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INDOOR AIR QUALITY AND MECHANICAL VENTILATION

CERTIFICATE OF INSTALLATION		CF2R-MCH-27-H
Indoor Air Quality and Mechanical Ventilation		(Page 1 of 5)
Project Name:	Enforcement Agency:	Permit Number:
Dwelling Address:	City:	Zip Code:

Title 24, Part 6, Section 150.0(o) **Ventilation for Indoor Air Quality.** All dwelling units shall meet the requirements of ANSI/ASHRAE Standard62.2-2016 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings subject to the amendments specified by Title 24, Part 6, Section 150.0(o)1

A. Dwelling Mechanical Ventilation - General Information

01	Dwelling Unit Name	
02	Building Type	
03	Project Scope	
04	Total Conditioned Floor Area of Dwelling Unit (For addition projects the conditioned floor area equals existing area plus addition area)	
05	Number of Bedrooms in Dwelling Unit (For addition projects the number of bedrooms equals the existing bedrooms plus addition bedrooms)	
06	Ventilation System Type	
07	Ventilation Operation Schedule	

Note:
Non-dwelling units do not meet the definition for a dwelling unit as defined in Section 100.1(b). Non-dwelling units are not designed to provide independent living facilities and do not provide permanent provisions for living, sleeping, eating, cooking and sanitation.

MCH-27b – Multifamily Ventilation

B. Ventilation - Total Ventilation Rate

A mechanical supply system, exhaust system, or combination thereof shall provide whole-building ventilation with outdoor air each hour at no less than the rate in 150.0(o)1Ci

01	Total Required Ventilation rate, (Q_{tot})	

C. Installed Ventilation - Total Ventilation Rate

A mechanical supply system, exhaust system, or combination thereof shall provide whole-building ventilation with outdoor air each hour at no less than the rate in 150.0(o)1Ci

01	02	03	04	05
Fan Name	Fan Location	Runtime (Min/Hr)	Installed Mechanical Ventilation Rate (CFM)	Equivalent Continuous Ventilation (CFM)
06	Total Installed Equivalent Continuous Ventilation (CFM)			

