

**2013 BUILDING ENERGY EFFICIENCY STANDARDS
FOR LOW-RISE RESIDENTIAL**
Prescriptive Package A¹ Climate Zone 10 (Effective July 1, 2014)

COMPONENT		ADDITION FLOOR AREA (SQFT)		
		≤ 400	> 400 and ≤ 700	> 700
BUILDING ENVELOPE	INSULATION² - Roof/Ceiling - Exterior Wall (above grade): • 2 x 4 wood framing • 2 x 6 wood framing - Raised Floor	U 0.031 / R 30 U 0.102 / R 13 U 0.074 / R 19 U 0.037 / R 19	U 0.031 / R 30 U 0.102 / R 13 U 0.074 / R 19 U 0.037 / R 19	U 0.031 / R 30 U=0.065 ³ / R 15+4 or R 13+5 U=0.065 ³ / R 15+4 or R 13+5 U 0.037 / R 19
	RADIANT BARRIER⁴	REQ	REQ	REQ
	ROOFING PRODUCTS⁵ - Low Sloped (≤ 2:12) • Aged Solar Reflectance • Thermal Emittance - Steep Sloped (> 2:12): • Aged Solar Reflectance • Thermal Emittance	 NR NR 0.20 0.75	 NR NR 0.20 0.75	 NR NR 0.20 0.75
	FENESTRATION⁶ - Max. U-factor - Max. SHGC - Max. Total Area - Max. West Facing area ⁷	0.32 0.25 75 ft ² or 30% of CFA 60 ft ²	0.32 0.25 120 ft ² or 25% of CFA 60 ft ²	0.32 0.25 175 ft ² or 20% of CFA 70 ft ² or 5% of CFA
	SPACE-HEATING SYSTEM⁸ - Electric-Resistant Allowed - If Gas central furnace <225,000 Btuh (effective 1/1/2015): • Weatherized unit, min. AFUE = • Non-weatherized unit, min. AFUE = - If Heat pump, single phase air source <65,000 Btuh (effective 1/1/2015): • Single Package System, min. HSPF = • Split System, min. HSPF =	No 78% 80% 8.0 8.2	No 78% 80% 8.0 8.2	No 78% 80% 8.0 8.2
HVAC SYSTEMS	SPACE-COOLING SYSTEM - Central Air Conditioner ⁹ (effective 1/1/2015): • Split System <45,000 Btuh • Split System ≥45,000 and <65,000 Btuh • Single Package System <65,000 Btuh - Refrigerant Charge Verification or Charged Indicator Display ¹⁰ - Whole House Fan ¹¹	14.0 SEER / 12.2 EER 14.0 SEER / 11.7 EER 14.0 SEER / 11.0 EER REQ NR	14.0 SEER / 12.2 EER 14.0 SEER / 11.7 EER 14.0 SEER / 11.0 EER REQ NR	14.0 SEER / 12.2 EER 14.0 SEER / 11.7 EER 14.0 SEER / 11.0 EER REQ NR
	CENTRAL SYSTEM AIR HANDLERS - Central Fan Integrated Ventilation System Fan Efficacy ¹²	REQ	REQ	REQ
	DUCTS - Duct sealing ¹³ - Duct insulation	REQ R-6	REQ R-6	REQ R-6
	WATER HEATER¹⁴ (gas storage ≤55 gallons, ≤75,000 Btuh, effective 4/16/2015) - Existing - Replacement or add water heater: • Gas-fired volume: - 30 gallons, min. EF = - 35 gallons, min. EF = - 40 gallons, min. EF = - 45 gallons, min. EF = - 50 gallons, min. EF = - 55 gallons, min. EF = • Instantaneous Gas-fired volume: <2 gallons, min. EF =	N/A 0.63 0.62 0.62 0.61 0.60 0.76 0.82	N/A 0.63 0.62 0.62 0.61 0.60 0.76 0.82	N/A 0.63 0.62 0.62 0.61 0.60 0.76 0.82
WATER HEATING				

ABBREVIATIONS:

AFUE	=	Furnace Annual Fuel Utilization Efficiency
BASIC	=	Basic Prescriptive Package D
CFA	=	Conditioned Floor Area
EF	=	Energy Factor
HSPF	=	Heating Seasonal Performance Factor
HERS	=	Home Energy Rating System
Min.	=	Minimum
N/A	=	Not Applicable
NR	=	Not Required
REQ	=	Required
SEER	=	Air Conditioner Seasonal Energy Efficiency Ratio
SHGC	=	Solar Heat Gain Coefficient

