



Local Governments Empowering Our Communities

HPWH Permitting Pilot

Stakeholder Engagement and Resources

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Initial Engagement

Two groups:

1. **Stakeholder Group** – wider group including contractors, manufacturers, local government staff, general building professionals
2. **Working Group** – focused group of Bay Area building department staff

Stakeholder and Working Group Meetings

Stakeholder Meeting 9/30/21	Surface issues
Working Group 12/9/21	Identify needed supports and resources
Working Group 1/27/22	Provide feedback on options
Stakeholder Meeting 3/24/22	Review materials

Key Takeaways

There is a lot of variation among jurisdictions

- Some jurisdictions have separate electrical and plumbing permits; others have joint permits
- Some jurisdictions have a fee to verify electrical load capacity; others only look at it in the field
- Some jurisdictions take weeks to issue permits; others are issuing same-day permits with no plan review (and some are doing both)
 - Delays are commonly caused by back & forth to correct/complete applications
- Same day permits:
 - Put more stress on inspections
 - Rely on contractors knowing code requirements
- Clear expectations are important

Focus on Resources

Purpose:

- To address common questions and clarify what is needed for code compliance
- To provide common resources that could be used by all jurisdictions
- To help building departments set clear expectations for applications

Three Resources

Building Code Assistance Sheet

- Summarizes code requirements and answers common code questions

Permit Supplement Template

- Provides a template form building departments can use to successfully permit a HPWH

Electrical Load Estimator

- Assists with calculating the impact of a HPWH on a home's electrical load using two different approaches

Assistance Sheet

- Can be used by both building department staff and applicants
- Summarizes code requirements and provides references to relevant code sections
- Answers common code questions

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 nd 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 Form¹ 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

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 §150.2001H4)			
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

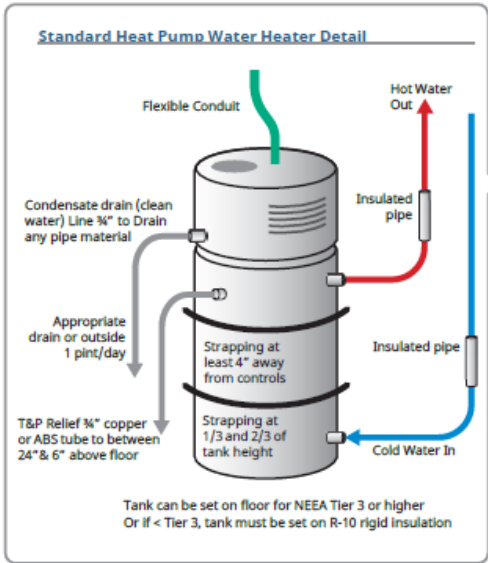
¹ Similar for CF1R-ALT-01 (altering other parts of the house) and CF1R-ADD-01 (prescriptive addition)



Permit Supplement Template

- Provides information on code requirements
- Includes places for applicants to fill in their specific details
- Intended to be used as part of a permit application

HPWH Permit Supplement Template



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

Installing in Closet or
Like other locations, provide thermal air circulation, venting of cooled air (if applicable) or door edges trimmed to provide sufficient vertical clearance. Can be removed and installed without bending.

Outdoor Compressor
Conform to planning code requirements and noise requirements.

Attic Install:
Adequate support for access and solid floor. Working platform minimum of appliance. Water heater overflow line to outdoor breaker on hot water.

Pipe Insulation:
All new and accessible pipes must be insulated. Pipes with a diameter of 2 inches or larger must have at least 2 inches of 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?

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 Tank

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 recommendation

Electrical Load Calculator

- Includes instructions
- Provides calculators for two approaches
- Can be used for other electrification projects as well

These Load Calculations are based on California Electrical Code Section 220.82 - Dwelling Unit

- Refer to Instructions.
- User inputs are only allowed in the orange-shaded cells, and in the blue-shaded cells if nameplate values are different than those listed.
- The existing entries in the orange cells are for example purposes only and should be deleted or over-written.

Applicable Equipment	Description of Load	Default Value (n
General Lighting/Power Load		
Required	Insert Total sq. footage of building ->	1,700
Required	Insert # of Kitchen Circuits ->	2
Required	Insert # of Laundry Circuits ->	1
Appliances and Equipment Excluding Air Conditioners and Space Heaters		
Instruction below		
Enter Quantity	Appliance Name	Default Value (n
	Microwave	1
	Trash Compactor	1
1	Dishwasher	1
	Disposal	1
	Electric Wall Oven	2
	Electric/Induction Cooktop	1
1	Electric Range (5 kW for induction, 10 kW for resistance)	10
1	Electric Clothes Dryer that is <i>not</i> connected to the laundry branch circuit	4
	Electric Heat Pump Clothes Dryer	1
	Electric Clothes Washer	1
	Electric Tankless Water Heater	15
	Electric Water Heater	4
	Electric Heat Pump Water Heater	1
	Level 2 Electric Vehicle Supply Equipment (EVSE) (Required for new homes)	7
	Evaporative Cooler	1
	Pool or Spa	2
	Other	
	Other	

Instructions Maximum Existing Load Service Load Calculation

Resources are available online

BayREN Website

<https://tinyurl.com/BayREN-HP-Resources>

TECH Website

<https://techcleanca.com/pilots/permitting-pilot/>

Please send any feedback on these resources to codes@bayren.org

More is needed

- Provide training and build familiarity with HPWH for both contractors and building department staff
 - Contractor training through TECH
 - Building Department training through BayREN
 - Hands-on experiences with HPWHs
- Work directly with building departments to address concerns and provide support
- Distribute resources