

# Individual Dwelling Units and Heat Pump Water Heaters

## 2022 HPWH Building Code Assistance Sheet

For prescriptive and mandatory requirements of other water heating systems and configurations refer to the 2022 Building Energy Efficiency Standards single family sections 150.0(n) for mandatory requirements, 150.2(b) for alterations, 150.2(a) for additions, or 150.1(c) for new construction. For multifamily refer to sections 160.4 for mandatory requirements, 180.2(b) for alterations, 180.1(a) for additions, or 170.2(d) for new construction. **Related Resources:** HPWH Code Requirements | HPWH Permit Supplement Template | Electrical Load Estimator

### When does the 2022 Code allow HPWHs?

	Performance Path	Prescriptive Path
New Construction	Allowed	Allowed (detailed in HPWH Code Requirements)
Additions installing a 2 <sup>nd</sup> water heater	Allowed	Allowed (detailed in HPWH Code Requirements)
Alterations	Allowed	Allowed (detailed in HPWH Code Requirements)

### Can a plumber (C-36 license) or HVAC contractor (C-20 license) apply for a permit for a HPWH? Yes! If:

- The HPWH does not include electrical work, OR
- The HPWH does require electrical work and the Authority Having Jurisdiction (AHJ) has a water heater permit or a joint plumbing/electrical permit, OR
- An electrical permit is required for a new panel, new circuit, etc., that permit can be applied for by a C-20 and/or C-36 licensed contractor in a Joint Venture with an Electrical Contractor (C-10 license), by a C-10 Contractor, or by a General (B).

### What is required for a HPWH on the required CF1R-ALT-05-E Compliance Form<sup>1</sup> and Permit Application?

- **Water Heater Type:** Heat Pump Water Heater
- **Fuel Type:** Electric
- **Heating Efficiency Type:** Uniform Energy Factor (UEF)
- **Heating Efficiency Value:** "NEEA Tier 3" or higher is required or meet all the following conditions:
  - The HPWH storage tank is located in the garage or conditioned space, the HPWH is located on an R-10 or higher incompressible rigid surface, and a communication interface is installed that either meets the requirements of Section 110.12(a) or has an ANSI/CTA-2015-B communication port.
  - Any HPWH used must have an efficiency value  $\geq$  the minimum UEF in accordance with federal appliance standards, which are provided here: [https://www.energy.ca.gov/sites/default/files/2022-10/2022\\_WaterHeating\\_EfficiencyGuide\\_ADA.pdf](https://www.energy.ca.gov/sites/default/files/2022-10/2022_WaterHeating_EfficiencyGuide_ADA.pdf)

Field	Field Name	Data Entry 1	Data Entry 2	Data Entry 3
02	Water Heating System ID or Name			
03	Water Heating System Type			
04	System Option (from §150.2(b)1Hiii)			
05	Water Heater Type			
06	Volume			
07	Fuel Type			
08	# of Water Heaters in System			

Source: <https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2022-building-energy-efficiency-3>

### What else is required to submit along with the permit?

Each jurisdiction has its own submittal requirements for a HPWH. Confirm AHJ-specific requirements with the building department. Be prepared to offer the following information during permit application or inspection:

- An **electrical line/circuit diagram** may be required, especially if the HPWH requires a new electric circuit, a new manual disconnect, or a new service panel. Applicants may use the HPWH Permit Supplement Template if AHJ deems appropriate.
- A **site diagram** may be required, especially if the HPWH is installed in a new location. Site diagrams should include the location of the water heater and demonstrate sufficient air volume and/or ventilation per manufacturer's specifications. Applicants may use the HPWH Permit Supplement Template if AHJ deems appropriate.
- **Electrical load calculations** may be required, especially if the HPWH adds to the building's electric load. If not required at permit application, have an electrical load calculation specific to the project site ready at inspection. Accepted load calculations can be developed in accordance with National Electric Code Sections 220.83b and 220.87. An electrical load calculation. Applicants may use the Electrical Load Estimator if appropriate.
- **Structural load calculations** may be required, especially if the HPWH is installed in a new location with raised floors, or if a HPWH with a larger tank is installed in the existing water heat location. If not required at permit submittal, have all structural

<sup>1</sup> Similar for CF1R-ALT-01 (altering other parts of the house) and CF1R-ADD-01 (prescriptive addition)

load calculations required for the project ready at final inspection.

