

CERTIFICATE OF COMPLIANCE
 Project Name: Matangi JADU
 Calculation Date/Time: 2021-06-11T08:33:19-07:00
 Input File Name: 0210447JADU_Matangi_JADU.rbd15x
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GENERAL INFORMATION

01	Project Name	Matangi JADU	05	Standard Version	2019
02	Plan Title	Title 24 Analysis	06	Software Version	EngiPro 8.2
03	Project Location	951 Clyde Avenue	07	Front Orientation (deg/ Cardinal)	135
04	City	Santa Clara	08	Number of Dwelling Units	1
05	Zip Code	95054	09	Number of Stories	1
06	Climate Zone	4	10	Addition Cond. Floor Area (ft²)	329
07	Building Type	Single Family	11	Existing Cond. Floor Area (ft²)	170
08	Project Scope	As-Built/Only	12	Total Cond. Floor Area (ft²)	2299
09	ADU Bedroom Count	1	13	ADU Bedroom Count	2
10	Is Natural Gas Available?	Yes	14	Existing Area (incl. new addition) (ft²)	170
11			15	Addition Area (incl. existing) (ft²)	329
12			16	Total Area (ft²)	2299
13			17	Existing Bedrooms	3
14			18	Addition Bedrooms	1
15			19	Total Bedrooms	4

COMPLIANCE RESULTS

01	Building Complies with Computer Performance	06
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.	06
03	This building incorporates one or more Special Features shown below	06

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ENERGY USE SUMMARY

Energy Use (BTU/ft²·yr)	Standard Design	Proposed Design	Compliance Margin	Percent Improvement
Space Heating	13.05	12.11	0.94	7.2
Space Cooling	27.2	28.84	-1.64	-6
IAQ Ventilation	4.6	4.6	0	0
Water Heating	106.75	92.83	13.92	13
Self-Reliation/Reliability Credit	N/A	0	0	N/A
Compliance Energy Total	151.6	138.38	13.22	8.7

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 option verification details from VCMF 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 details are provided in the building tables below. Registering (CFR 26) and (CFR 26) are required to be completed in the HERS Registry.

Building Level Verifications:

- Kitchen range hood
- Cooling System Verifications:
- Verified Refrigerant Charge
- Airflow in habitable rooms (SC3.1.4.1.1)
- Heating System Verifications:
- Verified heat pump rated heating capacity
- Wall-mounted thermostat in zones greater than 150 ft² (SC3.4.5)
- Ductless indoor units located entirely in conditioned space (SC3.1.4.1.8)
- Hydric Distribution System Verifications:
- None
- Domestic Hot Water System Verifications:
- None

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ZONE INFORMATION

Zone Name	Zone Type	HVAC System Name	Zone Floor Area (ft²)	Avg. Ceiling Height	Water Heating System 1	Water Heating System 2
JADU	Conditioned	HVAC System1	329	8	EDW Sys 1	N/A

OPAQUE SURFACES

Name	Zone	Construction	Area (ft²)	Orientation	IR (deg)	Window and Door Area (ft²)	U-Factor	U-Factor Source	BHGC	Solar W	SHGC	SHGC Source	Exterior Shading
Front Wall	JADU	R-35 Wall	135	Front	156	0	0	0	0	0	0	0	0
Left Wall	JADU	R-35 Wall	225	Left	156	0	0	0	0	0	0	0	0
Interior Surface 1	JADU	R-0 Wall	n/a	n/a	140	0	n/a	n/a	n/a	n/a	n/a	n/a	None
Interior Surface 2	JADU	R-0 Wall	n/a	n/a	140	0	n/a	n/a	n/a	n/a	n/a	n/a	None
Roof	JADU	R-30 Roof/Attic	n/a	n/a	329	0	n/a	n/a	n/a	n/a	n/a	n/a	None

ATTIC

Name	Construction	Type	Roof Rise (in 12)	Roof Reflectance	Roof Emittance	Radiant Barrier	Cool Roof
Attic JADU	Attic Roof/JADU	Unvented	4	0.1	0.85	Yes	No

