GENERAL INFORMATION					
01	Project Name	1 Story Example			
02	Calculation Description	2100 ft2 CEC Prototype with tile roof			
03	Project Location	1516 Ninth St			
04	City	Sacramento, CA	05	Standards Version	Compliance 2017
06	Zip Code	95814	07	Compliance Manager Version	BEMCmpMgr 2016.3.0 (987)
08	Climate Zone	CZ12	09	Software Version	CBECC-Res 2016.3.0 (971)
10	Building Type	Single Family	11	Front Orientation (deg/Cardinal)	0
12	Project Scope	Newly Constructed	13	Number of Dwelling Units	1
14	Total Cond. Floor Area (ft^2)	2100	15	Number of Zones	1
16	Slab Area (ft^2)	2100	17	Number of Stories	1
18	Addition Cond. Floor Area(ft^2)	n/a	19	Natural Gas Available	Yes
20	Addition Slab Area (ft^2)	n/a	21	Glazing Percentage (%)	20.0%

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	20.98	23.11	-2.13	-10.2%
Space Cooling	10.27	3.60	6.67	64.9%
IAQ Ventilation	1.17	1.17	0.00	0.0%
Water Heating	8.56	8.56	0.00	0.0%
Photovoltaic Offset	----	0.00	0.00	----
Compliance Energy Total	**40.98**	**36.44**	**4.54**	**11.1%**

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) with California modeling assumptions. 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 Efficiency	EDR of Proposed Efficiency	EDR Value of Proposed PV + Battery	Final Proposed EDR
47.1	44.5	61.1	-16.6

☐	Design meets Tier 1 requirement of 15% or greater code compliance margin (CALGreen A4.203.1.2.1) and QII verification prerequisite.
☐	Design meets Tier 2 requirement of 30% or greater code compliance margin (CALGreen A4.203.1.2.2) and QII verification prerequisite.
☐	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.

Notes:
- **Excess PV Generation EDR Credit: Bypassing PV size limit may violate Net Energy Metering (NEM) rules**

ENERGY DESIGN RATING PV SYSTEM INPUTS - DETAILED

DC System Size (kWdc)	Module Type	CFI	Azimuth (deg)	Tilt Input	Array Angle (deg)	Tilt: (x in 12)	Inverter Eff. (%)
6	Standard	☒	n/a	n/a	n/a	n/a	96

ENERGY DESIGN RATING BATTERY INPUTS

The battery model does not currently include energy consumption for cooling the battery during charging in environments above 77°F or to keep the battery from freezing in winter, if outdoors.

		Charging		Discharging	
Control	Capacity (kWh)	Efficiency	Rate (kW)	Efficiency	Rate (kW)
Default	150	0.95	5	0.95	5

REQUIRED SPECIAL FEATURES

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

- **PV System: 6.0 kWdc**
- **Battery System: 150 kWh**
- **Whole house fan**
- **Cool roof**
- **Insulation below 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:
- **IAQ mechanical ventilation**

Cooling System Verifications:
- **Minimum Airflow**
- **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 (ft^2)	Number of Dwelling Units	Number of Bedrooms	Number of Zones	Number of Ventilation Cooling Systems	Number of Water Heating Systems
1 Story Example	2100	1	3	1	1	1

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
Conditioned	Conditioned	HVAC System 1	2100	9	DHW System	n/a

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	Conditioned	R19 R5 Stucco Wall	0	Front	270	120	90
Left	Conditioned	R19 R5 Stucco Wall	90	Left	324	56.04	90
Back	Conditioned	R19 R5 Stucco Wall	180	Back	450	207.32	90
Right	Conditioned	R19 R5 Stucco Wall	270	Right	414	56.04	90
GarToHouse Front	Conditioned>>Garage	Gar House R19	n/a	n/a	180	20	n/a
GarToHouse Left	Conditioned>>Garage	Gar House R19	n/a	n/a	90	0	n/a
Ceiling (below attic) 1	Conditioned	R38 Ceiling below attic	n/a	n/a	2100	n/a	n/a
Gwall Front	Garage	Garage Ext Wall 2	0	Front	180	108	90
Gwall Left	Garage	Garage Ext Wall 2	90	Left	198	0	90
Gwall Right	Garage	Garage Ext Wall 2	270	Right	108	0	90
Gar Ceiling	Garage	R0 ClgBlwAttic Cons	n/a	n/a	440	n/a	n/a

