

**CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD**

CF1R-PRF-01E

Project Name: Residential Example

Calculation Date/Time: 2023-05-15T09:21:13-07:00

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Calculation Description: Title 24 Analysis

Input File Name: Single Family Sample.ribd22x

GENERAL INFORMATION					
01	Project Name	Residential Example			
02	Run Title	Title 24 Analysis			
03	Project Location	7188 Pleasant Way			
04	City	San Bernardino	05	Standards Version	2022
06	Zip code	90000	07	Software Version	EnergyPro 9.1
08	Climate Zone	10	09	Front Orientation (deg/ Cardinal)	90
10	Building Type	Single family	11	Number of Dwelling Units	1
12	Project Scope	Newly Constructed	13	Number of Bedrooms	3
14	Addition Cond. Floor Area (ft <sup>2</sup> )	0	15	Number of Stories	2
16	Existing Cond. Floor Area (ft <sup>2</sup> )	n/a	17	Fenestration Average U-factor	0.28
18	Total Cond. Floor Area (ft <sup>2</sup> )	2000	19	Glazing Percentage (%)	19.50%
20	ADU Bedroom Count	n/a			

COMPLIANCE RESULTS	
01	Building Complies with Computer Performance
02	This building incorporates features that require field testing and/or verification by a certified HERS rater under the supervision of a CEC-approved HERS provider.
03	This building incorporates one or more Special Features shown below

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Registration Date/Time:

HERS Provider:

CA Building Energy Efficiency Standards - 2022 Residential Compliance

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ENERGY DESIGN RATINGS						
	Energy Design Ratings			Compliance Margins		
	Source Energy (EDR1)	Efficiency <sup>1</sup> EDR (EDR2efficiency)	Total <sup>2</sup> EDR (EDR2total)	Source Energy (EDR1)	Efficiency <sup>1</sup> EDR (EDR2efficiency)	Total <sup>2</sup> EDR (EDR2total)
Standard Design	36.3	38.7	27.2			
Proposed Design	32.6	33.3	21.6	3.7	5.4	5.6
RESULT <sup>3</sup> : PASS						
<sup>1</sup> Efficiency EDR includes improvements like a better building envelope and more efficient equipment						
<sup>2</sup> Total EDR includes efficiency and demand response measures such as photovoltaic (PV) system and batteries						
<sup>3</sup> Building complies when source energy, efficiency and total compliance margins are greater than or equal to zero and unmet load hour limits are not exceeded						
<ul style="list-style-type: none"><li>Standard Design PV Capacity: 2.90 kWdc</li></ul>						

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ENERGY USE SUMMARY						
Energy Use	Standard Design Source Energy (EDR1) (kBtu/ft <sup>2</sup> -yr)	Standard Design TDV Energy (EDR2) (kTDV/ft <sup>2</sup> -yr)	Proposed Design Source Energy (EDR1) (kBtu/ft <sup>2</sup> -yr)	Proposed Design TDV Energy (EDR2) (kTDV/ft <sup>2</sup> -yr)	Compliance Margin (EDR1)	Compliance Margin (EDR2)
Space Heating	2.45	10.95	2.44	10.97	0.01	-0.02
Space Cooling	0.93	22.62	0.84	21.73	0.09	0.89
IAQ Ventilation	0.34	3.56	0.34	3.56	0	0
Water Heating	1.17	12.26	2.94	12.73	-1.77	-0.47
Self Utilization/Flexibility Credit				-6.42		6.42
Efficiency Compliance Total	<b>4.89</b>	<b>49.39</b>	<b>6.56</b>	<b>42.57</b>	<b>-1.67</b>	<b>6.82</b>
Photovoltaics	-1.66	-46.34	-1.62	-49.1		
Battery			-2.73	-2.93		
Flexibility						
Indoor Lighting	0.75	7.29	0.75	7.29		
Appl. & Cooking	3.02	20.65	3.02	20.67		
Plug Loads	2.74	27.98	2.74	27.98		
Outdoor Lighting	0.19	1.68	0.19	1.68		
<b>TOTAL COMPLIANCE</b>	<b>9.93</b>	<b>60.65</b>	<b>8.91</b>	<b>48.16</b>		

