

CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD

Project Name: 2016 - Base W/ HPA Opt. B (R-8)

Calculation Date/Time: 12:55, Tue, Jul 18, 2017

Calculation Description: 2016 CBECC Review

Input File Name: 2016_2-Story_CZ12_01.rbd16

GENERAL INFORMATION				
01	Project Name	2016 - Base W/ HPA Opt. B (R-8)		
02	Calculation Description	CEC Prototype with tile roof		
03	Project Location	1516 Ninth St		
04	City	Sacramento - CZ 12	05	Standards Version
06	Zip Code		07	Compliance Manager Version
08	Climate Zone	CZ12	09	Software Version
10	Building Type	Single Family	11	Front Orientation (deg/Cardinal)
12	Project Scope	Newly Constructed	13	Number of Dwelling Units
14	Total Cond. Floor Area (ft²)	2700	15	Number of Zones
16	Slab Area (ft²)	1250	17	Number of Stories
18	Addition Cond. Floor Area	n/a	19	Natural Gas Available
20	Addition Slab Area (ft²)	n/a	21	Glazing Percentage (%)

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

ENERGY USE SUMMARY				
04	05	06	07	08
Energy Use (kTDV/ft ² -yr)	Standard Design	Proposed Design	Compliance Margin	Percent Improvement
Space Heating	19.36	17.06	2.30	11.9%
Space Cooling	14.47	16.27	-1.80	-12.4%
IAQ Ventilation	1.15	1.15	0.00	0.0%
Water Heating	7.54	7.54	0.00	0.0%
Photovoltaic Offset	----	0.00	0.00	----
Compliance Energy Total	42.52	42.02	0.50	1.2%

ENERGY DESIGN RATING

Energy Design Rating (EDR) is an alternate way to express the energy performance of a building using a scoring system where 100 represents the energy performance of the Residential Energy Services (RESNET) reference home characterization of the 2006 International Energy Conservation Code (IECC). A score of zero represents the energy performance of a building that combines high levels of energy efficiency with renewable generation to "zero out" its TDV energy. Because EDR includes consideration of components not regulated by Title 24, Part 6 (such as domestic appliances and consumer electronics), it is not used to show compliance with Part 6 but may instead be used by local jurisdictions pursuing local ordinances under Title 24, Part 11 (CALGreen).

As a Standard Design building under the 2016 Building Energy Efficiency Standards is significantly more efficient than the baseline EDR building, the EDR of the Standard Design building is provided for Information. Similarly, the EDR score of the Proposed Design is provided separately from the EDR value of installed PV so that the effects of efficiency and renewable energy can both be seen

EDR of Standard Design		EDR of Proposed Design		EDR Value of Proposed PV		Final EDR of Proposed Design	
44.0		43.7		0.0		43.7	
<input type="checkbox"/>	Design meets Tier 1 requirement of 15% or greater code compliance margin (CALGreen A4.203.1.2.1) and QII verification prerequisite.						
<input type="checkbox"/>	Design meets Tier 2 requirement of 30% or greater code compliance margin (CALGreen A4.203.1.2.2) and QII verification prerequisite.						
<input type="checkbox"/>	Design meets Zero Net Energy (ZNE) Design Designation requirement for Single Family in climate zone CZ12 (Sacramento) (CALGreen A4.203.1.2.3) including on-site photovoltaic (PV) renewable energy generation sufficient to achieve a Final Energy Design Rating (EDR) of zero or less. The PV System must be verified.						

REQUIRED SPECIAL FEATURES

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

- Insulation above roof deck
- Window overhangs and/or fins

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 components tables below.

