

**2008 BUILDING ENERGY EFFICIENCY STANDARDS FOR LOW-RISE
RESIDENTIAL: Prescriptive Package D¹ Climate zone 10** (Effective Jan. 1, 2010)

COMPONENT	ADDITION FLOOR AREA (SQFT)		
	≤ 100	≤ 1000	> 1000
BUILDING ENVELOPE² - Insulation minimum: • Ceiling • Wall • Raised floor - Radiant Barrier ³	R-19 R-13 R-13 N/A	R-30 R-13 R-19 Req'd	R-30 R-13 R-19 Req'd
ROOFING PRODUCTS⁴ - Low Sloped: • Aged Solar Reflectance • Thermal Emittance - Steep Sloped (less than 5 lb/ft ²): • Aged Solar Reflectance • Thermal Emittance - Steep Sloped (5 lb/ft ² or more): • Aged Solar Reflectance • Thermal Emittance	NR NR 0.20 0.75 0.15 0.75	NR NR 0.20 0.75 0.15 0.75	NR NR 0.20 0.75 0.15 0.75
FENESTRATION⁵ - Max. total area - Max. West facing area ⁷ - Max. U-factor ⁸ - Max. SHGC	50 sqft N/A 0.40 0.40	20% + Removed ⁶ 5% 0.40 0.40	20% 5% 0.40 0.40
SPACE-HEATING SYSTEM⁹ - Electric-resistant allowed - If gas, min. AFUE = - If Heat pump, split system, min. HSPF = - If Heat pump, single package, min. HSPF =	No Mandatory ¹⁰ Mandatory ¹⁰ Mandatory ¹⁰	No 78% 7.7 ¹¹ 7.7 ¹¹	No 78% 7.7 ¹¹ 7.7 ¹¹
SPACE-COOLING SYSTEM⁹ - Split system A/C, min. SEER = • Refrigerant Charge Measurement or Charged Indicator Display ¹² - Single package A/C, min. SEER =	Mandatory ¹⁰ N/A Mandatory ¹⁰	13.0 ¹¹ Req'd 13.0 ¹¹	13.0 ¹¹ Req'd 13.0 ¹¹
CENTRAL FORCED AIR HANDLERS - Cooling Airflow and Watt Draw ¹³ - Central Fan Integrated Ventilation System Watt Draw ¹⁴	N/A N/A	Req'd Req'd	Req'd Req'd
DUCTS - Duct sealing ¹⁵ - Duct insulation	Req'd R-6	Req'd R-6	Req'd R-6
WATER HEATER - Existing - Replacement ¹⁶ , min. EF = - Add Water Heater ¹⁷ , min. EF =	N/A 0.58 or R-12 wrap 0.58	N/A 0.58 or R-12 wrap 0.58	N/A 0.58 or R-12 wrap 0.58

ABBREVIATIONS:

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

FOOTNOTES:

1. To comply with Prescriptive Package D, low-rise residential buildings shall be designed, constructed, and equipped to meet all the requirements of Package D.
2. The R-values shown for ceiling, wall, and raised floor are for wood frame construction with insulation installed between the framing member.
3. Radiant Barrier is a reflective material that has an emittance of 0.05 or less, tested according to ASTM C-1371 or ASTM E-408 and certified by 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.
4. Roofing Product's thermal emittance and 3-year aged solar reflectance shall be labeled and certified by the Cool Roof Rating Council (CRRC). Low sloped roof is a roof with 2:12 slope or less. Steep sloped roof is roof with slope greater than 2:12.
 - **For new roofing:** must meet Prescriptive Package D.
 - **For alteration to existing roofing:** replacement of existing roofing more than 50% of the roof or more than 1,000 ft² of roof, whichever is less, the following is required:
 - a. **For steep sloped roof (less than 5 lb/ft²):** minimum aged solar reflectance = 0.20 and minimum thermal emittance = 0.75, or minimum Solar Reflectance Index (SRI) = 16.
 - b. **For steep sloped roof (5 lb/ft² or more):** minimum aged solar reflectance = 0.15 and minimum thermal emittance = 0.75, or minimum Solar Reflectance Index (SRI) = 10.