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ENERGY USE INTENSITY				
	Standard Design (kBtu/ft <sup>2</sup> - yr )	Proposed Design (kBtu/ft <sup>2</sup> - yr )	Compliance Margin (kBtu/ft <sup>2</sup> - yr )	Margin Percentage
Gross EUI <sup>1</sup>	14.84	16.84	-2	-13.48
Net EUI <sup>2</sup>	6.42	8.64	-2.22	-34.58
Notes 1. Gross EUI is Energy Use Total (not including PV) / Total Building Area. 2. Net EUI is Energy Use Total (including PV) / Total Building Area.				

REQUIRED PV SYSTEMS											
01	02	03	04	05	06	07	08	09	10	11	12
DC System Size (kWdc)	Exception	Module Type	Array Type	Power Electronics	CFI	Azimuth (deg)	Tilt Input	Array Angle (deg)	Tilt: (x in 12)	Inverter Eff. (%)	Annual Solar Access (%)
1	NA	Standard (14-17%)	Fixed	none	false	90	Degrees	22	4.85	96	100
1	NA	Standard (14-17%)	Fixed	none	false	180	Degrees	22	4.85	96	100
1	NA	Standard (14-17%)	Fixed	none	false	270	Degrees	22	4.85	96	100

BATTERY SYSTEMS						
01	02	03	04	05	06	07
Control	Capacity (kWh)	Charging		Discharging		Round Trip Efficiency
		Charging Efficiency	Charging Rate (kW)	Discharging Efficiency	Discharging Rate (kW)	
Basic	12	0.95	n/a	0.95	n/a	0.9

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**REQUIRED SPECIAL FEATURES**

The following are features that must be installed as condition for meeting the modeled energy performance for this computer analysis.

- Battery System: 12 kWh (Self Utilization Credit taken)
- Insulation below roof deck
- Non-standard duct location (any location other than attic)

**HERS FEATURE SUMMARY**

The following is a summary of the features that must be field-verified by a certified HERS Rater as a condition for meeting the modeled energy performance for this computer analysis. Additional detail is provided in the building tables below. Registered CF2Rs and CF3Rs are required to be completed in the HERS Registry

- Indoor air quality ventilation
- Kitchen range hood
- Minimum Airflow
- Verified EER/EER2
- Verified SEER/SEER2
- Verified Refrigerant Charge
- Fan Efficacy Watts/CFM
- Duct leakage testing
- Ducts located entirely in conditioned space confirmed by duct leakage testing
- Compact distribution system expanded credit
- Drain water heat recovery system

**BUILDING - FEATURES INFORMATION**

01	02	03	04	05	06	07
Project Name	Conditioned Floor Area (ft <sup>2</sup> )	Number of Dwelling Units	Number of Bedrooms	Number of Zones	Number of Ventilation Cooling Systems	Number of Water Heating Systems
Residential Example	2000	1	3	2	0	1

**ZONE INFORMATION**

01	02	03	04	05	06	07
Zone Name	Zone Type	HVAC System Name	Zone Floor Area (ft <sup>2</sup> )	Avg. Ceiling Height	Water Heating System 1	Status
1st Floor Zone	Conditioned	Res HVAC1	1200	8	DHW Sys 1	New
2nd Floor Zone	Conditioned	Res HVAC1	800	8	DHW Sys 1	New

