



CITY OF LONG BEACH
 Department of Development Services
 BUILDING AND SAFETY BUREAU
ENERGY EFFICIENCY STANDARDS



LOW-RISE RESIDENTIAL PLAN REVIEW CHECKLIST

INFORMATION	PROJECT NO.:	EXPIRATION DATE:	STATUS:
	PROJECT ADDRESS:		
	WORK DESCRIPTION:		
	APPLICANT'S NAME:	TEL. NO.:	
	PLAN REVIEWER:	TEL. NO.:	562-570-
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	<p>Applicable Codes: 2016 California Building Code (CBC), 2016 California Residential Code (CRC), 2016 California Energy Efficiency Standards (CEES), 2016 CEES Reference Appendices, 2016 CEES Residential ACM Manual, and Long Beach Municipal Code (LBMC).</p> <p>Numbers within the parenthesis () refer to code sections from the applicable codes.</p> <p>Only the circled item numbers and Additional Comments apply to this project. Provide a written response to each comment and show where and how it has been addressed.</p>		

A. COMPLIANCE DOCUMENTS

1. Specify on the plans the energy compliance method use in the design:
 - a. Prescriptive Package A
 - b. Performance Approach
2. The following compliance documents shall be attached to plan:
 - a. Certificate of Compliance (CF-1R) / (ENV -1)
 - b. Mandatory Measures Summary (MF-1R)
 - c. _____
3. Compliance documents shall be produced by the latest approved version of Energy Commission approved computer programs. To obtain a list of Energy Commission approved compliance programs and versions, visit their website at:
http://www.energy.ca.gov/title24/2016standards/2016_computer_prog_list.html
4. Proposed fenestration U-Factor does not conform with Defaults values from Table 110.6-A. Specify on plan NFRC rated products are required for all fenestration with Non-Default U-Factors.
5. The Solar Heat Gain Coefficient (SHGC) for proposed glazing does not conform with Defaults values from Table 110.6. Specify on plan NFRC rated products are required for all fenestration with non-default U-factor and/or non-default SHGC values.
6. The conditioned floor area shown on CF-1R form does not match with plans submitted. Revise the calculations accordingly.
7. The window areas shown on CF-1R form does not match with plans submitted. Revise calculations accordingly.
8. Incorporate the fenestration SHGC and U-factors required as per CF-1R form on door and window schedule.
9. Analysis shall consider the type of material of all the energy insulation wall assemblies such as, but not to be limited to the following: Metal stud, brick, CMU, concrete, and/or wood. Revise calculations accordingly.

10. 11. Provide construction details for all energy insulation assemblies. Show type of insulation on sections; check with manufacturer for minimum assembly size to accommodate the required insulation material. Example: R-30 requires a 2x10 construction assembly.

B. Low Rise Residential Buildings

1. Prescriptive requirement for building envelope: The West facing windows shall not exceed 5% of the gross West facing exterior wall area. (Table 150.1-A) Provide radiant barrier detail on plans.
2. Masonry and factory built fireplaces shall have a closeable metal or glass doors covering the entire opening of the firebox and shall have combustion air intake as required by (150(e)1)

Note: If Green Code applicable; provide a sealed door instead of a closeable door.

3. Replacement fenestration, where all the glazing in an existing fenestration opening is replaced with a new manufactured fenestration product, shall not exceed the U-factor and Solar Heat Gain Coefficient requirements of Section 150.1(c)3A and 150.1(c)4 or as determined by performance approach. (150.2(b)1B)
4. Compliance form / Calculations shows duct sealing is required. State on plans 3rd party testing agency shall test ducts for leakage. Certificate of field verification and diagnostic testing signed and dated by HERS shall be submitted to building inspector prior to final inspection.

C. General Notes

(Include the following notes on the plans)

1. Operating information.

The builder shall provide the building owner at occupancy the appropriate Certificate(s) of Compliance and a list of the features, materials, components, and mechanical devices installed in the building and instructions on how to operate them efficiently. The instructions shall be consistent with specifications set forth by the executive director.

For residential buildings, such information shall, at a minimum, include information indicated on forms Certificate of Compliance, Certificate of installation, and for buildings for which compliance requires HERS field verification, Certificate(s) of Verification and Certificate of Acceptance. These forms shall be in paper or electronic format and shall conform to the applicable requirements of Section 10-103(a). (103(b)1)

2. The builder shall provide to the building owner at occupancy, maintenance information for all features, materials, components, and manufactured devices that required routine maintenance for efficient operation. Required routine maintenance actions shall be clearly stated and incorporated on a readily accessible label. The label may be limited to identifying, by title and/or publication number, the operation and maintenance manual for that particular model and type of feature, material, component, or manufactured device.