## 2022 HPWH Building Code Requirements

*BayREN and TECH Clean California offer this summary of California state level building code requirements for the installation of HPWHs. This is intended to assist permit applicants and building department staff to submit, review, approve, install, and inspect heat pump water heater alterations in single family homes.*

### Can a HPWH replace an existing water heater and is it allowed at the site?

For Single-Family New Construction, yes **IF**:

- The HPWH is rated as NEEA Tier 3 or higher; **OR**
- The HPWH is not NEEA Tier 3 or higher but meets minimum federal appliance standards and has the storage tank located in the garage or conditioned space; **OR**
- It can be demonstrated that the project complies with Energy Code using the performance method. § 150.1(b)1

For Single-Family Additions and Alterations, yes **IF**:

- The HPWH is rated as NEEA Tier 3 or higher (§ 150.2(a)1Dii and § 150.2(b)1Hiiic); **OR**
- The HPWH storage tank is not located outdoors and is located on an R-10 or higher incompressible rigid surface. The water heater shall be installed with a communication interface that either meets the requirements of Section 110.12(a) or has an ANSI/CTA-2015-B communication port. (§ 150.2(a)1Di and § 150.2(b)1Hiiib); **OR**
- It can be demonstrated that the project complies with Energy Code using the performance method. (§ 150.2(b)2).

For Multifamily New Construction and Additions, yes **IF**:

- The HPWH meets the federal minimum efficiency requirements. **OR**
- The HPWH is rated as NEEA Tier 3. **OR**
- It can be demonstrated that the project complies with Energy Code using the performance method. (§ 180.1(b))

For Multifamily Alterations, yes **IF**:

- The HPWH is rated as NEEA Tier 3 or higher (§ 180.2(b)3Ciii); **OR**
- The HPWH storage tank is not located outdoors and is located on an R-10 or higher incompressible rigid surface. The water heater shall be installed with a communication interface that either meets the requirements of Section 110.12(a) or has an ANSI/CTA-2015-B communication port. (§ 180.2(b)3Cii); **OR**
- The water-heating system determined by the Executive Director to use no more energy than the one specified in Sections 180.2(b)3Ci through iii; or if no natural gas is connected to the existing water heater location, a water-heating system determined by the Executive Director to use no more energy than the one specified in Section 180.2(b)3Civ (§ 180.2(b)3Cv).

### General Water Heater Requirements

- The installed HPWH matches what is on the approved CF1R form<sup>2</sup>.
- Accessible new and existing hot and cold-water pipes from the storage tank shall be insulated according to § 150.0(j)
- Condensate waste removal, and if necessary, a drop/overflow basin and drainage piping. Note that condensate contains no combustion products or acids and so may be drained to sanitary sewer or to outside via a hose.
- Seismic bracing for the storage tank.

### HPWH Issues Specific to Tank Size and Installation Location

- HPWH will be installed in a location with sufficient air volume or ventilation per manufacturer's required specifications.
- Safety bollards are present or will be installed if heat pump water heater is installed in garage in the normal path vehicle per 507.13 requirements
- If the water heater being replaced was a natural gas water heater, the natural gas line has been capped off, and gas valve removed.