PENETRATION / GLAZING

Name	Type	Surface	Orientation	Area (ft²)	U-Factor	U-Factor Source	BHGC	Solar W	SHGC	SHGC Source	Exterior Shading
French Door	Window	Loft Wall	Loft	225	1	12.61	0.3	NRC	0.23	NRC	Bug Screen
Window	Window	Loft Wall	Loft	225	1	14	0.3	NRC	0.23	NRC	Bug Screen

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SLAB FLOORS

Name	Zone	Area (ft²)	Perimeter (ft)	Edge Insul. R-value and Depth	Edge Insul. R-value and Depth	Carpeted Fraction	Heated
Slab	JADU	329	39	None	0	80%	No

OPAQUE SURFACE CONSTRUCTIONS

Construction Name	Surface Type	Construction Type	Framing	Total Cavity R-value	Interior / Exterior Conduction R-value	U-factor	Assembly Layers
R-35 Wall	Exterior Walls	Wood Framed Wall	2x4 @ 16 in. O.C.	R-15	None / None	0.095	Inside Finish: Gypsum Board Cavity Frame: R-15 2x4 Exterior Finish: 3 Coat Stucco
R-0 Wall	Interior Walls	Wood Framed Wall	2x4 @ 16 in. O.C.	R-0	None / None	0.277	Inside Finish: Gypsum Board Cavity / Frame: no insul. / 2x4 Other Side Finish: Gypsum Board
Attic Roof/JADU	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/Insulation/Decking Cavity / Frame: no insul. / 2x4
R-30 Roof Attic	Ceilings (Below attic)	Wood Framed Ceiling	2x4 @ 24 in. O.C.	R-30	None / None	0.052	Over Ceiling Joists: R-20.3 insul. Cavity / Frame: R-3.1 / 2x4 Inside Finish: Gypsum Board

BUILDING ENVELOPE - HERS VERIFICATION

Quality Insulation Installation (QI)	High R-value Spray Foam Insulation	Building Envelope Air Leakage	CFM50
Not Required	Not Required	Not Required	n/a

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WATER HEATING SYSTEMS

Name	System Type	Distribution Type	Water Heater Name (H)	Solar Heating System	Compact Distribution	HERS Verification
DHW Sys 1	Domestic Hot Water (DHW)	Standard Distribution System	DHW Heater 1 (1)	n/a	None	n/a

WATER HEATERS

Name	Heating Element Type	Tank Type	Efficiency	Input Rating (kW/Brk)	Tank Insulation R-value (in²/Btu)	Standby Loss or Recovery Eff	1/4 Hr. Rating or Flow Rate	NHEA Heat Pump Brand or Model	Tank Location or Ambient Condition	Status	Verified Existing Condition
DHW Heater 1	Gas	Conventional	1	0.55 LEF	14-200 LEF/hr	0	n/a	n/a	n/a	New	n/a

WATER HEATING - HERS VERIFICATION

Name	Pipe Insulation	Parallel Piping	Compact Distribution	Compact Distribution Type	Recirculation Control	Central DHW Distribution	Shower Drain Water Heat Recovery
DHW Sys 1 - 1/2	Not Required	Not Required	Not Required	None	Not Required	Not Required	Not Required

SPACE CONDITIONING SYSTEMS

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	New	NA	1	1

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HVAC - HEAT PUMPS

Name	System Type	Number of Units	Heating HSPF/COP	Cap 47	Cap 17	SEER	ER/CSEER	Zonally Controlled	Compressor Type	HERS Verification
Heat Pump System 1	VCMF-Ductless	1	8.2	12000	9160	14	11.7	Not Zonal	Single Speed	Heat Pump System 1 Heat Pump

HVAC HEAT PUMPS - HERS VERIFICATION

Name	Verified Airflow	Airflow Target	Verified EER	Verified SEER	Verified Refrigerant Charge	Verified HSPF	Verified Heating Cap 47	Verified Heating Cap 17
Heat Pump System 1	Not Required	0	Not Required	Not Required	Yes	No	Yes	Yes

