

CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD
CF1R-PRF-01
Project Name: 2 Zone MF Example 4

Calculation Date/Time: 10:48, Wed, Nov 01, 2017

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Calculation Description: MF Rev 3

Input File Name: MFexample4.ribd16

GENERAL INFORMATION					
01	Project Name	2 Zone MF Example 4			
02	Calculation Description	6960 ft2, 8 Unit CEC MF Prototype			
03	Project Location	1516 Ninth			
04	City	Sacramento, CA	05	Standards Version	Compliance 2017
06	Zip Code	95814	07	Compliance Manager Version	BEMCmpMgr 2016.3.0 (934 SP1)
08	Climate Zone	CZ12	09	Software Version	CBECC-Res 2016.3.0 (954)
10	Building Type	Multifamily	11	Front Orientation (deg/Cardinal)	0
12	Project Scope	Newly Constructed	13	Number of Dwelling Units	8
14	Total Cond. Floor Area (ft ²)	6960	15	Number of Zones	2
16	Slab Area (ft ²)	3480	17	Number of Stories	2
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 (%)	15.0%

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	10.20	9.24	0.96	9.4%
Space Cooling	26.06	22.39	3.67	14.1%
IAQ Ventilation	2.47	2.47	0.00	0.0%
Water Heating	15.46	15.46	0.00	0.0%
Photovoltaic Offset	----	0.00	0.00	----
Compliance Energy Total	54.19	49.56	4.63	8.5%

REQUIRED SPECIAL FEATURES
The following are features that must be installed as condition for meeting the modeled energy performance for this computer analysis.
<ul style="list-style-type: none"> Cool roof Insulation below roof deck Non-standard duct location (any location other than attic)

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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: <ul style="list-style-type: none"> • IAQ mechanical ventilation Cooling System Verifications: <ul style="list-style-type: none"> • Verified Refrigerant Charge • Fan Efficacy Watts/CFM HVAC Distribution System Verifications: <ul style="list-style-type: none"> • Duct Sealing Domestic Hot Water System Verifications: <ul style="list-style-type: none"> • -- 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
2 Zone MF Example 4	6960	8	12	2	0	8

ZONE INFORMATION				
01	02	03	04	05
Zone Name	Zone Type	Zone Floor Area (ft ²)	Avg. Ceiling Height	Number of Dwelling Units
Conditioned	Conditioned	3480	8	4
Conditioned-2	Conditioned	3480	8	4

DWELLING UNIT INFORMATION		
01	02	03
Dwelling Unit Name	Dwelling Unit Type	Zone
1stFlrOneBR-(1/2)	OneBR	Conditioned
1stFlrOneBR-(2/2)	OneBR	Conditioned
1stFlrTwoBR-(1/2)	TwoBR	Conditioned
1stFlrTwoBR-(2/2)	TwoBR	Conditioned
2ndFlrOneBR-(1/2)	OneBR	Conditioned-2
2ndFlrOneBR-(2/2)	OneBR	Conditioned-2
2ndFlrTwoBR-(1/2)	TwoBR	Conditioned-2
2ndFlrTwoBR-(2/2)	TwoBR	Conditioned-2

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DWELLING UNIT TYPES						
01	02	03	04	05	06	07
Name	CFA (ft ²)	Number of Bedrooms	Number in Building	Space Conditioning Systems Assigned	DHW System Name	IAQ Vent Fan Name
OneBR	780	1	4	2ndFlrOneBR 1/2 SplitAC:Furn80:Duct:Fan:1:3 2ndFlrOneBR 2/2 SplitAC:Furn80:Duct:Fan:1:3	DHW System 1	Default Minimum IAQ Fan
TwoBR	960	2	4	2ndFlrTwoBR 1/2 SplitAC2:Furn90:Duct:Fan:1:3 2ndFlrTwoBR 2/2 SplitAC2:Furn90:Duct:Fan:1:3	DHW System 1	Default Minimum IAQ Fan

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)
frontwall	Conditioned	R19/5 Exterior Wall 1	0	Front	991	236	90
backwall	Conditioned	R19/5 Exterior Wall 1	180	Back	991	313	90
leftwall	Conditioned	R19/5 Exterior Wall 1	90	Left	255	26	90
rightwall	Conditioned	R19/5 Exterior Wall 1	270	Right	255	26	90
frontwall-2	Conditioned-2	R19/5 Exterior Wall 1	0	Front	991	236	90
backwall-2	Conditioned-2	R19/5 Exterior Wall 1	180	Back	991	313	90
leftwall-1-2	Conditioned-2	R19/5 Exterior Wall 1	90	Left	255	26	90
rightwall-1-2	Conditioned-2	R19/5 Exterior Wall 1	270	Right	255	26	90
Ceiling (below attic)	Conditioned-2	R38 ClgBlwAttic Cons	n/a	n/a	3480	n/a	n/a
Interior Floor 1	Conditioned-2>>Conditioned	Interior Floor 2	n/a	n/a	3480	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
Attic	Tile high performance	Ventilated	4	0.2	0.85	No	Yes

