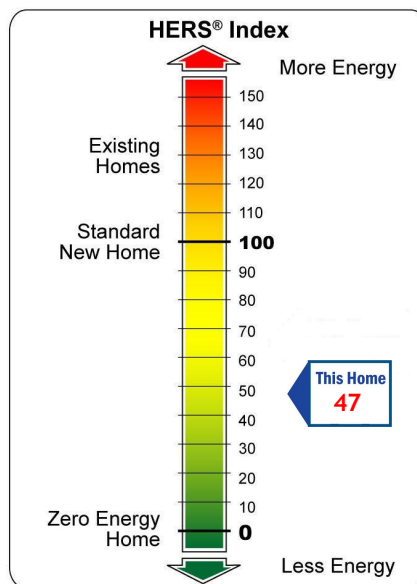
Michael Bestenlehner
Best Energy Rating &
Consulting
1066 E. Zesta Lane
Gilbert, AZ 85297



This home has been inspected
and performance tested in
accordance with Chapter 3 of
the RESNET standards.

RESNET®
www.resnet.us

HERS PERFORMANCE REPORT

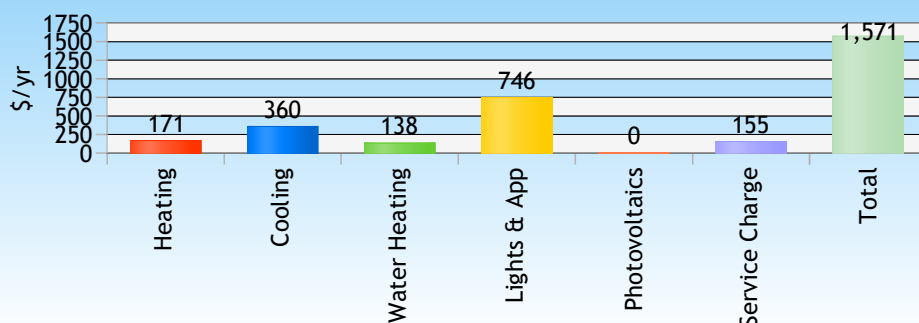


ENERGY RATING CERTIFICATE

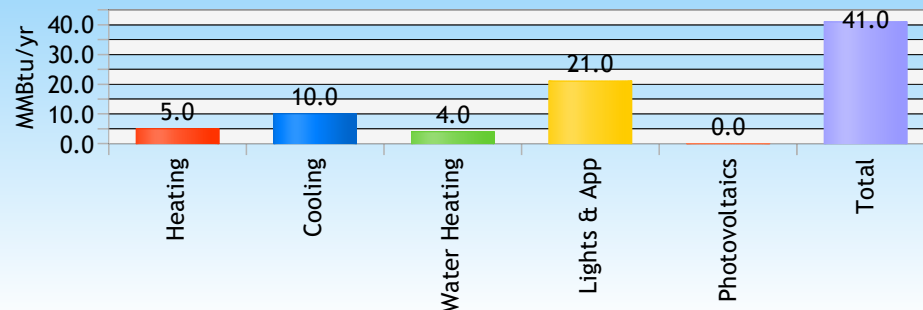


Projected Rating: Based on Plans - Field Confirmation Required.

Estimated Annual Energy Cost



Estimated Annual Energy Consumption



Name Nichols Residence
Address 3257 N. 337th Ave.
Tonopah, AZ 85354
House Type Single-family detached
Cond. Area 2388 sq. ft.
Rating No.
Issue Date April 04, 2018
Certification Inspected and Tested

Annual Estimates*
Electric(kWh): 11867
CO2 emissions(Tons): 6
Annual Savings**: \$1938
* Based on standard operating conditions
** Based on a HERS 130 Index Home

Michael Bestenlehner
Best Energy Rating & Consulting
1066 E. Zesta Lane
Certified Rater Michael Bestenlehner
Rater ID 5905566
Registry ID
Rating Date 2018-04-03
Signature

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