

CERTIFICATE OF INSTALLATION			CF2R-MCH-27-H
Indoor Air Quality and Mechanical Ventilation			(Page 1 of 7)
Project Name:	126 Dorchester Dr.	Enforcement Agency:	County of Sonoma
		Permit Number:	BLD18-2671
Dwelling Address:	126 Dorchester Dr.	City:	Santa Rosa
		Zip Code:	95403

Title 24, Part 6, Section 150.0(o) **Ventilation for Indoor Air Quality.** All dwelling units shall meet the requirements of ANSI/ASHRAE Standard 62.2. Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings. **Equation and table numbering on this form corresponds to the numbering for that information in the published ANSI/SHRAE Standard 62.2-2010.**

A. Dwelling Mechanical Ventilation - General Information		
01	Dwelling unit name	126 Dorchester Dr.
02	Building Type	Single Family
03	Project scope	Newly constructed building
04	Total Conditioned Floor Area of Dwelling Unit (For addition projects the conditioned floor area equals existing area plus addition area.)	1461
05	Number of bedrooms in dwelling unit (For addition projects the number of bedrooms equals the existing bedrooms plus addition bedrooms)	0
06	Ventilation Operation Schedule	Continuous
07	Whole-Building Ventilation Rate Calculation Method	Fan Ventilation Rate Method (4.1.1)
08	Whole Building Ventilation System Type	Standalone - Exhaust
09	IAQ Fan Location	CEILING
<p>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.</p>		

MCH-27a - Continuous Ventilation Airflow - Fan Ventilation Rate Method

B. Whole-Building Continuous Ventilation - Fan Ventilation Rate Method		
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 equation 4.1a.		
01	Required Continuous Whole-Building Ventilation Rate (Q_{fan})	22
02	Installed Continuous Whole-Building Ventilation Rate	81

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C. Compliance Statement		
01	Building passes continuous whole-building ventilation rate test	



D. Local Mechanical Exhaust System - Fan selection and duct design criteria for compliance

Local mechanical exhaust fans shall be installed in each kitchen and bathroom. Delivered local ventilation rates:

- All local ventilation rates have been measured using a flow hood, flow grid, or other airflow measuring device and meet the requirements of 62.2 Tables 5.1 or 5.2. OR
- The airflow rating at a pressure of 0.25 in. w.c. of a certified fan is assumed because the local ventilation system duct sizing meets the prescriptive requirements of 62.2 Table 5.3, or manufacturer's design criteria.

**Table 5.1
Intermittent Local Ventilation Exhaust Airflow Rates**

Application	Airflow	Notes
Kitchen	100 cfm	Vented range hood (including appliance-range hood combinations) required if exhaust fan flow is less than 5 ACH.
Bathroom	50 cfm	

**Table 5.2
Continuous Local Ventilation Exhaust Airflow Rates**

Application	Airflow	Notes
Kitchen	5 ACH	Based on Kitchen volume.
Bathroom	20 cfm	

**Table 5.3
Prescriptive Duct Sizing Requirements**

Duct Type	Flex Duct				Smooth Duct			
	50	80	100	125	50	80	100	125
Fan Rating cfm @ 0.25 in. w.g.								
	Maximum Allowable Duct Length (ft)							
Diameter, (in)	Flex Duct				Smooth Duct			
3	X	X	X	X	5	X	X	X
4	70	3	X	X	105	35	5	X
5	NL	70	35	20	NL	135	85	55
6	NL	NL	125	95	NL	NL	NL	145
7 and above	NL	NL	NL	NL	NL	NL	NL	NL

This table assumes no elbows. Deduct 15 ft of allowable duct length for each turn, elbow, or fitting. Interpolation and extrapolation in 62.2 Table 5.3 is not allowed. For airflow values not listed, use the next higher value. This table is not applicable for airflow > 125 cfm.

NL = no limit on duct length of this size.

X = not allowed, any length of duct of this size with assumed turns, elbows, fittings will exceed the rated pressure drop.

E. Other Requirements

The items listed below (6.1 through 6.8) 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 4.6.5) 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	<p>6.1 Transfer Air. Measures shall be taken to minimize air movement across envelope components to occupiable spaces from garages, unconditioned crawl spaces, and unconditioned attics. Supply and balanced ventilation systems shall be designed and constructed to provide ventilation air directly from the outdoors.</p>
02	<p>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 Chapter 13 of Guideline 24² for information on instructions and labeling.</p>
03	<p>6.3 Clothes Dryers. Clothes dryers shall be exhausted directly to the outdoors</p>
04	<p>6.4 Combustion and Solid-Fuel Burning Appliances. Combustion and solid-fuel burning appliances must be provided with adequate combustion and ventilation air and vented in accordance with manufacturer 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.</p> <p>Where atmospherically vented combustion appliances or solid-fuel burning 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/100 ft² (75 Lps/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 airflow. Atmospherically vented combustion appliances do not include direct-vent appliances.</p>
05	<p>6.5 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.</p>
06	<p>6.6 Ventilation Opening Area. Spaces shall have ventilation openings as listed below. Such openings shall meet the requirements of Section 6.8</p>
07	<p>6.7 Minimum Filtration. Mechanical systems that supply air to an occupiable space through ductwork exceeding 10 ft (3 m) in length and through a thermal conditioning component, except evaporative coolers, shall be provided with a filter having a designated minimum efficiency of MERV 6, or better, when tested in accordance with ANSI ASHRAE Standard 52.2, Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size, or a minimum Particle Size Efficiency of 50 percent in the 3.0-10 µm range in accordance with AHRI Standard 680, Performance Rating of Residential Air Filter Equipment. The system shall be designed such that all recirculated and mechanically supplied outdoor air is filtered before passing through the thermal conditioning components. The filter shall be located and installed in such a manner as to facilitate access and regular service by the owner.</p>