Alternatives:

1. Insulation with a thermal resistance of at least 0.85 hr.ft².°F/Btu or at least a ¾" air space is added to the roof deck over an attic; or
 2. Existing ducts in the attic are insulated and sealed; or
 3. With 1 ft² of free ventilation area of attic ventilation for every 150 ft² of attic floor area, and where at least 30% of the free ventilation area is within 2 feet vertical distance of the roof ridge; or
 4. Buildings with at least R-30 ceiling insulation; or
 5. Buildings with a radiant barrier in the attic; or
 6. Buildings that have no ducts in the attic; or
 7. R-3 or greater roof deck insulation above vented attic.
5. Fenestration products (e.g. windows, glazed doors, and skylights) shall be labeled and certified for overall U-factor and overall Solar Heat Gain coefficient (SHGC). Exception: for each building, up to 3 sqft of glazing installed in doors and up to 2 sqft of tubular skylights with dual-pane diffusers.

- **For new fenestration:** must meet Prescriptive Package D.
 - **For alteration fenestration:**
 - a. **For replacement fenestration:** must meet the maximum U-factor = 0.40 & SHGC = 0.40.
 - b. **For alterations that add fenestration area 50 sqft max:** must meet the maximum U-factor = 0.40 & SHGC = 0.40. The existing west-facing fenestration area shall not be increased by more than 50 sqft.
 - c. **For alterations that add fenestration over 50 sqft:** must meet the maximum U-factor = 0.40 & SHGC = 0.40 and the total fenestration area limited to 20% max and the west-facing fenestration limited to 5% max, or compliance must be demonstrated utilizing the performance method.
 - **For repair fenestration:** exempt from the Energy Standard requirement e.g. repair a broken pane of window glass.
6. The new window area plus the area of any glazing removed because of the addition.
 7. West facing fenestration area includes skylights tilted to the west or tilted in any direction when the roof slope is less than 1:12.
 8. For compliance of additions and alterations only, any dual glazed greenhouse windows and dual glazed skylights are assumed to meet the applicable U-factor requirement.
 9. Automatic setback thermostats must be installed with all space heating/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 CBC 1204.1.
 10. All applicable mandatory measures for insulation or HVAC systems must be met (see attachment for copy of the Mandatory Measures Checklist).
 11. HSPF and SEER values indicate minimum efficiency effective January 23, 2006.
 12. Refrigerant Charge Measurement (RCM) or Charge Indicator Display (CID) when is required in split system air conditioner shall have temperature measurement access holes (TMAH) or saturation temperature measurement sensors (STMS) and proper refrigerant charge confirmed through field verification and diagnostic testing by a HERS rater; OR be equipped with a Charge Indicator Display.
 13. Cooling Airflow and Fan Watt Draw when is required in split system air conditioner the central forced air system fans shall have airflow greater than 350 CFM /ton of nominal cooling capacity and fan watt draw less than 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.
 14. Central Fan Integrated Ventilation System Watt Draw when is required shall demonstrate the central forced air system fans, in Air Distribution Mode, a watt draw less than 0.58 watt/cfm. Additions 1,000 ft² or less are exempt from this requirement.
 15. Duct sealing when is required 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 new system in existing residence:**
When a completely new air conditioner, heat pump furnace or duct system is installed in existing residence, duct sealing and HERS verification is required as for new building.

- **For alterations:**

- a. 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. When split system air conditioner is changed-out refrigerant charge measurement or Charge Indicator Display installation is required and must be verified by HERS rater. The replacement unit must meet or exceed appliance efficiency standards.
- b. 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.

16. The mandatory measures apply to water heater replacement. Storage gas water heater with Energy Factor less than 0.58 shall be externally wrapped with R-12 insulation. The first 5 feet of hot and cold water heater pipes must be insulated. All hot water pipes from the heating source to the kitchen fixtures that are $\frac{3}{4}$ " – 2" Ø shall be insulated with 1" thick insulation and 1.5" thick insulation for greater than 2" Ø pipe.
17. If new water heater added serving the new addition only, the water heater must be 50 gallon or less, gas storage or gas instantaneous, nonrecirculating type with a minimum Energy Factor EF = 0.58.