D. Additional Envelope Requirements

01	Envelope Leakage	

E. Additional Central Ventilation System Balancing Requirements

01	Maximum Ventilation Flow (CFM)	

F. Compliance Statement

01	

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	G. Other Requirements
	The items listed below (6.1 through 6.6 and 6.8 through 6.9) correspond to the information given in ASHRAE 62.2 Section 6 "Other Requirements". Refer also to Chapter 4.6 of the Residential Compliance Manual (Section 4.6.8) for information describing these "Other Requirements". The signature of the Responsible Person in the declaration statement below certifies that the building complies with these requirements specified in ASHRAE 62.2 Section 6.1 through 6.9 if applicable.
01	a. **Adjacent Spaces and Transfer Air.** Measures shall be taken to minimize air movement across envelope components to dwelling units from adjacent spaces such as garages, unconditioned crawlspaces, unconditioned attics, and other dwelling. Supply and balanced ventilation systems shall be designed and constructed to provide ventilation air directly from the outdoors. 6.1.1 **Compliance for Attached Dwelling Units**. One method of demonstrating compliance with Section 6.1 shall be to verify a leakage rate below a maximum of 0.3 cfm per ft^2 (150 L/s per 100 m2) of the dwelling unit envelope area (i.e., the sum of the area of walls between dwelling units, exterior walls, ceiling, and floor) at a test pressure of 50 Pa by a blower door test conducted in accordance with either ANSI/ASTME779 or ANSI/ASTM-E1827. The test shall be conducted with the dwelling unit as if it were exposed to outdoor air on all sides, top, and bottom by opening doors and windows of adjacent dwelling units.
02	**6.2 Instructions and Labeling.** Information on the ventilation design and/or ventilation systems installed, instructions on their proper operation to meet the requirements of this standard, and instructions detailing any required maintenance (similar to that provided for HVAC systems) shall be provided to the owner and the occupant of the dwelling unit. Controls shall be labeled as to their function (unless that function is obvious, such as toilet exhaust fan switches). See Section 13 of ASHRAE Guideline 24 [5] for information on instructions and labeling.
03	**6.3 Clothes Dryers.** Clothes dryers shall be exhausted directly to the outdoors. Exception: Condensing dryers plumbed to a drain.
04	**6.4 Combustion and Solid-Fuel Burning Appliances.** 6.4.1 Combustion and solid-fuel-burning appliances must be provided with adequate combustion and ventilation air and installed in accordance with manufacturers' installation instructions; NFPA 54/ANSI Z223.1, *National Fuel Gas Code*; NFPA 31, *Standard for the Installation of Oil-Burning Equipment*; or NFPA 211, *Standard for Chimneys, Fireplaces, Vents, and Solid-Fuel Burning Appliances*, or other equivalent code acceptable to the building official. 6.4.2 Where atmospherically vented combustion appliances or solid-fuelburning appliances are located inside the pressure boundary, the total net exhaust flow of the two largest exhaust fans (not including a summer cooling fan intended to be operated only when windows or other air inlets are open) shall not exceed 15 cfm per 100 ft2 (75 L/s per 100 m2) of occupiable space when in operation at full capacity. If the designed total net flow exceeds this limit, the net exhaust flow must be reduced by reducing the exhaust flow or providing compensating outdoor air. Gravity or barometric dampers in nonpowered exhaust makeup air systems shall not be used to provide compensating outdoor air. Atmospherically vented combustion appliances do not include direct-vent appliances. Combustion appliances that pass safety testing performed according to ANSI/BPI-1200, Standard Practice for Basic Analysis of Buildings,21 shall be deemed as complying with Section 6.4.2.
05	**6.5 Air tightness Requirements** 6.5.1 **Garages.** When an occupiable space adjoins a garage, the design must prevent migration of contaminants to the adjoining occupiable space. Air seal the walls, ceilings, and floors that separate garages from occupiable space. To be considered air-sealed, all joints, seams, penetrations, openings between door assemblies and their respective jambs and framing, and other sources of air leakage through wall and ceiling assemblies separating the garage from the residence and its attic area shall be caulked, gasketed, weather stripped, wrapped, or otherwise sealed to limit air movement. Doors between garages and occupiable spaces shall be gasketed or made substantially airtight with weather stripping.
06	**6.6 Ventilation Opening Area.** Spaces shall have ventilation openings as listed below. Such openings shall meet the requirements of Section 6.8. Exception: Attached dwelling units and spaces that meet the local ventilation requirements set for bathrooms in Section 5 [of ASHRAE 62.2]. 6.6.1 **Habitable Spaces.** Each habitable space shall be provided with ventilation openings with an openable area not less than 4% of the floor area or less than 5 ft2 (0.5 m2). 6.6.2 **Toilets and Utility Rooms**. Toilets and utility rooms shall be provided with ventilation openings with an openable area not less than 4% of the room floor area or less than1.5 ft2 (0.15 m2). Exceptions: 1. Utility rooms with a dryer exhaust duct. 2. Toilet compartments in bathrooms.

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07	**6.8 Air Inlets.** Air inlets that are part of the ventilation design shall be located a minimum of 10 ft (3 m) from known sources of contamination such as a stack, vent, exhaust hood, or vehicle exhaust. The intake shall be placed so that entering air is not obstructed by snow, plantings, or other material. Forced air inlets shall be provided with rodent/insect screens (mesh not larger than 1/2 in. [13 mm]). Exceptions: 1. Ventilation openings in the wall may be as close as a stretched-string distance of 3 ft (1 m) from sources of contamination exiting through the roof or dryer exhausts. 2. No minimum separation distance shall be required between windows and local exhaust outlets in kitchens and bathrooms. 3. Vent terminations covered by and meeting the requirements of the National Fuel Gas Code (NFPA 54/ANSI Z223.1)7 or equivalent. 4. Where a combined exhaust/intake termination is used to separate intake air from exhaust air originating in a living space other than kitchens, no minimum separation distance between these two openings is required. For these combined terminations, the exhaust air concentration within the intake airflow shall not exceed 10%, as established by the manufacturer.
08	**6.9 Carbon Monoxide Alarms.** A carbon monoxide alarm shall be installed in each dwelling unit in accordance with NFPA 720, *Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment*, and shall be consistent with requirements of applicable laws, codes, and standards.
The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.	

