City of Sonoma

Building Department Informational Handout

Energy Resources for Minor Residential Alterations

Handout No: 27
Date: 1/27/2020

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

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*
    - 2019-CF1R-ALT-01-E-PrescriptiveAlterationsBuilding.pdf (completed online – Registration with a HERS provider is required)
    - 2019-CF1R-ALT-05-E-PrescriptiveAlterations-SimpleNonHERS-PaperVersion.pdf (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://energycodeace.com/download/35120/file_path/fieldList/FactSheet.Res-HVAC-Alts.2019

    Forms that can be used for HVAC Change-outs or Added HVAC components:

    - 2019-CF1R-ALT-05-E-PrescriptiveAlterations-SimpleNonHERS-PaperVersion.pdf (paper version - No HERS registration required if all criteria is met)
    - 2019-CF1R-ALT-02-E-PrescriptiveAlterationsHVAC.pdf (completed online – Registration with a HERS provider is required)
    - 2019-CF1R-ALT-01-E-PrescriptiveAlterationsBuilding.pdf (completed online – Registration with a HERS provider is required)

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

  Information:

  https://energycodeace.com/download/35127/file_path/fieldList/FactSheet.Res-Fenestration.2019

  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)
  - 2019-CF1R-ALT-05-E-PrescriptiveAlterations-SimpleNonHERS-PaperVersion.pdf (paper version - No HERS registration required if all criteria is met)
  - 2019-CF1R-ALT-01-E-PrescriptiveAlterationsBuilding.pdf (completed online – Registration with a HERS provider is required)

- **Replacement or Added Water Heater**

  Information:

  https://energycodeace.com/download/35088/file_path/fieldList/FactSheet.Res-DHW.2019

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

  - CF-1R-ALT-WATER HEATERS (Available from City of Sonoma ONLY) (paper version – see City of Sonoma Informational Handout #15 - Residential Water Heaters - No HERS registration required if all criteria is met)
  - 2019-CF1R-ALT-05-E-PrescriptiveAlterations-SimpleNonHERS-PaperVersion.pdf (Paper version - No HERS registration required if all criteria is met.)
  - 2019-CF1R-ALT-01-E-PrescriptiveAlterationsBuilding.pdf (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 located 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 2019 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	R-19	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-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
		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-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	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
			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 0.059 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 0.077 R-13
		Below Grade	Below Grade Interior [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 0.067 R-15
			Below Grade Exterior [5]	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
	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 Products	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

(continued)

TABLE 150.1-A—continued
COMPONENT PACKAGE—SINGLE-FAMILY STANDARD BUILDING DESIGN

				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	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN
		If Heat Pump, HSPF[7]		MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN
	Space Cooling	SEER		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	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	NR
		Whole House Fan[8]		NR	NR	NR	NR	NR	NR	REQ	REQ	REQ	REQ	REQ	REQ	0.REQ	REQ	NR	NR
	Central System Air Handlers	Central Fan Integrated Ventilation System Fan Efficacy		REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ
	Ducts[10]	Roof/Ceiling Option 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	R8-	R-8
			§150.1(c)9A	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
		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
			§150.1(c)9B	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															

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-ft^2.
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 Appliance Efficiency 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.