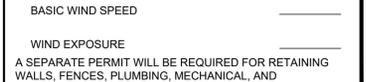
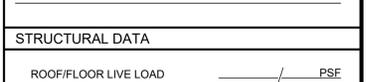
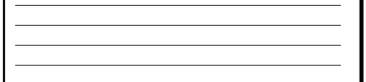
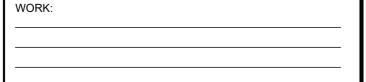
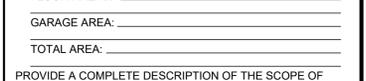
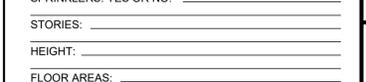
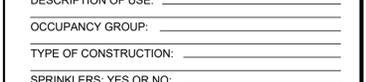
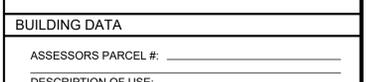
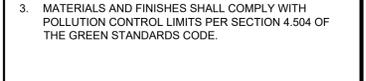
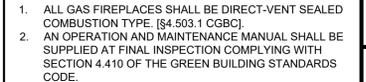
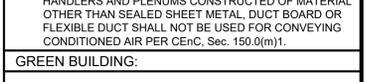
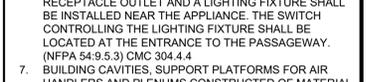
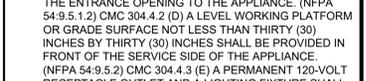
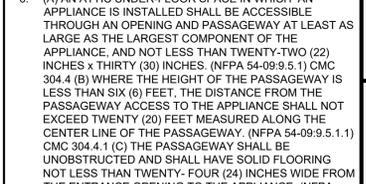
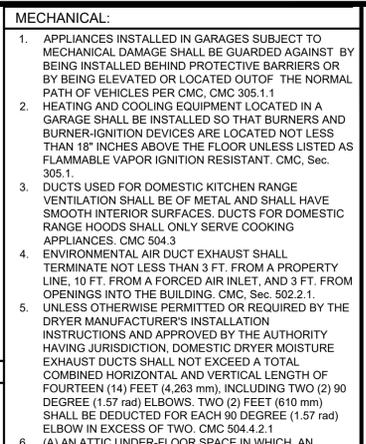
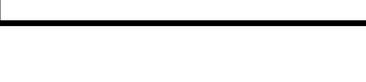
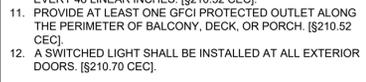
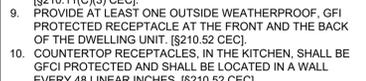
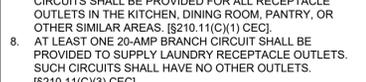
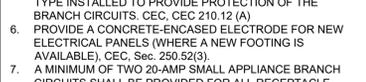
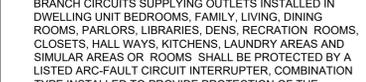
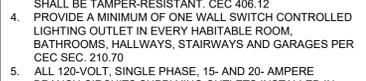
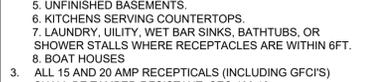
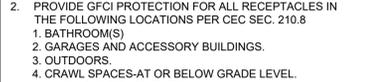
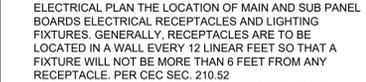
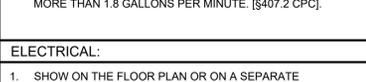
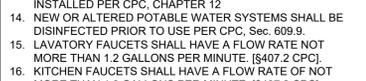
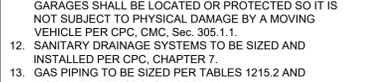
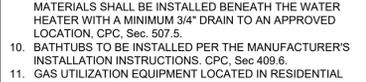
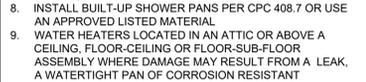
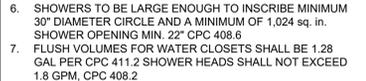
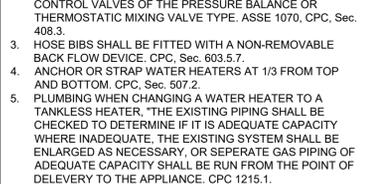
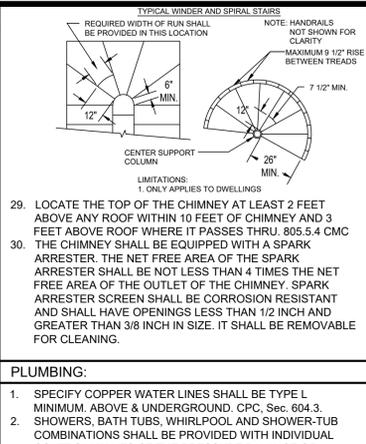
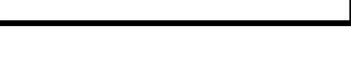
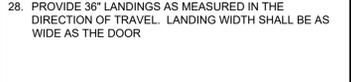
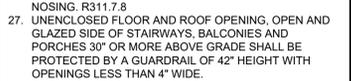
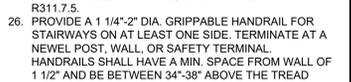
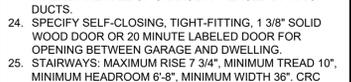
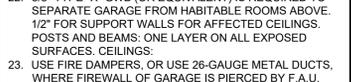
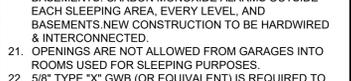
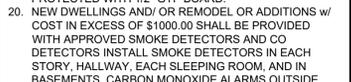
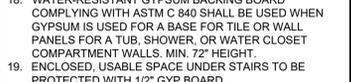