VARIABLE CAPACITY HEAT PUMP COMPLIANCE OPTION - HERS VERIFICATION

Name	Certified Low-Static VCMF System	Airflow to Habitable Rooms	Ductless Units in Conditioned Space	Wall Mount Thermostat	Air Filter Sizing	Low Leakage Ducts in Conditioned Space	Minimum Airflow per RA3 and SC3.3.4.1	Certified non-continuous 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) RANS

Dwelling Unit	IAQ CFM	IAQ Wats/CFM	IAQ Fan Type	IAQ Recovery Effectiveness (%)	SHEAQ Recovery Effectiveness - SHE
5Fam-401/402/403ent	25	0.25	Default	0	n/a

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DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name: Nicholas Bignardi
 Signature Date: 2021-06-11 08:42:31
 Title: HERS Certification Identification (if applicable): n/a
 Phone: 408-866-1620

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury under the laws of the State of California:

- I am eligible under Division 9 of the Business and Professions Code to accept responsibility for the building design identified on this Certificate of Compliance.
- I certify that the energy ratings 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.
- 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: Nicholas Bignardi
 Signature Date: 2021-06-11 08:42:31
 License: n/a
 Phone: 408-866-1620

Digitally signed by CaCERTS. This digital signature is provided in order to secure the content of this registered document, and in no way implies Registration Provider for the accuracy of the information.

2019 Low-Rise Residential Mandatory Measures Summary

NOTE: Low-rise residential buildings subject to the Energy Standards must comply with all applicable mandatory measures, regardless of the compliance approach used. Review the respective section for more information. *Exceptions may apply. (1)(2)(3)

Building Envelope Measures:

- § 110.6(a)1. Air Leakage:** Manufactured fenestration, exterior doors, and exterior pet doors must limit air leakage to 0.3 CFM per square foot or less when tested per NFRC-400, ASTM E283 or AAMA/WDMA/CSA 1011.9-2014.
- § 110.6(a)5. Labeling:** Fenestration products and exterior doors must have a label meeting the requirements of § 10-111(e).
- § 110.6(b). Field fabricated exterior doors and fenestration products** must have a U-factor and solar heat gain coefficient (SHGC) values from Tables 110-C.1, 110-C.8, or J4.5 for exterior doors. They must be caulked and/or weather-stopped.
- § 110.7. Air Leakage:** All joints, penetrations, and other openings in the building envelope that are potential sources of air leakage must be caulked, gasketed, or weather stopped.
- § 110.8(a). Insulation Certification by Manufacturers:** Insulation must be certified by the Department of Consumer Affairs, Bureau of Household Goods and Services (BHGS).
- § 110.8(b). Insulation Requirements for Heated Slab Floors:** Heated slab floors must be insulated per the requirements of § 110.8(g).
- § 110.8(c). Roofing Products Solar Reflectance and Thermal Emittance:** The thermal emittance and aged solar reflectance values of the roofing material must meet the requirements of § 110.8(b) and be labeled per § 10-113 when the installation of a cool roof is specified on the CFR.
- § 110.8(d). Radiant Barrier:** When required, radiant barriers must have an emittance of 0.05 or less and be certified to the Department of Consumer Affairs.
- § 150.0(a). Ceiling and Rafter Roof Insulation:** Minimum R-22 insulation in wood-frame ceiling, or the weighted average U-factor must not exceed 0.043. Minimum R-19 or weighted average U-factor of 0.044 or less in rafter roof alteration. Also access doors must have permanently attached insulation using adhesive or mechanical fasteners. The attic access must be gasketed to prevent air leakage. Insulation must be installed in direct contact with a continuous roof or ceiling which is sealed to limit infiltration and exfiltration as specified in § 110.7, including but not limited to placing insulation either above or below the roof deck or on top of a drywall ceiling.
- § 150.0(b). Loose-fill Insulation:** Loose fill insulation must meet the manufacturer's required density for the labeled R-value.
- § 150.0(c). Wall Insulation:** Minimum R-13 insulation in 2x4 inch wood framing wall or have a U-factor of 0.102 or less, or R-20 in 2x6 inch wood framing or have a U-factor of 0.071 or less. Oppaque non-framed assemblies must have an overall assembly U-factor not exceeding 0.102. Masonry walls must meet Tables 150.1-A or B.
- § 150.0(d). Raised-Roof Insulation:** Minimum R-19 insulation in raised wood framed floor or 0.037 maximum U-factor.
- § 150.0(f). Slab Edge Insulation:** Slab edge insulation must meet all of the following: have a water absorption rate, for the insulation material alone without facings, no greater than 0.3 percent; have a water vapor permeance no greater than 2.0 perms per inch; be protected from physical damage and UV light deterioration; and, when installed as part of a heated slab floor, meet the requirements of § 110.8(g).
- § 150.0(g)1. Vapor Retarder:** In climate zones 1 through 16, the earth floor of unvented crawl space must be covered with a Class I or Class II vapor retarder. This requirement also applies to controlled ventilation crawl space for buildings complying with the exception to § 150.0(d).
- § 150.0(g)2. Vapor Retarder:** In climate zones 14 and 16, a Class I or Class II vapor retarder must be installed on the conditioned space side of all insulation in all exterior walls, vented attics, and unvented attics with air permeable insulation.
- § 150.0(h). Fenestration Products:** Fenestration, including skylights, separating conditioned space from unconditioned space or outdoors must have a maximum U-factor of 0.94, or if fenestration must not exceed 0.94.