- Building-level Verifications:**
- High quality insulation installation (QII)
 - IAQ mechanical ventilation
- Cooling System Verifications:**
- Minimum Airflow
 - Refrigerant Charge
 - Fan Efficacy Watts/CFM
- HVAC Distribution System Verifications:**
- Duct Sealing
- Domestic Hot Water System Verifications:**
- -- None --

BUILDING - FEATURES INFORMATION

01	02	03	04	05	06	07
Project Name	Conditioned Floor Area (ft2)	Number of Dwelling Units	Number of Bedrooms	Number of Zones	Number of Ventilation Cooling Systems	Number of Water Heating Systems
2016 - Base W/ HPA Opt. B (R-8)	2700	1	4	1	0	1

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ZONE INFORMATION						
01	02	03	04	05	06	07
Zone Name	Zone Type	HVAC System Name	Zone Floor Area (ft ²)	Avg. Ceiling Height	Water Heating System 1	Water Heating System 2
House	Conditioned	HVACSystem	2700	9	DHWSystem	

OPAQUE SURFACES							
01	02	03	04	05	06	07	08
Name	Zone	Construction	Azimuth	Orientation	Gross Area (ft ²)	Window & Door Area (ft ²)	Tilt (deg)
Front Wall (1-Coat)	House	R-19+R5 Walls	90	Front	728	128	90
Left Wall (1-Coat)	House	R-19+R5 Walls	180	Left	551	135	90
Back Wall (1-Coat)	House	R-19+R5 Walls	270	Back	950	216	90
Right Wall (1-Coat)	House	R-19+R5 Walls	0	Right	461	81	90
Int. Grg. Wall (Front)	House>>Garage	R-19 Garage Wall			180	20	
Int. Grg. Wall (Right)	House>>Garage	R-19 Garage Wall			90	0	
Kneewall (Grg.)	House>>Garage Attic - Roof Plane	R-19 Garage Wall			42	0	
Attic - Ceiling Plane	House	R-38 Ceiling			1450		
Floor Above Garage	House>>Garage	R-19 Floor Above Garage			200		
Ext. Grg. Wall (Front)	Garage	R-0+R5 Garage Ext Wall	90	Front	180	128	90
Ext. Grg. Wall (Left)	Garage	R-0+R5 Garage Ext Wall	180	Left	108	0	90
Ext. Grg. Wall (Right)	Garage	R-0+R5 Garage Ext Wall	0	Right	198	0	90
GarageToGarageAttic	Garage	R-0 Garage Ceiling			240		

ATTIC							
01	02	03	04	05	06	07	08
Name	Construction	Type	Roof Rise	Roof Reflectance	Roof Emittance	Radiant Barrier	Cool Roof
House Attic - Roof Plane	Tile Roof w/ R-8 AD & RB	Ventilated	5	0.1	0.85	Yes	No
Garage Attic - Roof Plane	Tile Roof Garage w/ RB	Ventilated	5	0.1	0.85	Yes	No

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FENESTRATION / GLAZING									
01	02	03	04	05	06	07	08	09	10
Name	Type	Surface (Orientation-Azimuth)	Width (ft)	Height (ft)	Multiplier	Area (ft ²)	U-factor	SHGC	Exterior Shading
F1	Window	Front Wall (1-Coat) (Front-90)	3.0	5.0	7.2	108.0	0.31	0.22	Insect Screen (default)
L1	Window	Left Wall (1-Coat) (Left-180)	3.0	5.0	9	135.0	0.31	0.22	Insect Screen (default)
B1	Window	Back Wall (1-Coat) (Back-270)	3.0	5.0	14.4	216.0	0.31	0.22	Insect Screen (default)
R1	Window	Right Wall (1-Coat) (Right-0)	3.0	5.0	5.4	81.0	0.31	0.22	Insect Screen (default)

OPAQUE DOORS			
01	02	03	04
Name	Side of Building	Area (ft ²)	U-factor
Entry Dr.	Front Wall (1-Coat)	20.0	0.50
Entry Dr. @ Garage	Int. Grg. Wall (Front)	20.0	0.50
Garage Car Dr.	Ext. Grg. Wall (Front)	128.0	1.00

OVERHANGS AND FINS													
01	02	03	04	05	06	07	08	09	10	11	12	13	14
Window	Overhang					Left Fin				Right Fin			
	Depth	Dist Up	Left Extent	Right Extent	Flap Ht.	Depth	Top Up	DistL	Bot Up	Depth	Top Up	Dist R	Bot Up
F1	1	1.33	3	3	0.4	0	0	0	0	0	0	0	0
L1	1	1.33	3	3	0.4	0	0	0	0	0	0	0	0
B1	1	1.33	3	3	0.4	0	0	0	0	0	0	0	0
R1	1	1.33	3	3	0.4	0	0	0	0	0	0	0	0