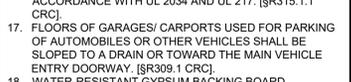
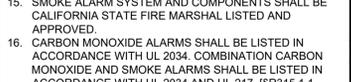
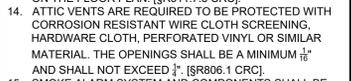
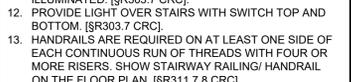
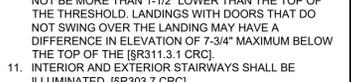
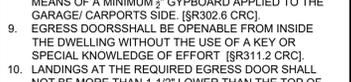
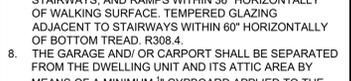
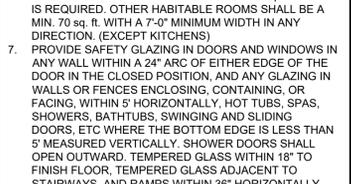
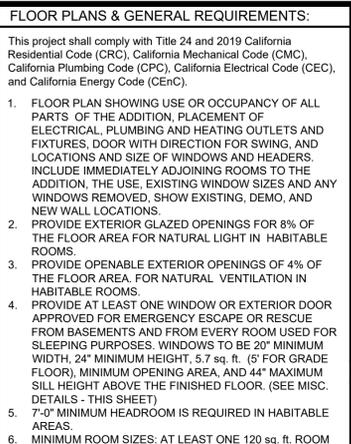
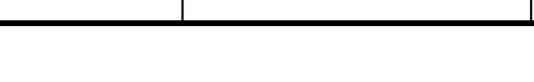
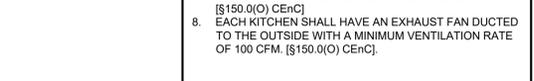
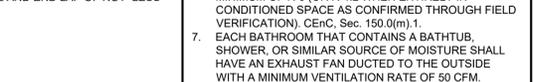
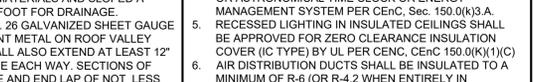
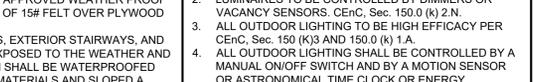
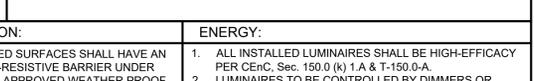
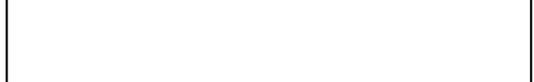
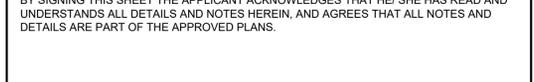
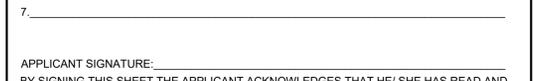
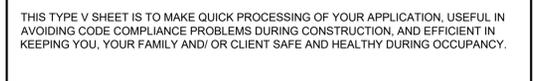
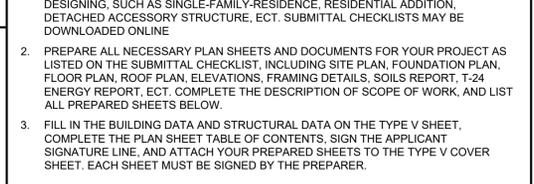
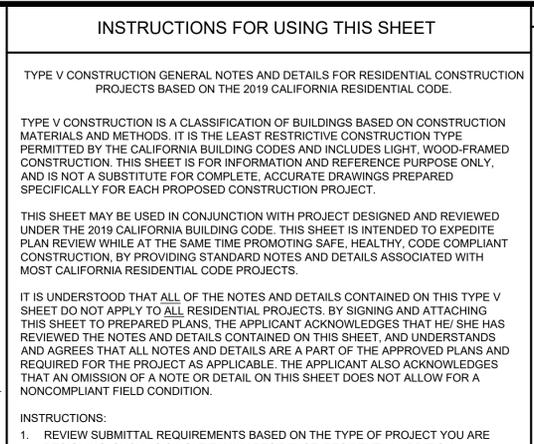
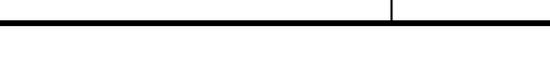
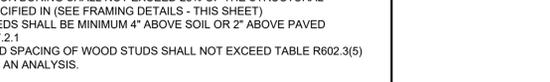
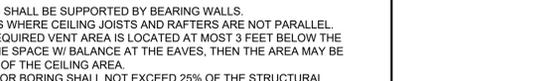
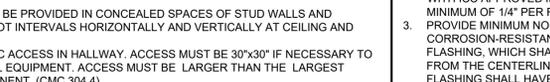
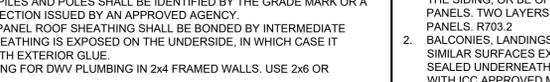
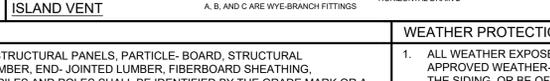
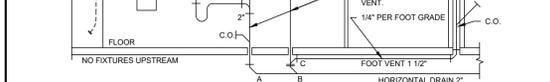
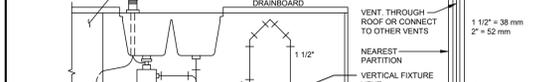
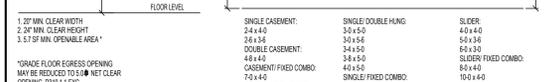
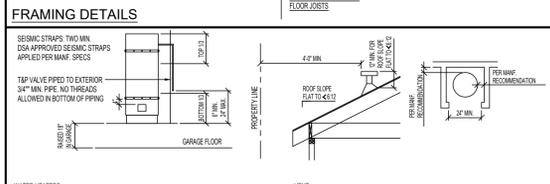
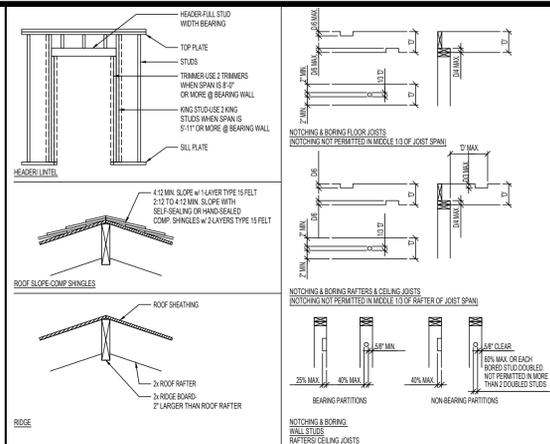
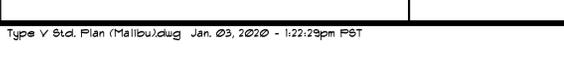
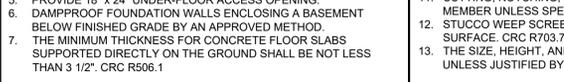
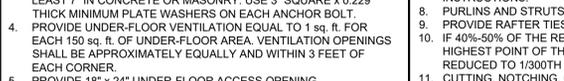
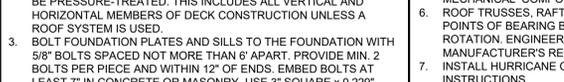
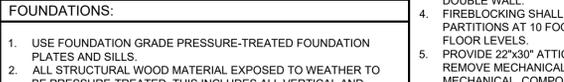
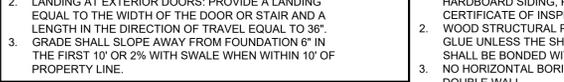
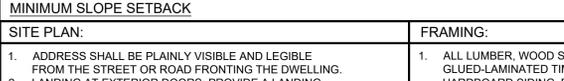
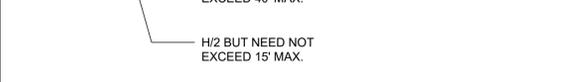
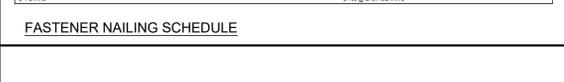


