



# KITTITAS COUNTY COMMUNITY DEVELOPMENT SERVICES

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**R-004**  
BULLETIN

## 2012 Whole House Ventilation Worksheet

FOR MORE INFORMATION VISIT THE CDS WEBSITE AT: [WWW.CO.KITTITAS.WA.US/CDS](http://WWW.CO.KITTITAS.WA.US/CDS)

### Whole House Ventilation per IRC M1507.1

#### Outdoor Air Inlets per IRC M1507.3.4.4, M1507.3.5.3 & M1507.3.6.5

#### Ventilation Duct Insulation per IRC M1507.3.5.2, M1507.3.6.4, M1507.3.7.2

Check the box to describe which one of the four prescriptive Whole House Ventilation Systems you will be using.

Option 1 - Whole House Ventilation Using Exhaust Fans (IRC M1507.3.4)

- \_\_\_\_\_ CFM Exhaust Fan Flow Rating Per Table M1507.3.3(1). Location of whole house exhaust fan(s) must be shown on the plans. Intermittent operation factored per Table M1507.3.3(2).
- Fan controls: 24 hour clock timer with capability of continuous operation, manual and automatic control & accessible.
- Whole house fans located 4 feet or less from the interior grille shall have a sone rating of 1.0 or less at 0.1 inches w.g.
- Outdoor air shall be distributed to each habitable room by individual outdoor air inlets. Where outdoor air supplies are separated from exhaust points by doors, provisions shall be made to ensure air flow by installation of distribution ducts, undercutting doors, grilles, transoms, or similar means. Doors shall be undercut a minimum of ½" above the floor covering.

Option 2 - Whole House Ventilation Integrated with a Forced Air System (IRC M1507.3.5).

- Integrated whole house ventilation systems shall provide outdoor air at the rate calculated using Section M1507.3.3.
- Integrated forced-air ventilation systems shall distribute outdoor air to each habitable space through the forced-air system ducts. Integrated forced-air ventilation systems shall have an outdoor air inlet duct connecting a terminal element on the outside of the building to the return air plenum of the forced-air system, at a point within 4 feet upstream of the air handler. The outdoor air inlet duct connection to the return air stream shall be located upstream of the forced-air system blower and shall not be connected directly into a furnace cabinet to prevent thermal shock to the heat exchanger.
- The system shall be equipped with a motorized damper connected to the automatic ventilation control as specified in M1507.3.2.

Option 3 - Whole House Ventilation Using a Supply Fan (IRC M1507.3.6).

- Supply fan ventilation systems shall distribute outdoor air to each habitable space through the forced-air system ducts or through dedicated ducts to each habitable space. Supply fans shall have the capacity to provide the amount of outdoor air specified in Table M1507.3.3(1). The outdoor air must be filtered before it is delivered to habitable spaces. The filter may be located at the intake device, in line with the fan, or, in the case of a connection to the return plenum of the air handler, using the furnace filter. An outdoor air inlet shall be connected to either the supply or return air stream.
- An outdoor air inlet duct connection to the supply air stream shall be located downstream of the forced-air system blower. An outdoor air inlet duct connection to the return air stream shall be located at least 4 feet upstream of the forced-air system blower and its filter. Neither type of duct shall be connected directly into a furnace cabinet to prevent thermal shock to the heat exchanger. The outdoor air inlet duct shall be prescriptively sized in accordance with Table M1507.3.6.2. The terminal element on the outside of the building shall be sized 2 inches in diameter larger than the outdoor air inlet duct.
- The system shall be equipped with a back-draft damper and one of the following:
  - A calibrated manual volume damper installed and set to meet the measured flow rates specified in Table M1507.3.3(1) by field testing with a pressure gauge and/or following manufacturer's installation instructions; or
  - A manual volume damper installed and set to meet the measured flow rates specified in Table M1507.3.3(1) by field testing with a flow hood or a flow measuring station; or
  - An automatic flow-regulating device sized to the specified flow rates in Table M1507.3.3(1) which provides constant flow over a pressure range of 0.20 to 0.60 inches water gauge.

Option 4 - Whole House Ventilation Using a Heat Recovery Ventilation System (IRC M1507.3.7).

- All duct work in heat recovery systems shall be sized and installed per the manufacturer's instructions. System minimum flow rating shall be not less than that specified in Table M1507.3.3(1). Heat recovery ventilation systems shall have a filter on the upstream side of the heat exchanger in both the intake and exhaust airstreams with a minimum efficiency rating value (MERV) of 6.

**TABLE M1507.3.3(1)  
CONTINUOUS WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM AIRFLOW RATE REQUIREMENTS**

DWELLING UNIT FLOOR AREA (square feet)	NUMBER OF BEDROOMS				
	0-1	2-3	4-5	6-7	>7
	Airflow in CFM				
<1500	30	45	60	75	90
1501-3000	45	60	75	90	105
3001-4500	60	75	90	105	120
4501-6000	75	90	105	120	135
6001-7500	90	105	120	135	150
>7500	105	120	135	150	165

For SI: 1 square foot = 0.0929 m<sup>2</sup>, 1 cubic foot per minute = 0.0004719 m<sup>3</sup>/s.

**TABLE M1507.3.3(2)  
INTERMITTENT WHOLE-HOUSE MECHANICAL VENTILATION RATE / FACTORS<sup>a, b</sup>**

RUN-TIME PERCENTAGE IN EACH 4-HOUR SEGMENT	25%	33%	50%	66%	75%	100%
Factor <sup>a</sup>	4	3	2	1.5	1.3	1.0

a. For ventilation system run time values between those given, the factors are permitted to be determined by interpolation.  
b. Extrapolation beyond the table is prohibited.

**TABLE M1507.3.6.2  
PRESCRIPTIVE SUPPLY FAN DUCT SIZING**

Supply Fan Tested CFM at 0.40" w.g.		
Specified Volume from Table M1507.3.3(1)	Minimum Smooth Duct Diameter	Minimum Flexible Duct Diameter
50-90 cfm	4 inch	5 inch
90-120 cfm	5 inch	6 inch
120-150 cfm	6 inch	7 inch
250-400 cfm	7 inch	8 inch

**TABLE M1507.4  
MINIMUM REQUIRED LOCAL EXHAUST RATES FOR  
ONE- AND TWO-FAMILY DWELLINGS**

AREA TO BE EXHAUSTED	EXHAUST RATES
Kitchens	100 cfm intermittent or 25 cfm continuous
Bathrooms—toilet rooms Laundry rooms Indoor swimming pools & spas	Mechanical exhaust capacity of 50 cfm intermittent or 20 cfm continuous

For SI: 1 cubic foot per minute = 0.0004719 m<sup>3</sup>/s.