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OPAQUE SURFACE CONSTRUCTIONS						
01	02	03	04	05	06	07
Construction Name	Surface Type	Construction Type	Framing	Total Cavity R-value	Winter Design U-value	Assembly Layers
R-19+R5 Walls	Exterior Walls	Wood Framed Wall	2x6 @ 16 in. O.C.	R 19	0.051	<ul style="list-style-type: none"> • Inside Finish: Gypsum Board • Cavity / Frame: R-19 / 2x6 • Sheathing / Insulation: R1 Sheathing • Exterior Finish: R4 Synthetic Stucco
R-38 Ceiling	Ceilings (below attic)	Wood Framed Ceiling	2x4 Bottom Chord of Truss @ 24 in. O.C.	R 38	0.025	<ul style="list-style-type: none"> • Inside Finish: Gypsum Board • Cavity / Frame: R-9.1 / 2x4 Btm Chrd • Over Ceiling Joists: R-28.9 insul.
Tile Roof w/ R-8 AD & RB	Attic Roofs	Wood Framed Ceiling	2x4 Top Chord of Roof Truss @ 24 in. O.C.	none	0.094	<ul style="list-style-type: none"> • Cavity / Frame: no insul. / 2x4 Top Chrd • Roof Deck: Wood Siding/sheathing/decking • Above Deck Insulation: R8 Sheathing • Tile Gap: present • Roofing: 10 PSF (RoofTile)
Tile Roof Garage w/ RB	Attic Roofs	Wood Framed Ceiling	2x4 Top Chord of Roof Truss @ 24 in. O.C.	none	0.400	<ul style="list-style-type: none"> • Cavity / Frame: no insul. / 2x4 Top Chrd • Roof Deck: Wood Siding/sheathing/decking • Tile Gap: present • Roofing: 10 PSF (RoofTile)
R-0+R5 Garage Ext Wall	Exterior Walls	Wood Framed Wall	2x6 @ 16 in. O.C.	none	0.125	<ul style="list-style-type: none"> • Inside Finish: Gypsum Board • Cavity / Frame: no insul. / 2x6 • Sheathing / Insulation: R1 Sheathing • Exterior Finish: R4 Synthetic Stucco
R-0 Garage Ceiling	Ceilings (below attic)	Wood Framed Ceiling	2x4 Bottom Chord of Truss @ 24 in. O.C.	none	0.481	<ul style="list-style-type: none"> • Inside Finish: Gypsum Board • Cavity / Frame: no insul. / 2x4 Btm Chrd
R-19 Floor Above Garage	Interior Floors	Wood Framed Floor	2x6 @ 16 in. O.C.	R 19	0.048	<ul style="list-style-type: none"> • Floor Surface: Carpeted • Floor Deck: Wood Siding/sheathing/decking • Cavity / Frame: R-19 / 2x6 • Ceiling Below Finish: Gypsum Board
R-19 Garage Wall	Interior Walls	Wood Framed Wall	2x6 @ 16 in. O.C.	R 19	0.067	<ul style="list-style-type: none"> • Inside Finish: Gypsum Board • Cavity / Frame: R-19 / 2x6 • Other Side Finish: Gypsum Board

SLAB FLOORS						
01	02	03	04	05	06	07
Name	Zone	Area (ft ²)	Perimeter (ft)	Edge Insul. R-value & Depth	Carpeted Fraction	Heated
House Slab-on-Grade	House	1250	128	None	0.8	No
Garage Slab-on-Grade	Garage	440	54	None	0	No

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CF1R-PRF-01

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BUILDING ENVELOPE - HERS VERIFICATION			
01	02	03	04
Quality Insulation Installation (QII)	Quality Installation of Spray Foam Insulation	Building Envelope Air Leakage	CFM50
Required	Not Required	Not Required	---

WATER HEATING SYSTEMS					
01	02	03	04	05	06
Name	System Type	Distribution Type	Water Heater	Number of Heaters	Solar Fraction (%)
DHWSystem	DHW	Standard	Tankless / 0.82 EF (1)	1	n/a