FASTENER NAILING SCHEDULE

ITEM	TYPE	SIZE	SPACING
1. JOIST TO JOIST	COMMON	16D	12" o.c.
2. JOIST TO STUD	COMMON	16D	12" o.c.
3. STUD TO STUD	COMMON	16D	12" o.c.
4. STUD TO JOIST	COMMON	16D	12" o.c.
5. STUD TO PLATE	COMMON	16D	12" o.c.
6. STUD TO RAFTER	COMMON	16D	12" o.c.
7. STUD TO TRUSS	COMMON	16D	12" o.c.
8. STUD TO WALL	COMMON	16D	12" o.c.
9. STUD TO CEILING	COMMON	16D	12" o.c.
10. STUD TO FLOOR	COMMON	16D	12" o.c.
11. STUD TO WINDOW	COMMON	16D	12" o.c.
12. STUD TO DOOR	COMMON	16D	12" o.c.
13. STUD TO PORCH	COMMON	16D	12" o.c.
14. STUD TO GARAGE	COMMON	16D	12" o.c.
15. STUD TO ATTIC	COMMON	16D	12" o.c.
16. STUD TO BATH	COMMON	16D	12" o.c.
17. STUD TO KITCHEN	COMMON	16D	12" o.c.
18. STUD TO LIVING	COMMON	16D	12" o.c.
19. STUD TO BEDROOM	COMMON	16D	12" o.c.
20. STUD TO HALL	COMMON	16D	12" o.c.
21. STUD TO CLOSET	COMMON	16D	12" o.c.
22. STUD TO PORCH	COMMON	16D	12" o.c.
23. STUD TO GARAGE	COMMON	16D	12" o.c.
24. STUD TO ATTIC	COMMON	16D	12" o.c.
25. STUD TO BATH	COMMON	16D	12" o.c.
26. STUD TO KITCHEN	COMMON	16D	12" o.c.
27. STUD TO LIVING	COMMON	16D	12" o.c.
28. STUD TO BEDROOM	COMMON	16D	12" o.c.
29. STUD TO HALL	COMMON	16D	12" o.c.
30. STUD TO CLOSET	COMMON	16D	12" o.c.



PLAN SHEET TABLE OF CONTENTS:

1. GENERAL NOTES
2. FOUNDATION
3. FRAMING
4. ROOFING
5. EXTERIOR FINISHES
6. INTERIOR FINISHES
7. MECHANICAL
8. ELECTRICAL
9. PLUMBING
10. GREEN BUILDING

WEATHER PROTECTION:

1. ALL WEATHER EXPOSED SURFACES SHALL HAVE AN APPROVED WEATHER-RESISTIVE BARRIER UNDER THE SIDING, OR BE OF APPROVED WEATHER PROOF PANELS. TWO LAYERS OF 15# FELT OVER PLYWOOD PANELS.
2. BALCONIES, LANDINGS, EXTERIOR STAIRWAYS, AND SIMILAR SURFACES EXPOSED TO THE WEATHER AND SEALED UNDERNEATH SHALL BE WATERPROOFED WITH ICC APPROVED MATERIALS AND SLOPED A MINIMUM OF 1/4" PER FOOT FOR DRAINAGE.
3. PROVIDE MINIMUM NO. 28 GALVANIZED SHEET GAUGE CORROSION-RESISTANT METAL ON ROOF VALLEY FLASHING, WHICH SHALL ALSO EXTEND AT LEAST 12" FROM THE CENTERLINE EACH WAY. SECTIONS OF FLASHING SHALL HAVE AN END LAP OF NOT LESS THAN 4".

ENERGY:

1. ALL INSTALLED LUMINAIRES SHALL BE HIGH-EFFICACY PER CEC, Sec. 150.0 (k) 1 A & T-150.0-A.
2. LUMINAIRES TO BE CONTROLLED BY DIMMERS OR VACANCY SENSORS. CEC, Sec. 150.0 (k) 2.N.
3. ALL OUTDOOR LIGHTING TO BE HIGH EFFICACY PER CEC, Sec. 150 (K)3 AND 150.0 (k) 1.A.
4. ALL OUTDOOR LIGHTING SHALL BE CONTROLLED BY A MANUAL ON/OFF SWITCH AND BY A MOTION SENSOR OR ASTRONOMICAL TIME CLOCK OR ENERGY MANAGEMENT SYSTEM PER CEC, Sec. 150.0(K)3.A.
5. RECESSED LIGHTING IN INSULATED CEILINGS SHALL BE APPROVED FOR ZERO CLEARANCE INSULATION COVER (IC TYPE) BY UL PER CEC, CEC 150.0(K)(1)(C).
6. AIR DISTRIBUTION DUCTS SHALL BE INSULATED TO A MINIMUM OF R-6 (OR R-4.2 WHEN ENTIRELY IN CONDITIONED SPACE AS CONFIRMED THROUGH FIELD VERIFICATION). CEC, Sec. 150.0(m).
7. EACH BATHROOM THAT CONTAINS A BATHTUB, SHOWER, OR SIMILAR SOURCE OF MOISTURE SHALL HAVE AN EXHAUST FAN DUCTED TO THE OUTSIDE WITH A MINIMUM VENTILATION RATE OF 50 CFM. [§150.0(i) CEC].
8. EACH KITCHEN SHALL HAVE AN EXHAUST FAN DUCTED TO THE OUTSIDE WITH A MINIMUM VENTILATION RATE OF 100 CFM. [§150.0(i) CEC].

2019 CA RESIDENTIAL CODE

TYPE V

COVER SHEET

PLAN CHECK #:

PERMIT #:

ADDRESS:

WORK DESCRIPTION:

CITY OF: MALIBU

23825 STUART RANCH ROAD

MALIBU, CA 90265

310-456-3356

INCORPORATED MARCH 28, 1971

THESE CODE REQUIREMENTS GOVERN ANY ERRORS SHOWN ON OTHER PLANS. SHEET 1 OF 2



2019 Low-Rise Residential Mandatory Measures Summary

NOTE: Low-rise residential buildings subject to the Energy Standards must comply with all applicable mandatory measures, regardless of the compliance approach used. Review the respective section for more information. *Exceptions may apply. (Original 08/2019)