For dwelling units, buildings or tenant spaces that are not individually owned and operated, or are centrally operated, such information shall be provided to the person(s) responsible for maintaining the feature, material, component, or mechanical device installed in the building. This operating information shall be in paper or electronic format (103(b)2)

3. All systems, equipment and/or building components shall comply with the applicable manufacturer provisions and installation provisions of Title 24, Part 6, Chapter 2, Sections 110.
4. All appliances for which a California Standard has been established in the Appliance Efficiency Regulations shall be certified by the manufacturer as compliant with the applicable standards. (110.0)
5. Service water-heating systems that have a total capacity greater than 167,000 Btu/hr., outlets that require higher than service water temperatures as listed in the ASHRAE Handbook, Applications Volume, shall have separate remote heaters, heat exchangers, or boosters to supply the outlet with the higher temperature. (110.3(c)1)
6. Controls for service water-heating systems shall limit the outlet temperature at public lavatories to 110 °F. (110.3(c)3)
7. Unfired service water-heater storage tanks and backup tanks for solar water-heating systems shall have:
 - a. External insulation with an installed R-value of at least R-12, or
 - b. Internal and external insulation with a combined R-value of at least R-16, or

- c. The heat loss of the tank surface, based on an 80 °F water air temperature difference shall be less than 6.5 Btu/hr. per square foot. (110.3(c)4)
8. Any pool or spa heating system or equipment shall:
 - a. Have a thermal efficiency that complies with the appliance efficiency regulations.
 - b. Have a readily accessible on-off switch, mounted on the outside of the heater that allows shutting off the heater without adjusting the thermostat setting.
 - c. Have a permanent, readable, weatherproof instruction card that gives instructions for the proper, energy efficient operation of the pool or spa heater.
 - d. Not utilize electric resistance heating.
 - e. Have at least 36 inches of pipe between the filter and heater or dedicated suction and return lines, or built-in or built-up connections shall be installed to allow for the future addition of solar heating equipment.
 - f. Have a thermal insulation cover for outdoor pools or spas that have a heat pump or gas heater.
 - g. Have directional inlets for the pool or spa that adequately mix the pool water.
 - h. Have a time switch or similar control mechanism shall be installed as part of the pool water circulation control system that will allow all pumps to be set or programmed to run only during the off-peak electric demand period, and for the minimum time necessary to maintain the water in the condition required by applicable public health standards. (110.4)
9. Space conditioning equipment shall meet the efficiency standards specified in Section 110.2.
10. Pilot lights shall be prohibited for:
 - a. Fan-type central furnaces,
 - b. Household cooking appliances, except for household cooking appliances without an electrical supply voltage connection and in which each pilot consumes less than 150 Btu/hr.
 - c. Pool heaters,
 - d. Spa heaters (Section 110.5)
11. Manufactured fenestration products and exterior doors shall have air infiltration rates not exceeding 0.3 cfm/ft² of window area, 0.3 cfm/ft² of residential door area, 0.3 cfm/ft² of nonresidential single door area, and 1.0 cfm/ft² of nonresidential double door area. (110.6(a)(1))
12. Fenestration products shall be certified for overall U-values and overall SHGC, and shall have a temporary label which lists the certified U-value and SHGC, and certifies that applicable air infiltration requirements are met. (110.6(a))
13. Field manufactured fenestration products and exterior doors, other than unframed glass doors and fire doors, shall be caulked between the fenestration products or exterior door and the building, and shall be weather stripped. (110.6(b))
14. Joints and other openings in the building envelope that are potential sources of air leakage shall be caulked, gasketed, weather stripped, or otherwise sealed to limit infiltration and exfiltration (110.7)
15. Insulation shall be certified by the manufacturer as compliant with the California Quality Standards for Insulating Material, Title 24, Part 12, Chapter 12 & 13, CCR. (110.8(a))
16. Urea formaldehyde foam insulation may only be used in exterior side walls, and requires a four-mil-thick plastic polyethylene vapor barrier between the urea formaldehyde foam insulation and the interior space. (110.8(b))
17. All insulating material shall be installed in compliance with the flame spread rating and smoke density requirements of the CBC. (110.8(c))
18. If insulation is installed on an existing space conditioning duct, it shall comply with Section 605 of the CMC. (110.8(d)3)