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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	frontwall (Front-0)	----	----	1	156.0	0.32	0.25	Insect Screen (default)
B1	Window	backwall (Back-180)	----	----	1	313.0	0.32	0.25	Insect Screen (default)
L1	Window	leftwall (Left-90)	----	----	1	26.0	0.32	0.25	Insect Screen (default)
R1	Window	rightwall (Right-270)	----	----	1	26.0	0.32	0.25	Insect Screen (default)
F1-2	Window	frontwall-2 (Front-0)	----	----	1	156.0	0.32	0.25	Insect Screen (default)
B1-2	Window	backwall-2 (Back-180)	----	----	1	313.0	0.32	0.25	Insect Screen (default)
L1-2	Window	leftwall-1-2 (Left-90)	----	----	1	26.0	0.32	0.25	Insect Screen (default)
R1-2	Window	rightwall-1-2 (Right-270)	----	----	1	26.0	0.32	0.25	Insect Screen (default)

OPAQUE DOORS			
01	02	03	04
Name	Side of Building	Area (ft ²)	U-factor
Entry	frontwall	80.0	0.50
Entry-2	frontwall-2	80.0	0.50

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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-factor	Assembly Layers
Tile high performance	Attic Roofs	Wood Framed Ceiling	2x4 Top Chord of Roof Truss @ 24 in. O.C.	R 13	0.070	<ul style="list-style-type: none"> Inside Finish: Gypsum Board Cavity / Frame: R-13 / 2x4 Top Chrd Roof Deck: Wood Siding/sheathing/decking Tile Gap: present Roofing: 10 PSF (RoofTile)
R19/5 Exterior Wall 1	Exterior Walls	Wood Framed Wall	2x6 @ 16 in. O.C.	R 19 in 5-1/2 in. cavity (R-18)	0.051	<ul style="list-style-type: none"> Inside Finish: Gypsum Board Cavity / Frame: R-19 in 5-1/2 in. (R-18) / 2x6 Sheathing / Insulation: R5 Sheathing Exterior Finish: Synthetic Stucco
R38 ClgBlwAttic Cons	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.
Interior Floor 2	Interior Floors	Wood Framed Floor	2x6 @ 16 in. O.C.	none	0.199	<ul style="list-style-type: none"> Floor Surface: Carpeted Floor Deck: Wood Siding/sheathing/decking Cavity / Frame: no insul. / 2x6 Ceiling Below 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
Slab On Grade 1	Conditioned	3480	292	None	0.8	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	07
Name	System Type	Number of Systems in Building	Multi-Family Distribution Type	Water Heater	Number of Water Heaters/System	Solar Fraction (%)
DHW System 1	Standard	8	Multi-family: No loops or recirc pump	Small Instantaneous (1)	1	n/a

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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	120,000 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
1stFlrOneBR 1/2 SplitAC:Furn80:Duct:Fan:1:3	Other Heating and Cooling System	Furn80	SplitAC	Fan	Duct
1stFlrOneBR 2/2 SplitAC:Furn80:Duct:Fan:1:3	Other Heating and Cooling System	Furn80	SplitAC	Fan	Duct
1stFlrTwoBR 1/2 SplitAC2:Furn90:Duct:Fan:1:3	Other Heating and Cooling System	Furn90	SplitAC2	Fan	Duct
1stFlrTwoBR 2/2 SplitAC2:Furn90:Duct:Fan:1:3	Other Heating and Cooling System	Furn90	SplitAC2	Fan	Duct
2ndFlrOneBR 1/2 SplitAC:Furn80:Duct:Fan:1:3	Other Heating and Cooling System	Furn80	SplitAC	Fan	Duct
2ndFlrOneBR 2/2 SplitAC:Furn80:Duct:Fan:1:3	Other Heating and Cooling System	Furn80	SplitAC	Fan	Duct
2ndFlrTwoBR 1/2 SplitAC2:Furn90:Duct:Fan:1:3	Other Heating and Cooling System	Furn90	SplitAC2	Fan	Duct
2ndFlrTwoBR 2/2 SplitAC2:Furn90:Duct:Fan:1:3	Other Heating and Cooling System	Furn90	SplitAC2	Fan	Duct

HVAC - HEATING UNIT TYPES			
01	02	03	04
Name	System Type	Number of Units	Efficiency
Furn80	CntrlFurnace - Fuel-fired central furnace	4	80 AFUE
Furn90	CntrlFurnace - Fuel-fired central furnace	4	90 AFUE

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HVAC - COOLING UNIT TYPES							
01	02	03	04	05	06	07	08
Name	System Type	Number of Units	Efficiency		Zonally Controlled	Multi-speed Compressor	HERS Verification
			EER	SEER			
SplitAC	SplitAirCond - Split air conditioning system	4	11.3	13	No	No	SplitAC-hers-cool
SplitAC2	SplitAirCond - Split air conditioning system	4	11.8	14	No	No	

HVAC COOLING - HERS VERIFICATION					
01	02	03	04	05	06
Name	Verified Airflow	Airflow Target (CFM)	Verified EER	Verified SEER	Verified Refrigerant Charge
SplitAC-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
Duct	DuctsInAll	Sealed and tested	4.2	Conditioned zone	None	Duct-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
Duct-hers-dist	Required	total leakage <= 12.0 or leakage to outdoors <= 5.0	Required	Not Required	Not Required	Not Required	n/a

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

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

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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
1stFlrOneBR 1/2	38	0.25	Default	0	Required
1stFlrTwoBR 1/2	51	0.25	Default	0	Required

This Certificate of Compliance is not registered

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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:

Registration Number:

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