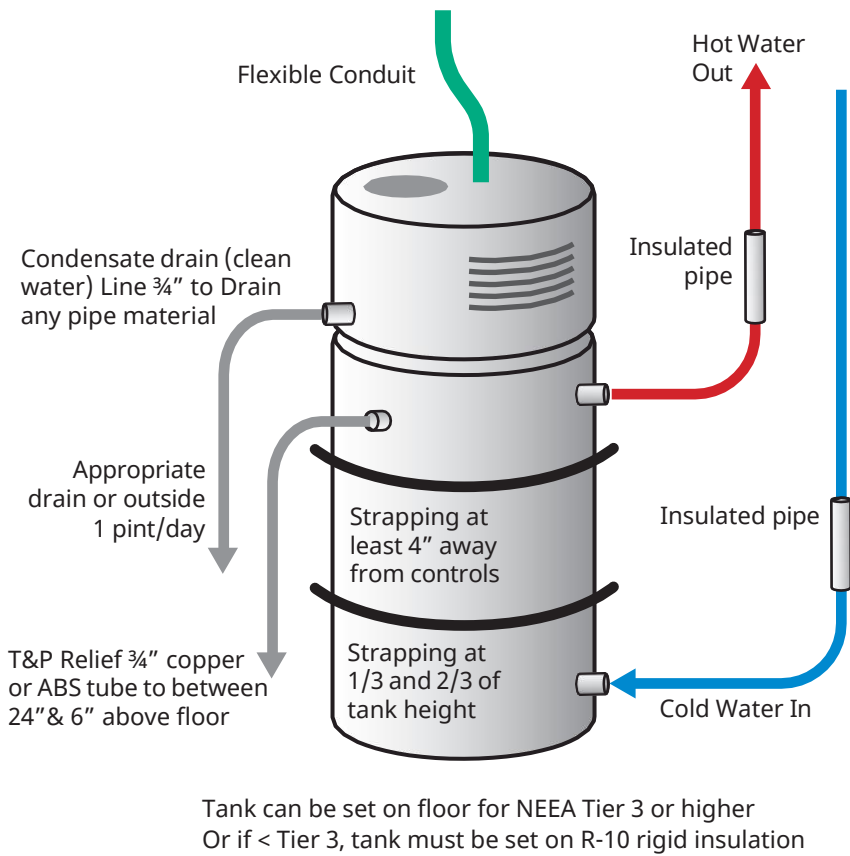
### Electric Circuit and Service Panel

- New electric circuit, conduit, manual disconnect, or visible circuit breaker will be installed that is sufficient for the HPWH.
- Existing electric service panel is sufficient for the building's new load with the HPWH, **OR**
- Electric service panel sufficient for the building's new load will be installed, **OR**
- Existing electric service panel is sufficient for the building's new load with the HPWH because a circuit pausing device or method will be used and will be connected to the dedicated HPWH circuit.

<sup>2</sup> Similar for CF1R-ALT-01 (altering other parts of the house) and CF1R-ADD-01 (prescriptive addition)

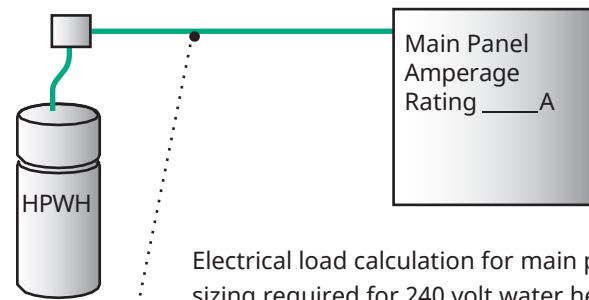
# HPWH Permit Supplement Template

## Standard Heat Pump Water Heater Detail



## Single Line Electric Diagram

Disconnecting means (e.g., breaker or switch or plug) must be in sight of heat pump water heater



Electrical load calculation for main panel sizing required for 240 volt water heaters. (Include electrical code calculation as required)

Wire type and gauge:

Conduit type:

Conduit size:

If other steps are used please add details below:

Site or floor plan outline to show labeled locations of water heater and electric panel(s):

Click above to upload image or include/staple illustration

## Additional Code Considerations

**Installing in Closet or Mechanical Room:**  
Like other locations, provide for adequate thermal air circulation means or thermal venting of cooled air (ducts or vented doors, or door edges trimmed up.) Ensure sufficient vertical clearance so that the filter can be removed and inserted without bending.

**Outdoor Compressor Install:**  
Conform to planning department setback requirements and noise requirements

**Attic Install:**  
Adequate support for weight, 22" x 30" access and solid floor path min. 24" wide, Working platform min 30" x 30" in front of appliance. Water heater in pan with 3/4" overflow line to outdoors. Include vacuum breaker on hot water line.

