Building Regulation Division
Lynn Underwood,
Building Official

August 12, 2019

Dear Heating and Air Professional:

Beginning **September 3, 2019**, the **2015 Virginia Uniform Statewide Building Code** will replace the **2012 Virginia Uniform Statewide Building Code** and the **2012** code will no longer be in effect. There are changes in the new **Energy Code** that apply specifically to HVAC installations in residential construction. One significant change is in regard to **Duct Testing**. For your information, code sections are included in the attachment pages 1-3.

- **Duct Testing**

  a) The code states that the visual inspection is no longer an alternative to duct testing. Please see page 1 in the attachment for the code sections regarding the new duct testing requirement. Notice that certification for the technician performing the test is not needed; however, training on the testing equipment is necessary.

  b) Although leakage testing can be done at any time, the rough-in stage phase is most logical and allows for corrections before the ductwork is concealed. Please be aware that inspectors need to receive test results before they can pass your final inspections.

In addition to the new requirement for **Duct Testing** from the **2015** code, **Mechanical Ventilation** has been in effect by the **Energy Code** since July, 2014.

- **Mechanical Ventilation**

  Mechanical Ventilation can be achieved in different ways. Please see Page 2 and 3 for code sections. Page 3 has an example of a supply-only ventilation system. Page 4 has a comparison table of whole-house ventilation systems.

York County will be checking compliance with these code requirements beginning this September. If you have questions about the items mentioned above, please contact me at 757-890-3522 or e-mail me at: lynn.underwood@yorkcounty.gov. Our inspectors are also available to clarify these requirements at your work sites.

Sincerely,

Lynn Underwood

Lynn Underwood, MCP, CBO
Building Official

Duct Testing

N1103.3.3.3 (R403.3.3.) Duct Testing (Mandatory).
Ducts shall be pressure tested to determine air leakage by one of the following methods:

1. Rough-in test: Total leakage shall be measured with a pressure differential of 0.1 inch w.g. (25 Pa) across the system, including the manufacturer's air handler enclosure if installed at the time of the test. All register boots shall be taped or otherwise sealed during the test.

2. Post-construction test: Total leakage shall be measured at a pressure differential of 0.1 inch w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test.

Exception: A duct leakage test is not required for ducts and air handlers located entirely within the building thermal envelope.

A written report of the results of the test shall be signed by the party conducting the test and provided to the code official. The licensed mechanical contractor installing the mechanical system shall be permitted to perform the duct testing. The contractor shall have been trained on the equipment used to perform the test.

N1103.3.3.4 (R403.3.4) Duct Leakage (Prescriptive) The total leakage of the ducts, when measured in accordance with Section R403.3.3, shall be as follows:

1. Rough-in test: The total leakage shall be less than or equal to 4 cubic feet per minute (113.3L/min) per 100 square feet of conditioned floor area where the air handler is installed at the time of the test. Where the air handler is not installed at the time of the test, the total leakage shall be less than or equal to 3 cubic feet per minute per 100 square feet of conditioned floor area.

2. Post-construction test: Total leakage shall be less than or equal to 4 cubic feet per minute per 100 square feet of conditioned floor area.

2015 Residential Energy Code Requirements for Mechanical Ventilation

N1103.6 (R403.6)

Mechanical Ventilation (Mandatory).
The building shall be provided with ventilation that meets the requirements of Section M1507 of this code or the *International Mechanical Code*, as applicable, *or with other approved means of ventilation*. Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating.

N1103.6.1 (R403.6.1) Whole-house mechanical ventilation system fan efficacy. When installed to function as a whole-house mechanical ventilation system, mechanical ventilation system fans shall meet the efficacy requirements of Table N1103.6.1.

Exception: Where mechanical ventilation fans are integral to tested and listed HVAC equipment, they shall be powered by an electronically commutated motor.

TABLE N1103.6.1 (R403.6.1) MECHANICAL VENTILATION SYSTEM FAN EFFICACY

FAN LOCATION	AIR FLOW RATE MINIMUM (CFM)	MINIMUM EFFICACY (CFM/WATT)	AIR FLOW RATE MAXIMUM (CFM)
Range hoods	Any	2.8 cfm/watt	Any
In-line fan	Any	2.8 cfm/watt	Any
Bathroom, utility room	10	1.4 cfm/watt	< 90
Bathroom, utility room	90	2.8 cfm/watt	Any

2015 Residential Mechanical Code Requirements for Mechanical Ventilation

M1507.1 General. Where local exhaust or whole-house 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 supply or exhaust 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

DWELLING UNIT FLOOR AREA (square feet)	NUMBER OF BEDROOMS				
	0 – 1	2 – 3	4 – 5	6 – 7	> 7
	Airflow in CFM				
< 1,500	30	45	60	75	90
1,501 – 3,000	45	60	75	90	105
3,001 – 4,500	60	75	90	105	120
4,501 – 6,000	75	90	105	120	135
6,001 – 7,500	90	105	120	135	150
> 7,500	105	120	135	150	165

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

TABLE M1507.3.3(2)
INTERMITTENT WHOLE-HOUSE MECHANICAL VENTILATION RATE FACTORS[a, b]

RUN-TIME PERCENTAGE IN EACH 4-HOUR SEGMENT	25%	33%	50%	66%	75%	100%
Factor[a]	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.

