

# MANDATORY MEASURES SUMMARY: RESIDENTIAL (Page 1 of 2) MF-1R

Project Title	Date
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Note: Low-rise residential buildings subject to the Standards must contain these measures regardless of the compliance approach used. More stringent compliance requirements from the Certificate of Compliance supersede the items marked with an asterisk (\*) below. When this checklist is incorporated into the permit documents, the features noted shall be considered by all parties as minimum component performance specifications for the mandatory measures whether they are shown elsewhere in the documents or on this checklist only.

**Instructions:** Check or initial applicable boxes when completed or check NA if not applicable.

DESCRIPTION	NA	Designer	Enforce-ment
<b>Building Envelope Measures:</b>	✓	✓	✓
* §150(a): Minimum R-19 in wood frame ceiling insulation or equivalent U-factor in metal frame ceiling.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§150(b): Loose fill insulation manufacturer's labeled R-Value: _____.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
* §150(c): Minimum R-13 wall insulation in wood framed walls or equivalent U-factor in metal frame walls (does not apply to exterior mass walls).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
* §150(d): Minimum R-13 raised floor insulation in framed floors or equivalent U-factor.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§150(e): Installation of Fireplaces, Decorative Gas Appliances and Gas Logs.			
1. Masonry and factory-built fireplaces have:			
a. closeable metal or glass door covering the entire opening of the firebox	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. outside air intake with damper and control, flue damper and control	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. No continuous burning gas pilot lights allowed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§150(f): Air retarding wrap installed to comply with §151 meets requirements specified in the ACM Residential Manual.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§150(g): Vapor barriers mandatory in Climate Zones 14 and 16 only.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§150(i): Slab edge insulation - water absorption rate for the insulation material alone without facings no greater than 0.3%, water vapor permeance rate no greater than 2.0 perm/inch.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§118: Insulation specified or installed meets insulation installation quality standards. Indicate type and include CF-6R Form: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§116-17: Fenestration Products, Exterior Doors, and Infiltration/Exfiltration Controls.			
1. Doors and windows between conditioned and unconditioned spaces designed to limit air leakage.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Fenestration products (except field-fabricated) have label with certified U-factor, certified Solar Heat Gain Coefficient (SHGC), and infiltration certification.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Exterior doors and windows weatherstripped; all joints and penetrations caulked and sealed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Space Conditioning, Water Heating and Plumbing System Measures:</b>			
§110-§113: HVAC equipment, water heaters, showerheads and faucets certified by the Energy Commission.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§150(h): Heating and/or cooling loads calculated in accordance with ASHRAE, SMACNA or ACCA.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§150(i): Setback thermostat on all applicable heating and/or cooling systems.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§150(j): Water system pipe and tank insulation and cooling systems line insulation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1. Storage gas water heaters rated with an Energy Factor less than 0.58 must be externally wrapped with insulation having an installed thermal resistance of R-12 or greater.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Back-up tanks for solar system, unfired storage tanks, or other indirect hot water tanks have R-12 external insulation or R-16 internal insulation and indicated on the exterior of the tank showing the R-value.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. The following piping is insulated according to Table 150-A/B or Equation 150-A Insulation Thickness:			
1. First 5 feet of hot and cold water pipes closest to water heater tank, non-recirculating systems, and entire length of recirculating sections of hot water pipes shall be insulated to Table 150B.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Cooling system piping (suction, chilled water, or brine lines), piping insulated between heating source and indirect hot water tank shall be insulated to Table 150-B and Equation 150-A.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Steam hydronic heating systems or hot water systems >15 psi, meet requirements of Table 123-A.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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<b>Space Conditioning, Water Heating and Plumbing System Measures: (continued)</b>	<b>NA</b> ✓	<b>Designer</b>	<b>Enforce-ment</b>
5. Insulation must be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Insulation for chilled water piping and refrigerant suction piping includes a vapor retardant or is enclosed entirely in conditioned space.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Solar water-heating systems/collectors are certified by the Solar Rating and Certification Corporation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>* §150(m): Ducts and Fans</b>			