WATER HEATERS										
01	02	03	04	05	06	07	08	09	10	11
Name	Heater Element Type	Tank Type	Number of Units	Tank Volume (gal)	Energy Factor or Efficiency	Input Rating/Pilot	Tank Insulation R-value (Int/Ext)	Standby Loss / Recovery Eff	NEEA Heat Pump Type	Tank Location or Ambient Condition
Tankless / 0.82 EF	Gas	Small Instantaneous	1	0	0.82 EF	195,000 Btu/hr	R-0	n/a	0 n/a	n/a

SPACE CONDITIONING SYSTEMS					
01	02	03	04	05	06
SC Sys Name	System Type	Heating Unit Name	Cooling Unit Name	Fan Name	Distribution Name
HVACSystem	Other Heating and Cooling System	80% AFUE	14 SEER / 11.7 EER / RC	HVACFan	R-8 Ducts

HVAC - HEATING UNIT TYPES			
01	02	03	04
Name	System Type	Number of Units	Efficiency
80% AFUE	CntrlFurnace	1	80 AFUE

HVAC - COOLING UNIT TYPES							
01	02	03	04	05	06	07	08
Name	System Type	Number of Units	Efficiency		Zonally Controlled	Compressor Type	HERS Verification
			EER	SEER			
14 SEER / 11.7 EER / RC	SplitAirCond	1	11.7	14	Not Zonal	Single Speed	14 SEER / 11.7 EER / RC-hers-cool

Registration Number:

Registration Date/Time:

HERS Provider:

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HVAC COOLING - HERS VERIFICATION					
01	02	03	04	05	06
Name	Verified Airflow	Airflow Target	Verified EER	Verified SEER	Verified Refrigerant Charge
14 SEER / 11.7 EER / RC-hers-cool	Required	350	Not Required	Not Required	Required

HVAC - DISTRIBUTION SYSTEMS						
01	02	03	04	05	06	07
Name	Type	Duct Leakage	Insulation R-value	Duct Location	Bypass Duct	HERS Verification
R-8 Ducts	DuctsAttic	Sealed and tested	8	Attic	None	R-8 Ducts-hers-dist

HVAC DISTRIBUTION - HERS VERIFICATION							
01	02	03	04	05	06	07	08
Name	Duct Leakage Verification	Duct Leakage Target (%)	Verified Duct Location	Verified Duct Design	Buried Ducts	Deeply Buried Ducts	Low-leakage Air Handler
R-8 Ducts-hers-dist	Required	5.0	Not Required	Not Required	Not Required	Not Required	---

HVAC - FAN SYSTEMS			
01	02	03	04
Name	Type	Fan Power (Watts/CFM)	HERS Verification
HVACFan	Single Speed PSC Furnace Fan	0.58	HVACFan-hers-fan

HVAC FAN SYSTEMS - HERS VERIFICATION		
01	02	03
Name	Verified Fan Watt Draw	Required Fan Efficiency (Watts/CFM)
HVACFan-hers-fan	Required	0.58

IAQ (Indoor Air Quality) FANS					
01	02	03	04	05	06
Dwelling Unit	IAQ CFM	IAQ Watts/CFM	IAQ Fan Type	IAQ Recovery Effectiveness(%)	HERS Verification
SFam IAQVentRpt	65	0.25	Default	0	Required

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DOCUMENTATION AUTHOR'S DECLARATION STATEMENT	
1. I certify that this Certificate of Compliance documentation is accurate and complete.	
Documentation Author Name:	Documentation Author Signature:
Company:	Signature Date:
Address:	CEA/HERS Certification Identification (If applicable):
City/State/Zip:	Phone:
RESPONSIBLE PERSON'S DECLARATION STATEMENT	
I certify the following under penalty of perjury, under the laws of the State of California:	
<ol style="list-style-type: none"> 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. 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. 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. 	
Responsible Designer Name:	Responsible Designer Signature:
Company:	Date Signed:
Address:	License:
City/State/Zip:	Phone:

This Certificate of Compliance is not registered