



## Permit Center

Dept. of Community Development

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### WHOLE HOUSE VENTILATION USING THE PRESCRIPTIVE METHOD IN 2015 IRC

Purpose: We have all heard about office and school buildings which cause people to become ill. If improperly ventilated, our homes can cause some of us to become ill too. With all of the new materials we use to construct and furnish our buildings, it is very important that our homes are ventilated in such a way as to provide us with a method to get the stale air out and fresh air in.

**Please check the appropriate box to describe which of the four prescriptive Whole House Ventilation Systems you will be using, and fill in any blanks or boxes under the system you choose.**

- Option 1.** Whole house Ventilation Using Exhaust Fans (IRC Section M1507.3.4)
- \_\_\_\_\_ CFM Exhaust Fan Flow Rating Per Table M1507.3.3(1) and multiplied by factor in Table M1507.3.3(2) (attached). Location of whole house exhaust fan(s) must be shown on the plans.  
The intermittent mechanical ventilation system shall operate at least one hour out of every four when designed for intermittent operation in accordance with Table M1507.3.3(2).
  - Fan Controls: 24 hour clock timer capable of continuous operation, with manual and automatic control, & be 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. per HVI 915 (2009) At the time of final inspection, the automatic control shall be set to operate the whole-house fan according to the schedule used to calculate the whole-house fan sizing.
  - Outdoor air shall be distributed to each habitable room by individual outdoor air inlets with controllable and secure openings, provide at least 4 sq. in. of opening for each space, located at least 10 feet from appliance ducts, and located away from where objectionable odors, fumes and vapors are present.
- Option 2.** Whole house Ventilation Integrated with a Forced Air Heating System (IRC Section M1507.3.5)
- \_\_\_\_\_ inch Fresh air duct, connected to the furnace return plenum, sized Per Section M1507.3.3.
  - 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 will be equipped with a motorized damper connected to the automatic ventilation control as specified in Section M1507.3.2. The required flow rate shall be verified by field testing with a flow hood or a flow measuring station.
  - Outdoor Air inlets shall be screened or otherwise protected from entry by leaves or other material and located
  - All Ventilation supply ducts in the conditioned space shall be insulated to a minimum of R-4
- Option 3.** Whole house Ventilation Using a Supply Fan (IRC Section M1507.3.6)
- \_\_\_\_\_ inch Outdoor air inlet duct, connected to the furnace supply air stream, sized Per Table M1507.6.2. (attached)
  - Fresh Air inlet: Back-draft Damper plus one of the following: **(Choose one)**
    - Calibrated manual volume damper installed and set to meet the measured flow rates in Table 1507.3.3(1) (attached) 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 M1507.3.3(1) by field testing with a flow hood or flow measuring station.
    - An automatic flow-regulating device sized to the specified flow rate in Table M1507.3.3(1) which provides constant flow over a pressure range of 0.20 to 0.60 inches water gauge.
  - Outdoor Air inlets shall be screened or otherwise protected from entry by leaves or other material and located
  - All Ventilation supply ducts in the conditioned space shall be insulated to a minimum of R-4
- Option 4.** Whole house Ventilation Using a Heat Recovery Ventilation System
- All duct work in heat recovery system shall be at least 6 inches in diameter
  - Balancing dampers shall be installed on the inlet and exhaust side.
  - Flow measurement grids shall be installed on the supply and return.
  - System minimum flow rating shall not be less than specified in Table M1507.3.3(1).
  - Outdoor air inlets shall be screened or otherwise protected from entry by leaves or other material and located
  - Ventilation Supply Ducts in the conditioned space upstream of the heat exchanger shall be insulated to a minimum of R-4

## General Requirements

At the time of final inspection, the automatic control time shall be set to operate the whole house fan according to the schedule used for the calculation.

- A label shall be affixed to the control that reads "Whole House Ventilation" (see operating instructions)
- 24-hour clock timer installed with capability of continuous operation, manual and automatic control, readily accessible.
- Installer shall provide the manufacturer's installation, operating instructions, and a whole house ventilation system operation description.
- Standard air leakage caulking shall be installed in the following locations (WSEC Table R402.4.1.1):
  - a) Wiring / plumbing / duct register penetrations
  - b) Rim joist / mud sill (heated lower floors)
  - c) Light fixture / flue penetrations
  - d) Around window and door frames

Airflow between fresh air ports OR openable screened windows and whole-house fan ensured by undercut door (minimum 1/2"), or grilles. (IRC M1507.3)

## REFERENCE TABLES

**Table M1507.3.3(1)**  
Continuous Whole House Ventilation  
System Airflow Rate Requirements (cfm)

Floor Area (ft <sup>2</sup> )	Number of Bedrooms				
	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

**Table M1507.3.3(2)**  
Intermittent Whole House Mechanical  
Ventilation Factors

Run-Time Percentage in Each 4-Hour Segment	25%	33%	50%	66%	75%	100%
Factor	4	3	2	1.5	1.3	1.0

**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
90-150 cfm	5 inch	6 inch
150-250 cfm	6 inch	7 inch
250-400 cfm	7 inch	8 inch

## PRESCRIPTIVE HEATING SYSTEM SIZING

All heating equipment must be sized using a recognized engineering practice. Typical sources include:

- ASHRAE Handbook of Fundamentals.
- ACCA Manual J, 8th Edition- Residential Load Calculation.
- ACCA Manual N- Commercial Load Calculation.