Calculation Date/Time: 11:11, Fri, Apr 12, 2019

Calculation Description: 1 Story Example Rev 2

Input File Name: 1storyExample2CompactDist-Cardinal.ribd19

GENER	AL INFORMATION									
01	Project Name	Story Example Compact Distribution								
02	Calculation Description	2100 ft2 CEC Prototype with tile roof								
03	Project Location	1516 Ninth St								
04	City	Sacramento, CA	05	Standards Version	Compliance 2020					
06	Zip Code	95814	07	Compliance Manager Version	BEMCmpMgr 2019.0.11 Alpha (1301)					
08	Climate Zone	CZ12	09	Software Version	CBECC-Res 2019.0.11 Alpha (1068)					
10	Building Type	Single Family	11	Front Orientation (deg/Cardinal)	Cardinal					
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 (ft²)	2100	17	Number of Stories	1					
18	Addition Cond. Floor Area(ft ²)	n/a	19	Gas Type	Natural Gas					
20	Addition Slab Area (ft ²)	n/a	21	Glazing Percentage (%)	18.6%					

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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	ENERGY	USE SUMMARY		,
Energy Use (kTDV/ft ² -yr)	Standard Design	Proposed Design	Compliance Margin	Percent Improvement
Space Heating	23.41	23.75	-0.34	-1.5%
Space Cooling	16.88	10.91	5.97	35.4%
IAQ Ventilation	2.61	2.61	0.00	0.0%
Water Heating	12.05	10.70	1.35	11.2%
Self Utilization Credit		0.00	0.00	
North Facing Compliance Total	54.95	47.97	6.98	12.7%
Space Heating	23.41	23.72	-0.31	-1.3%
Space Cooling	16.88	16.64 2.61 10.70	0.24	1.4%
IAQ Ventilation	2.61	2.61	0.00	0.0%
Water Heating	12.05	10.70	1.35	11.2%
Self Utilization Credit	-	0.00	0.00	
East Facing Compliance Total	54.95	53.67	1.28	2.3%
Space Heating	23.41	24.02	-0.61	-2.6%
Space Cooling	16.88	11.66	5.22	30.9%
IAQ Ventilation	2.61	2.61	0.00	0.0%
Water Heating	12.05	10.70	1.35	11.2%
Self Utilization Credit		0.00	0.00	
South Facing Compliance Total	54.95	48.99	5.96	10.8%
Space Heating	23.41	24.54	-1.13	-4.8%
Space Cooling	16.88	15.91	0.97	5.7%
IAQ Ventilation	2.61	2.61	0.00	0.0%
Water Heating	16.88 2.61 12.05	10.70	1.35	11.2%
Self Utilization Credit		0.00	0.00	
West Facing Compliance Total	54.95	53.76	1.19	2.2%

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	Energy De	esign Ratings	Complianc	e Margins
	Efficiency ¹ (EDR)	Total² (EDR)	Efficiency¹ (EDR)	Total² (EDR)
Standard Design	45.4	25.7		
Proposed Designs				
North Facing	42.5	22.4	2.9	3.3
East Facing	44.9	24.0	0.5	1.7
South Facing	42.9	22.8	2.5	2.9
West Facing	44.9	24.1	0.5	1.6

RESULT 3: COMPLIES

Standard Design PV Capacity: 2.69 kW

RECHIRED	DV SYSTEM	- SIMPLIFIED

DC System Size (kWdc)	Module Type	Array Type	CFI	Azimuth (deg)	Tilt Input	Tilt Angle (deg)	Tilt (x in 12)	Inverter Eff. (%)
2.00	Standard	Fixed (open rack)	\boxtimes	n/a	n/a	n/a	n/a	n/a

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.

		Char	ging	Disch	arging
Control	Capacity (kWh)	Efficiency	Rate (kW)	Efficiency	Rate (kW)
Basic	5.00	0.95	n/a	0.95	n/a

REQUIRED SPECIAL FEATURES

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

- Whole house fan
- Cool roof
- · Insulation below roof deck
- · Window overhangs and/or fins
- PV System: 2 kWdc
- · Battery System: 5 kWh

Registration Number:

Registration Date/Time:

HERS Provider:

CA Building Energy Efficiency Standards - 2019 Residential Compliance

Report Version - CF1R-Invalid Version-1301

¹Efficiency measures include improvements like a better building envelope and more efficient equipment

²Total EDR includes efficiency, photovoltaics and batteries

³Building complies when all efficiency and total margins are greater than or equal to zero

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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
- Whole House Fan Airflow and Fan Efficacy

Cooling System Verifications:

- Minimum Airflow
- Verified Refrigerant Charge
- Fan Efficacy Watts/CFM

HVAC Distribution System Verifications:

Duct Sealing

Domestic Hot Water System Verifications:

-- None --

BUILDING - FEATURES INFORMA	ATION					
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 Compact Distribution	2100	1	3	1	1	1