19. If external insulation is installed on an existing unfired water storage tank or on an existing back-up tank for a solar water heating system, it shall have an R-value of at least R-12, or the heat loss of the tank surface based on an 80 °F water-air temperature difference shall be less than 6.5 Btu per hour per square foot. (110.8(d)2)
20. Service water-heating systems shall be equipped with automatic temperature controls capable of adjustment from the lowest to the highest acceptable temperature settings for the intended use as listed the ASHRAE Handbook, and HVAC application Volume (110.3(a)1)
21. Service hot water systems with circulating pumps or with electrical heat trace systems shall be capable of automatically turning off the system. (110.3(c)2)
22. The opaque portions of framed demising walls shall have insulation with an installed R-value of at least R-13 between framing members. (120.7(b)7)

D. Residential Notes

- 1 A masonry or factory-built fireplace shall have the following:
 - a) Closeable metal or glass doors covering the entire opening of the firebox;
 - b) A combustion air intake to draw air from the outside of the building directly into the firebox, which is at least six square inches in area and is equipped with a readily accessible, operable, and tight-fitting damper or combustion-air control device

(Exception: An outside combustion-air intake is not required if the fireplace will be installed over concrete slab flooring and the fireplace will not be located on an exterior wall.); and
 - c) A flue damper with a readily accessible control. (Title 24, Part 6, Chapter 7, Section 150 (e)).

Note: If Green Code applicable; provide a sealed door instead of a closeable door.
- 2 All heating and/or cooling systems other than wood stoves shall have an automatic thermostat with a clock mechanism or other setback mechanism approved by the Executive Director of the California Energy Commission that shuts the system off during peak periods of nonuse and that allows the building occupant to automatically set back the thermostat set points for at least four periods within 24 hours. (Title 24 chapter 7, Section 150(i) & 110.2(c))
- 3 The minimum installed weight per square foot of any loose-fill insulation shall conform to the insulation manufacturer's labeled R-value. (Title 24, Part 6, Chapter 7, Section 150.0 (b))
- 4 Insulation shall be provided for water heaters as follows:
 - a) Storage gas water heaters with an energy factor equal to or less than the federal minimum standards shall be externally wrapped with insulation having an insulated thermal resistance of R-12 or greater.
 - b) Unfired hot water tanks, such as storage tanks and backup storage tanks for solar water-heating systems shall be externally wrapped with insulation having an installed thermal resistance of R-12 or greater or have internal insulation of at least R-16 and a label on the exterior of the tank showing the insulation R-value.
 - c) Piping, whether buried or unburied, for recirculating sections of domestic hot water systems, piping from the heating source to the storage tank for an indirect-fired domestic water-heating system and the first five feet of hot and cold water pipes from the storage tank for non-recirculating systems and cooling systems shall be thermally insulated as specified in subsection A & B.
 - d) Solar water-heating systems and/or collectors shall be certified by the Solar Rating and Certification Corporation. (Title 24, Part 6, Chapter 7, Section 150 (j))
- 5 Lighting
 - a) All installed luminaires shall be high efficacy in accordance with TABLE 150.0-A (150(k)1.A) High Efficacy Luminaires. A high efficacy luminaire or LED Light Engine with Integral Heat Sink has an efficacy that is no lower than the efficacies contained in TABLE 150-C and is not a low efficacy luminaire as specified by Section 150(k)2.

EXCEPTION 1 to Section 150(k)1: To qualify as high efficacy, a luminaire rated only for use with a high intensity discharge reflector lamp shall have a minimum lamp efficacy within 2 lumens per watt of the minimum lamp efficacies in TABLE 150-C.

b) Lighting in Kitchens.

A minimum of 50 percent of the total rated wattage of permanently installed lighting in kitchens shall be high efficacy.

EXCEPTION to Section 150(k)3: Up to 50 watts for dwelling units less than or equal to 2,500 ft² or 100 watts for dwelling units larger than 2,500 ft² may be exempt from the 50 percent high efficacy requirement when all lighting in the kitchen is controlled in accordance with applicable provisions in section 150.0(k)2.