**Pipe Insulation:**  
All new and accessible existing hot water pipes must be insulated. Pipes with a diameter of 2 inches or less must have insulation as thick as the pipes' diameter. Pipes with a diameter greater than 2 inches must have at least 2 inches of pipe insulation.

**Project Address:** \_\_\_\_\_

**City:** \_\_\_\_\_

**Scope:** Heat Pump Water Heater Installation

**Controlling Codes:** 2022 Calif. Plumbing Code, CEC, 2022 California Energy Code

Make & Model # \_\_\_\_\_ Model Nameplate Volts: \_\_\_\_\_ Amps: \_\_\_\_\_

Tank Size: \_\_\_\_\_ Gallons Storage: \_\_\_\_\_

Efficiency Energy Factor: \_\_\_\_\_ UEF

NEEA Tier: \_\_\_\_\_ Electric Circuit Breaker Size: \_\_\_\_\_

Installed with a communication interface that either meets the requirements of Title 24 Part 6 Section 110.12(a) or has an ANSI/CTA-2015-B communication port if not NEEA Tier 3 or higher?  Yes  No

## STATEMENT OF COMPLIANCE:

By my signature, I attest that the information provided is true and accurate.

Name of Applicant: \_\_\_\_\_ Date: \_\_\_\_\_

Located on an R-10 or higher incompressible rigid surface if not NEEA Tier 3 or higher?  Yes  No

Location Type: (Check all that apply)

In conditioned space  Garage or Basement  Outdoors (NEEA Tier 3 or higher)

Outdoor Closet (NEEA Tier 3 or higher)  In Attic  In Location of Previous Tanked Water Heater