FOOTNOTES:

1. To comply with Prescriptive Package A, low-rise residential buildings shall be designed, constructed, and equipped to meet all the requirements of Package A.
2. The R-values/U-factors shown for ceiling, wall, and raised floor insulations are for wood-frame construction with insulation installed between the framing members.
3. U-factor = 0.065 can be met by cavity insulation alone or with continuous insulation alone, or with both cavity and continuous insulation that results in a U-factor equal to or less than 0.065, such as "R-15+4" (means R-15 cavity insulation plus R-4 continuous insulation) or "R-13+5" (means R-13 cavity insulation plus R-5 continuous insulation).
4. **RADIANT BARRIER** is a highly reflective, low emitting material installed at the underside surface of the roof deck and the inside surface of gable ends or other exterior vertical surfaces in attics to reduce solar heat gain. A radiant barrier shall have an emittance of 0.05 or less, tested in accordance with ASTM C1371 or ASTM E408, and shall be certified to the Department of Consumer Affairs. The radiant barrier requirement only applies to the new addition roof area. It is not necessary to retrofit a radiant barrier in the existing attic. If existing roof sheathing over an attic space is being replaced, a continuous radiant barrier must be installed. To meet prescriptive requirement, provide a minimum free ventilation area of 1 ft² of vent area for each 300 ft² of attic floor area with 30% upper vent. A minimum air space between the top surface of the radiant barrier and roof decking of not less than 1.5" at the center of the truss /rafter span must be provided.
5. For **addition** ≤ 300 ft² cool roof compliance is not required. Roofing Product's thermal emittance and 3-year aged solar reflectance shall be labeled and certified by the Cool Roof Rating Council (CRRC).
 - **For new roofing:** must meet Prescriptive Package A.
 - **For alteration to existing roofing (reroofing):** Replacement of existing roofing more than 50% of the roof, the following is required:
 - a) **For low-sloped roof (≤ 2:12):** Cool Roof is not required.
 - b) **For steep sloped roof (> 2:12):** Minimum aged solar reflectance = 0.20 and minimum thermal emittance = 0.75, or minimum Solar Reflectance Index (SRI) = 16.
Alternatives:
 - 1) Air-space of 1.0 inch (25 mm) is provided between the top of the roof deck to the bottom of the roofing product; or
 - 2) The installed roofing product has a profile ratio of rise to width of 1 to 5 for 50% or greater of the width of the roofing product; or
 - 3) Existing ducts in the attic are insulated and sealed according to Energy Standards Section 150.1(c)9; or
 - 4) Buildings with at least R-38 ceiling insulation; or

