



February 11, 2025

Re: 24176 - Richmond Two Bedroom Tudor ADU

Hello,

The Title 24 Part 6 Energy calculations are complete.

- The new construction 2 bedroom project complies with a 2.3 total EDR (2.5 efficiency EDR) margin with the following assumptions:- North Lowest number

New construction:

1. Envelope:

a. Roof:

- a. Roofing material (if cool roof required) No
- b. Radiant barrier Yes
- c. Vented attic
- d. Upper roof insulation None
- e. Ceiling insulation R-30

b. Roof:

- a. Roofing material (if cool roof required) No
- b. Radiant barrier No
- c. Rafter
- d. Upper roof insulation None
- e. Rafter insulation R-30

c. Wall:

- a. Framing type 2x6
- b. Insulation in wall R-21
- c. Insulation not interrupted with framing None

d. Slab: Unheated slab on grade

e. Windows/Glass Doors: NFRC rated

- i. U-factor = 0.30
- ii. SHGC = 0.35

f. Skylights: none

g. Solid Doors: - 2 bed unit only

- a. Type Exterior
 - b. NFRC (if required) No
2. HVAC:
- a. Efficiency: 7.5 HSPF2, 14.3 SEER2, 10 EER2
 - b. Heat pump heating: 18,000 Btu/hr @ 47°F; 11,800 Btu/hr @ 17°F
 - c. Distribution: Ductless
3. Ventilation:
- a. IAQ: Continuous exhaust fan shall be installed with minimum airflow of 45 CFM, 1.0 sone or better
 - b. New Kitchen hood for new home: HVI certified, Electric- 65% CE or 160 CFM and 3 sones max. (new)
4. Water Heating:
- a. Efficiency: Generic Teir 3 Heat Pump
 - b. Volume: 50
 - c. Location (if heat pump): Inside
 - d. Recirculation pump: NO
5. Solar Photovoltaic: 2 Bed- min. size required 2.5 kWdc with the following:
- a. Array Type: Fixed
 - b. Power Electronics: None
 - c. Inverter: none
 - d. Azimuth: 105-300
 - e. Tilt: $\leq 7:12$
 - f. Inverter Eff: 96
 - g. Shade factor: 10
6. **Battery Storage/ready (2022)**: All single-family residences, that include one or two dwelling units shall meet the following
- a. At least one of the following shall be provided:
 - i. ESS ready interconnection equipment with a minimum backed up capacity of 60 amps and a minimum of four ESS supplied branch circuits, or
 - ii. A dedicated raceway from the main service to a panelboard (subpanel) that supplies the branch circuits in 150.0(s)2. All branch circuits are permitted to be supplied by the main service panel prior to the installation of an ESS. The trade size of the raceway shall be not less than one inch. The panelboard

that supplies the branch circuits (subpanel) must be labeled "Subpanel shall include all backed-up load circuits."

- b. A minimum of four branch circuits shall be identified and have their source of supply collocated at a single panelboard suitable to be supplied by the ESS. At least one circuit shall supply the refrigerator, one lighting circuit shall be located near the primary egress, and at least one circuit shall supply a sleeping room receptacle outlet.
 - c. The main panelboard shall have a minimum busbar rating of 225 amps.
 - d. Sufficient space shall be reserved to allow future installation of a system isolation equipment/transfer switch within 3 feet of the main panelboard. Raceways shall be installed between the panelboard and the system isolation equipment/transfer switch location to allow the connection of backup power source.
7. **Electric Ready:** When natural or propane gas is used for space heating, water heating, cooktop or dryer, then electric ready requirements will apply (2022 code)

HERS testing to be completed before or during construction:

- Indoor air quality ventilation
- Kitchen range hood
- Verified heat pump rated heating capacity
- VCHP credit:
 - Wall-mounted thermostat in zones greater than 150 ft²
 - Ductless indoor units located entirely in conditioned space
 - Verified Airflow in habitable rooms
 - Verified Refrigerant Charge

The following are known form errors or current modeling restrictions:

None

The CF1R is now processed through CHEERS and watermarked. Make sure to place the CF1R and Mandatory Measures on the drawings. The above are minimums that need to be met in order to be in compliance by the above compliance margin. You can always install more efficient items, but if anything less efficient is installed, the report will have to be revised to reflect the changes. Please let us know if you cannot meet any of the assumptions so the report can be revised to show the project still complies.

Feel free to contact me if you have any questions or need clarification about the above.