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OPAQUE SURFACES							
01	02	03	04	05	06	07	08
Name	Zone	Construction	Azimuth	Orientation	Gross Area (ft <sup>2</sup> )	Window and Door Area (ft <sup>2</sup> )	Tilt (deg)
Front Wall	1st Floor Zone	R-21 Wall w/R-2	0	Right	320	81	90
Left Wall	1st Floor Zone	R-21 Wall w/R-2	90	Front	240	40	90
Back Wall	1st Floor Zone	R-21 Wall w/R-2	180	Left	320	88.7	90
Right Wall	1st Floor Zone	R-21 Wall w/R-2	270	Back	240	32	90
Front Wall 2	2nd Floor Zone	R-21 Wall w/R-2	0	Right	320	60	90
Left Wall 2	2nd Floor Zone	R-21 Wall w/R-2	90	Front	240	24	90
BackWall	2nd Floor Zone	R-21 Wall w/R-2	180	Left	320	70	90
Right Wall 2	2nd Floor Zone	R-21 Wall w/R-2	270	Back	240	32	90
Wall to Garage	1st Floor Zone>> __Garage__	R-13 Wall	n/a	n/a	100	20	n/a
R-38 Roof	1st Floor Zone	R-38 HP Attic	n/a	n/a	500	n/a	n/a
R-38 Roof 2	2nd Floor Zone	R-38 HP Attic	n/a	n/a	800	n/a	n/a
GarageRoof	__Garage__	R-30 Roof Attic	n/a	n/a	340	n/a	n/a
Interior Floor	2nd Floor Zone	R-0 Floor No Crawlspace	n/a	n/a	700	n/a	n/a
Floor over Garage	2nd Floor Zone	R-19 Floor No Crawlspace	n/a	n/a	100	n/a	n/a
GarageWallFront	__Garage__	Garage Ext Wall	0	Right	180	128	90
GarageWallLeft	__Garage__	Garage Ext Wall	90	Front	198	0	90
GarageWallRight	__Garage__	Garage Ext Wall	270	Back	108	0	90

ATTIC							
01	02	03	04	05	06	07	08
Name	Construction	Type	Roof Rise (x in 12)	Roof Reflectance	Roof Emittance	Radiant Barrier	Cool Roof
Attic __Garage__	Attic Garage Roof Cons	Ventilated	4	0.1	0.85	Yes	No
Attic 1st Floor Zone	Attic Roof1st Floor Zone	Ventilated	4	0.1	0.85	No	No

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ATTIC							
01	02	03	04	05	06	07	08
Name	Construction	Type	Roof Rise (x in 12)	Roof Reflectance	Roof Emittance	Radiant Barrier	Cool Roof
Attic 2nd Floor Zone	Attic Roof2nd Floor Zone	Ventilated	4	0.1	0.85	No	No

FENESTRATION / GLAZING													
01	02	03	04	05	06	07	08	09	10	11	12	13	14
Name	Type	Surface	Orientation	Azimuth	Width (ft)	Height (ft)	Mult.	Area (ft <sup>2</sup> )	U-factor	U-factor Source	SHGC	SHGC Source	Exterior Shading
Front Windows	Window	Front Wall	Right	0			1	60	0.28	NFRC	0.2	NFRC	Bug Screen
Left Windows	Window	Left Wall	Front	90			1	40	0.28	NFRC	0.2	NFRC	Bug Screen
Back Windows	Window	Back Wall	Left	180			1	72	0.28	NFRC	0.2	NFRC	Bug Screen
Right Windows	Window	Right Wall	Back	270			1	32	0.28	NFRC	0.2	NFRC	Bug Screen
Front Windows 2	Window	Front Wall 2	Right	0			1	60	0.28	NFRC	0.2	NFRC	Bug Screen
Left Windows 2	Window	Left Wall 2	Front	90			1	24	0.28	NFRC	0.2	NFRC	Bug Screen
Back Windows 2	Window	BackWall	Left	180			1	70	0.28	NFRC	0.2	NFRC	Bug Screen
Right Windows 2	Window	Right Wall 2	Back	270			1	32	0.28	NFRC	0.2	NFRC	Bug Screen

OPAQUE DOORS			
01	02	03	04
Name	Side of Building	Area (ft <sup>2</sup> )	U-factor
Entry Door	Front Wall	21	0.2
Back Door	Back Wall	16.7	0.2
Door	Wall to Garage	20	0.2

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OPAQUE DOORS			
01	02	03	04
Name	Side of Building	Area (ft <sup>2</sup> )	U-factor
GarageCarDoorFront	GarageWallFront	128	0.7

SLAB FLOORS							
01	02	03	04	05	06	07	08
Name	Zone	Area (ft <sup>2</sup> )	Perimeter (ft)	Edge Insul. R-value and Depth	Edge Insul. R-value and Depth	Carpeted Fraction	Heated
Slab-on-Grade	1st Floor Zone	1200	160	none	0	80%	No
GarageSlab	__Garage__	440	54	none	0	0%	No