- 5) Buildings with a radiant barrier in the attic meeting the requirements of Energy Standards Section 150.1(c)2; or
 - 6) Buildings that have no ducts in the attic; or
 - 7) R-4 or greater insulation above the roof deck.
6. Fenestration products (e.g. windows, glazed doors, and skylights) shall be labeled and certified for the U-factor and Solar Heat Gain coefficient (SHGC).
- **For new fenestration:** Must meet Prescriptive Package A, exceptions
 - up to 3 sqft of new glazing area installed in doors do not have to meet the U-factor and SHGC.
 - up to 3 sqft of new tubular skylights area with dual-pane diffusers do not have to meet the U-factor and SHGC.
 - up to 16 sqft of new skylight area with maximum U-factor = 0.55 and SHGC = 0.30.
 - **For alteration fenestration:**
 - a) **For replacement fenestration:**
 - Vertical fenestration replacement up to 75 sqft with maximum U-factor = 0.40 and SHGC = 0.35.
 - Skylight replacement with maximum U-factor = 0.55 and SHGC = 0.30.
 - b) **For alterations that add vertical fenestration & skylight:**
 - **Over 75 sqft:** Must meet Prescriptive Package A and required to meet the total fenestration area and west facing fenestration area.
 - **Up to 75 sqft:** Must meet Prescriptive Package A and not required to meet the total fenestration area and west facing fenestration area.
 - **Up to 16 sqft skylight:** With maximum U-factor = 0.55 and SHGC = 0.30 and not required to meet the total fenestration area and west facing fenestration area.
 - **For repair fenestration:** exempt from the Energy Standard requirement e.g. repair a broken pane of window glass.
7. West-facing fenestration area includes skylights tilted to the west or tilted in any direction when the pitch is less than 1:12.
8. Setback thermostats must be installed with all unitary heating or cooling system that allows to program the temperature set points for at least four periods within 24 hours except for gravity gas wall heaters, gravity floor heaters, gravity room heaters, room air conditioners, and air conditioner heat pump. The heating system capacity must be adequate to meet the minimum requirements of CRC 303.9. 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 kW or 7,000 Btu/hr and is controlled by a time-limiting device not exceeding 30 minutes.
9. For information about other system types efficiency requirements refer to Table 4-6 of the 2013 Residential Compliance Manual.
10. Air-cooled air conditioners and air-source heat pumps (including but not limited to ducted split systems, ducted packaged systems, and mini-split system) shall have Measurement Access Holes (MAH) installed and correct refrigerant charge confirmed through field verification and diagnostic testing by a HERS rater; OR be equipped with a Charge Indicator Display (CID) device. Packaged systems for which the manufacturer has verified correct system refrigerant charge prior to shipment from the factory are not required to confirm refrigerant charge through field verification and diagnostic testing.
11. Whole House Fan (WHF) is required only in new buildings and in buildings with **additions > 1,000 ft²**. Whole House Fan must capable of minimum total airflow 2 cfm/square foot of conditioned floor area. Provide at least 1 sqft of attic vent free area for each 375 CFM air flow. Only Whole House Fans that are listed in the Appliance Efficiency Directory may be installed. Field verification and diagnostic testing of airflow performance by a HERS rater is required.

12. Central forced air system fans used in central fan integrated ventilation systems shall demonstrate, in Air Distribution Mode, an air-handling unit fan efficacy less than or equal to 0.58 W/CFM as confirmed through field verification and diagnostic testing by a HERS rater.

Cooling Airflow and Fan Watt Draw when is required for ducted systems including split and package air conditioners and heat pumps. The central forced air system fans shall have airflow greater than or equal to 350 CFM /ton of nominal cooling capacity and fan watt draw less than or equal to 0.58 watt/cfm; AND have a hole for placement of a static pressure probe (HSPP) or a permanently installed static pressure probe (PSPP). The airflow and watt draw must be field verified and diagnostic tested by a HERS rater.

13. Duct sealing must be field verified by HERS rater and diagnostic tested for duct leakage. If a house has no air distribution ducts, then Sealed Duct System testing is not required.

➤ **For an entirely new or complete replacement space-conditioning systems:** duct sealing and HERS verification is required.

➤ **For alterations:**

- Alterations including the installation or replacement of an air handler, a cooling or heating coil, a furnace heat exchanger, or an outdoor condensing unit of a split system air conditioner or heat pump requires duct sealing and verification by HERS rater. Refrigerant charge measurement or Charge Indicator Display installation is required for installation or replacement of ducted split systems, ducted package systems, and mini split systems and must be verified by HERS rater. The replacement unit must meet or exceed appliance efficiency standards.
- When more than 40 feet of new or replacement ducts are installed in unconditioned space, the duct sealing and HERS verification is required.

Exceptions: Duct sealing is not required when the existing duct system is documented to have been previously sealed and verified, duct system with less than 40 linear feet in unconditioned spaces, or existing duct systems constructed, insulated or sealed with asbestos.

➤ **For extension of existing duct system:**

If the existing duct system remain unaltered (see “alteration” above) and the new extension ducts less 40 linear feet HERS verification is not required ; however, the mandatory measures including the R-6 duct insulation requirement apply.

14. The mandatory measures also apply to water heater replacement. Storage gas water heater with energy factor equal to or less than the federal minimum standards shall be externally wrapped with minimum R-12 insulation. Insulation R3.6 or 1” thickness minimum is required for all piping with a nominal diameter of ¾” or larger, all hot water pipes from the water heater to the kitchen fixtures, and the first 5 feet of hot and cold water pipes from the storage tank.

When a second water heater installed serving the new addition only, the water heater must be ≤ 55 gallon (≤ 75,000 Btuh) gas storage, nonrecirculating type, and meet the minimum Energy Factor.