ZONE INFORMATION		4				
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

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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	R21 R5 Stucco Wall	0	Front	270	146.25	90
Left	Conditioned	R21 R5 Stucco Wall	90	Left	324	72	90
Back	Conditioned	R21 R5 Stucco Wall	180	Back	450	154.02	90
Right	Conditioned	R21 R5 Stucco Wall	270	Right	414	38	90
GarToHouse Front	Conditioned>>Garage	Gar House R21	n/a	n/a	180	20	n/a
GarToHouse Left	Conditioned>>Garage	Gar House R21	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 Wall R-0	0	Front	180	108	90
Gwall Left	Garage	Garage Wall R-0	90	Left	198	0	90
Gwall Right	Garage	Garage Wall R-0	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	Туре	Roof Rise	Roof Reflectance	Roof Emittance	Radiant Barrier	Cool Roof
Gar Attic	Tile Roof	Ventilated	5	0.2	0.85	No	No
Attic	Tile R-19 below deck	Ventilated	5	0.2	0.85	No	Yes

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01	02	03	04	05	06	07	08	09	10
Name	Туре	Surface (Orientation-Azimuth)	Width (ft)	Height (ft)	Multiplier	Area (ft ²)	U-factor	SHGC	Exterior Shading
F-6060	Window	Front (Front-0)	6.0	6.0	1	36.0	0.30	0.23	Insect Screen (default)
F-4050 x3	Window	Front (Front-0)	4.0	5.0	3	60.0	0.30	0.23	Insect Screen (default)
F-1660 x2	Window	Front (Front-0)	1.5	6.0	2	18.0	0.30	0.23	Insect Screen (default
F-3636	Window	Front (Front-0)	3.5	3.5	1	12.3	0.30	0.23	Insect Screen (default
L-5040 x2	Window	Left (Left-90)	5.0	4.0	2	40.0	0.30	0.23	Insect Screen (default
L-4040 x2	Window	Left (Left-90)	4.0	4.0	2	32.0	0.30	0.23	Insect Screen (default
B1 SGD	Window	Back (Back-180)	6.0	6.7	1	40.0	0.30	0.23	Insect Screen (default
B-6010	Window	Back (Back-180)	6.0	1.0	1	6.0	0.30	0.23	Insect Screen (default
B-6040 x3	Window	Back (Back-180)	6.0	4.0	3	72.0	0.30	0.23	Insect Screen (default
B-6050	Window	Back (Back-180)	6.0	5.0	1	30.0	0.30	0.23	Insect Screen (defaul
B-3020	Window	Back (Back-180)	3.0	2.0	1	6.0	0.30	0.23	Insect Screen (defaul
R-3030 x2	Window	Right (Right-270)	3.0	3.0	2	18.0	0.30	0.23	Insect Screen (defaul
R-4050	Window	Right (Right-270)	4.0	5.0	1	20.0	0.30	0.23	Insect Screen (defaul

OPAQUE DOORS			
01	02	03	04
Name	Side of Building	Area (ft ²)	U-factor
Front Dr	Front	20.0	0.20
GarToHouse Dr	GarToHouse Front	20.0	0.20
GDoor	Gwall Front	108.0	1.00

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OVERHANGS AND FINS							'						1
01	02	03	04	05	06	07	08	09	10	11	12	13	14
			Overhang	,			Left I	in			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
F-6060	1	1.33	3	10	0	0	0	0	0	0	0	0	0
F-4050 x3	1	1.33	6	6	0	0	0	0	0	0	0	0	0
F-1660 x2	4	1.33	3	3	0	0	0	0	0	0	0	0	0
F-3636	1	1.33	10	10	0	0	0	0	0	0	0	0	0
B1 SGD	6	1.33	4	4	0	0	0	0	0	0	0	0	0
B-6010	1	0	4	4	0	0	0	0	0	0	0	0	0
B-6040 x3	1	1.33	23	23	0	0	0	0	0	0	0	0	0
B-6050	1	1.33	10	10	0	0	0	0	0	0	0	0	0
B-3020	1	1.33	10	10	0	0	0	0	0	0	0	0	0

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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 Wall R-0	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 BoardCavity / Frame: no insul. / 2x4 Btm Chrd
Gar House R21	Interior Walls	Wood Framed Wall	2x4 @ 16 in. O.C.	R 21	0.075	 Inside Finish: Gypsum Board Cavity / Frame: R-21 / 2x4 Other Side Finish: Gypsum Board
Tile R-19 below deck	Attic Roofs	Wood Framed Ceiling	2x4 @ 24 in. O.C.	R 19	0.049	 Under Roof Joists: R-6.0 insul. Cavity / Frame: R-13.0 / 2x4 Roof Deck: Wood Siding/sheathing/deckin 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/deckir 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.
R21 R5 Stucco Wall	Exterior Walls	Wood Framed Wall	2x6 @ 16 in. O.C.	R 21	0.048	 Inside Finish: Gypsum Board Cavity / Frame: R-21 / 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				
Required	Not Required	Not Required	n/a				

