



KITTITAS COUNTY COMMUNITY DEVELOPMENT SERVICES

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R-004
BULLETIN

2009 Whole House Ventilation Worksheet

FOR MORE INFORMATION VISIT THE CDS WEBSITE AT: WWW.CO.KITTITAS.WA.US/CDS

Whole House Ventilation Using Prescriptive Method

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

Option 1 - Intermittent Whole House Ventilation Using Exhaust Fans (IRC M1508.4)

- _____ CFM Exhaust Fan Flow Rating Per Table M1508.2 (attached). Location of whole house exhaust fan(s) must be shown on the plans.
- 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 1/2" above the floor covering.

Option 2 - Intermittent Whole House Ventilation Integrated with a Forced Air Heating System (IRC M1508.5).

- Integrated whole house ventilation systems shall provide outdoor air at the rate calculated using Section M1508.3. The delivered ventilation rate for intermittently operating ventilation systems shall be the combination of its delivered capacity from Table M1508.2, and its ventilation effectiveness and daily fractional operation time from Table M1508.3.
- The system shall distribute outdoor air to each habitable room through the forced air systems ducts with an outdoor air inlet duct connected at the return air plenum of the forced air system, at a point within 4 feet upstream of the air handler.
- The system shall be equipped with a motorized damper connected to the automatic ventilation control clock timer.
- The system shall be controlled by a 24-hour clock timer and shall control the system blower and automatic damper. The timer shall be capable of operating without energizing other energy-consuming appliances.
- At the time of final inspection, the automatic control timer shall be set to operate the whole house ventilation system for at least 8 hours a day.

Option 3 – Intermittent Whole House Ventilation Using a Supply Fan (IRC M1508.6).

- Outdoor air shall be distributed through the forced-air system ducts or through dedicated ducts to habitable rooms. Supply fans shall have the capacity to provide the amount of air specified in Table M1508.2 and air must be filtered before delivery.
- _____ inch outdoor air inlet duct, connected to the furnace supply air stream or return, sized per Table M1506.2.
- Fresh Air inlet duct Back-draft Damper Selection: (Choose one).
 - Calibrated manual volume damper installed and set to meet the measured flow rates in Table M 1508.2 by field testing with a pressure gauge and/or following manufacturer's installation instructions.
 - A manual volume damper installed and set to meet the measured flow rates specified in Table M1508.2 by field testing with a flow hood or flow measuring station.
 - An automatic flow-regulating device sized to the specified flow rate in Table M 1508.2 which provides constant flow over a pressure range of 0.20 to 0.60 inches water gauge.
- At the time of final inspection, the automatic control timer shall be set to operate the whole house ventilation system for at least 8 hours a day.

Option 4 - Whole House Ventilation Using a Heat Recovery Ventilation System (IRC M1508.7).

- All duct work in heat recovery system shall be sized and installed per the manufacturer's instructions.
- System minimum flow rating shall not be less than specified in Table M1508.2.
- 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 ratings value of (MERV) of 6.
- Outdoor air inlets shall be screened or otherwise protected from entry by leaves or other material and located per M1508.7.4.
- Ventilation supply ducts in the conditioned space upstream of the heat exchanger shall be insulated to a min. of R-4.

**TABLE M1508.2
MINIMUM VENTILATION RATES
(Continuously Operating Systems)**

FLOOR AREA (ft ²)	BEDROOMS ¹				
	0-1	2-3	4-5	6-7	>7
<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

¹Ventilation rates in table are minimum outdoor airflow rates measured in cfm.

M1508.3 Intermittently Operating Ventilation Systems. The delivered ventilation rate for intermittently operating ventilation systems shall be the combination of its delivered capacity from Table M1508.2, and its ventilation effectiveness and daily fractional operation time from Table M1508.3.

$$Q_f = Q_r / (\epsilon f)$$

Where:

Q_f = Outdoor air flow rate

Q_r = Ventilation air requirement (from Table M1508.2)

ϵ = Ventilation effectiveness (from Table M1508.3)

f = Fractional operation time (from Table M1508.3)

**TABLE M1508.3
VENTILATION EFFECTIVENESS FOR
INTERMITTENT FANS**

Daily Fractional Operation Time, f	Ventilation Effectiveness, ϵ
$f < 35\%$	0.33
$35\% \leq f < 60\%$	0.50
$60\% \leq f < 80\%$	0.75
$80\% \leq f$	1.0

**TABLE 1508.6.2
Prescriptive Supply Fan Duct Sizing**

Supply Fan Tested CFM at 0.40" WG		
Specified Volume from Table 3-2	Minimum Smooth Duct Diameter	Minimum Flexible Duct Diameter
50 – 90 CFM	4 inch	5 inch
90 - 150 CFM	5 inch	6 inch
150 - 250 CFM	6 inch	7 inch
250 - 400 CFM	7 inch	8 inch