

CERTIFICATE OF COMPLIANCE		Calculation Date/Time: 2021-06-11T08:51:21-07:00		CFJR-PRF-01E (Page 1 of 9)	
Project Name: Matangi ADU		Input File Name: 0210447AU_Matangi ADU_rbc19x			
GENERAL INFORMATION					
01	Project Name	Matangi ADU			
02	Run Title	Title 24 Analysis			
03	Project Location	901 Clyde Avenue			
04	City	Santa Clara	05	Standards Version	2019
06	Zip code	95054	07	Software Version	EnsignPro 8.2
08	Climate Zone	4	09	Front Orientation (deg/ Cardinal)	45
10	Building Type	Single Family	11	Number of Dwelling Units	1
12	Project Scope	NewConstruction	13	Number of Bedrooms	2
14	Addition Cond. Floor Area (ft²)	0	15	Number of Stories	1
16	Existing Cond. Floor Area (ft²)	710	17	Fenestration Average U-Factor	0.3
18	Total Cond. Floor Area (ft²)	710	19	Glasing Percentage (%)	11.57%
20	ADU Bedroom Count	n/a	21	ADU Conditioned Floor Area	n/a
22	Is Natural Gas Available?	Yes			
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 DESIGN RATINGS											
		Energy Design Ratings		Compliance Margins							
		Efficiency (EDR)	Total (EDR)	Efficiency (EDR)	Total (EDR)						
Standard Design		52.4	25.6	0.1	0						
Proposed Design		52.3	25.6	0.1	0						
RESULTS: COMPLIES											
2. Efficiency EDR includes improvements to the building envelope and more efficient equipment 3. Total EDR includes efficiency and demand response measures such as photovoltaic (PV) systems and batteries 3. Building complies when efficiency and demand response margins are greater than or equal to zero											
* Standard Design PV Capacity: 1.36 kWdc * PV System required to 1.36 kWdc (a factor of 1.898) to achieve Standard Design PV PV scaling											
ENERGY USE SUMMARY											
Energy Use (kWh/ft²-yr)		Standard Design	Proposed Design	Compliance Margin	Percent Improvement						
Space Heating		9.58	14.61	-4.85	-50.7						
Space Cooling		22.18	20.01	1.57	7.1						
IAQ Ventilation		3.31	3.31	0	0						
Water Heating		24.28	21.05	3.23	13.3						
Self Utilization/Reliability Credit		n/a	0	n/a	n/a						
Compliance Energy Total		59.33	59.38	-0.05	-0.1						
REQUIRED PV SYSTEMS - SIMPLIFIED											
01	02	03	04	05	06	07	08	09	10	11	12
DC System Size (kWdc)	Exception	Module Type	Array Type	Power Electronics	CR	Azimuth (deg)	Tilt Input	Array Angle (deg)	Tilt (in 12)	Inverter Eff. (%)	Annual Solar Access (%)
1.0	NA	Standard	Fixed	none	true	150-270	n/a	n/a	<+7.12	96	100

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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.						
* Variable capacity heat pump compliance system verification details from VCPM Staff report, Appendix B, and RA3						
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 table below. Registered CPDs and CPDRs are required to be completed in the HERS Registry						
Building-level Verifications:						
* Indoor air quality ventilation						
* Kitchen range hood						
* Cooling System Verifications:						
* Verified Refrigerant Charge						
* Airflow in habitable rooms (SC3.1.A.1.7)						
Heating System Verifications:						
* Verified heat pumped heating capacity						
* Verified indoor units located entirely in conditioned space (SC3.1.A.1.8)						
* HVAC Distribution System Verifications:						
* None						
* 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
Matangi ADU	888	1	2	1	0	1
ZONE INFORMATION						
01	02	03	04	05	06	07
Zone Name	Zone Type	HVAC System Name	Zone Floor Area (ft²)	Avg. Ceiling Height	Water Heating System 1	Water Heating System 2
ADU	Conditioned	HVAC System1	888	9	ERW Sys 1	N/A