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H. Air Moving Equipment

The items listed below (7.1 through 7.4) correspond to the information given in ASHRAE 62.2 Section 7 "Air-Moving Equipment". Refer also to Chapter 4.6 of the Residential Compliance Manual (Section 4.6.9) for information describing these requirements in more detail. The signature of the Responsible Person in the declaration statement below certifies that the building complies with these requirements specified in ASHRAE 62.2 Section 7.1 through 7.4 if applicable.

01	**7.1 Selection and Installation.** Ventilation devices and equipment serving individual dwelling units shall be tested in accordance with ANSI/ASHRAE Standard 51/AMCA 210, *Laboratory Methods of Testing Fans for Aerodynamic Performance Rating*, and ANSI/AMCA Standard 300, *Reverberant Room Method for Sound Testing of Fans*, and rated in accordance with the airflow and sound rating procedures of the Home Ventilating Institute (HVI) (HVI 915, *Loudness Testing and Rating Procedure*; HVI 916, *Air Flow Test Procedure* ; and HVI 920, *Product Performance Certification Procedure Including Verification and Challenge*). Installations of systems or equipment shall be carried out in accordance with manufacturers' design requirements and installation instructions.
02	**7.2 Sound Ratings for Fans.** Ventilation fans shall be rated for sound at no less than the minimum airflow rate required by this standard as noted below. These sound ratings shall be at a minimum of 0.1 in. of water (25 Pa) static pressure in accordance with the HVI procedures referenced in Section 7.1. Exception: HVAC air handlers and remote mounted fans need not meet sound requirements. To be considered for this exception, a remote mounted fan must be mounted outside the habitable spaces, bathrooms, toilets, and hallways, and there must be at least 4 ft (1 m) of ductwork between the fan and the intake grille. 7.2.1 **Dwelling-Unit Ventilation or Continuous Local Exhaust Fans.** These fans shall be rated for sound at a maximum of 1.0 sone. 7.2.2 **Demand-Controlled Local Exhaust Fans.** Bathroom exhaust fans used to comply with Section 5.2 shall be rated for sound at a maximum of 3 sone. Kitchen exhaust fans used to comply with Section 5.2 shall be rated for sound at a maximum of 3 sones at one or more airflow settings greater than or equal to 100 cfm (47 L/s). Exceptions: 1. Fans with a minimum airflow setting exceeding 400 cfm (189 L/s) need not comply. 2. Kitchen Range hoods may be rated for sound at the static pressure determined at working speed as specified in HVI 916 section 7.
03	**7.3 Exhaust Ducts.** 7.3.1 **Multiple Exhaust Fans Using One Duct.** Exhaust fans in separate dwelling units shall not share a common exhaust duct. If more than one of the exhaust fans in a single dwelling unit shares a common exhaust duct, each fan shall be equipped with a backdraft damper to prevent the recirculation of exhaust air from one room to another through the exhaust ducting system. 7.3.2 **Single Exhaust Fan Ducted to Multiple Inlets.** Where exhaust inlets are commonly ducted across multiple dwelling units, one or more exhaust fans located downstream of the exhaust inlets shall be designed and intended to run continuously, or a system of one or more backdraft dampers shall be installed to isolate each dwelling unit from the common duct when the fan is not running.
04	**7.4 Supply Ducts.** Where supply outlets are commonly ducted across multiple dwelling units, one or more supply fans located upstream of all the supply outlets shall be designed and intended to run continuously, or a system of one or more backdraft dampers shall be installed to isolate each dwelling unit from the common duct when the fan is not running.

The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.