OPAQUE SURFACE CONSTRUCTIONS							
01	02	03	04	05	06	07	08
Construction Name	Surface Type	Construction Type	Framing	Total Cavity R-value	Interior / Exterior Continuous R-value	U-factor	Assembly Layers
Garage Ext Wall	Exterior Walls	Wood Framed Wall	2x4 @ 16 in. O. C.	R-0	None / None	0.361	Inside Finish: Gypsum Board Cavity / Frame: no insul. / 2x4 Exterior Finish: 3 Coat Stucco
R-21 Wall w/R-2	Exterior Walls	Wood Framed Wall	2x6 @ 16 in. O. C.	R-21	None / 2	0.058	Inside Finish: Gypsum Board Cavity / Frame: R-21 / 2x6 Sheathing / Insulation: R-2 Sheathing Exterior Finish: 3 Coat Stucco
R-13 Wall	Interior Walls	Wood Framed Wall	2x4 @ 16 in. O. C.	R-13	None / None	0.092	Inside Finish: Gypsum Board Cavity / Frame: R-13 / 2x4 Other Side Finish: Gypsum Board
Attic Garage Roof Cons	Attic Roofs	Wood Framed Ceiling	2x8 @ 24 in. O. C.	R-0	None / 0	0.638	Roofing: Light Roof (Asphalt Shingle) Roof Deck: Wood Siding/sheathing/decking Cavity / Frame: no insul. / 2x8

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OPAQUE SURFACE CONSTRUCTIONS							
01	02	03	04	05	06	07	08
Construction Name	Surface Type	Construction Type	Framing	Total Cavity R-value	Interior / Exterior Continuous R-value	U-factor	Assembly Layers
Attic Roof1st Floor Zone	Attic Roofs	Wood Framed Ceiling	2x6 @ 24 in. O. C.	R-19	None / 0	0.055	Roofing: Light Roof (Asphalt Shingle) Roof Deck: Wood Siding/sheathing/decking Cavity / Frame: R-19 / 2x6
Attic Roof2nd Floor Zone	Attic Roofs	Wood Framed Ceiling	2x6 @ 24 in. O. C.	R-19	None / 0	0.055	Roofing: Light Roof (Asphalt Shingle) Roof Deck: Wood Siding/sheathing/decking Cavity / Frame: R-19 / 2x6
R-30 Roof Attic	Ceilings (below attic)	Wood Framed Ceiling	2x4 @ 24 in. O. C.	R-30	None / None	0.032	Over Ceiling Joists: R-20.9 insul. Cavity / Frame: R-9.1 / 2x4 Inside Finish: Gypsum Board
R-38 HP Attic	Ceilings (below attic)	Wood Framed Ceiling	2x4 @ 24 in. O. C.	R-38	None / None	0.025	Over Ceiling Joists: R-28.9 insul. Cavity / Frame: R-9.1 / 2x4 Inside Finish: Gypsum Board
R-0 Floor No Crawlpace	Interior Floors	Wood Framed Floor	2x12 @ 16 in. O. C.	R-0	None / None	0.196	Floor Surface: Carpeted Floor Deck: Wood Siding/sheathing/decking Cavity / Frame: no insul. / 2x12 Ceiling Below Finish: Gypsum Board
R-19 Floor No Crawlpace	Interior Floors	Wood Framed Floor	2x10 @ 16 in. O. C.	R-19	None / None	0.045	Floor Surface: Carpeted Floor Deck: Wood Siding/sheathing/decking Cavity / Frame: R-19 / 2x10 Ceiling Below Finish: Gypsum Board

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BUILDING ENVELOPE - HERS VERIFICATION				
01	02	03	04	05
Quality Insulation Installation (QII)	High R-value Spray Foam Insulation	Building Envelope Air Leakage	CFM50	CFM50
Not Required	Not Required	N/A	n/a	n/a