Building Envelope Measures:	
§ 110.6(a):	Air Leakage. Manufactured fenestration, exterior doors, and exterior pet doors must limit air leakage to 0.3 cm per square foot or less when tested per NFRC-400, ASTM E283 or AIAA/ANCA/CSA 1011.8, 21440-2011.
§ 110.6(a):	Labeling. Fenestration products and exterior doors must have a label meeting the requirements of Section 10-111(a).
§ 110.6(b):	Field fabricated exterior doors and fenestration products must use U-factors and solar heat gain coefficient (SHGC) values from Tables 110.6-A, 110.6-B, or JA.5 for exterior doors. They must be caulked and/or weather stripped.
§ 110.7:	Air Leakage. All joints, penetrations, and other openings in the building envelope that are potential sources of air leakage must be caulked, gasketed, or weather stripped.
§ 110.8(a):	Insulation Certification by Manufacturers. Insulation must be certified by the Department of Consumer Affairs, Bureau of Household Goods and Services (BHGS).
§ 110.8(g):	Insulation Requirements for Heated Slab Floors. Heated slab floors must be insulated per the requirements of Section 110.8(g).
§ 110.8(i):	Roofing Products Solar Reflectance and Thermal Emittance. The thermal emittance and aged solar reflectance values of the roofing material must meet the requirements of § 110.8(i) and be labeled per §110-113 when the installation of a cool roof is specified on the CFR.
§ 110.8(j):	Radiant Barrier. When required, radiant barriers must have an emittance of 0.05 or less and be certified to the Department of Consumer Affairs.
§ 110.8(k):	Ceiling and Rafter Roof Insulation. Minimum R-22 insulation in wood-frame ceiling; or the weighted average U-factor must not exceed 0.043. Minimum R-19 or weighted average U-factor of 0.054 or less in a rafter roof alteration. Attic access doors must have permanently attached insulation using adhesive or mechanical fasteners. The attic access must be gasketed to prevent air leakage. Insulation must be installed in direct contact with a continuous roof or ceiling which is sealed to limit infiltration and exfiltration as specified in § 110.7, including but not limited to placing insulation either above or below the roof deck or on top of a drywall ceiling.
§ 150.0(a):	Loose-fill Insulation. Loose fill insulation must meet the manufacturer's required density for the labeled R-value.
§ 150.0(c):	Wall Insulation. Minimum R-13 insulation in 2x4 inch wood framing wall or have a U-factor of 0.102 or less, or R-20 in 2x6 inch wood framing or have a U-factor of 0.071 or less. (R-19 in 2x6 or U-factor of 0.074 or less). Opaque non-framed assemblies must have an overall assembly U-factor not exceeding 0.102, equivalent to an installed value of R-13 in a wood framed assembly. Masonry walls must meet Table 150.1-A or B.
§ 150.0(d):	Raised-floor Insulation. Minimum R-19 insulation in raised wood framed floor or 0.037 maximum U-factor.
§ 150.0(f):	Slab Edge Insulation. Slab edge insulation must meet all of the following: have a water absorption rate, for the insulation material alone without facings no greater than 0.3%, have a water vapor permeance no greater than 2.0 perm per inch, be protected from physical damage and UV light deterioration, and, when installed as part of a heated slab floor, meet the requirements of § 110.8(g).
§ 150.0(g):	Vapor Retarder. In climate zones 1 through 16, the earth floor of unvented crawl space must be covered with a Class I or Class II vapor retarder. This requirement also applies to controlled ventilation crawl space for buildings complying with the exception to § 150.0(f).
§ 150.0(g):	Vapor Retarder. In climate zones 14 and 15, a Class I or Class II vapor retarder must be installed on the conditioned space side of all insulation in all exterior walls, vented attics, and unvented attics with air-permeable insulation.
§ 150.0(i):	Fenestration Products. Fenestration, including skylights, separating conditioned space from unconditioned space or outdoors must have a maximum U-factor of 0.58; or the weighted average U-factor of all fenestration must not exceed 0.58.
Fireplaces, Decorative Gas Appliances, and Gas Log Measures:	
§ 110.5(e):	Pilot Light. Continuously burning pilot lights are not allowed for indoor and outdoor fireplaces.
§ 150.0(e):	Closable. Masonry or factory-built fireplaces must have a closable metal or glass door covering the entire opening of the firebox.
§ 150.0(e):	Combustion Intake. Masonry or factory-built fireplaces must have a combustion outside air intake, which is at least six square inches in area and is equipped with a readily accessible, operable, and light-fitting damper or combustion-air control device.
§ 150.0(e):	Flue Damper. Masonry or factory-built fireplaces must have a flue damper with a readily accessible control.
Space Conditioning, Water Heating, and Plumbing System Measures:	
§ 110.0(c) 110.3:	Certification. Heating, ventilation and air conditioning (HVAC) equipment, water heaters, showerheads, faucets, and all other regulated appliances must be certified by the manufacturer to the Energy Commission.
§ 110.2(a):	HVAC Efficiency. Equipment must meet the applicable efficiency requirements in Table 110.2-A through Table 110.2-K.
§ 110.2(b):	Controls for Heat Pumps with Supplementary Electric Resistance Heaters. Heat pumps with supplementary electric resistance heaters must have controls that prevent supplementary heater operation when the heating load can be met by the heat pump alone; and in which the cut-on temperature for compression heating is higher than the cut-off temperature for supplementary heating, and the cut-off temperature for compression heating is higher than the cut-off temperature for supplementary heating.
§ 110.2(c):	Thermostats. All heating or cooling systems not controlled by a central energy management control system (EMCS) must have a setback thermostat.
§ 110.3(c):	Water Heating Recirculation Loops Serving Multiple Dwelling Units. Water heating recirculation loops serving multiple dwelling units must meet the air release valve, backflow prevention, pump priming, pump isolation valve, and recirculation loop connection requirements of § 110.3(c).
§ 110.3(c):	Isolation Valves. Instantaneous water heaters with an input rating greater than 6.8 kBtu per hour (2 kW) must have isolation valves with hose bibbs or other fittings on both cold and hot water lines to allow for flushing the water heater when the valves are closed.
§ 110.5:	Pilot Lights. Continuously burning pilot lights are prohibited for natural gas, fan-type vented furnaces, household cooling appliances (appliances without an electrical supply voltage connection with pilot lights that consume less than 150 Btu/h are exempt), and pool and spa heaters.
§ 150.0(h):	Building Cooling and Heating Loads. Heating and/or cooling loads are calculated in accordance with the ASHRAE Handbook, Equipment Volume, Applications Volume, and Fundamentals Volume; the SMACNA Residential Comfort System Installation Standards Manual; or the ACCA Manual J using design conditions specified in § 150.0(h).