Fireplaces, Decorative Gas Appliances, and Gas Log Measures:

- § 110.5(e). Pilot Light:** Continuously burning pilot lights are not allowed for indoor and outdoor fireplaces.
- § 150.0(e)1. Closable Doors:** Masonry or factory-built fireplaces must have a closable metal or glass door covering the entire opening of the firebox.
- § 150.0(e)2. Combustion Intake:** Masonry or factory-built fireplaces must have a combustion outside air intake, which is at least six square inches in area and equipped with a readily accessible, operable, and lockable damper or combustion air control device.
- § 150.0(e)3. Flue Damper:** Masonry or factory-built fireplaces must have a flue damper with a readily accessible control.

Space Conditioning, Water Heating, and Plumbing System Measures:

- § 110.0§ 110.3. Certification:** Heating, ventilation and air conditioning (HVAC) equipment, water heaters, showerheads, faucets, and all other regulated appliances must be certified by the manufacturer to the California Energy Commission.
- § 110.2(a). HVAC Efficiency:** Equipment must meet the applicable efficiency requirements in Table 110.2-A through Table 110.2-K.
- § 110.2(b). Controls for Heat Pumps with Supplementary Electric Resistance Heaters:** Heat pumps with supplementary electric resistance heaters must have controls that prevent supplementary heater operation when the heating load can be met by the heat pump alone and in which the cut-on temperature for compression heating is higher than the cut-off temperature for supplementary heating, and the cut-off temperature for compression heating is higher than the cut-off temperature for supplementary heating.
- § 110.2(c). Thermostats:** All heating or cooling systems not controlled by a central energy management control system (EMCS) must have a setback thermostat.
- § 110.2(d). Water Heating Recirculation Loops Serving Multiple Dwelling Units:** Water heating recirculation loops serving multiple dwelling units must meet the air release valve, backflow prevention, pump priming, pump isolation valve, and recirculation loop connection requirements of § 110.3(d)4.
- § 110.3(c)6. Isolation Valves:** Instantaneous water heaters with an input rating greater than 6.8 kBtu per hour (2 kW) must have isolation valves with hose bibbs or other fittings on both cold and hot water lines to allow for flushing the water heater when the valves are closed.
- § 110.5. Pilot Lights:** Continuously burning pilot lights are prohibited for natural gas fan-type central furnaces, household cooking appliances (except appliances without an electrical supply voltage connection with pilot lights that consume less than 150 Btu per hour), and pool and spa heaters.
- § 150.0(y)1. Building Cooling and Heating Loads:** Heating and/or cooling loads are calculated in accordance with the ASHRAE Handbook, Equipment Volume, Applications Volume, and Fundamentals Volume; the SMACNA Residential Comfort System Installation Standards Manual, or the ACCA Manual J using design conditions specified in § 150.0(y)2.

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