

March 2, 2020

Richard Brown
Managing Director
Council Members
Washington State Building Code Council
Olympia, WA 98504

RE: Edits to IRC CR102

Dr. Brown and Council Members

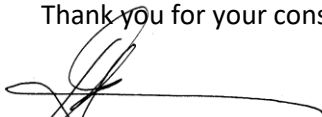
The original CR102 for the IRC ventilation sections (§M1505) did not include the changes approved by the IMC/IRC TAG and approved by the MVE sub committee and later the SBCC. As a result, the public review process for these code sections were not included in the final CR103 for the other codes. The new CR102 attempted to reconstruct the original language. For the most part, this final CR102 was a complete transcription of the final decisions of the MVE committee. As the original proposer I have reviewed the CR102 document and consulted with other proposers that addressed the IRC ventilation. Specifically, Michael Moore of Newport Ventures and Michael Lubliner of WSU and a TAG member. This separate review resulted both edits and corrections.

The only significant change was to the IRC language that required a balanced flow ventilation system and replace it with language that made this a design option. It was not the intent of my original proposal to require balance flow ventilation in any occupancy other than R-2 multi-family and the IRC transcription used the language aimed at this occupancy from the original IMC proposal.

In the final energy code document, the balanced flow HRV options are worth additional points when paired with improved envelope tightness. At this stage in the development of ever more efficient single-family homes that was left as a builder option to be traded off against other decisions.

Attachment 1 Includes changes recommended from this review both editorial and substantive. Changes in the CR102 are highlighted in this attachment. The SBCC should adopt these changes for the 2018 code cycle.

Thank you for your consideration.



David Baylon
922 34th Ave
Seattle, WA 98122
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Attachment 1: Revisions to the IRC Section M1505.4

WAC 51-51-1505 Section M1505—(~~Overhead exhaust hoods~~) Mechanical ventilation.

~~((M1505.1 General. Domestic open-top broiler units shall have a metal exhaust hood, having a minimum thickness of 0.0157-inch (0.3950 mm) (No. 28 gage) with 1/4 inch (6.4 mm) clearance between the hood and the underside of combustible material or cabinets. A clearance of not less than 24 inches (610 mm) shall be maintained between the cooking surface and the combustible material or cabinet. The hood shall be not less than the width of the broiler unit, extend over the entire unit, and when located inside the building envelope, shall discharge to the outdoors and be equipped with a backdraft damper or other means to control infiltration/exfiltration when not in operation. Broiler units incorporating an integral exhaust system, and listed and labeled for use without an exhaust hood, or broiler units permanently installed outside the building envelope and having the cooking surface at least 5'0" below a 1-hour fire resistance rated ceiling, need not have an exhaust hood.))~~

M1505.4 Whole-house mechanical ventilation system. Each dwelling unit shall be equipped with a ventilation system. The whole-house mechanical ventilation systems shall be designed in accordance with Sections M1505.4.1 through M1505.4.4.

M1505.4.1 System design. The whole house ventilation system shall consist of one or more supply fans, one or more exhaust fans, or an ERV/HRV with integral fans, associated ducts and controls. Whole-house mechanical ventilation system with supply and exhaust fans per Sections M1505.4.1.2, M1505.4.1.3, M1505.4.1.4, and M1505.4.1.5. Local exhaust fans are permitted to serve as part of the whole house ventilation system when provided with the proper controls per Section M1505.4.2. The systems shall be designed and installed to supply **and/or** exhaust the minimum outdoor airflow rates per Section M1505.4.3 as **corrected by the balanced and/or distributed** modified by whole house ventilation system coefficients per Section **M1504.5.3.1 M1505.4.3.1**, where applicable. The whole house ventilation system shall operate continuously at the minimum ventilation rate determined per Section M1505.4.2 unless configured with intermittent off controls per Section M1505.4.3.2.

M1505.4.1.1 Whole house system component requirements. Whole house ventilation supply and exhaust fans specified in this section shall have a minimum efficacy as

prescribed in the Washington State Energy Code. Design and installation of the system or equipment shall be carried out in accordance with manufacturers' installation instructions. Whole house ventilation fans shall be rated for sound at no less than the minimum airflow rate required by Section M1505.4.3.1. Ventilation fans shall be rated for sound at a maximum of 1.0 sone. This sound rating shall be at a minimum of 0.1 in. w.c. (25 Pa) static pressure in accordance with HVI procedures specified in Sections M1505.4.1.2 and M1505.4.1.3.