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WATER HEATING SY	STEMS									1					
01		02		03		04	04 09		5	06		07			08
Name DHW System	1	System Ty	ре		ution Type ndard	Water Heat Small Instantane		Hea	per of ters	(%	Shower Drain Wat Heat Recovery Efficiency n/a n/a		covery ency	HER	S Verification n/a
WATER HEATERS			,	1		1	1							1	
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 Energ Factor / Energ Factor / Efficien	Thermal	In:	Tank sulation R-value Int/Ext)	L	andby oss / covery Eff	First I Ratir Flow I	ng/Bra	EA Heat Pu and / Mode Other		Tank Location or Ambient Condition
Small Instantaneous	Gas	Small Instantaneou	s 1	0	0.82 EF	<= 200 kBtu/	hr F	R-0/R-0		n/a	n/a	a	n/a		n/a
SPACE CONDITIONI	NG SYSTEM	<u> </u>													
	01			02		03	3 04				05		06		
SC	Sys Name	Syste		em Type	Heatin	g Unit Name	Cooling Unit Nam		e Fan N		an Name Distr		Distrib	ution Name	
HVA	C System 1		Other Heati	ng and Cool /stem	ooling Furn 80			Split 14 11.7			HVAC Fan 1			Attic Default	
HVAC - HEATING UN	IIT TYPES														
	01			02					03			04			
	Name			System Type				Number of Units			ts	Efficiency			
	Furn 80		4		CntrlFurnace				1			80 AFUE			
HVAC - COOLING UN	NIT TYPES														
01			02		03	04	05	06			07		07		08
Name		Syste	m Type	N	umber of Units	Efficienc EER	y SEER	Zona	ally Con	trolled	trolled Compress		assor Type HFF		Verification
Split 14 11.7	Split 14 11.7 SplitAirCond			1	11.7	14	+	Not Zon			ingle Speed	` 	Split 14	11.7-hers-cool	
HVAC COOLING - HE	RS VERIFIC	ATION				•									
01	72.1.110		02			03		04				05		06	
Name		7	/erified Airflo	ow.	Airflow Target		,	Verified EER			Verified SEER		V	Verified Refrigerant Charge	
Split 14 11.7-he	ers-cool		Required		1	350		Not Requ	uired		Not Required			Re	quired

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HVAC - DISTRIBUTION SYSTEM	S										
01	02		03	04	04			06	07		
Name	Туре		Duct Leakage	Insulation	Insulation R-value		E	Bypass Duct	HERS Verification		
Attic Default	Duc	ctsAttic	Sealed and tested	8		Attic		None	Attic Default-hers-dist		
HVAC DISTRIBUTION - HERS VE	RIFICATION					,					
01		02	03	04	05	06		07	08		
	Due	ct Leakage	Duct Leakage	Verified Duct	Verified D	uct Buri	ed	Deeply Buried	Low-leakage		
Name	Ve	erification	Target (%)	Location	Design	Duc	ts	Ducts	Air Handler		
Attic Default-hers-dist	F	Required	5.0	Not Required	Not Requi	red Not Red	quired	Not Required	n/a		
HVAC - FAN SYSTEMS											
01			02			03		04			
Name			Туре			n Power (Watts/CI	M)	HERS Verification			
HVAC Fan 1		Sing	Single Speed PSC Furnace Fan			0.45			HVAC Fan 1-hers-fan		
HVAC FAN SYSTEMS - HERS VE	RIFICATION										
01			.0			03					
Nam	ie		Verified Fan Watt Draw				Required Fan Efficiency (Watts/CFM)				
HVAC Fan 1	-hers-fan		Required 0.45								
IAQ (Indoor Air Quality) FANS			.0		,						
01		02		03		04		05	06		
Dwelling Unit	IAQ CFM		IAQ W	IAQ Watts/CFM		IAQ Fan Type		Recovery iveness(%)	HERS Verification		
SFam IAQVentRpt		90	(Default		0	Required			
COOLING VENTILATION		0,0		,							
01		02	03	0.	4	05		06	07		
Name Airflow Rate (CFM/		irflow Rate (CFM/ft2)	Cooling Vent CFM	Cooling Ven	t Watts/CFM	ts/CFM Total Watts		Number of Fans	HERS Verification		

1.5

Whole House Fan

0.14

3150

441

Required

CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD

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DOCUMENTATION AUTHOR'S DECLARATION STATEMENT	
I. 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	
Regulations.	rtificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of f Compliance are consistent with the information provided on other applicable compliance documents,
Responsible Designer Name:	Responsible Designer Signature:
Company:	Date Signed:
Address:	License:
City/State/Zip:	Phone:

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