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DOCUMENTATION AUTHOR'S DECLARATION STATEMENT	
1. I certify that this Certificate of Installation documentation is accurate and complete.	
Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/HERS Certification Identification (if applicable):
City/State/Zip:	Phone:

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Installation is true and correct.
2. I am either: a) a responsible person eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the Certificate of Compliance, plans, and specifications approved by the enforcement agency.
4. I understand that a HERS rater will check the installation to verify compliance and if such checking determines the installation fails to comply, I am required to offer any necessary corrective action at no charge to the building owner.
5. I will ensure that a registered copy of this Certificate of Installation shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a registered copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	

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CF2R-MCH-27b-H User Instructions

Section A. General Information

1. Building Unit Name: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document. This is the unique identifier for this dwelling unit. Needed mostly for multifamily dwelling units. Ventilation is calculated and provided for each dwelling unit individually.
2. Building Type: This field is filled out automatically. It is referenced from the CF1R. Values are "Single Family Attached", "Single Family Detached" and "Multifamily". User is allowed to overwrite imported value with "Non-dwelling unit" selection.
3. Project Scope: This field is filled out automatically. It is referenced from the CF1R.
    - If parent document is the CF1R-PRF-01, values are "Newly Constructed", "Newly Constructed (Addition Alone)" and "Addition and /or Alteration"
    - If parent document is CF1R-NCB-01, values are "Newly Constructed" and "Newly Constructed (Addition Alone)"
    - If parent document is CF1R-ADD-01, values are "ADU Addition < 300 ft^2"," ADU Addition > 300 to < 400 ft^2"," ADU Addition > 400 to < 700 ft^2" and "ADU Addition > 700 to < 1000 ft^2".
4. Total Conditioned Floor Area of Dwelling Unit: This field is filled out automatically. It is referenced from the CF2R-MCH-01.
5. Number of Bedrooms in Dwelling Unit: This field is filled out automatically. It is referenced from the CF2R-MCH-01.
6. Ventilation system Type: This may be filled out automatically or be user input.
    - If parent document is the CF1R-PRF-01, the value will be filled out automatically.
    - If building type is equal to Non-dwelling unit, an N/A value will be filled out automatically.
    - If parent document is the CF1R-NCB or CF1R-ADD, user selects from list of Supply, Exhaust, Balanced, Balanced – ERV, Balanced – HRV, Central Fan Integrated (CFI), Central Ventilation System – Supply and Central Ventilation System – Exhaust and Central Ventilation System Balanced.
7. Ventilation operation schedule: This may be filled out automatically or be user input.
    - If building type is equal to Non-dwelling unit, an N/A value will be filled out automatically.
    - User selects from list of Continuous, Short-Term Average, Scheduled and Real-time Control.
    - Note if "Ventilation System Type" (A11) = Central Fan Integrated & "Ventilation Operation Schedule" (A12) = Continuous; then user will not be allowed to proceed.

Section B. Whole Building Continuous Ventilation – Total Ventilation Rate Method

1. This value is automatically calculated using equation 150.0-B from the Energy Standards.

Section C. Installed Ventilation – Total Ventilation Rate Method

2. User input text identifying the fan name for each installed ventilation fan.
3. User input text identifying the fan location for each installed ventilation fan.
4. Runtime (Min/Hr): This value may be filled out automatically or be user input.
    - If ventilation operation schedule from section A = "continuous", then value of 60 will be automatically entered.
    - If ventilation operation schedule from section A = "short term average", then user enter value of less than or equal to 60 for each installed ventilation fan.
5. User to enter CFM value from test procedures described in RA3.7.4 for each installed ventilation fan.
6. Equivalent continuous ventilation CFM is automatically calculated for each ventilation fan.
7. Total installed equivalent continuous ventilation CFM is automatically calculated based on the installed ventilation fans.

Section D. Additional Envelope Requirements

1. Envelope Leakage: This field is filled out automatically. It is referenced from the CF2R-MCH-24, which must be completed prior to this document.

Section E. Additional Central Ventilation System Balancing Requirements

1. Maximum Ventilation Flow (CFM): This field is filled out automatically calculated.

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