ATTIC

01	02	03	04	05	06	07	08
Name	Construction	Type	Roof Rise	Roof Reflectance	Roof Emittance	Radiant Barrier	Cool Roof
Gar Attic	Tile Roof	Ventilated	5	0.2	0.85	No	No
Attic	Tile High Performance	Ventilated	5	0.2	0.85	No	Yes

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 (Front-0)	10.0	5.0	1	50.0	0.32	0.25	Insect Screen (default)
F2	Window	Front (Front-0)	10.0	5.0	1	50.0	0.32	0.25	Insect Screen (default)
L1	Window	Left (Left-90)	6.0	4.7	2	56.0	0.32	0.25	Insect Screen (default)
B1 SGD	Window	Back (Back-180)	8.0	7.7	1	61.4	0.32	0.25	Insect Screen (default)
B2	Window	Back (Back-180)	6.0	4.7	3	84.6	0.32	0.25	Insect Screen (default)
B3 SGD	Window	Back (Back-180)	8.0	7.7	1	61.4	0.32	0.25	Insect Screen (default)
R1	Window	Right (Right-270)	6.0	4.7	2	56.0	0.32	0.25	Insect Screen (default)

OPAQUE DOORS

01	02	03	04
Name	**Side of Building**	**Area (ft^2)**	**U-factor**
Front Dr	Front	20.0	0.50
GarToHouse Dr	GarToHouse Front	20.0	0.50
GDoor	Gwall Front	108.0	1.00

OVERHANGS AND FINS

01	02	03	04	05	06	07	08	09	10	11	12	13	14
	Overhang					Left Fin				Right Fin			
Window	**Depth**	**Dist Up**	**Left Extent**	**Right Extent**	**Flap Ht.**	**Depth**	**Top Up**	**Dist L**	**Bot Up**	**Depth**	**Top Up**	**Dist R**	**Bot Up**
F1	1	1.33	3	28	0.4	0	0	0	0	0	0	0	0
F2	1	1.33	28	3	0.4	0	0	0	0	0	0	0	0
L1	1	1.33	6	8	0.4	0	0	0	0	0	0	0	0
B1 SGD	6	1.33	4	40	0.4	0	0	0	0	0	0	0	0
B2	6	1.33	23	23	0.4	0	0	0	0	0	0	0	0
B3 SGD	6	1.33	40	4	0.4	0	0	0	0	0	0	0	0
R1	1	1.33	8	8	0.4	0	0	0	0	0	0	0	0

OPAQUE SURFACE CONSTRUCTIONS

01	02	03	04	05	06	07
Construction Name	**Surface Type**	**Construction Type**	**Framing**	**Total Cavity R-value**	**Winter Design U-factor**	**Assembly Layers**
Garage Ext Wall 2	Exterior Walls	Wood Framed Wall	2x6 @ 16 in. O.C.	none	0.347	• *Inside Finish: Gypsum Board* • *Cavity / Frame: no insul. / 2x6* • *Exterior Finish: 3 Coat Stucco*
R0 ClgBlwAttic Cons	Ceilings (below attic)	Wood Framed Ceiling	2x4 Bottom Chord of Truss @ 24 in. O.C.	none	0.481	• *Inside Finish: Gypsum Board* • *Cavity / Frame: no insul. / 2x4 Btm Chrd*
Gar House R19	Interior Walls	Wood Framed Wall	2x6 @ 16 in. O.C.	R 19 in 5-1/2 in. cavity (R-18)	0.069	• *Inside Finish: Gypsum Board* • *Cavity / Frame: R-19 in 5-1/2 in. (R-18) / 2x6* • *Other Side Finish: Gypsum Board*
Tile High Performance	Attic Roofs	Wood Framed Ceiling	2x4 @ 24 in. O.C.	R 13	0.072	• *Around Roof Joists: R-0.0 insul.* • *Cavity / Frame: R-13.0 / 2x4* • *Roof Deck: Wood Siding/sheathing/decking* • *Tile Gap: present* • *Roofing: 10 PSF (RoofTile)*
Tile Roof	Attic Roofs	Wood Framed Ceiling	2x4 @ 24 in. O.C.	none	0.400	• *Cavity / Frame: no insul. / 2x4* • *Roof Deck: Wood Siding/sheathing/decking* • *Tile Gap: present* • *Roofing: 10 PSF (RoofTile)*
R38 Ceiling below attic	Ceilings (below attic)	Wood Framed Ceiling	2x4 Bottom Chord of Truss @ 24 in. O.C.	R 38	0.025	• *Inside Finish: Gypsum Board* • *Cavity / Frame: R-9.1 / 2x4 Btm Chrd* • *Over Ceiling Joists: R-28.9 insul.*
R19 R5 Stucco Wall	Exterior Walls	Wood Framed Wall	2x6 @ 16 in. O.C.	R 19 in 5-1/2 in. cavity (R-18)	0.051	• *Inside Finish: Gypsum Board* • *Cavity / Frame: R-19 in 5-1/2 in. (R-18) / 2x6* • *Sheathing / Insulation: R5 Sheathing* • *Exterior Finish: Synthetic Stucco*

