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Indoor Air Quality & Mechanical Ventilation (Mandatory Measure)

Under ASHRAE 62.2, there are several prescriptive methods of how to meet the Local Exhaust and Whole-Building Ventilation requirements. This summary guide will only discuss the simplest methods of Prescriptive Approach for meeting the ANSI/ASHRAE 62.2 requirements, which contractors will most likely use to meet these requirements as required by the 2008 Building Energy Efficiency Standards.

Code Requirements (Residential 2010 California Energy Code and ASHRAE 62.2)

The Mandatory Measures, Section 150-(o) is NEW for the 2010 California Energy Code. These mandatory measures required that low-rise residential buildings meet the requirements of ASHRAE Standard 62.2 for "Indoor Air Quality and Mechanical Ventilation". This is a health and safety measure developed by ASHRAE to ensure that dwelling units have acceptable indoor air quality.

1) When Required?

It is mandated for all newly-constructed low-rise residential buildings (up to 3 stories) and additions greater than 1,000 square feet (original building must also comply).

2) Local Exhaust Ventilation in Bathroom and Kitchen

- Each bathroom is required to have a 50 cfm minimum exhaust fan ducted to the outside. Bathroom is any room with a bathtub, shower, spa or similar sources of moisture. Toilet room is not considered a bathroom.
- Each kitchen is required to have a 100 cfm minimum exhaust fan ducted to the outside. *The range hood over the stove may be used to meet this requirement, but the range hood must be vented to the outside. Re-circulating range hoods cannot be used.*
- The ducting for the exhaust fan shall be sized according to ASHRAE Standard 62.2, Table 7.1 (see item 4). *Flex duct shall not be used in range hood.*
- Local exhaust fans are required to be rated for sound at a maximum of 3 sones, unless their maximum rated airflow exceeds 400 cfm.

3) Whole-Building Ventilation

In addition to the local exhaust fans in the bathrooms and kitchens, an exhaust fan shall be sized to provide ventilation for the whole house. *Window operation is not a permissible method.*

- The whole-building exhaust fan shall provide a minimum ventilation rate accordance to Equation 4.1(a):

$$Q_{fan} = 0.01\ A_{floor} + 7.5\ (N_{br} + 1)$$

Where Q_{fan} = fan flow rate, (cfm)
A_{floor} = conditioned floor area, ft^2
N_{br} = number of bedroom; not to be less than one

- This exhaust fan can be controlled by a standard on/off switch, but the switch MUST be labeled to inform home occupants that it is the whole-building ventilation exhaust fan that is *intended to operate continuously.* This exhaust fan is required to be rated for *sound* at a *maximum* of 1 sone.
- The ducting for the exhaust fan shall be sized according to ASHRAE Standard 62.2, Table 7.1

4) **Prescriptive Duct Sizing Requirements (ASHRAE Standard 62.2 Table 7.1)**

Table 7.1 Prescriptive Duct Sizing Requirements								
Duct Type	Flex Duct				Smooth Duct			
Fan Rating (cfm @ 0.25 in. w.c)	50	80	100	125	50	80	100	125
	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.
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
w.c. = water column

Required Information on Plans:

A note block should be provided on the plans that identifies a local exhaust ventilation and whole building ventilation.

1) **Local Exhaust Ventilation**

Bathroom

- □ Specify Bathroom Fan Flow (cfm) = _____;
- □ Duct Type = _____ ;
- □ Duct Size (in) = _____ and Maximum Allowable Duct Length (ft) = _____;
- □ This exhaust fan is required to be rated for *sound* at a *maximum* of 3 sones.

Kitchen

- □ Specify Kitchen Fan Flow (cfm) = _____;
- □ Duct Type = _____ ;
- □ Duct Size (in) = _____ and Maximum Allowable Duct Length (ft) = _____;
- □ This exhaust fan is required to be rated for *sound* at a *maximum* of 3 sones.

2) **Whole Building Ventilation**

- □ Specify Building Fan Flow (cfm) = _____ and Duct Type = _____;
- □ Duct Size (in) = _____ and Maximum Allowable Duct Length (ft) = _____;
- □ This exhaust fan is required to be rated for *sound* at a *maximum* of 1 sone;
- □ This exhaust fan is intended to operate continuously to ensure indoor air quality.

Note: Sone = unit of loudness. Normal talking at 3 feet away ranges from 1 to 4 sones.