E. Other Requirements

The items listed below (6.1 through 6.8) 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 4.6.5) 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.

08	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 inch).
09	6.9 Carbon Monoxide Detectors. A carbon monoxide alarm shall be installed in each dwelling unit in accordance with NFPA 720, <i>Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment 14</i> , and shall be consistent with requirements of applicable laws, codes, and standards.

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

F. Air Moving Equipment

The items listed below (7.1 through 7.3) 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 4.6.6) 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 7.3 if applicable.

01	7.1 Selection and Installation. Ventilation devices and equipment shall be tested and listed in accordance with specific standards. 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. w.c. (25 Pa) static pressure. 7.2.1 Whole Building or Continuous Ventilation Fans. These fans shall be rated for sound at a maximum of 1.0 sone. 7.2.2 Intermittent Local Exhaust Fans. Fans used to comply with Section 5.2 shall be rated for sound at a maximum of 3 sone, unless their maximum rated airflow exceeds 400 cfm (200 L/s). (Some exceptions may apply.)
03	7.3 Multibranch Exhaust Ducting. If more than one of the exhaust fans in a dwelling unit shares a common exhaust duct, each fan shall be equipped with a back draft damper to prevent the recirculation of exhaust air from one room to another through the exhaust ducting system.

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

G. Multifamily Buildings -Other Requirements

The items listed below correspond to the information given in ASHRAE 62.2 Section 8 "Multifamily Buildings". Refer also to Chapter 4.6 of the Residential Compliance Manual (Section 4.6.5) 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 8, if applicable.

01	<p>8.2 Whole-Building Mechanical Ventilation. For multifamily buildings, the term "building" in Section 4 refers to a single dwelling unit.</p> <p>8.4.1 Transfer Air. Measures shall be taken to minimize air movement across envelope components separating dwelling units, including sealing penetrations in the common walls, ceilings, and floors of each unit and by sealing vertical chases adjacent to the units. All doors between dwelling units and common hallways shall be gasketed or made substantially airtight.</p> <p>8.4.1.1 Compliance. One method of demonstrating compliance with Section 8.4.1 shall be to verify a leakage rate below a maximum of 0.2 cfm/ ft² (100 L/s per 100 m²) of the dwelling unit envelope area (i.e., the sum of the area of the walls between dwelling units, exterior walls, ceiling and floor) at a test pressure of 50 Pa by a blower door test. 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.</p> <p>8.5.1 Exhaust Ducts. Exhaust fans in separate dwelling units shall not share a common exhaust duct. Exhaust inlets from more than one dwelling unit may be served by a single exhaust fan downstream of all the exhaust inlets if the fan is designated and intended to run continuously or if each inlet is equipped with a back-draft damper to prevent cross-contamination when the fan is not running.</p> <p>8.5.2 Supply Ducts. Supply outlets to more than one dwelling unit may be served by a single fan upstream of all the supply outlets if the fan is designed and intended to run continuously or if each supply outlet is equipped with a back-draft damper to prevent cross-contamination when the fan is not running.</p>
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The responsible persons signature on this compliance document affirms that all applicable requirements in this table have been met

Documentation Author's Declaration Statement

1. I certify that this Certificate of Installation documentation is accurate and complete.

Documentation Author Name: Eric D Bergesen	Documentation Author Signature: <i>Eric D Bergesen</i>
Company: Home Energy HERS Testing	Signature Date: 2019-08-07 11:34:15
Address: PO Box 1811	CEA/ HERS Certification Identification (if applicable): N/A
City/State/Zip: Sebastopol CA 95473	Phone: 707-292-3911

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: Laurel Lewis	<i>Electronically Signed By Authorized Rep</i> <i>Laurel Lewis</i>	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner) AAA ENERGY SYSTEMS INC	Position With Company (Title): CORP SECRETARY	
Address: 333 SUTTON PLACE	CSLB License: 443118	
City/State/Zip: SANTA ROSA CA 95407	Phone: 707-585-8670	Date Signed: 2019-08-07 11:34:15
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	

Digitally signed by CalCERTS. This digital signature is provided in order to secure the content of this registered document, and in no way implies Registration Provider responsibility for the accuracy of the information.

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CA Building Energy Efficiency Standards
2016 Residential Compliance

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