SLAB FLOORS

01	02	03	04	05	06	07
Name	**Zone**	**Area (ft^2)**	**Perimeter (ft)**	**Edge Insul. R-value & Depth**	**Carpeted Fraction**	**Heated**
Slab On Grade	Conditioned	2100	162	None	0.8	No
Gslab	Garage	440	44	None	0	No

BUILDING ENVELOPE - HERS VERIFICATION

01	02	03	04
Quality Insulation Installation (QII)	**Quality Installation of Spray Foam Insulation**	**Building Envelope Air Leakage**	**CFM50**
Not Required	Not Required	Not Required	n/a

WATER HEATING SYSTEMS

01	02	03	04	05	06
Name	**System Type**	**Distribution Type**	**Water Heater**	**Number of Heaters**	**Solar Fraction (%)**
DHW System	DHW	Standard	Small Instantaneous (1)	1	n/a

WATER HEATERS

01	02	03	04	05	06	07	08	09	10	11	12
Name	**Heater Element Type**	**Tank Type**	**Number of Units**	**Tank Volume (gal)**	**Uniform Energy Factor / Energy Factor / Efficiency**	**Input Rating / Pilot / Thermal Efficiency**	**Tank Insulation R-value (Int/Ext)**	**Standby Loss / Recovery Eff**	**First Hour Rating / Flow Rate**	**NEEA Heat Pump Brand / Model**	**Tank Location or Ambient Condition**
Small Instantaneous	Gas	Small Instantaneous	1	0	0.82 EF	125,000 Btu/hr	0	n/a	n/a	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**
HVAC System 1	Other Heating and Cooling System	Furn 80	Split 14 11.7	HVAC Fan 1	Attic Default

HVAC - HEATING UNIT TYPES

01	02	03	04
Name	**System Type**	**Number of Units**	**Efficiency**
Furn 80	CntrlFurnace	1	80 AFUE

HVAC - COOLING UNIT TYPES

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

HVAC COOLING - HERS VERIFICATION

01	02	03	04	05	06
Name	**Verified Airflow**	**Airflow Target**	**Verified EER**	**Verified SEER**	**Verified Refrigerant Charge**
Split 14 11.7-hers-cool	Required	350	Not Required	Not Required	Not Required

HVAC - DISTRIBUTION SYSTEMS

01	02	03	04	05	06	07
Name	**Type**	**Duct Leakage**	**Insulation R-value**	**Duct Location**	**Bypass Duct**	**HERS Verification**
Attic Default	DuctsAttic	Sealed and tested	8	Attic	None	Attic Default-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**
Attic Default-hers-dist	Required	5.0	Not Required	Not Required	Not Required	Not Required	n/a

HVAC - FAN SYSTEMS

01	02	03	04
Name	**Type**	**Fan Power (Watts/CFM)**	**HERS Verification**
HVAC Fan 1	Single Speed PSC Furnace Fan	0.58	HVAC Fan 1-hers-fan

HVAC FAN SYSTEMS - HERS VERIFICATION

01	02	03
Name	**Verified Fan Watt Draw**	**Required Fan Efficiency (Watts/CFM)**
HVAC Fan 1-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	51	0.25	Default	0	Required

COOLING VENTILATION

01	02	03	04	05	06
Name	**Airflow Rate (CFM/ft2)**	**Cooling Vent CFM**	**Cooling Vent Watts/CFM**	**Total Watts**	**Number of Fans**
Whole House Fan	1.5	3150	0.1	315	1

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: 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: