



Supplemental Plan Check Corrections Sheet for Energy Conservation (2011 LABC)

Plan Check / PCIS application number: _____
Job Address _____
P.C. Engineer _____ (Email: firstname.lastname@city.org) Phone _____

For instruction and other information, read the master plan check list attached.
Obtain the following Information Bulletins, Affidavits or forms from our web site (www.ladbs.org)

NOTE: Numbers in parenthesis () refer to Code sections of Title 24, California Code of Resources, Part 6. Tables referenced herein are from:

- 2008 California State Building Energy Efficiency Standards,
- 2008 Referenced Appendices
- 2008 Residential ACM Manual
- 2008 Non-Residential ACM Manual

A copy of referenced standards above can be obtained at: (www.energy.ca.gov/title24/2008standards/index.html)

A. All Buildings

1. Specify design package used and method of compliance:
 - Prescriptive Component Package _____
 - Prescriptive Overall Envelope
 - Performance Approach
2. The following compliance documents shall be attached to plan :
 - Certificate of Compliance (CF-1R) / (ENV -1)
 - Mandatory Features Summary (MF-1R)
 - _____
3. Compliance documents shall be produced by up-to-date version of Energy Commission Approved computer programs. To obtain a list of Energy Commission approved compliance programs, visit their website at :
http://www.energy.ca.gov/title24/2008standards/2008_computer_prog_list.html
5. Proposed fenestration U-Factor does not conform with Defaults values from Table 116-A. / Alternate Defaults values from table NI-1 (*ACM manual*). Specify on plan NFRC rated products are required for all fenestration with Non-Default U-Factors.
6. The Solar Heat Gain Coefficient (SHGC) for proposed glazing does not conform with Defaults values from Table 116-B. Specify on plan NFRC rated products are required for all fenestration with Non-Default SHGC.
7. The conditioned floor area shown on CF-1R form does not match with plans submitted. Revise calculation(s) accordingly.
8. The window area (at _____ facing wall) shown on CF-1R form does not match with plans submitted. Revise calculation(s) accordingly.
9. Incorporate the fenestration SHGC and U-factors required as per CF-1R form with window schedule.
10. 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 calculation(s) accordingly.
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. Non-residential, High-rise residential, and hotel / motel buildings

1. Insulation is not allowed on T-bar ceiling. (118(e))
2. Opaque portions of framed demising walls shall have insulation with no less than R-13. (118(f))
3. Prescriptive requirement for building envelope :
 - Cool Roof coating is required. Note on plan all Cool Roof product shall have a clearly visible packaging label that lists the reflectance and emittance tested in accordance with CRRC-1. (141, 142, 149(b)1B)

- Skylight(s) are required for building over 8,000 ft² and ceiling heights over 15'-0" and lighting power density over 0.5 W/ft². (143(c))
- At least one half of the floor area shall be in the daylight area under skylights. Provide skylights in accordance with (143(c)).

format and shall conform to the applicable requirements of Section 10-103(a). (Title 24, Part 1, Section 10-103(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.

C. 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.
2. Provide radiant barrier detail on plans.
3. 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.

4. 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 Package D or as determined by performance approach. (152(b))
5. 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. NOTE: If using prescriptive package for compliance, using alternative stated in footnote 9 and 10 of Table 151-C will not require testing. (10-103(c)2)
6. Compliance credit for air retarding wrap in low rise residential buildings, show air retarding wrap on construction section. (150(f))

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 (Title 24, Part 1, Section 10-103(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 111 through 119.
- 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. (Title 24, Part 6, Chapter 2, Section 111)
- 5 Service water-heating systems that have a total capacity greater than 167,000 Btu/hr, shall have separate remote heaters, heat exchangers, or boosters to supply higher temperature at outlets that require higher than service water temperatures as listed in the 1995 ASHRA E Handbook. (Title 24, Part 6, Chapter 2, Section 113)
- 6 Controls for service water-heating systems shall limit the outlet temperature at public lavatories to 110 °F. (Title 24, Part 6, Chapter 2, Section 113)

- 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. (Title 24, Part 6, Chapter 2, Section 113)

D. General Notes

Attach the following notes to plan :

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 (CF-1R), Installation Certificate (CF-6R), and for buildings for which compliance requires HERS field verification. Certificate(s) of Field Verification and Diagnostic Testing (CF-4R). These forms shall be in paper or electronic

- 8 Any pool or spa heating system or equipment shall:
 - a) Have a thermal efficiency for gas-fired systems of at least 78%, when tested according to ANSI standard Z21.10.3-1994.
 - 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 or a pilot light.
 - 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.
(Title 24, Part 6, Chapter 2, Section 114)
- 9 Space conditioning equipment shall meet the efficiency standards specified in Title 24, Part 6, Chapter 2, Section 112.
- 10 Pilot lights shall be prohibited for:
- a) Fan-type central furnaces
 - b) Household cooking appliances, except noted below.
 - c) Pool heaters
 - d) Spa heaters
- except for household cooking appliances without an electrical supply voltage connection and in which each pilot consumes less than 150 Btu/hr (Title 24, Part 6, Chapter 2, Section 115)
- 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. (Title 24, Part 6, Chapter 2, Section 116)
- 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. (Title 24, Part 6, Chapter 2, Section 116)
- 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 weatherstripped. (Title 24, Part 6, Chapter 2, Section 116)
- 14 Joints and other openings in the building envelope that are potential sources of air leakage shall be caulked, gasketed, weatherstripped, or otherwise sealed to limit infiltration and exfiltration (Title 24, Part 6, Chapter 2, Section 117)
- 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.(Title 24, Part 6, Chapter 2, Section 118)
- 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. (Title 24, Part 6, Chapter 2, Section 118)
- 17 All insulating material shall be installed in compliance with the flame spread rating and smoke density requirements of the CBC. (Title 24, Part 6, Chapter 2, Section 118)
- 18 If insulation is installed on an existing space conditioning duct, it shall comply with Section 605 of the CMC. (Title 24, Part 6, Chapter 2, Section 118)
- 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. (Title 24, Part 6, Chapter 2, Section 118)
- 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 in Table 2, Chapter 49 of the ASHRAE Handbook, and HVAC application Volume (Title 24, Part 6, Chapter 2, Section 113)
- 21 Service hot water systems with circulating pumps or with electrical heat trace systems shall be capable of automatically turning off the system. (Title 24, Part 6, Chapter 2, Section 113)
- 22 The opaque portions of framed demising walls shall have insulation with an installed R-value of at least R-13 between framing members. (Title 24, Part 6, Chapter 2, Section 118)
- 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) & 151(f))

- 3 The minimum installed weight per square foot of any loose-fill insulation shall conform with the insulation manufacturer's labeled R-value. (Title 24, Part 6, Chapter 7, Section 150 (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) **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)8: 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 the following conditions are met:

- A. All low efficacy luminaires in the kitchen are controlled by a manual-on occupant sensor, dimmer,

energy management control system (EMCS), or a multi-scene programmable control system; and

- B. All permanently installed luminaires in garages, laundry rooms, closets greater than 70 square feet, and utility rooms are high efficacy and are controlled by a manual-on occupant sensor.

NOTE: For the purpose of this requirement, kitchen lighting includes all permanently installed lighting in the

kitchen except for lighting that is internal to cabinets for the purpose of illuminating only the inside of the cabinets. Lighting in areas adjacent to the kitchen, including but not limited to dining and nook areas, are considered kitchen lighting if they are not separately switched from kitchen lighting.

- c) **Lighting in Bathroom, Garages, Laundry Rooms, Closets, and Utility Rooms.** Permanently installed luminaires in bathrooms, attached and detached garages, laundry rooms, closets and utility rooms shall be high efficacy luminaires.

EXCEPTION 1 to Section 150(k)10: Permanently installed low efficacy luminaires shall be allowed provided that they are controlled by a manual-on occupant sensor certified to comply with the applicable requirements of Section 119.

EXCEPTION 2 to Section 150(k)10: Permanently installed low efficacy luminaires in closets less than 70 square feet are not required to be controlled by a manual-on occupant sensor.