EXCEPTION: HVAC air handlers, ERV/HRV units, and remote mounted fans need not meet the sound requirements. To be considered for this exception, a remote mounted fan must be mounted outside the habitable spaces, bathrooms, toilets, and hallways, and there must be at least 4 ft (1 m) of ductwork between the fan and the intake grille.

The whole house supply fan shall provide ducted outdoor ventilation air to each habitable space within the residential unit.

EXCEPTION: Interior joining spaces provided with a 30 cfm whole house transfer fan or a permanent opening with an area of not less than 8 percent of the floor area of the interior adjoining space but not less than 25 square feet do not require ducted outdoor ventilation air to be supplied directly to the space. Whole house transfer fans shall meet the sone rating of Section M1505.4.1.1 and shall have whole house ventilation controls that comply with Section M1505.4.2.

M1505.4.1.2 Exhaust fans. Exhaust fans required shall be ducted directly to the outside. Exhaust air outlets shall be designed to limit the pressure difference to the outside to limiting the outlet free area maximum velocity to 500 ft per min and equipped with backdraft dampers or motorized dampers in accordance with Washington State Energy Code. Exhaust fans shall be tested and rated in accordance with the airflow and sound rating procedures of the Home Ventilating Institute (HVI 915, HVI Loudness Testing and Rating Procedure, HVI 916, HVI Air-flow Test Procedure, and HVI 920, HVI Product Performance Certification Procedure as applicable). Exhaust fans required in this section may be used to provide local ventilation. Exhaust fans that are designed for intermittent exhaust airflow rates higher than the continuous exhaust air-flow rates in Table 403.8.3 1505.4.3(3) shall be provided with occupancy sensors or humidity sensors to automatically override the fan to the high-speed airflow rate. The exhaust fans shall be tested, and the testing results shall be submitted and posted in accordance with Section 403.8.6.7-1505.4.1.6.

M1505.4.1.3 Supply fans. Supply fans used in meeting the requirements of this section shall supply outdoor air from intake openings in accordance with IMC Sections 401.4 and 401.5. Intake air openings shall be designed to limit the pressure difference to the outside to limiting the inlet free area maximum velocity to 500 ft per min and When designed for intermittent off operation, supply systems shall be equipped with motorized dampers in accordance with Washington State Energy Code. Supply fans shall be tested and rated in accordance with the airflow and sound

rating procedures of the Home Ventilating Institute (HVI 915, HVI Loudness Testing and Rating Procedure, HVI 916, HVI Airflow Test Procedure, and HVI 920, HVI Product Performance Certification Procedure as applicable). Where outdoor air is provided to each habitable dwelling unit or sleeping unit by supply fan systems the outdoor air shall be filtered. The filter shall be accessible for regular maintenance and re- placement. The filter shall have a Minimum Efficiency Rating Value (MERV) of at least 8.

M1505.4.1.4 Balanced whole house ventilation system. A balanced whole house ventilation system shall include both supply and exhaust fans. The supply and exhaust fans shall have airflow that is within 10 per- cent of each other. The tested and balanced total mechanical exhaust airflow rate is within 10 percent or 5 cfm, whichever is greater, of the total mechanical supply airflow rate. The flow rate test results shall be submitted and posted in accordance with Section M1505.4.1.7. The exhaust fan shall meet the requirements of Section M1505.4.1.2. The supply fan shall meet the requirements of Section M1505.4.1.3. For dwelling units required by the Washington State Energy Code to have a balanced system, the system is required to have balanced whole house ventilation but is not required to have distributed whole house ventilation where the distributed system coefficient from Table 403.8.2 is utilized to correct the whole-house mechanical ventilation rate. Balanced ventilation systems with both supply and exhaust fans in a packaged product, such as an ERV/HRV shall meet the requirements of HVI 920, as applicable. Intermittent dryer exhaust, intermittent range hood exhaust, and intermittent toilet room exhaust airflow rates above the residential dwelling or sleeping unit minimum ventilation rate are exempt from the balanced airflow calculation.

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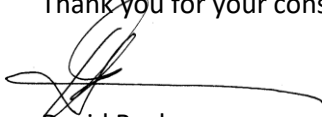
Richard Brown, Managing Director
Kjell Anderson, Chairman, MVE Subcommittee
Council Members
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Olympia, WA 98504

RE: Edits to IMC §408.3.6

Dr. Brown and Council Members

In the process of reviewing the IRC CR102 we also identified edits that were applicable to the IMC section 403.8.6. These changes are not extensive and are designed to correct some references and simplify the enforcement of the installed fans. We realize that this portion of the 2018 code has been completed and the CR103 has been approved. Nevertheless, these changes will simplify the enforceability of these section of the IMC and allow more design flexibility for systems permitted under these sections. I have attached the changes to IMC §403.8.6 for review by the SBCC. The proposed changes here were developed with Michael Moore of Newport ventures and Michael Lubliner. They participated in the original proposal and Mr. Lubliner was a member of the IMC/IRC TAG. These changes are substantially editorial. I have highlighted the changes in **Attachment 2**.

