



City of Sonoma

Building Department Informational Handout

Energy Resources for Minor Residential Alterations

Handout No: 27
Date: 3/5/2024

The following information provides the typical minimum prescriptive energy documentation needed for permit applications for minor residential alteration work (not including floor area additions). The forms must be fully completed as applicable and must be signed by both the Documentation Author and the Responsible Designer for the proposed work. Some of the forms must be registered with a HERS provider (as indicated)

Applicants may otherwise choose to show energy compliance through a performance approach which requires submittal of calculated energy documentation showing that the proposed energy budget for the building uses less energy than the standard energy budget for the building using compliance software certified for use by the CA Energy Commission.

A way to determine the energy documentation forms needed for your project is to use the online Energy Forms Ace tool at <https://energycodeace.com/resources>.

All residential energy forms can be found on the CA Energy Commission web site at: <https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2022-building-energy-efficiency-2> Links to helpful information and energy forms for minor residential alteration projects are provided below.

- ◆ **Small Residential Alterations (no additional conditioned floor area or volume)** and any of the types of work shown below may use the following energy forms to show compliance.
- ◆ *Forms that can be used for Small Residential Alterations*
 - **CF1R-ALT-01-E Prescriptive Residential Alterations**
<https://www.energy.ca.gov/filebrowser/download/4687> (completed online – Registration with a HERS provider is required)
 - **CF1R-ALT-05-E Prescriptive Alterations That Do Not Require HERS Field Verification** (paper version - No HERS registration required if all criteria is met)

Or the following forms specific to the type of work may be used.

♦ **For Residential HVAC Change-outs**

Information: <https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2022-building-energy-efficiency-2> *Forms that can be used for HVAC Change-outs or Added HVAC components:*

- [CF1R-ALT-05-E Prescriptive Alterations That Do Not Require HERS Field Verification](#)
(paper version - No HERS registration required if all criteria is met)
- [CF1R-ALT-02-E Prescriptive Alterations to Space Conditioning Systems](#) (completed online – Registration with a HERS provider is required)
- [CF1R-ALT-01-E Prescriptive Residential Alterations](#) (completed online – Registration with a HERS provider is required)

♦ **Replacement or Added Fenestration/Glazing in Existing Residence**

Information:

Compliance Baseline for Single-family Section 150.1: Climate Zones 1, 2, 11, 12, 16 Quick Reference Sheet 2022
<https://energycodeace.com/resources/?itemId=103024>

Forms that can be used for Replacement or Added Fenestration/Glazing in Existing Residence:

- [CF-1R-ALT-WINDOWS](#) (Available from City of Sonoma ONLY) (paper version – see [City of Sonoma Informational Handout #28 - Residential Window Replacement Requirements](#) - No HERS registration required if all criteria is met)
- [CF1R-ENV-05-E Alternative Default Fenestration Procedure \(NA6\) Worksheet](#) (paper version - HERS registration required if all criteria is met)
- [CF1R-ALT-01-E Prescriptive Residential Alterations](#) (completed online – Registration with a HERS provider is required)

◆ **Replacement or Added Water Heater**

Information: Fact Sheet: Single-family, Multifamily, Hotel and Motel Domestic Water Heating 2022
<https://energycodeace.com/resources/?itemId=156695>

Forms that can be used for Replacement or Added Residential Hot Water Heater

- [CF2R-PLB-02-E Non-HERS - Single Dwelling Unit Hot Water System Distribution](#) (Paper version - No HERS registration required if all criteria is met.)
- [CF2R-PLB-22-H HERS Verified Single Dwelling Unit Hot Water System Distribution](#) (completed online – Registration with a HERS provider is required)

The following table provides a quick reference for the Prescriptive Component Package for Single Family Building Design. (Low-Rise Residential Buildings) pursuant to CA Energy §150.1 **The City of Sonoma is in Climate Zone 2.** The reference provides an overview of the typical minimum baseline (Prescriptive) requirements for specific elements or features for a building or its components related to energy design. Exceptions to the listed requirements may apply to additions and alterations pursuant to §150.2 of the 2022 CA Energy Code.