WATER HEATING SYSTEMS								
01	02	03	04	05	06	07	08	09
Name	System Type	Distribution Type	Water Heater Name	Number of Units	Solar Heating System	Compact Distribution	HERS Verification	Water Heater Name (#)
DHW Sys 1	Domestic Hot Water (DHW)	Standard	DHW Heater 1	1	n/a	Expanded	DHW Sys 1-hers-dhw	DHW Heater 1 (1)

WATER HEATERS												
01	02	03	04	05	06	07	08	09	10	11	12	13
Name	Heating Element Type	Tank Type	# of Units	Tank Vol. (gal)	Heating Efficiency Type	Efficiency	Rated Input Type	Input Rating or Pilot	Tank Insulation R-value (Int/Ext)	Standby Loss or Recovery Eff	1st Hr. Rating or Flow Rate	Tank Location
DHW Heater 1	Gas	Consumer Instantaneous	1	0	UEF	0.97	Btu/Hr	200000	0	n/a	n/a	

WATER HEATING - COMPACT DISTRIBUTION						
01	02	03	04	05	06	07
Dwelling Unit type	Water Heating System Name	Master Bath distance of furthest fixture to Water Heater (ft)	Kitchen distance of furthest fixture to Water Heater (ft)	Furthest Third furthest fixture to Water Heater (ft)	Compactness Factor	HERS Verification
Dwelling	DHW Sys 1	n/a	n/a	n/a	0.6	Expanded Credit

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WATER HEATING - DRAIN WATER HEAT RECOVERY					
01	02	03	04	05	06
Dwelling Unit type	DHW System and DWHR Names	Installation Configuration	Shower Drains	Shower Drain Water Heat Recovery Efficiency (%)	HERS Verification
Dwelling	DHW Sys 1 - 1 - DWHR-1	Equal Flow	2	43	Required

WATER HEATING - HERS VERIFICATION						
01	02	03	04	05	06	07
Name	Pipe Insulation	Parallel Piping	Compact Distribution	Compact Distribution Type	Recirculation Control	Shower Drain Water Heat Recovery
DHW Sys 1 - 1/1	Not Required	Not Required	Required	Expanded	Not Required	Required

SPACE CONDITIONING SYSTEMS								
01	02	03	04	05	06	07	08	09
Name	System Type	Heating Unit Name	Heating Equipment Count	Cooling Unit Name	Cooling Equipment Count	Fan Name	Distribution Name	Required Thermostat Type
Res HVAC1	Heating and cooling system other	Heating Component 1	1	Cooling Component 1	1	HVAC Fan 1	Air Distribution System 1	Setback

HVAC - HEATING UNIT TYPES			
01	02	03	04
Name	System Type	Number of Units	Heating Efficiency
Heating Component 1	Central gas furnace	1	AFUE-96

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HVAC - COOLING UNIT TYPES								
01	02	03	04	05	06	07	08	09
Name	System Type	Number of Units	Efficiency Metric	Efficiency EER/EER2/CEER	Efficiency SEER/SEER2	Zonally Controlled	Mult-speed Compressor	HERS Verification
Cooling Component 1	Central split AC	1	EER2/SEER2	12.2	15	Not Zonal	Single Speed	Cooling Component 1-hers-cool

HVAC COOLING - HERS VERIFICATION					
01	02	03	04	05	06
Name	Verified Airflow	Airflow Target	Verified EER/EER2	Verified SEER/SEER2	Verified Refrigerant Charge
Cooling Component 1-hers-cool	Required	350	Required	Required	Required

HVAC - DISTRIBUTION SYSTEMS											
01	02	03	04	05	06	07	08	09	10	11	12
Name	Type	Design Type	Duct Ins. R-value		Duct Location		Surface Area		Bypass Duct	Duct Leakage	HERS Verification
			Supply	Return	Supply	Return	Supply	Return			
Air Distribution System 1	Conditioned space-entirely	Non-Verified	R-8	R-8	Conditioned Zone	Conditioned Zone	n/a	n/a	No Bypass Duct	Sealed and Tested	Air Distribution System 1-hers-dist