2019 Low-Rise Residential Mandatory Measures Summary

Requirements for Ventilation and Indoor Air Quality:	
§ 150.0(a):	Requirements for Ventilation and Indoor Air Quality. All dwelling units must meet the requirements of ASHRAE Standard 62.2, Ventilation and Acceptable Indoor Air Quality in Residential Buildings subject to the amendments specified in § 150.0(a).
§ 150.0(a):	Single Family Detached Dwelling Units. Single family detached dwelling units, and attached dwelling units not sharing ceilings or floors with other dwelling units, occupancies, public garages, or commercial garages, must have mechanical ventilation airflow provided at rates determined by ASHRAE 62.2 Sections 4.1.1 and 4.1.2 and as specified in § 150.0(a).
§ 150.0(a):	Multifamily Attached Dwelling Units. Multifamily attached dwelling units must have mechanical ventilation airflow provided at rates in accordance with Equation 150.0-B and must be either a balanced system or continuous supply or continuous exhaust system. If a balanced system is not used, all units in the building must use the same system type and the dwelling-unit envelope leakage must be ≤ 0.3 CFM at 50 Pa (0.2 inch water) per square foot of dwelling unit envelope surface area and verified in accordance with Reference Residential Appendix RA3.8.
§ 150.0(a):	Multifamily Building Central Ventilation Systems. Central ventilation systems that serve multiple dwelling units must be balanced to provide ventilation airflow for each dwelling unit at a rate equal to or greater than the rate specified by Equation 150.0-B. All unit airflows must be within 20% of the unit with the lowest airflow rate as it relates to the individual unit's minimum required airflow rate needed for compliance.
§ 150.0(a):	Kitchen Range Hoods. Kitchen range hoods must be rated for sound in accordance with Section 7.2 of ASHRAE 62.2.
§ 150.0(a):	Field Verification and Diagnostic Testing. Dwelling unit ventilation airflow must be verified in accordance with Reference Residential Appendix RA3.7. Kitchen range hoods must be verified in accordance with Reference Residential Appendix RA3.7.4.3 to confirm it is rated by HUD to comply with the airflow rates and sound requirements as specified in Section 5 and 7.2 of ASHRAE 62.2.
Pool and Spa Systems and Equipment Measures:	
§ 110.4(a):	Certification by Manufacturers. Any pool or spa heating system or equipment must be certified to have all of the following: a thermal efficiency that complies with the Appliance Efficiency Regulations; an on-off switch mounted outside of the heater that allows shutting off the heater without adjusting the thermostat setting; a permanent weatherproof plate or card with operating instructions; and must not use electric resistance heating.
§ 110.4(b):	Piping. Any pool or spa heating system or equipment must be installed with at least 36 inches of pipe between the filter and the heater, or dedicated suction and return lines, or both in or bulk-up connectors to allow for future solar heating.
§ 110.4(c):	Covers. Outdoor pools or spas that have a heat pump or gas heater must have a cover.
§ 110.4(d):	Directional Inlets and Time Switches for Pools. Pools must have directional inlets that adequately mix the pool water, and a time switch that will allow all pumps to be set or programmed to run only during off-peak electric demand periods.
§ 110.5:	Pilot Light. Natural gas pool and spa heaters must not have a continuously burning pilot light.
§ 150.0(p):	Pool Systems and Equipment Installation. Residential pool systems or equipment must meet the specified requirements for pump sizing, flow rate, piping, filters, and valves.
Lighting Measures:	
§ 110.9:	Lighting Controls and Components. All lighting control devices and systems, ballasts, and luminaires must meet the applicable requirements of § 110.9.
§ 150.0(k):	Luminaire Efficacy. All installed luminaires must meet the requirements in Table 150.0-A.
§ 150.0(k):	Blank Electrical Boxes. The number of electrical boxes that are more than 5 feet above the finished floor and do not contain a luminaire or other device must be no greater than the number of bedrooms. These electrical boxes must be served by a dimmer, vacancy sensor control, or fan speed control.
§ 150.0(k):	Recessed Downlight Luminaires in Ceilings. Luminaires recessed into ceilings must meet all of the requirements for: insulation contact (IC) labeling; air leakage; sealing; maintenance; and socket and light source as described in § 150.0(k).
§ 150.0(k):	Electronic Ballasts for Fluorescent Lamps. Ballasts for fluorescent lamps rated 13 watts or greater must be electronic and must have an output frequency no less than 20 kHz.
§ 150.0(k):	Night Lights, Step Lights, and Path Lights. Night lights, step lights, and path lights are not required to comply with Table 150.0-A or be controlled by vacancy sensors provided they are rated to consume no more than 5 watts of power and emit no more than 150 lumens.
§ 150.0(k):	Lighting Integral to Exhaust Fans. Lighting integral to exhaust fans (except when installed by the manufacturer in kitchen exhaust hoods) must meet the applicable requirements of § 150.0(k).
§ 150.0(k):	Screw based luminaires. Screw based luminaires must contain lamps that comply with Reference Joint Appendix JA8.
§ 150.0(k):	Light Sources in Enclosed or Recessed Luminaires. Lamps and other separable light sources that are not compliant with the JA8 elevated temperature requirements, including marking requirements, must not be installed in enclosed or recessed luminaires.
§ 150.0(k):	Light Sources in Drawers, Cabinets, and Linen Closets. Light sources provided to drawers, cabinet or linen closets are not required to comply with Table 150.0-A or be controlled by vacancy sensors insofar that they are rated to consume no more than 5 watts of power, emit no more than 150 lumens, and are equipped with controls that automatically turn the lighting off when the drawer, cabinet or linen closet is closed.
§ 150.0(k):	Interior Switches and Controls. All forward phase cut dimmers used with LED light sources must comply with NEMA SSL 7A.
§ 150.0(k):	Interior Switches and Controls. Exhaust fans must be controlled separately from lighting systems.
§ 150.0(k):	Interior Switches and Controls. Lighting must have readily accessible wall-mounted controls that allow the lighting to be manually turned ON and OFF.
§ 150.0(k):	Interior Switches and Controls. Controls and equipment must be installed in accordance with manufacturer's instructions.
§ 150.0(k):	Interior Switches and Controls. Controls must not bypass a dimmer, occupant sensor, or vacancy sensor function if the control is installed to comply with § 150.0(k).
§ 150.0(k):	Interior Switches and Controls. Lighting controls must comply with the applicable requirements of § 110.9.



2019 Low-Rise Residential Mandatory Measures Summary

§ 150.0(h):	Clearance. Air conditioner and heat pump outdoor condensing units must have a clearance of at least 5 feet from the outlet of any dryer vent.
§ 150.0(h):	Liquid Line Drier. Air conditioners and heat pump systems must be equipped with liquid line filter driers if required, as specified by the manufacturer's instructions.
§ 150.0(i):	Storage Tank Insulation. Unfired hot water tanks, such as space tanks and backup storage tanks for solar water-heating systems, must have a minimum of R-12 internal insulation or R-16 internal insulation where the internal insulation R-value is indicated on the exterior of the tank.
§ 150.0(j):	Water Piping, Solar Water-heating System Piping, and Space Conditioning System Line Insulation. All domestic hot water piping must be insulated as specified in Section 608.11 of the California Plumbing Code. In addition, the following piping conditions must have a minimum insulation wall thickness of 1/2 inch or a minimum insulation R-value of 7.7: the first 5 feet of cold water pipes from the storage tank; all hot water piping with a nominal diameter equal to or greater than 3/4 inch and less than 1 inch; all hot water piping with a nominal diameter less than 3/4 inch that is associated with a domestic hot water recirculation system, from the heating source to storage tank or between tanks, buried below grade; and from the heating source to kitchen fixtures.
§ 150.0(j):	Insulation Protection. Piping insulation must be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind as required by Section 120.3(b). Insulation exposed to weather must be water retardant and protected from UV light (no adhesive tapes). Insulation covering chilled water piping and refrigerant suction piping located outside the conditioned space must include, or be protected by, a Class I or Class II vapor retarder. Pipe insulation buried below grade must be installed in a waterproof and non-combustible casing or sleeve.
§ 150.0(k):	Gas or Propane Water Heating Systems. Systems using gas or propane water heaters to serve individual dwelling units must include all of the following: A dedicated 125 volt, 20 amp electrical receptacle that is connected to the electric panel with a 120/240 volt 3 conductor, 10 AWG copper branch circuit, within 3 feet from the water heater without obstruction. Both ends of the unused conductor must be labeled with the word "spare" and be electrically isolated. Have a reserved single pole circuit breaker space in the electrical panel adjacent to the circuit breaker for the branch circuit and label with the words "40 Amp", "Category III or IV vent", or a Type B vent with straight pipe between the outside termination and the space where the water heater is installed; a condensate drain that is no more than 2 inches higher than the base of the water heater, and allows natural draining without pump assistance; and a gas supply line with a capacity of at least 200,000 Btu per hour.
§ 150.0(l):	Recirculating Loops. Recirculating loops serving multiple dwelling units must meet the requirements of § 110.3(c).
§ 150.0(l):	Solar Water-heating Systems. Solar water-heating systems and collectors must be certified and rated by the Solar Rating and Certification Corporation (SRCC), the International Association of Plumbing and Mechanical Officials, Research and Testing (IAPMO R&T), or by a listing agency that is approved by the Executive Director.
Ducts and Fans Measures:	
§ 110.8(i):	Ducts. Insulation installed on an existing space-conditioning duct must comply with California Mechanical Code (CMC) Section 604.0. If a contractor installs the insulation, the contractor must notify the customer in writing that the insulation meets this requirement.
§ 150.0(m):	CMC Compliance. All air-distribution system ducts and plenums must meet the requirements of the CMC Section 601.0, 602.0, 603.0, 604.0, 605.0 and ANSISMACNA-006-2006 HVAC Duct Construction Standards Metal and Flexible 3rd Edition. Portions of supply-air and return-air ducts and plenums must be insulated to a minimum installed level of R-4.0 or a minimum installed level of R-4.2 when ducts are entirely in conditioned space as confirmed through field verification and diagnostic testing (RA3.1.4.3.8). Portions of the duct system completely exposed and surrounded by directly conditioned space are not required to be insulated. Connections of metal ducts and inner core of flexible ducts must be mechanically fastened. Openings must be sealed with mastic, tape, or other duct-closure system that meets the applicable requirements of UL 181, UL 181A, or UL 181B or aerosol sealant that meets the requirements of UL 723. If mastic or tape is used to seal openings greater than 1/4 inch, the combination of mastic and either mesh or tape must be used. Building cavities, support platforms for air handlers, and plenums designed or constructed with materials other than sealed sheet metal, duct board or flexible duct must not be used to convey conditioned air. Building cavities and support platforms may contain ducts. Ducts installed in cavities and support platforms must not be compressed to cause reductions in the cross-sectional area.
§ 150.0(m):	Factory-Fabricated Duct Systems. Factory-fabricated duct systems must comply with applicable requirements for duct construction, connections, and closures; joints and seams of duct systems and their components must not be sealed with cloth back rubber adhesive duct tapes unless such tape is used in combination with mastic and draw bands.
§ 150.0(m):	Field-Fabricated Duct Systems. Field-fabricated duct systems must comply with applicable requirements for: pressure-sensitive tapes, mastics, sealants, and other requirements specified for duct construction.
§ 150.0(m):	Backdraft Damper. Fan systems that exchange air between the conditioned space and outdoors must have backdraft or automatic dampers.
§ 150.0(m):	Gravity Ventilation Dampers. Gravity ventilating systems serving conditioned space must have either automatic or readily accessible, manually operated dampers in all openings to the outside, except combustion inlet and outlet air openings and elevator shaft vents.
§ 150.0(m):	Protection of Insulation. Insulation must be protected from damage, sunlight, moisture, equipment maintenance, and wind. Insulation exposed to weather must be suitable for outdoor service. For example, protected by aluminum, sheet metal, painted canvas, or plastic cover. Cellular foam insulation must be protected as above or painted with a coating that is water retardant and provides shielding from solar radiation.
§ 150.0(m):	Porous Inner Core Flex Duct. Porous inner core flex ducts must have a non-porous layer between the inner core and outer vapor barrier.
§ 150.0(m):	Duct System Sealing and Leakage Test. When space conditioning systems use forced air duct systems to supply conditioned air to an occupiable space, the ducts must be sealed and duct leakage tested, as confirmed through field verification and diagnostic testing, in accordance with § 150.0(m)11 and Reference Residential Appendix RA3.
§ 150.0(m):	Air Filtration. Space conditioning systems with ducts exceeding 10 feet and the supply side of ventilation systems must have MERV 13 or equivalent filters. Filters for space conditioning systems must have a 2 inch depth or can be 1 inch if sized per Equation 150.0-A. Pressure drops and labeling must meet the requirements in §150.0(m)12. Filters must be accessible for regular service.
§ 150.0(m):	Space Conditioning System Airflow Rate and Fan Efficacy. Space conditioning systems that use ducts to supply cooling must have a hole for the placement of a static pressure probe, or a permanently installed static pressure probe in the supply plenum. Airflow must be ≥ 350 CFM per ton of nominal cooling capacity, and an air-handling unit fan efficacy ≤ 0.45 watts per CFM for gas furnace air handlers and ≤ 0.58 watts per CFM for all others. Small duct high velocity systems must have an airflow ≥ 250 CFM per ton of nominal cooling capacity, and an air-handling unit fan efficacy ≤ 0.62 watts per CFM. Field verification testing is required in accordance with Reference Residential Appendix RA3.3.