TABLE 150.1-A COMPONENT PACKAGE – Single-Family Standard Building Design

Single-Family				Climate Zone																		
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16			
				Building Envelope Insulation																		
Building Envelope	Roofs/Ceilings	Option B (meets 150.1(c)9A)	Below Roof Deck Insulation ^{1,2} (With Air Space)	NR	NR	NR	R 19	NR	NR	NR	NR	R 19	R 19	R 19	R 19	R 19	R 19	R 19	R 19			
			Ceiling Insulation	R 38	R 38	R 30	R 38	R 30	R 30	R 30	R 30	R 38	R 38	R 38	R 38	R 38	R 38	R 38	R 38	R 38	R 38	
			Radiant Barrier	NR	REQ	REQ	NR	REQ	REQ	REQ	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
		Option C (meets 150.1(c)9B)	Ceiling Insulation	R 38	R 30	R 30	R 30	R 30	R 30	R 30	R 30	R 30	R 30	R 30	R 38	R 38	R 38	R 38	R 38	R 38	R 38	
			Radiant Barrier	NR	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	NR	
	Walls	Above Grade	Framed ³	U 0.048	U 0.048	U 0.048	U 0.048	U 0.048	U 0.065	U 0.065	U 0.048	U 0.048	U 0.048	U 0.048	U 0.048	U 0.048	U 0.048	U 0.048	U 0.048	U 0.048		
			Mass Wall Interior ^{4,5}	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.059 R 17	
			Mass Wall Exterior ^{4,5}	U 0.125 R 8.0	U 0.125 R 8.0	U 0.125 R 8.0	U 0.125 R 8.0	U 0.125 R 8.0	U 0.125 R 8.0	U 0.125 R 8.0	U 0.125 R 8.0	U 0.125 R 8.0	U 0.125 R 8.0	U 0.125 R 8.0	U 0.125 R 8.0	U 0.125 R 8.0	U 0.125 R 8.0	U 0.125 R 8.0	U 0.125 R 8.0	U 0.125 R 8.0	U 0.125 R 8.0	U 0.077 R 13
		Below Grade	Below Grade Interior ⁶	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.067 R 15
			Below Grade Exterior ⁶	U 0.200 R 5.0	U 0.200 R 5.0	U 0.200 R 5.0	U 0.200 R 5.0	U 0.200 R 5.0	U 0.200 R 5.0	U 0.200 R 5.0	U 0.200 R 5.0	U 0.200 R 5.0	U 0.200 R 5.0	U 0.200 R 5.0	U 0.200 R 5.0	U 0.200 R 5.0	U 0.200 R 5.0	U 0.200 R 5.0	U 0.200 R 5.0	U 0.100 R 10	U 0.100 R 10	U 0.053 R 19

TABLE 150.1-A COMPONENT PACKAGE – Single- Family Standard Building Design (continued)

			Climate Zone																
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
Building Envelope	Floors	Slab Perimeter	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	U-0.58 R-7.0	
		Raised	U- 0.037 R-19	U- 0.037 R-19	U- 0.037 R-19	U- 0.037 R-19	U- 0.037 R-19	U- 0.037 R-19	U- 0.037 R-19	U- 0.037 R-19	U- 0.037 R-19	U- 0.037 R-19	U- 0.037 R-19	U- 0.037 R-19	U- 0.037 R-19	U- 0.037 R-19	U- 0.037 R-19	U- 0.037 R-19	
		Concrete Raised	U 0.092 R-8.0	U 0.092 R-8.0	U 0.269 R-0	U 0.269 R-0	U 0.269 R-0	U 0.269 R-0	U 0.269 R-0	U 0.269 R-0	U 0.269 R-0	U 0.269 R-0	U 0.092 R-8.0	U 0.138 R-4.0	U 0.092 R-8.0	U 0.092 R-8.0	U 0.138 R-4.0	U 0.092 R-8.0	
	Quality Insulation Installation (QII)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
	Roofing Product	Low-Sloped	Aged Solar Reflectance	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.63	NR	0.63	NR
			Thermal Emittance	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.75	NR	0.75	NR
		Steep-Sloped	Aged Solar Reflectance	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.20	0.20	0.20	0.20	0.20	0.20	NR
			Thermal Emittance	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.75	0.75	0.75	0.75	0.75	0.75	NR
	Fenestration	Maximum U-factor		0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
		Maximum SHGC		NR	0.23	NR	0.23	NR	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	NR
		Maximum Total Area		20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
		Maximum West Facing Area		NR	5%	NR	5%	NR	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	NR
	Door	Maximum U-factor		0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20