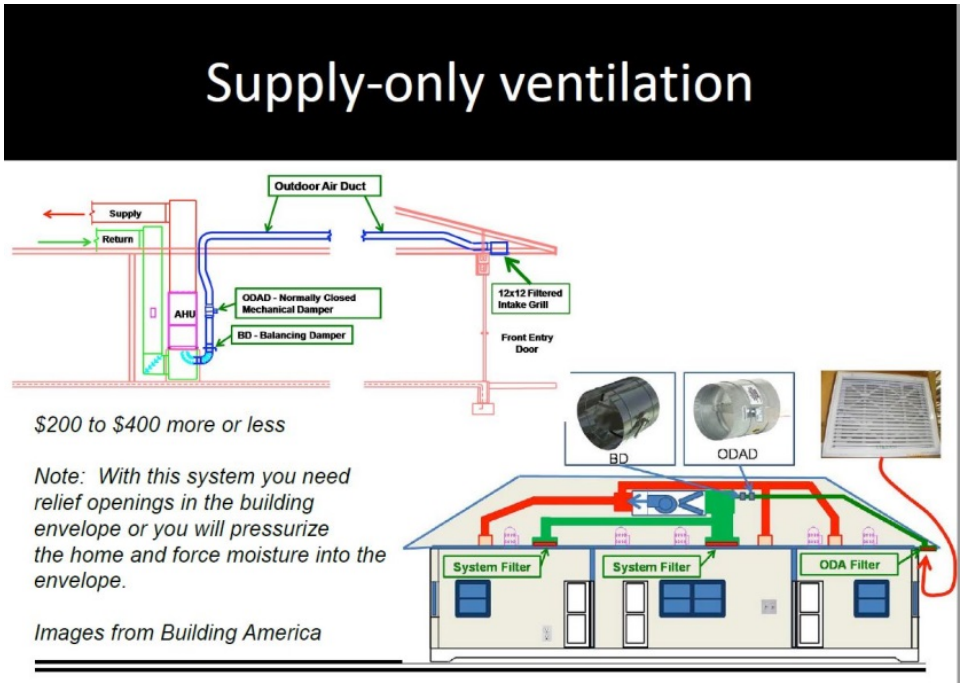
M1507.4 Local exhaust rates.

Local exhaust systems shall be designed to have the capacity to exhaust the minimum air flow rate determined in accordance with Table M1507.4.

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	Mechanical exhaust capacity of 50 cfm intermittent or 20 cfm continuous

For SI: 1 cubic foot per minute = 0.0004719 m^3/s.



Comparison of Whole-House Ventilation Systems

Ventilation System	Pros	Cons
Exhaust	• Relatively inexpensive and simple to install • Works well in cold climates.	• Can draw pollutants into living space • Not appropriate for hot humid climates • Rely in part on random air leakage • Can increase heating and cooling costs • May require mixing of outdoor and indoor air to avoid drafts in cold weather • Can cause backdrafting in combustion appliances.
Supply	• Relatively inexpensive and simple to install • Allow better control than exhaust systems • Minimize pollutants from outside living space • Prevent backdrafting of combustion gases from fireplaces and appliances • Allow filtering of pollen and dust in outdoor air • Allow dehumidification of outdoor air • Work well in hot or mixed climates.	• Can cause moisture problems in cold climates • Will not temper or remove moisture from incoming air • Can increase heating and cooling costs • May require mixing of outdoor and indoor air to avoid drafts in cold weather.
Balanced	• Appropriate for all climates	• Can cost more to install and operate than exhaust or supply systems • Will not temper or remove moisture from incoming air • Can increase heating and cooling costs.
Energy Recovery & Heat Recovery Ventilators	• Reduce heating and cooling costs • Available as both small wall- or window-mounted models or central ventilation systems • Cost-effective in climates with extreme winters or summers and high fuel costs.	• Can cost more to install than other ventilation systems • May not be cost-effective in mild climates • May be difficult to find contractors with experience and expertise to install these systems • Require freeze and frost protection in cold climates • Require more maintenance than other ventilation systems.

Source: U.S. Department of Energy