HVAC DISTRIBUTION - HERS VERIFICATION								
01	02	03	04	05	06	07	08	09
Name	Duct Leakage Verification	Duct Leakage Target (%)	Verified Duct Location	Verified Duct Design	Buried Ducts	Deeply Buried Ducts	Low-leakage Air Handler	Low Leakage Ducts Entirely in Conditioned Space
Air Distribution System 1-hers-dist	Yes	5.0	Required	Not Required	Not Required	Credit not taken	Not Required	No

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HVAC - FAN SYSTEMS			
01	02	03	04
Name	Type	Fan Power (Watts/CFM)	Name
HVAC Fan 1	HVAC Fan	0.45	HVAC Fan 1-hers-fan

HVAC FAN SYSTEMS - HERS VERIFICATION		
01	02	03
Name	Verified Fan Watt Draw	Required Fan Efficacy (Watts/CFM)
HVAC Fan 1-hers-fan	Required	0.45

INDOOR AIR QUALITY (IAQ) FANS								
01	02	03	04	05	06	07	08	09
Dwelling Unit	Airflow (CFM)	Fan Efficacy (W/CFM)	IAQ Fan Type	Includes Heat/Energy Recovery?	IAQ Recovery Effectiveness - SRE	Includes Fault Indicator Display?	HERS Verification	Status
SFam IAQVentRpt	87	0.35	Exhaust	No	n/a	No	Yes	

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<b>DOCUMENTATION AUTHOR'S DECLARATION STATEMENT</b>	
1. I certify that this Certificate of Compliance documentation is accurate and complete.	
Documentation Author Name:	Documentation Author Signature:
Company: <b>DEBUG</b>	Signature Date: <b>10/31/2023</b>
Address:	CEA/ HERS Certification Identification (If applicable):
City/State/Zip:	Phone:
<b>RESPONSIBLE PERSON'S DECLARATION STATEMENT</b>	
I certify the following under penalty of perjury, under the laws of the State of California: <ol style="list-style-type: none"><li>1. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design identified on this Certificate of Compliance.</li><li>2. I certify that the energy features and performance specifications identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.</li><li>3. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.</li></ol>	
Responsible Designer Name: <b>Rob Parker</b>	Responsible Designer Signature:
Company: <b>Bernard Parker &amp; Assoc.</b>	Date Signed:
Address: <b>573 Oak Drive</b>	License:
City/State/Zip: <b>Sacramento, CA 95000</b>	Phone: <b>(415) 256-5555</b>

Registration Number:

Registration Date/Time:

HERS Provider:

CA Building Energy Efficiency Standards - 2022 Residential Compliance

Report Version: 2022.0.000  
Schema Version: rev 20220901

Report Generated: 2023-05-15 09:21:55

**ECON-1**

Date  
10/31/2023

Rate: Gas PG&E P				Fuel Type: Natural Gas					
	STANDARD			PROPOSED			MARGIN		
	Energy Use (therms)	Peak Demand (kBtu/hr)	Cost (\$)	Energy Use (therms)	Peak Demand (kBtu/hr)	Cost (\$)	Energy Use (therms)	Peak Demand (kBtu/hr)	Cost (\$)
Jan	17	34.6	21	23	29.9	29	-6	4.8	-7
Feb	28	34.8	35	33	31.9	41	-5	2.9	-6
Mar	6	24.0	7	13	21.7	16	-7	2.3	-9
Apr	5	27.5	6	11	26.9	13	-6	0.5	-8
May	3	6.3	4	9	7.0	12	-6	-0.7	-8
Jun	3	6.3	4	9	6.9	11	-5	-0.7	-7
Jul	4	6.8	4	8	9.8	10	-5	-3.0	-6
Aug	4	5.1	4	8	5.8	10	-5	-0.7	-6
Sep	3	5.1	4	8	6.8	10	-4	-1.7	-6
Oct	4	6.3	5	9	7.0	11	-5	-0.7	-6
Nov	5	24.3	6	10	22.7	13	-6	1.6	-7
Dec	17	32.7	21	23	28.6	29	-6	4.1	-8
Year	98	34.8	122	164	31.9	204	-66	2.9	-82
CO <sub>2</sub>	0.57	tons/yr		0.96	tons/yr		-0.38	tons/yr	

**Site Energy Use Index:** 8.64 kBtuh/yr