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OPAQUE SURFACES														
01	02	03	04	05	06	07	08							
Name	Zone	Construction	Admuth	Orientation	Gross Area (ft²)	Window and Door Area (ft²)	TR (adj)							
Front Wall	ADU	R-19 Wall	45	Front	184	26.7	90							
Left Wall	ADU	R-19 Wall	135	Left	296	30	90							
Right Wall	ADU	R-21 Wall	225	Right	184	0	90							
Right Wall	ADU	R-21 Wall	315	Right	296	40	90							
Roof	ADU	R-38 Roof Attic	n/a	n/a	500	n/a	n/a							
Raised Floor	ADU	R-19 Floor Crawlspace	n/a	n/a	888	n/a	n/a							
OPAQUE SURFACES - CATHEDRAL CEILINGS														
01	02	03	04	05	06	07	08	09	10	11				
Name	Zone	Construction	Admuth	Orientation	Area (ft²)	Slight Area (ft²)	Roof Rise (in 12)	Roof Reflectance	Roof Emittance	Coil Roof				
Vaulted Roof	ADU	R-38 Roof No Attic	180	n/a	388	0	4	0.1	0.95	No				
ATTIC														
01	02	03	04	05	06	07	08							
Name	Construction	Type	Roof Rise (in 12)	Roof Reflectance	Roof Emittance	Radiant Barrier	Coil Roof							
Attic ADU	Attic Roof/Attic	Ventilated	4	0.1	0.95	Yes	No							
PENETRATION / GLAZING														
01	02	03	04	05	06	07	08	09	10	11	12	13	14	
Name	Type	Surface	Orientation	Admuth	Width (in)	Height (in)	Mult.	U-factor	U-factor NFRC	SHGC NFRC	SHGC Source	SHGC	Exterior Shading	
Glass Door	Window	Front Wall	Front	45	3	26.7	0.3	0.3	0.23	0.23	NFRC	0.23	NFRC	Exterior Shading
Window	Window	Left Wall	Left	135				1	20	0.3	0.3	0.23	NFRC	Exterior Shading
Window 2	Window	Left Wall	Left	135				1	10	0.3	0.3	0.23	NFRC	Exterior Shading

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FENESTRATION / GLAZING															
01	02	03	04	05	06	07	08	09	10	11	12	13	14		
Name	Type	Surface	Orientation	Admuth	Width (in)	Height (in)	Mult.	Area (ft²)	U-factor	U-factor NFRC	SHGC NFRC	SHGC Source	SHGC	Exterior Shading	
Window 3	Window	Right Wall	Right	315				3	40	0.3	0.3	0.23	0.23	NFRC	Exterior Shading
Window 4	Window	Right Wall	Right	315				1	0	0.3	0.3	0.23	0.23	NFRC	Exterior Shading
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								
R-19 Wall	Exterior Walls	Wood Framed Wall	2x6 @ 16 in. O.C.	R-19	None / None	0.074	Inside Finish: Gypsum Board Cavity / Frame: R-13 in 5-1/2 in. (R-19) / 2x6 Exterior Finish: 3 Coat Stucco								
R-21 Wall	Exterior Walls	Wood Framed Wall	2x6 @ 16 in. O.C.	R-21	None / None	0.069	Inside Finish: Gypsum Board Cavity / Frame: R-21 / 2x6 Exterior Finish: 3 Coat Stucco								
R-38 Roof No Attic	Cathedral Ceilings	Wood Framed Ceiling	2x12 @ 16 in. O.C.	R-38	None / None	0.036	Roofing: Light Roof (Asphalt Shingles) Roof Deck: Wood Siding/Air Sealing/Insulating Cavity / Frame: R-30 / 2x12 Inside Finish: Gypsum Board								
Attic Roof/Attic	Attic Roofs	Wood Framed Ceiling	2x4 @ 24 in. O.C.	R-0	None / None	0.644	Roofing: Light Roof (Asphalt Shingles) Roof Deck: Wood Siding/Air Sealing/Insulating Cavity / Frame: n/a / 2x4								
R-19 Floor Crawlspace	Floors Over Crawlspace	Wood Framed Floor	2x6 @ 16 in. O.C.	R-19	None / None	0.049	Floor Surface: Carpeted Floor Deck: Wood Siding/Air Sealing/Insulating Cavity / Frame: R-19 / 2x6								