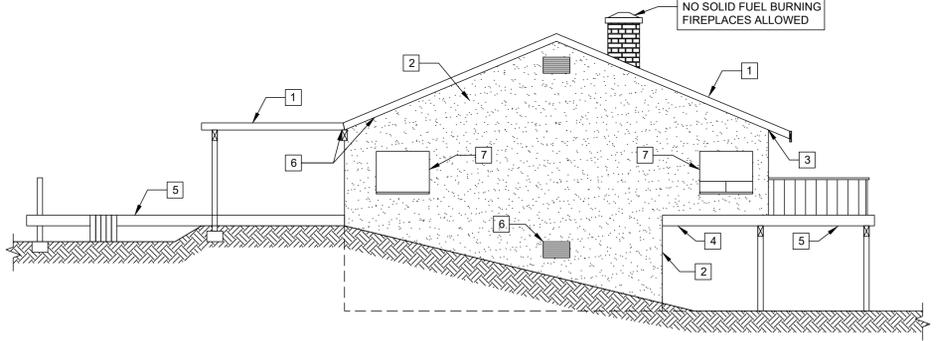


2019 Low-Rise Residential Mandatory Measures Summary

§ 150.0(k):	Interior Switches and Controls. An energy management control system (EMCS) may be used to comply with control requirements if it provides functionality of the specified controls in § 110.9 meets the Installation Certificate requirements of § 130.4; meets the EMCS requirements of § 130.0(e); and meets all other requirements in § 150.0(k).
§ 150.0(k):	Interior Switches and Controls. A multiuse programmable controller may be used to comply with dimmer requirements in § 150.0(k) if it provides the functionality of a dimmer according to § 110.9, and complies with all other applicable requirements in § 150.0(k).
§ 150.0(k):	Interior Switches and Controls. In bedrooms, garages, laundry rooms, and utility rooms, at least one luminaire in each of these spaces must be controlled by an occupant sensor or a vacancy sensor providing automatic-off functionality. If an occupant sensor is installed, it must be initially configured to manual-on operation using the manual control required under Section 150.0(k).
§ 150.0(k):	Interior Switches and Controls. Luminaires that are or contain light sources that meet Reference Joint Appendix JA8 requirements for dimming, and that are not controlled by occupancy or vacancy sensors, must have dimmer controls.
§ 150.0(k):	Interior Switches and Controls. Under cabinet lighting must be controlled separately from ceiling-installed lighting systems.
§ 150.0(k):	Residential Outdoor Lighting. For single-family residential buildings, outdoor lighting permanently mounted to a residential building, or to other buildings on the same lot, must comply with § 150.0(k)(A) (ON and OFF switch) and the requirements in either § 150.0(k)(A) (photocell or other a motion sensor or automatic time switch control) or § 150.0(k)(A) (astronomical time clock), or an EMCS.
§ 150.0(k):	Residential Outdoor Lighting. For low-rise residential buildings with four or more dwelling units, outdoor lighting for private patios, balconies, and porches, and residential parking lots and carports with less than eight vehicles per site must comply with either Section 150.0(k)(A) or with the applicable requirements in Sections 110.9, 130.0, 130.2, 130.4, 140.7 and 141.0.
§ 150.0(k):	Residential Outdoor Lighting. For low-rise residential buildings with four or more dwelling units, any outdoor lighting for residential patios or carports with a total of eight or more vehicles per site and any outdoor lighting not regulated by Section 150.0(k)(B) or Section 150.0(k)(D) must comply with the applicable requirements in Sections 110.9, 130.0, 130.2, 130.4, 140.7 and 141.0.
§ 150.0(k):	Internally illuminated address signs. Internally illuminated address signs must comply with § 140.8; or must consume no more than 5 watts of power as determined according to § 130.0(c).
§ 150.0(k):	Residential Garages for Eight or More Vehicles. Lighting for residential parking garages for eight or more vehicles must 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):	Interior Common Areas of Low-rise Multifamily Residential Buildings. In a low-rise multifamily residential building where the total interior common area in a single building equals 20 percent or less of the floor area, permanently installed lighting for the interior common areas in that building must be comply with Table 150.0-A and be controlled by an occupant sensor.
§ 150.0(k):	Interior Common Areas of Low-rise Multifamily Residential Buildings. In a low-rise multifamily residential building where the total interior common area in a single building equals more than 20 percent of the floor area, permanently installed lighting for the interior common areas in that building must: 1. Comply with the applicable requirements in Sections 110.9, 130.0, 130.1, 140.6 and 141.0, and 2. Lighting installed in corridors and stairwells must be controlled by occupant sensors that reduce the lighting power in each space by at least 50 percent. The occupant sensors must be capable of turning the light fully on and off from all designated paths of ingress and egress.
Solar Ready Buildings:	
§ 110.10(a):	Single Family Residences. Single family residences located in subdivisions with ten or more single family residences and where the application for a tentative subdivision map for the residences has been deemed complete and approved by the enforcement agency, which do not have a photovoltaic system installed, must comply with the requirements of § 110.10(b) through § 110.10(e).
§ 110.10(a):	Low-rise Multifamily Buildings. Low-rise multifamily buildings that do not have a photovoltaic system installed must comply with the requirements of § 110.10(b) through § 110.10(e).
§ 110.10(b):	Minimum Solar Zone Area. The solar zone must have a minimum total area as described below. The solar zone must comply with access, pathway, smoke ventilation, and spacing requirements as specified in Title 24, Part 9 or other Parts of Title 24 or in any requirements adopted by a local jurisdiction. The solar zone total area must be comprised of areas that have no dimension less than 5 feet and are no less than 80 square feet each for buildings with total area less than or equal to 10,000 square feet or no less than 160 square feet each for buildings with roof areas greater than 10,000 square feet. For single family residences, the solar zone must be located on the roof or overhang of the building and have a total area no less than 250 square feet. For low-rise multifamily buildings the solar zone must be located on the roof or overhang of the building, or on the roof or overhang of another structure located within 250 feet of the building, or on covered parking installed with the building project, and have a total area no less than 15 percent of the total roof area of the building excluding any skylight area. The solar zone requirement is applicable to the entire building, including steep-sloped occupancy.
§ 110.10(b):	Azimuth. All sections of the solar zone located on steep-sloped roofs must be oriented between 90 degrees and 300 degrees of true north.
§ 110.10(b):	Shading. The solar zone must not contain any obstructions, including but not limited to: vents, chimneys, architectural features, and roof mounted equipment.
§ 110.10(b):	Shading. Any obstruction located on the roof or any other part of the building that projects above a solar zone must be located at least twice the distance, measured in the horizontal plane, of the height difference between the highest point of the obstruction and the horizontal projection of the nearest point of the solar zone, measured in the vertical plane.
§ 110.10(b):	Structural Design Loads on Construction Documents. For areas of the roof designated as a solar zone, the structural design loads for roof dead load and roof live load must be clearly indicated on the construction documents.
§ 110.10(b):	Interconnection Pathways. The construction documents must indicate a location reserved for inverters and metering equipment and a pathway reserved for routing of conduit from the solar zone to the point of interconnection with the electrical service; and for single family residences and central water-heating systems, a pathway reserved for routing plumbing from the solar zone to the water-heating system.
§ 110.10(b):	Documentation. A copy of the construction documents or a comparable document indicating the information from § 110.10(b) through § 110.10(c) must be provided to the occupant.
§ 110.10(e):	Main Electrical Service Panel. The main electrical service panel must have a minimum busbar rating of 200 amps.
§ 110.10(e):	Main Electrical Service Panel. The main electrical service panel must have a reserved space to allow for the installation of a double pole circuit breaker for a future solar electric installation. The reserved space must be permanently marked as "For Future Solar Electric".

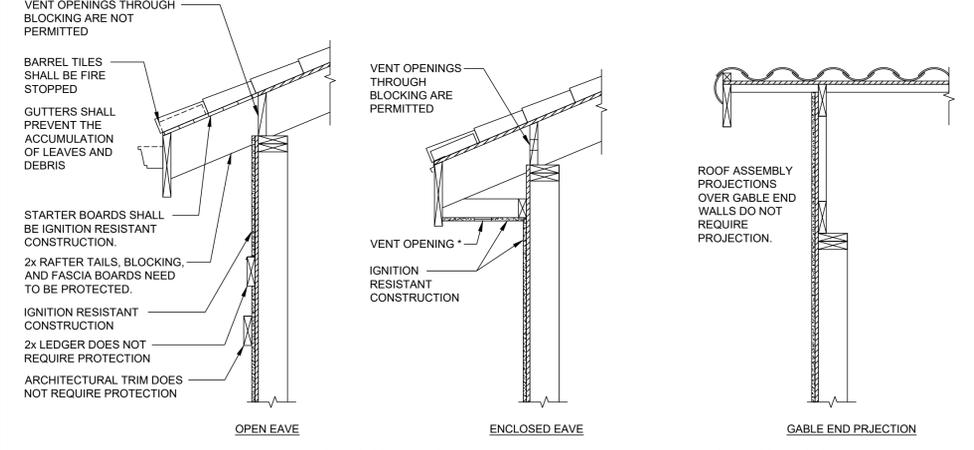
MATERIALS AND CONSTRUCTION METHODS FOR EXTERIOR WILDFIRE EXPOSURE:

- Any new buildings, additions, alterations or repairs made to existing buildings located or moved within a State Responsibility Area or Wildland-Urban Interface Fire Area shall comply with Chapter R337. [§ R337.1.3, Los Angeles County Code]
- Group U accessory buildings located less than 50 feet from an applicable building shall comply with Chapter R337. Group U accessory buildings not exceeding 120 square feet and located at least 30 feet from an applicable building are exempt from this section. [§R337.1.3 CRC]
- When provided, valley flashings shall be not less than 0.019-inch (No. 26 galvanized sheet gage) corrosion-resistant metal installed over a minimum 36-inch wide underlayment consisting of one layer of 72 pound mineral-surfaced nonperforated cap sheet complying with ASTM D3909 running the full length of the valley. [§R337.5.3 CRC]
- Roof gutters shall be provided with the means to prevent the accumulation of leaves and debris in the gutter. [§R337.5.4]
- Exterior porch ceilings shall be approved noncombustible material, ignition-resistant material, one layer of 5/8" Type X gypsum board, the exterior portion of an approved one-hour wall assembly, or have the horizontal underside meet the performance criteria of SFM 12-7A-3 or ASTM E2957. [§R337.7.6 CRC]
- Underfloor area of elevated or overhanging buildings and appendages shall be enclosed to grade or shall be approved noncombustible material, ignition-resistant material, one layer of 5/8" Type X gypsum board, the exterior portion of an approved one-hour wall assembly or have the horizontal underside meet the performance criteria of SFM 12-7A-3 or ASTM E2957. Heavy timber columns and beams do not require protection. [§R337.7.8, R337.7.9 CRC]
- Awnings shall have frames of noncombustible material, fire-retardant-treated wood, heavy timber, or one-hour construction with combustible or noncombustible covers. [§R337.10.2 CRC, 3105 CBC]



- Roof coverings shall be Class A as specified in Section R902.1. Where the roof profile allows a space between the roof covering and the roof decking, the spaces shall be constructed to prevent the intrusion of flames and embers, be firestopped with approved materials and have one layer of 72 pound mineral-surfaced nonperforated cap sheet complying with ASTM D3909 installed over the combustible decking. Wood shingles and wood shakes are prohibited. [§R337.5.2 CRC]
- Exterior wall covering or wall assembly shall be approved noncombustible material, ignition-resistant material, heavy timber, log wall construction or shall meet the performance criteria of standard SFM 12-7A-1 for 10 minute direct flame contact exposure test. Alternatively, one layer of 5/8-inch Type X gypsum sheathing shall be applied behind the exterior covering or cladding on the exterior side of the framing. [§R337.7.3 CRC]
- Exterior wall coverings shall extend from the top of the foundation to the roof, and terminate at 2-inch nominal solid wood blocking between rafters and eaves at all roof overhangs, or in the case of enclosed eaves, terminate at the enclosure. [§R337.7.3.1 CRC]
- The exposed roof deck on the underside of unenclosed eaves shall be approved noncombustible material, ignition-resistant material, one layer of 5/8" Type X gypsum board, or exterior portion of an approved one-hour wall assembly. [§R337.7.4 CRC]
Exceptions
a. Solid wood rafter tails having a minimum nominal dimension of 2 inches.
b. Solid wood blocking with a minimum nominal dimension of 2 inches installed between rafter tails.
- Enclosed eaves and eave soffits shall be approved noncombustible material, ignition-resistant material, one layer of 5/8" Type X gypsum board, the exterior portion of an approved one-hour wall assembly, or have the horizontal underside meet the performance criteria of SFM 12-7A-3 or ASTM E2957. [§R337.7.5 CRC]
- Exposed underside of floor projections over an exterior wall shall be approved noncombustible material, ignition-resistant material, one layer of 5/8" Type X gypsum board, the exterior portion of an approved one-hour wall assembly or have the horizontal underside meet the performance criteria of SFM 12-7A-3 or ASTM E2957. [§R337.7.7 CRC]
- Walking surface material of decks, porches, balconies and stairs located within 10 feet of the building shall be ignition-resistant material complying with both SFM 12-7A-4 and SFM 12-7A-5, exterior fire retardant-treated wood, noncombustible material or meet the requirements of SFM 12-7A-4A when the exterior wall covering is either noncombustible or ignition-resistant. [§R337.9.2, R337.9.3 CRC]
- Roof and underfloor vents shall be protected by corrosion-resistant, noncombustible wire mesh with openings a minimum of 1/16-inch and shall not exceed 1/8-inch. [§R337.6.2 CRC]
- Vents shall not be installed on the underside of eaves and cornices, unless the vents are approved to resist the intrusion of flame and embers, the attic space is sprinklered in accordance with CBC Sec. 903.3.1.1, or if the exterior wall and underside of the eave are of ignition resistant materials and the vents are located more than 12 feet from the ground or walking surface. [§R337.6.3 CRC]
- Exterior windows and exterior glazed doors shall be multiple-pane glazing with a minimum of one tempered pane, glass block units, have a fire resistance rating of 20 minutes when tested in accordance with NFPA 257, or meet the requirements of SFM 12-7A-2. [§R337.8.2.1 CRC]
- Exterior doors shall be of approved noncombustible construction or ignition-resistant material, solid core wood having stiles and rails not less than 1-3/8 inches thick with interior field panel thickness no less than 1-1/4 inches thick, shall have a fire-resistance rating of not less than 20 minutes when tested according to NFPA 252 or meet the requirements of SFM-7A-1. [§R337.8.3 CRC]

PROTECTION OF ROOF EAVES AND PROJECTIONS



- VENT OPENINGS ARE PERMITTED IN THE UNDERSIDE OF ENCLOSED EAVES IN ACCORDANCE WITH EITHER ONE OF THE FOLLOWING CONDITIONS:
 - THE ATTIC SPACE BEING VENTILATED IS FULLY PROTECTED BY AN AUTOMATIC SPRINKLER SYSTEM INSTALLED IN ACCORDANCE WITH CBC Sec. 903.3.1.1.
 - THE EXTERIOR WALL COVERING AND EXPOSED UNDERSIDE OF THE EAVE ARE OF NONCOMBUSTIBLE OR IGNITION RESISTANT MATERIALS AND THE VENT IS LOCATED MORE THAN 12 FEET FROM THE GROUND OR WALKING SURFACE OF A DECK, PORCH, PATIO OR SIMILAR SURFACE.

VENT OPENINGS SHALL BE COVERED WITH A NONCOMBUSTIBLE, CORROSION RESISTANT MATERIAL HAVING $\frac{1}{8}$ " OPENINGS.

PLAN CHECK # :
PERMIT # :
ADDRESS:
"THESE CODE REQUIREMENTS GOVERN