ABLE 150.1-A COMPONENT PACKAGE – Single-Family Standard Building Design (continued)

			Climate Zone																	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
HVAC System	Space Heating ⁹	Electric-Resistance Allowed	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No		
		If gas, AFUE	MIN	MIN	NA	NA	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	NA	NA	MIN	MIN	
		If Heat Pump, HSPF 7 /HSPF2	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN
	Space Cooling	SEER/SEER2	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN
		Refrigerant Charge Verification or Fault Indicator Display	NR	REQ	NR	NR	NR	NR	NR	NR	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	NR	NR
	Central System Air Handlers	Whole-house fan ⁸	NR	NR	NR	NR	NR	NR	NR	NR	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	NR	NR
		Central Fan Integrated Ventilation System Fan Efficacy	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ
	Ducts ¹⁰	Roof/Ceiling Options B	Duct Insulation	R-8	R-8	R- 6	R-8	R- 6	R- 6	R- 6	R-8	R-8	R-8	R-8	R-8	R-8	R-8	R-8	R-8	R-8
			§150.1(c)9A	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Roof/Ceiling Option C	Duct Insulation	R-6	R-6	R-6	R-6	R-6	R-6	R-6	R-6	R-6	R-6	R-6	R-6	R-6	R-6	R-6	R-6	R-6
§150.1(c)9B			REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ
Water Heating	All Buildings		System Shall meet Section 150.1(c)8																	

Footnote requirements to TABLE 150.1-A:

1. Install the specified R-value with an air space present between the roofing and the roof deck. Such as standard installation of concrete or clay tile.
2. R-values shown for below roof deck insulation are for wood-frame construction with insulation installed between the framing members. Alternatives including insulation above rafters or above roof deck shall comply with the performance standards.
3. Assembly U-factors for exterior framed walls can be met with cavity insulation alone or with continuous insulation alone, or with both cavity and continuous insulation that results in an assembly U-factor equal to or less than the U-factor shown. Use Reference Joint Appendices JA4 Table 4.3.1, 4.3.1(a), or Table 4.3.4 to determine alternative insulation products to be less than or equal to the required maximum U-factor.
4. Mass wall has a heat capacity greater than or equal to 7.0 Btu/h-ft².
5. "Interior" denotes insulation installed on the inside surface of the wall. "Exterior" denotes insulation installed on the exterior surface of the wall.

6. Below grade "interior" denotes insulation installed on the inside surface of the wall, and below grade "exterior" denotes insulation installed on the outside surface of the wall.
7. HSPF means "heating seasonal performance factor."
8. When whole-house fans are required (REQ), only those whole-house fans that are [listed](#) in the Home Ventilating Institute Certified Products Directory may be installed. Compliance requires installation of one or more WHFs whose total airflow -cfm is capable of meeting or exceeding a minimum 1.5 cfm/square foot of conditioned floor area as specified by Section 150.1(c)12.
9. A supplemental heating unit may be installed in a space served directly or indirectly by a primary heating system, provided that the unit thermal capacity does not exceed 2 kilowatts or 7,000 Btu/hr and is controlled by a time-limiting device not exceeding 30 minutes.
10. For duct and air handler location: REQ denotes location in [conditioned space](#). When the table indicates ducts and air handlers are in conditioned space, a [HERS](#) verification is required as specified by Reference Residential Appendix [RA3.1.4.3.8](#).