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GLAZING 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				
R-38 Roof Attic	Ceilings (Below Attic)	Wood Framed Ceiling	2x4 @ 24 in. O.C.	R-38	None / None	0.025	Over Ceiling Space: R-28.8 Insul. Cavity / Frame: R-9.1 / 2x4 Inside Finish: Gypsum Board				
BUILDING ENVELOPE - HERS VERIFICATION											
01	02	03	04	05	06	07	08				
Quality Insulation Installation (QI)	High R-value 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	Distribution Type	Water Heater Name (if)	Solar Heating System	Compact Distribution	HERS Verification					
ERW Sys 1	Domestic Hot Water (DHW)	Standard Distribution System	ERW Heater (1)	n/a	None	n/a					
WATER HEATERS											
01	02	03	04	05	06	07	08	09	10	11	12
Name	Heating Element Type	Tank Type	# of Units	Tank Vol. (gal)	Energy Factor or Efficiency	Input Rating or Flow Rate	Tank Insulation R-value (in/Et)	Standby Loss or Recovery Eff	1st Hr. Rating or Flow Rate	NEEA Heat Pump Brand or Model	Tank Location or Ambient Condition
ERW Heater 1	Gas	Consumer Instantaneous	1	0	0.96 UEF	200000-Btu/hr	0	n/a	n/a	n/a	n/a

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WATER HEATING - HERS VERIFICATION										
01	02	03	04	05	06	07	08			
Name	Pipe Insulation	Parallel Piping	Compact Distribution	Compact Distribution Type	Recirculation Control	Central DHW Distribution	Shower Drain Water Heat Recovery			
ERW Sys 1 - 1/2	Not Required	Not Required	Not Required	None	Not Required	Not Required	Not Required			
SPACE CONDITIONING SYSTEMS										
01	02	03	04	05	06	07	08	09	10	11
Name	System Type	Heating Unit Name	Cooling Unit Name	Fan Name	Distribution Name	Required Thermostat Type	Status	Verified Existing Condition	Heating Equipment Count	Cooling Equipment Count
HVAC System1	Heat pump heating cooling	Heat Pump System 1	Heat Pump System 1	n/a	n/a	Setback	None	NA	1	1
HVAC - HEAT PUMPS										
01	02	03	04	05	06	07	08	09	10	11
Name	System Type	Number of Units	Heating HSPF/COP	Cooling Cap 17	SEER	EEER/CEER	Zoneally Controlled	Compressor Type	HERS Verification	
Heat Pump System 1	VCPM ductless	1	8.2	24000	18000	14	11.7	Not Zonal	Single Speed	Heat Pump System 1 Heat Recovery
HVAC HEAT PUMPS - HERS VERIFICATION										
01	02	03	04	05	06	07	08	09		
Name	Verified Airflow	Airflow Target	Verified EER	Verified SEER	Verified Refrigerant Charge	Verified HSPF	Verified Heating Cap 17	Verified Heating Cap 17		
Heat Pump System 1 Heat Recovery	Not Required	0	Not Required	Not Required	Yes	No	Yes	Yes		

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VARIABLE CAPACITY HEAT PUMP COMPLIANCE OPTION - HERS VERIFICATION									
01	02	03	04	05	06	07	08	09	10
Name	Certified Low-Static VCPM System	Airflow to Habitable Rooms	Ductless Units in Conditioned Space	Wall Mount Thermostat	Air Filter Sizing Range Pressure Drop Rating	Low Voltage Disconnect in Conditioned Space	Minimum Airflow per IAQ.3 and SC3.3.4.1.1	Certified Fan	Indoor Fan not Running Continuously
Heat Pump System 1	Not required	Required	Required	Required	Not required	Not required	Not required	Not required	Not required
IAQ/INDOOR AIR QUALITY PANS									
01	02	03	04	05	06				
Dwelling Unit	IAQ CFM	IAQ Wats/CFM	IAQ Fan Type	IAQ Recovery Effectiveness (%)	IAQ Recovery Effectiveness - SHGC				
SHGC/IAQ/vent	40	0.25	Default	0	n/a				

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