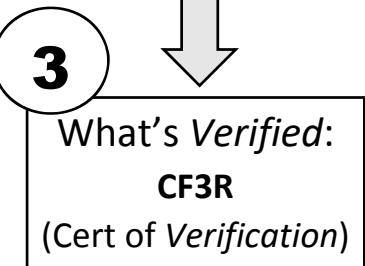
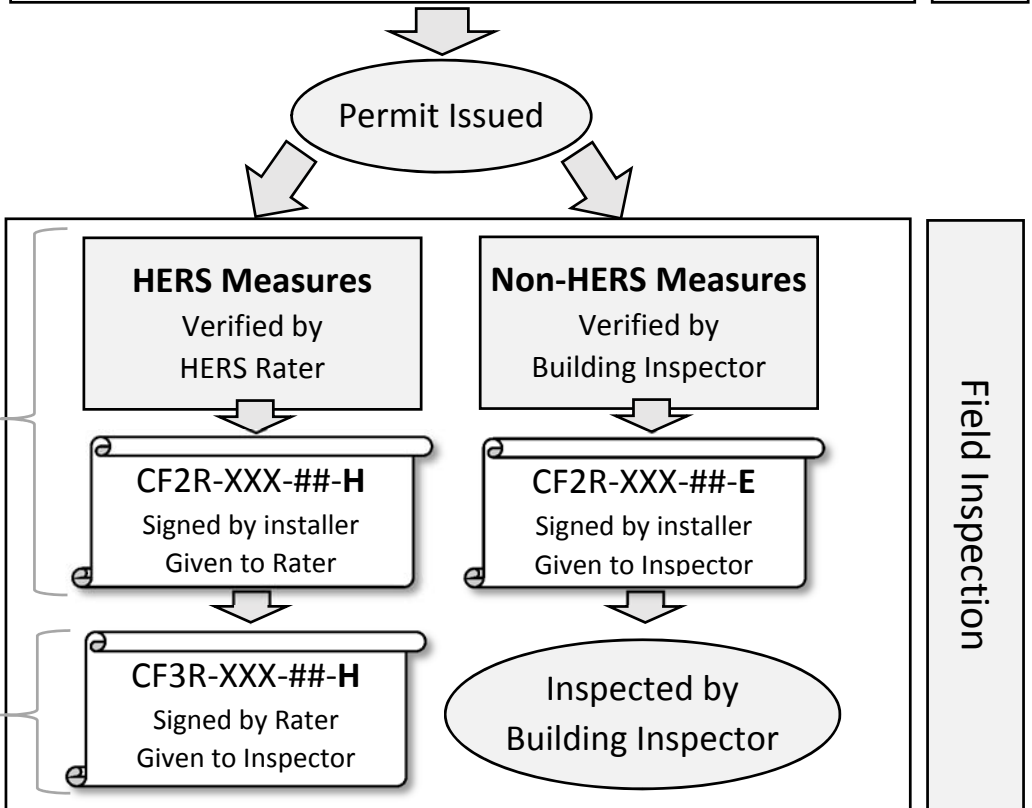
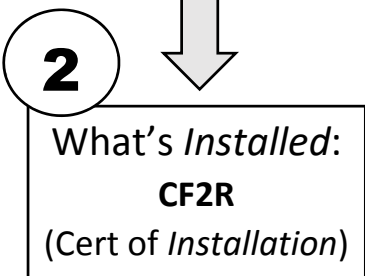
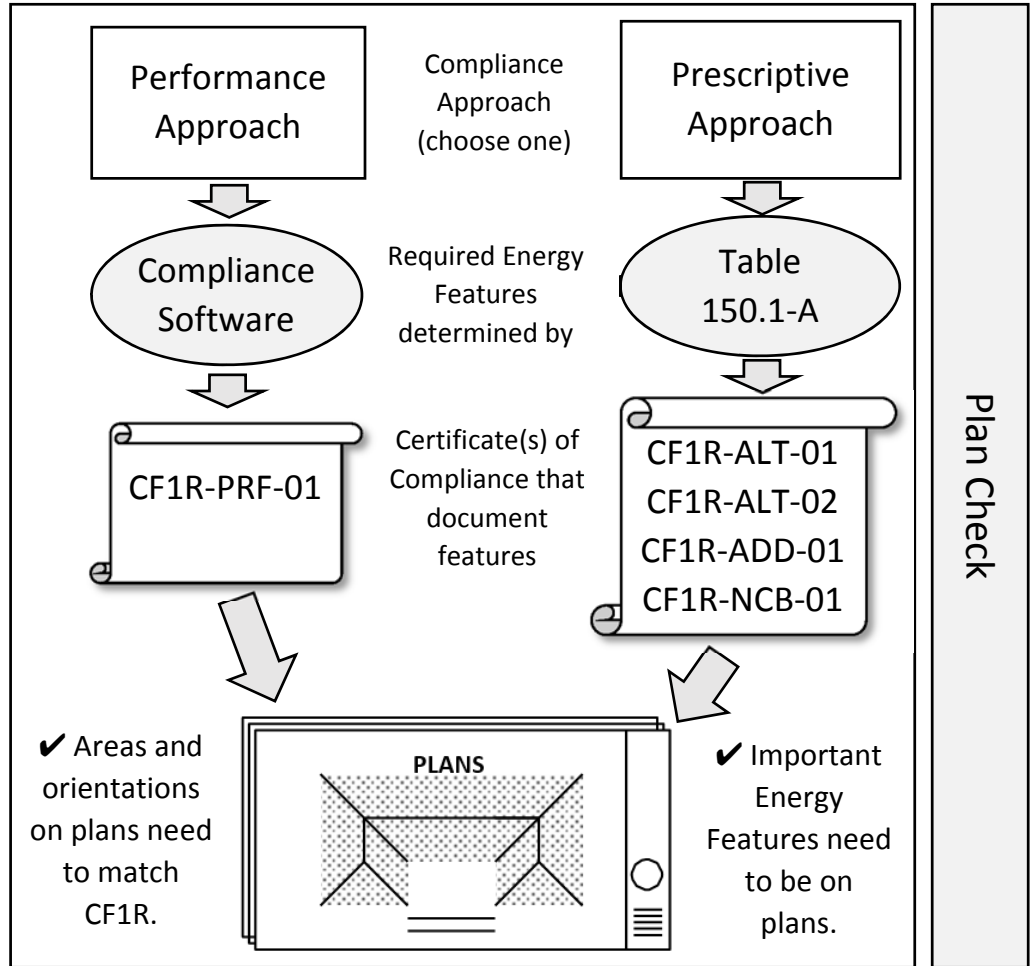
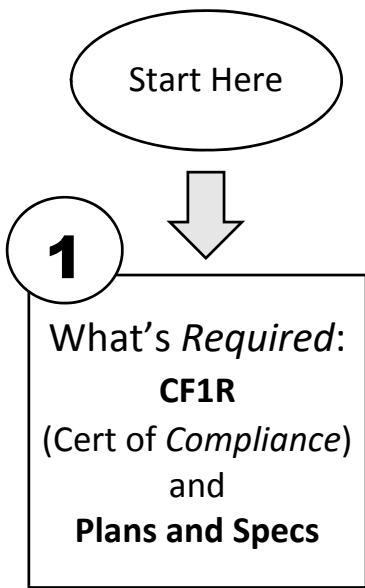
Venting Type: (Check all that apply)