- d) **Lighting other than in Kitchens, Bathrooms, Garages, Laundry Rooms, Closets, and Utility Rooms.** Permanently installed luminaires located in rooms or areas other than in kitchens, bathrooms, garages, laundry rooms, and utility rooms shall be high efficacy luminaires.

EXCEPTION 1 to Section 150(k)11: Permanently installed low efficacy luminaires shall be allowed provided they are controlled by either a dimmer switch that complies with the applicable requirements of Section 119, or by a manual-on occupant sensor that complies with the applicable requirements of Section 119.

EXCEPTION 2 to Section 150(k)11: Lighting in detached storage buildings less than 1000 square feet located on a residential site is not required to comply with Section 150(k)11.

- e) **Recessed Luminaires in Insulated Ceilings.** Luminaires recessed into insulated ceilings shall meet all of the following conditions:

1. Be listed, as defined in Section 101, 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; and

EXCEPTION to Section 150(k)12B: An exhaust fan housing shall not be required to be certified airtight.

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

Note: An exhaust fan shall be sealed with a gasket or caulk between the exhaust fan housing and ceiling.

4. For recessed luminaires with ballasts to qualify as high efficacy for compliance with Section 150(k), the ballasts shall be certified to the Commission to comply with Section 119(n); 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.

- f) **Outdoor Lighting.** Luminaires providing outdoor lighting, including outdoor lighting for private patios on low-rise residential buildings with four or more dwelling units, entrances, balconies, and porches, and which are permanently mounted to a residential building or to other buildings on the same lot shall be high efficacy luminaires.

EXCEPTION 1 to Section 150(k)13: Permanently installed outdoor low efficacy luminaires shall be allowed provided that they are controlled by a manual on/off switch, a motion sensor not having an override or bypass switch that disables the motion sensor, and one of the following methods:

A. Photocontrol not having an override or bypass switch that disables the photocontrol; or

B. Astronomical time clock not having an override or bypass switch that disables the astronomical time clock; or

C. Energy management control system (EMCS) not having an override or bypass switch that allows the luminaire to be always on.

EXCEPTION 2 to Section 150(k)13: Outdoor luminaires used to comply with Exception 1 to Section 150(k)13 may be controlled by a temporary override switch which bypasses the motion sensing function provided that the motion sensor is automatically reactivated within 6 hours.

EXCEPTION 3 to Section 150 (k) 13: Permanently installed luminaires in or around swimming pools, water features, or other locations subject to Article 680 of the California Electric Code need not be high efficacy luminaires.

- g) **Parking Lots and Garages.** Lighting for parking lots and carports with a total eight or more vehicles shall comply with the applicable requirements in Sections 130, 132, 134, and 147. Lighting for parking garages for eight or more vehicles shall comply with the applicable requirements in Sections 130, 131, 134, and 146.

- h) **Common Areas of Low-rise Residential Buildings.** Permanently installed lighting in the enclosed, non-dwelling spaces of low-rise residential buildings with four or more dwelling units shall be high efficacy luminaires.

EXCEPTION to Section 150 (k)16: Permanently installed low efficacy luminaires that are shall be allowed provided that they are controlled by an occupant sensor(s) certified to comply with Section the applicable requirements of 119. (Title 24, Part 6, Chapter 7, Section 150 (k))

- 6 Material used for slab edge insulation shall meet the following minimum specifications:

- a) Water absorption rate no greater than 0.3 percent.
- b) Water vapor permeance no greater than 2.0 perm/inch.
- c) Concrete slab perimeter insulation must be protected from physical damage and ultraviolet light deterioration.

(Title 24, Part 6, Chapter 7, Section 150 (l))

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(f))

- 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 be at least R-30. (Title 24, Part 6, Chapter 2, Section 118)

- 9 Raised floors separating conditioned spaces from unconditioned spaces shall be insulated between wood-framing members with insulation having an installed thermal resistance of R-13 or greater. (Title 24, Part 6, Chapter 7, Section 150 (d))