Thank you for your consideration.



David Baylon
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Attachment 2: Proposed edits to IMC Section 403.8.6

403.8.6 Whole house ventilation system component requirements. Whole house ventilation supply and exhaust fans specified in this section shall have a minimum efficacy as prescribed in the *Washington State Energy Code*. The fans shall be rated for sound at a maximum of 1.0 sone at design airflow and static pressure conditions. Design and installation of the system or equipment shall be carried out in accordance with manufacturer's installation instructions.

EXCEPTIONS:

1. Central supply or exhaust fans serving multiple residential units do not need to comply with the maximum fan sone requirements.
2. Interior joining spaces provided with a 30 cfm transfer fan or a 25 square foot permanent opening do not require supply ventilation air directly to the space. Transfer fans shall meet the sone rating above and have whole house ventilation controls in accordance with Section 403.8.5.
3. Fans not rated for sound under HVI 915 are not required to meet the sone requirement

403.8.6.1 Exhaust fans. Exhaust fans required shall be ducted directly to the outside in accordance with Section 501.3. Exhaust air outlets shall be designed to limit the pressure difference to the outside to limiting the outlet free area maximum velocity to 500 feet per minute and equipped with backdraft dampers or motorized dampers in accordance with *Washington State Energy Code*. Exhaust fans shall be tested and rated in accordance with HVI 915, HVI 916, and HVI 920, as applicable. Exhaust fans required in this section may be used to provide local ventilation. Exhaust fans that are designed for intermittent exhaust airflow rates higher than the continuous exhaust airflow rates in Table 403.8.3 shall be provided with occupancy sensors or humidity sensors to automatically override the fan to the high speed airflow rate. The exhaust fans shall be tested, and the testing results shall be submitted and posted in accordance with Section 403.8.6.7.

EXCEPTION: Central exhaust fans serving multiple residential units do not need to comply with the HVI testing requirements.

403.8.6.2 Supply fans. Supply fans used in meeting the requirements of this section shall supply outdoor air from intake openings in accordance with Sections 401.4 and 401.5. Intake air openings shall be designed to limit the pressure difference to the outside to limiting the inlet free area maximum velocity to 500 feet per minute and When designed for intermittent off operation supply fans shall be equipped with motorized dampers in accordance with the *Washington State Energy Code*. Supply fans shall be tested and rated in accordance with HVI 915, HVI 916, and HVI 920, as applicable. Where outdoor air is provided to each habitable dwelling unit or sleeping unit by supply fan systems the outdoor air shall be filtered. The filter shall be provided with access for regular maintenance and replacement. The filter shall have a Minimum Efficiency Rating Value (MERV) of at least 8.

EXCEPTION: Central supply fans serving multiple residential units do not need to comply with the HVI testing requirements.

403.8.6.3 Balanced whole house ventilation system. A balanced whole house ventilation system shall include both supply and exhaust fans. The supply and exhaust fans shall have airflow that is within 10 percent of each other. The tested and balanced total mechanical exhaust airflow rate is within 10 percent or 5 cfm, whichever is greater, of the total mechanical supply airflow rate. The flow rate test results shall be submitted and posted in accordance with Section 403.8.6.6. The exhaust fan shall meet the requirements of Section 403.8.6.2. The supply fan shall meet the requirements of Section 403.8.6.3. Fans shall be tested and rated in accordance with HVI 915 and HVI 916. Where integrated systems that include both supply and exhaust fans the integrated system will comply with HVI 920. For R-2 dwelling and sleeping units, the system is required to have balanced whole house ventilation but is not required to the system coefficient from Table 403.8.2 is utilized to correct the whole house mechanical ventilation rate. The system shall be design and balanced to meet the pressure equalization requirements of Section 501.4. Intermittent dryer exhaust, intermittent range hood exhaust, and intermittent toilet room exhaust airflow rates above the residential dwelling or sleeping unit minimum ventilation rate are exempt from the balanced airflow calculation. Supply air shall be filtered. The filter shall be provided with access for regular maintenance and replacement. The filter shall have a Minimum Efficiency Rating Value (MERV) of at least 8.

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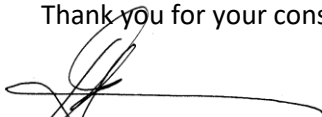
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