Not Vented  Exhaust Vented  Supply Vented

Describe venting origin and destination: \_\_\_\_\_

Dimensions of room or closet \_\_\_\_\_ ft x \_\_\_\_\_ ft x \_\_\_\_\_ ft > \_\_\_\_\_ manufacture recommended cubic feet

# Compliance Process for Residential New Construction and Additions



# List of Incentive Programs

All of these incentive programs support the installation of Heat Pump Water Heaters (electric) to replace gas water heaters in existing buildings. They apply to single family homes, and some may also apply to single units in multifamily buildings. Please visit the program websites for more details and contact information. Some websites maintain lists of enrolled contractors/installers as a resource to you. Projects that meet the eligibility requirements for multiple BayREN/CCA-funded program can be layered for a larger incentive unless marked otherwise.

Program	Incentive Amount	Who Applies	Eligible Customers	Website
BayREN Home+	\$1,000	Customer or Contractor	Residents of all 9 Bay Area counties (excluding Palo Alto, Healdsburg, City of Alameda and SVP customers)	<a href="http://bayrenresidential.org/get-rebates">bayrenresidential.org/get-rebates</a>
BayREN HPWH Contractor Incentives	\$1,000	Contractor*	MCE, EBCE, and SVP customers (Administered by BayREN)	<a href="http://bayren.org/hpwh">bayren.org/hpwh</a>
City of Alameda	\$1,500	Customer	Alameda Municipal Power residential customers	<a href="http://alameda.dsmtracker.com/shop/residential-rebates">alameda.dsmtracker.com/shop/residential-rebates</a>
Electrify Marin	\$1,000	Customer	Residents of Marin County	<a href="http://marincounty.org/depts/cd/divisions/sustainability/energy-programs/electrify">marincounty.org/depts/cd/divisions/sustainability/energy-programs/electrify</a>
Future Fit	\$1,000-\$3,500 <i>Layered incentives cannot exceed \$3,500 or total project cost</i>	Customer	Silicon Valley Clean Energy customers	<a href="http://svcleanenergy.org/water-heating">svcleanenergy.org/water-heating</a>
GridSavvy	\$700-\$1,000	Customer or Contractor*	Sonoma Clean Power customers	<a href="http://sonomacleanpower.org/programs/gridsavvy">sonomacleanpower.org/programs/gridsavvy</a>
Palo Alto HPWH Program**	\$500-\$1,500	Customer	Palo Alto Utility customers	<a href="http://cityofpaloalto.org/gov/depts/utl/residents/save_energy_n_water/rebates">cityofpaloalto.org/gov/depts/utl/residents/save_energy_n_water/rebates</a>
PCE HPWH and Panel Upgrade Incentive Program	\$500-\$1,500	Contractor*	Peninsula Clean Energy customers	<a href="http://peninsulacleanenergy.com/heat-pump-water-heater">peninsulacleanenergy.com/heat-pump-water-heater</a>