1. All ducts and plenums installed, sealed and insulated to meet the requirement of the CMC Sections 601, 602, 603, 604, 605 and Standard 6-5; supply-air and return-air ducts and plenums are insulated to a minimum installed level of R-4.2 or enclosed entirely in conditioned space. Openings shall 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 shall be used.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Building cavities, support platforms for air handlers, and plenums defined or constructed with materials other than sealed sheet metal, duct board or flexible duct shall not be used for conveying conditioned air. Building cavities and support platforms may contain ducts. Ducts installed in cavities and support platforms shall not be compressed to cause reductions in the cross-sectional area of the ducts.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Joints and seams of duct systems and their components shall not be sealed with cloth back rubber adhesive duct tapes unless such tape is used in combination with mastic and draw bands.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Exhaust fan systems have back draft or automatic dampers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Gravity ventilating systems serving conditioned space have either automatic or readily accessible, manually operated dampers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Protection of Insulation. Insulation shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind. Cellular foam insulation shall be protected as above or painted with a coating that is water retardant and provides shielding from solar radiation that can cause degradation of the material.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Flexible ducts cannot have porous inner cores.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>§114: Pool and Spa Heating Systems and Equipment.</b>			
1. A thermal efficiency that complies with the Appliance Efficiency Regulations, on-off switch mounted outside of the heater, weatherproof operating instructions, no electric resistance heating and no pilot light.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. System is installed with:			
a. at least 36" of pipe between filter and heater for future solar heating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. cover for outdoor pools or outdoor spas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Pool system has directional inlets and a circulation pump time switch.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>§115: Gas fired fan-type central furnaces, pool heaters, spa heaters or household cooking appliances have no continuously burning pilot light. (Exception: Non-electrical cooking appliances with pilot &lt; 150 Btu/hr)</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>§118(i): Cool Roof material meets specified criteria</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Residential Lighting Measures:</b>			
<b>§150(k)1: HIGH EFFICACY LUMINAIRES OTHER THAN OUTDOOR HID: contain only high efficacy lamps as outlined in Table 150-C, and do not contain a medium screw base socket (E24/E26). Ballast for lamps 13 watts or greater are electronic and have an output frequency no less than 20 kHz</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>§150(k)1: HIGH EFFICACY LUMINAIRES - OUTDOOR HID: contain only high efficacy lamps as outlined in Table 150-C, luminaire has factory installed HID ballast</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>§150(k)2: Permanently installed luminaires in kitchens shall be high efficacy luminaires. Up to 50 percent of the wattage, as determined in § 130 (c), of permanently installed luminaires in kitchens may be in luminaires that are not high efficacy luminaires, provided that these luminaires are controlled by switches separate from those controlling the high efficacy luminaires.</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>§150(k)3: Permanently installed luminaires in bathrooms, garages, laundry rooms utility rooms shall be high efficacy luminaires. OR are controlled by an occupant sensor(s) certified to comply with Section 119(d) that does not turn on automatically or have an always on option.</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>§150(k)4: Permanently installed luminaires located other than in kitchens, bathrooms, garages, laundry rooms, and utility rooms shall be high efficacy luminaires (except closets less than 70ft<sup>2</sup>): OR are controlled by a dimmer switch OR are controlled by an occupant sensor that complies with Section 119(d) that does not turn on automatically or have an always on option.</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>§150(k)5: Luminaires that are recessed into insulated ceilings are approved for zero clearance insulation cover (IC) and are certified airtight to ASTM E283 and labeled as air tight (AT) to less than 2.0 CFM at 75 Pascals.</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>§150(k)6: Luminaires providing outdoor lighting and permanently mounted to a residential building or to other buildings on the same lot shall be high efficacy luminaires (not including lighting around swimming pools/water features or other Article 680 locations) OR are controlled by occupant sensors with integral photo control certified to comply with Section 119(d).</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>§150(k)7: Lighting for parking lots for 8 or more vehicles shall have lighting that complies with Sec. 130, 132, and 147. Lighting for parking garages for 8 or more vehicles shall have lighting that complies with Sec. 130, 131, and 146.</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>§150(k)8: 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 OR are controlled by occupant sensor(s) certified to comply with Section 119(d).</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>