Whole-House Mechanical Ventilation Options
2015 IRC/IECC – Residential (IRC M1507)

Option 1 - Bathroom Exhaust Fan with Make-up Air Inlet in separate area.

1. To minimize energy consumption and reduce run times on bathroom fans, it is recommended that the bathroom fan run intermittently rather than continuously to meet IRC/IMC minimum air flow requirements.
2. Fan Controller
   a. Shall be sized to run continuously or controlled to run intermittently by a stand-alone controller or built-in controls by fan manufacturer.
   b. The air conditioning contractor shall ensure the start-up technicians program the controllers and verify the required ventilation rates.
   c. A readily-accessible ventilation override control shall be provided with an identifying label if its function is not obvious.
   d. By sizing the fan to enable intermittent operation, intelligent controls can be used to time-shift ventilation to off-peak heating and cooling hours of the day.
3. Make-up air duct
   a. Shall be a min. of 6 inches (recommended 8 inches).
   b. Shall have a backdraft damper and not be located in the same room as the exhaust fan.
   c. To maximize draw through the make-up duct, locating the duct close to the return air filter box would be a best practice. Alternatively, locating the duct in the Laundry Room would have the added benefit of providing make-up air for the dryer. Either location is acceptable.
   d. Provide filtered intake grille with washable filter.

Option 2 - Bathroom exhaust fan with make-up air inlet in return air box

1. This option is identical to Option 1, with the one exception that the make-up air duct runs directly to the return air filter box with a motorized damper and filtered intake.
2. Make-up air duct shall be a minimum of 6 inches (recommended 8 inches).
3. Make-up air duct shall include a motorized damper. Outdoor air intakes shall restrict outdoor air intake when not in use. The motorized damper shall be controlled automatically and operate in sequence with the exhaust bathroom fan to allow sufficient make-up air to meet IRC/IMC minimum ventilation rates.

Option 3 - Air Intake Duct to supply plenum with inline fan

1. Inline supply fan shall meet IRC/IMC minimum ventilation rates.
2. System shall be controlled by a stand-alone controller or built-in controls by the fan manufacturer. To minimize energy consumption and reduce run times, controls are recommended to enable time-shifting ventilation away from peak heating and cooling hours.
3. The builder shall ensure the electricians properly wire the inline fan that is installed by the air conditioning contractor.
4. The air conditioning contractor shall ensure the start-up technicians program the controllers and verify the required ventilation rates.

Option 4 - Energy or Heat Recovery Ventilator (ERV or HRV)

1. Builders and their trade contractors are responsible for vetting ERV/HRV systems for meeting IRC/IMC ventilation requirements.
SECTION M1507
MECHANICAL VENTILATION

M1507.1 General.
Where local exhaust or whole-house mechanical ventilation is provided, the equipment shall be designed in accordance with this section.

M1507.2 Recirculation of air.
Exhaust air from bathrooms and toilet rooms shall not be recirculated within a residence or to another dwelling unit and shall be exhausted directly to the outdoors. Exhaust air from bathrooms and toilet rooms shall not discharge into an attic, crawl space or other areas inside the building.

M1507.3 Whole-house mechanical ventilation system.
Whole-house mechanical ventilation systems shall be designed in accordance with Sections M1507.3.1 through M1507.3.3.

M1507.3.1 System design.
The whole-house ventilation system shall consist of one or more supply or exhaust fans, or a combination of such, and associated ducts and controls. Local exhaust or supply fans are permitted to serve as such a system. Outdoor air ducts connected to the return side of an air handler shall be considered as providing supply ventilation.

M1507.3.2 System controls.
The whole-house mechanical ventilation system shall be provided with controls that enable manual override.

M1507.3.3 Mechanical ventilation rate.
The whole-house mechanical ventilation system shall provide outdoor air at a continuous rate of not less than that determined in accordance with Table M1507.3.3(1).

Exception: The whole-house mechanical ventilation system is permitted to operate intermittently where the system has controls that enable operation for not less than 25-percent of each 4-hour segment and the ventilation rate prescribed in Table M1507.3.3(1) is multiplied by the factor determined in accordance with Table M1507.3.3(2).

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

<table>
<thead>
<tr>
<th>DWELLING UNIT FLOOR AREA (square feet)</th>
<th>NUMBER OF BEDROOMS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 - 1</td>
</tr>
<tr>
<td>&lt; 1,500</td>
<td>30</td>
</tr>
<tr>
<td>1,501 - 3,000</td>
<td>45</td>
</tr>
<tr>
<td>3,001 - 4,500</td>
<td>60</td>
</tr>
<tr>
<td>4,501 - 6,000</td>
<td>75</td>
</tr>
<tr>
<td>6,001 - 7,500</td>
<td>90</td>
</tr>
<tr>
<td>&gt; 7,500</td>
<td>105</td>
</tr>
</tbody>
</table>

For SI: 1 square foot = 0.0929 m², 1 cubic foot per minute = 0.0004719 m³/s.

### TABLE M1507.3.3(2)
INTERMITTENT WHOLE-HOUSE MECHANICAL VENTILATION RATE FACTORS

<table>
<thead>
<tr>
<th>RUN-TIME PERCENTAGE IN EACH 4-HOUR SEGMENT</th>
<th>25%</th>
<th>33%</th>
<th>50%</th>
<th>66%</th>
<th>75%</th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor*</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1.5</td>
<td>1.3</td>
<td>1.0</td>
</tr>
</tbody>
</table>

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.