

Individual Dwelling Units and Heat Pump Water Heaters

2019 Building Code Assistance Packet

For other water heating systems and configurations refer to the 2019 Building Energy Efficiency Standards section 150.2 for existing or 150.1 for new construction.

What is this Heat Pump Water Heater 2019 Building Code Assistance Packet?

This 2019 Building Code Assistance Packet offers general code compliance information for heat pump water heaters in individual dwelling units. It also provides tools for permit applicants and building departments to ensure successful and code compliant HPWH projects. These tools are attached or can be referenced at the links provided and can be used as templates to support permit applications and projects. The tools include:

- HPWH Permitting Checklist (page 2)
- HPWH Permit Supplement Template
- Electrical Load Estimator

When does the 2019 Code allow HPWHs?

	Performance Path	Prescriptive Path
New Construction	Allowed	Allowed (two options)
Additions installing a 2 nd water heater	Allowed	Any electric is allowed when no gas service is available
Alterations	Allowed	Allowed as described below

Can a HPWH replace an existing water heater? YES! If:

- The building is in CZ 1-15, **natural gas is connected to the existing water heater location**, and the installed HPWH is not located outdoors **AND**:
 - o Is rated as NEEA Tier 3 (§ 150.2(b)1Hiii); **OR**
 - o Meets minimum federal appliance standards with demand responsive controls, and is located on an R-10 rigid surface (§ 150.2(b)1Hiii); **OR**
- No natural gas is connected to the existing water heater location** and the HPWH meets minimum federal appliance standards. § 150.2(b)1Hiii; **OR**
- The permit applicant can demonstrate the project complies with Energy Code using the performance method. § 150.2(b)2

Can a plumber (C-36 specialty contractor) apply for a permit for a heat pump water heater? Yes! If:

- The heat pump water heater does not include electrical work, **OR**
- The heat pump water heater does require electrical work and the 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-36 in a Joint Venture with a C-10, by a C-10, or by General (B).

What is required for a HPWH on the required CF1R-ALT-05-E Compliance Form¹ and Permit Application

STATE OF CALIFORNIA
Prescriptive Residential Alterations That Do Not Require HERS Field Verification
 CEC-CF1R-ALT-05-E (Revised 01/20)
 CERTIFICATE OF COMPLIANCE
 Prescriptive Residential Alterations That Do Not Require HERS Field Verification
 Project Name: Smith Res water heater replacement
 Date Prepared: _____
 CALIFORNIA ENERGY COMMISSION
 CF1R-ALT-05-E
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H. Water Heating Systems (Section 150.2(b)1G)														
01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
Dwelling Unit Name	Water Heating System ID or Name	Water Heating System Location or Area Served	Water Heating System Type	Water Heater Type	# of Water Heaters in System	Water Heater Storage Volume (gal)	Fuel Type	Rated Input Type	Rated Input Value	Heating Efficiency Type	Heating Efficiency Value	Standby Loss (%)	Exterior Insulation R-Value	Back-Up Solar Savings Fraction
House	HPWH	garage	DHW	HPWH	1	80	Electric	kW	4.5	Uniform Energy Factor	Tier 3	n/a	n/a	n/a
Add Row	Delete Row													

Source: ww2.energy.ca.gov/title24/2019standards/2019_compliance_documents/Residential_Documents/Alterations_and_Additions_Non_HERS_Verified_Forms/

- Water Heater Type: HPWH
- Fuel Type: Electric
- Heating Efficiency Type: Uniform Energy Factor (UEF)
- Heating Efficiency Value: "Tier 3" if required for a building with natural gas service; or a value ≥ the minimum UEF in accordance with federal appliance standards.

What else is required to submit along with the permit?

Each jurisdiction has its own submittal requirements for a HPWH. Be prepared to offer the following information required at either permit application or at 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.
- 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 required specifications.
- **Electrical load calculations** may be required, especially if the HPWH adds to the building's electric load. If not required at permit, 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.
- **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 any structural load calculation required for the project ready at final inspection.

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

HPWH Permitting Checklist

2019 Building Code Compliance Checklist (for permit submittal and or field inspection)

BayREN and TECH Clean California offer the following checklist for California state level building code requirements for the installation of heat pump water heaters. 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.

This checklist has been reviewed and vetted by the following organizations:

BayREN Logo

CEC Logo

TUCC/ICC Logo

Other?

HPWH Permitting Checklist

Is a Heat Pump Water Heater allowed at the site? (Check one)

- The building is in CZ 1-15, **natural gas is connected to the existing water heater location**, and the installed HPWH is not located outdoors
AND:
 - Is rated as NEEA Tier 3 (§ 150.2(b)1Hiiiic); **OR**
 - Meets minimum federal appliance standards with demand responsive controls, and is located on an R-10 rigid surface (§ 150.2(b)1Hiiiib); **OR**
- No natural gas is connected to the existing water heater location** and the HPWH meets minimum federal appliance standards. § 150.2(b)1Hiiiid; **OR**
- The permit applicant can demonstrate the project complies with Energy Code using the performance method. § 150.2(b)2

General Water Heat Requirements (Check all that apply)

- The installed HPWH matches what's on the approved CF1R form.
- Insulation for new and existing hot and cold-water pipes from the storage tank (when accessible).
- 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 (Check all that apply)

- HPWH will be installed in the same location and with the same size storage tank as existing tanked water heater.
- If the HPWH has a storage tank volume greater than the existing water heater and the HPWH is installed on raised floor, a structural load calculation has been performed.
- 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 of the 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.

Electric Circuit (Check at least one)

- Existing electric service panel is sufficient for the building's new load with the HWPH, **OR**
- New electric circuit, conduit, and manual disconnect will be installed that is sufficient for the HPWH.

Electric Service Panel (Check at least one)

- Existing electric service panel is sufficient for the building's new load with the HWPH, **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 smart load center will be installed in the building's existing electric service panel and will be connected to the dedicated HPWH circuit.

Jurisdictions *May* Require (Check all that apply)

- Submit a site diagram* (Note - Applicant may use HPWH Permit Supplement Template if appropriate)
- Submit the electrical line diagram* (Note - Applicants may use the HPWH Permit Supplement Template for this requirement)
- Submit the electrical load calculation.* (Note – Applicant may use the Electrical Load Estimator if appropriate)
 - Submit the structural load calculation.*

Statement of Compliance:

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

Name of Applicant: _____

Contractor/Company Name: _____

Signature of Applicant: _____

CSLB License Number: _____

Date: _____

Project Address: _____