- c) Lighting installed in attached and detached garages, laundry rooms, and utility rooms shall be high efficacy luminaires and controlled by vacancy sensors (Section 150.0(k)(6)).
- b) Lighting for residential parking garages for eight or more vehicles shall comply with the applicable requirements for nonresidential garages in Sections 110.9, 130.0, 130.1, 130.4, 140.6, and 141.0. (150.0(k)5)
- d) Lighting installed in rooms or areas other than: kitchens, bathrooms, garages, laundry rooms, and utility rooms, shall be high efficacy, or shall be controlled by either dimmers or vacancy sensors (Section 150.0(k)(7)).

EXCEPTION 1: Luminaires in closets less than 70 square feet.

EXCEPTION 2: Lighting in detached storage building less than 1000 square feet located on a residential site.

e) Luminaires recessed into ceilings shall meet all of the following conditions:

- 1. Be listed, as defined in Section 100.1, for zero clearance insulation contact (IC) by Underwriters Laboratories or other nationally recognized testing/rating laboratories; and,
- 2. Have a label that certifies that the luminaire is airtight with air leakage less than 2.0 CFM at 75 Pascals when tested in accordance with ASTM E283. An exhaust fan housing shall not be required to be certified airtight; and
- 3. Be sealed with a gasket or caulk between the luminaire housing and ceiling, and shall have all air leak paths between conditioned and unconditioned spaces sealed with a gasket or caulk; and
- 4. For recessed luminaires with ballasts to qualify as high efficacy for compliance with Section 150.0(k), the ballasts shall be certified to the Commission to comply with applicable requirements in Section 110.9; and
- 5. Allow ballast maintenance and replacement to be readily accessible to building occupants from below the ceiling without requiring the cutting of holes in the ceiling.

e) Residential Outdoor Lighting. Luminaires providing residential outdoor lighting shall meet the following requirements as applicable (150.0(k)3)Section 150.0(k)(9)):

- 1. Lighting mounted to a single-family residential building or accessory buildings shall be high efficacy, or may be low efficacy if it meets all of the following requirement: For single-family residential buildings, outdoor lighting permanently mounted to a residential building, or to other buildings on the same lot, shall meet the requirement in item i and the requirements in either item ii or item iii:
 - i. Controlled by a manual ON and OFF switch that does not override to ON the automatic actions of Items ii or iii below; and
 - ii. Controlled by photocell and motion sensor. Controls that override to ON shall not be allowed unless the override shall automatically return the photocontrol and automatic time switch control to its normal operation within 6 hours; or a motion sensor not having an override or bypass switch that disables the motion sensor, or controlled by a motion sensor having a temporary override switch which temporarily bypasses the motion sensing function and automatically reactivates the motion sensor within 6 hours; and
 - iii. Controlled by one of the following methods:
 - a. Photocontrol and automatic time switch control as per 150.0(k)3A.iii.a; or not having an override or bypass switch that disables the photocontrol; or



- b. Astronomical time clock per 150.0(k)3.A.iii.b; or not having an override or bypass switch that disables the astronomical time clock, and which is programmed to automatically turn the outdoor lighting OFF during daylight hours; or
 - c. Energy management control system meeting Section 150.0(k)(93)(A.(iii).(c) and 130.5.
- 6 Material used for slab edge insulation shall meet the following minimum specifications (Section 150.0(lf):
 - a) Water absorption rate no greater than 0.3 percent.
 - b) Water vapor permeance no greater than 2.0 perm/inch.
 - b) Concrete slab perimeter insulation must be protected from physical damage and ultraviolet light deterioration.
 - c) Insulation for a heated slab floor shall meet the requirements of Section 110.8(g).
- 7 Concrete-slab floor perimeter insulation shall be provided 16 inches deep, or the depth of the footing of the building, whichever is less. (Title 24, Part 6, Chapter 8, Section 151(c)(D150.1(c)1.D).
- 8 If insulation is installed in the existing attic of a low-rise residential building, the total resultant R-value after addition of insulation shall meet the requirement of Section 150.0(a), typically R-30with U-factor not exceeding U=0.043. (Title 24, Part 6, Chapter 2, Section 110.8(d))
- 9 Raised floors separating conditioned spaces from unconditioned spaces shall be insulated between wood-faming members with insulation having an installed thermal resistance of R-19 or greater. (Title 24, Part 6, Chapter 7, Section 150.0 (d))

ADDITIONAL WRITTEN COMMENTS

No.	Comment	Code Sec. No.