

PROJECT AT A GLANCE

PROJECT NAME	Rivero Custom Home
LOCATION	Berkeley
CLIMATE ZONE	3
YEAR BUILT	2018
LOTS	1
SQUARE FEET	1,344
TOTAL INCENTIVE	\$4,950
DELTA EDR	15

PROJECT TEAM

BUILDER	John Newton
ARCHITECT	Design & Development
HERS RATER	Steve Mann
ENERGY CONSULTANT	Steve Mann



“The home’s energy efficiency started with a completely insulated mat slab foundation, 24” spaced advanced framing, raised-heel scissor trusses, and modest south and west glazing. Great care was taken to maintain a continuous air barrier in order to achieve very low [air] leakage and then a high-efficiency, whole-house heat recovery ventilation system was installed to maintain a continuous supply of filtered and tempered air. The smallest available high-efficiency ductless mini-split provides ample heating and cooling for the few hours it is needed in Berkeley’s mild climate and a high capacity CO₂ heat pump hot water heater allows the home to heat all necessary water during off-peak periods.”

— *Jose Rivero, Homeowner*

To complement Berkeley’s mild climate, Mr. Rivero implemented advanced energy saving measures in virtually every aspect of design. The home features advanced 24” stud framing, better-than-code wall and attic insulation, and continuous exterior insulation, yielding a well-insulated and sealed envelope. Windows with a low U-factor and modest solar heat gain coefficient reduce the rate of heat transfer while capitalizing on the advantage of the mild climate and warmer south and west facing windows. Mr. Rivero claimed Quality Insulation Installation HERS verification, which ensures maximum performance of the thermal envelope. In addition, the project team installed high efficiency heat pump domestic hot water and HVAC systems, heat recovery ventilation, 100 percent LED lighting, and ENERGY STAR® appliances. Each of the specified measures exceed California building code and results in substantial energy savings.

IMPLEMENTED ENERGY EFFICIENCY MEASURES

The California Advanced Homes Program encourages residential new construction builders to meet the visionary goals of the California Public Utilities Commission (CPUC) to help builders prepare for future code changes and build better-than-code homes ahead of code changes.

Building Envelope



Ceiling/Attic: Installed R-38 insulation, an above code R value, to decrease the amount of heat escaping into the attic.

Walls: Installed a combination of R-21 cavity insulation and R-4 continuous exterior insulation, ensuring occupants have excellent thermal comfort and the conditioned space requires less space heating and cooling.

QII: Verified the quality of the insulation installation through HERS inspection to ensure maximum thermal performance. QII minimizes air leakage and thermal bridging between the conditioned and unconditioned spaces.

Windows: Installed windows (0.29 U factor/0.27 SHGC) exceeding 2016 Title 24 prescriptive climate zone three U factor of 0.32. In addition, the glazing areas are concentrated on the east, south, and west facing walls to capitalize on solar heating.

Mechanical Systems



Water Heating: Installed a 43 gallon, 3.09 EF heat pump water heater with CO₂ refrigerant. The DHW system has a 71 gallon first hour delivery and supplies enough hot water for 2 to 4 people.

Space Conditioning: Installed a high-efficiency ductless minisplit heat pump HVAC system rated at 33 SEER, 12.5 EER, and 14.2 HSPF.

Ventilation: Installed a heat recovery ventilation system with a cross-counterflow heat exchanger that achieves efficiencies up to 84%. The heat exchanger decreases the space heating load by using exhaust air to heat incoming supply air.
