



STATE OF WASHINGTON
STATE BUILDING CODE COUNCIL

Log No. 077
Proponent Revision
5/20/22

1. State Building Code to be Amended:

- International Building Code
- ICC ANSI A117.1 Accessibility Code
- International Existing Building Code
- International Residential Code
- International Fire Code
- Uniform Plumbing Code

- International Mechanical Code
- International Fuel Gas Code
- NFPA 54 National Fuel Gas Code
- NFPA 58 Liquefied Petroleum Gas Code
- Wildland Urban Interface Code

For the Washington State Energy Code, please see specialized [energy code forms](#)

Section(s):
WSMC 401.4

Title:
Intake Opening Location

2. Proponent Name (Specific local government, organization or individual):

Proponent: **Reed Rushing, Rushing**
Title: **Principal**
Date: **4/8/2022**

3. Designated Contact Person:

Name: **Reed Rushing**
Title: **Principal**
Address: **Seattle, WA**

Office Phone: () **206-285-7100**
Cell: () **206-715-2445**
E-Mail address: **reedr@rushingco.com**

4. Proposed Code Amendment. Reproduce the section to be amended by underlining all added language, striking through all deleted language. Insert new sections in the appropriate place in the code in order to continue the established numbering system of the code. If more than one section is proposed for amendment or more than one page is needed for reproducing the affected section of the code, additional pages may be attached.

Clearly state if the proposal modifies an existing amendment or if a new amendment is needed. If the proposal modifies an **existing amendment**, show the modifications to the existing amendment by underlining all added language and striking through all deleted language. If a new amendment is needed, show the modifications to the **model code** by underlining all added language and striking through all deleted language.

Code(s) WSMC Section(s) 401.4

Enforceable code language must be used.

Amend section to read as follows:

See proposed changes below in red, underline with track changes.

401.4 Intake opening location. Air intake openings shall comply with all of the following:

1. Intake openings shall be located not less than 10 feet (3048 mm) from lot lines or buildings on the same lot. Lot lines shall not be defined as a separation from a street or public way.
2. Mechanical and gravity outdoor air intake openings shall be located not less than 10 feet (3048 mm) horizontally from any hazardous or noxious contaminant source, such as vents, streets, alleys, parking lots and loading docks, except as specified in Item 3 or Section 501.3.1. Outdoor air intake openings shall be permitted to be located less than 10 feet (3048 mm) horizontally from streets, alleys, parking garage entries, parking lots and loading docks provided that the openings are located not less than 25 feet (7620 mm) vertically above such locations. Where openings front on a street or public way, the distance shall be measured from the closest edge of the street or public way.

Exceptions:

1. Intake air openings providing less than 500 cfm of outdoor air to Group R occupancies are permitted to be located less than 10 feet (3048 mm) horizontally from parking lots provided that the openings are not less than 15 feet (4572 mm) vertically above the parking lot.
- 1.2. Intake air openings providing less than 500 cfm of outdoor air to Group R occupancies are permitted to be located less than 10 feet (3048 mm) horizontally from parking garage entries provided that the openings are not less than 15 feet (4572 mm) vertically above the clear height for vehicle in the parking garage.

5. Briefly explain your proposed amendment, including the purpose, benefits and problems addressed. Specifically note any impacts or benefits to business, and specify construction types, industries and services that would be affected. Finally, please note any potential impact on enforcement such as special reporting requirements or additional inspections required.

The added exception will allow small systems to intake less than 25' above a street or parking lot. Multiple jurisdictions enforce this requirement of the code differently. Requiring residential ERV intakes to be 25' above a surface parking lot or open parking garage on the level below adds considerable cost and complexity to a project. ASHRAE 62.1-2019 Table 5-1 only requires a 5' separation from the anticipated exhaust source location from a driveway, street, or parking place to air intakes.

Object	Minimum Distance, ft (m)
Class 2 air exhaust/relief outlet	10 (3)
Class 3 air exhaust/relief outlet	15 (5)
Class 4 air exhaust/relief outlet	30 (10)
Cooling tower exhaust	25 (7.5)
Cooling tower intake or basin	15 (5)
Driveway, street, or parking place	5 (1.5)
Garage entry, automobile loading area, or drive-in queue	15 (5)
Garbage storage/pick-up area, dumpsters	15 (5)
Plumbing vents terminating at least 3 ft (1 m) above the level of the outdoor air intake	3 (1)
Plumbing vents terminating less than 3 ft (1 m) above the level of the outdoor air intake	10 (3)
Roof, landscaped grade, or other surface directly below intake	1 (0.30)
Thoroughfare with high traffic volume	25 (7.5)
Truck loading area or dock, bus parking/idling area	25 (7.5)
Vents, chimneys, and flues from combustion appliances and equipment	15 (5)

See end of this section for code alternate request from a recent 2018 WSMC project.

6. Specify what criteria this proposal meets. You may select more than one.

- The amendment is needed to address a critical life/safety need.
- The amendment clarifies the intent or application of the code.
- The amendment is needed to address a specific state policy or statute.
- The amendment is needed for consistency with state or federal regulations.
- The amendment is needed to address a unique character of the state.
- The amendment corrects errors and omissions.

7. Is there an economic impact: Yes No

If no, state reason: Clarify code requirements and increased unified enforcement across jurisdictions.

If yes, provide economic impact, costs and benefits as noted below in items a – f.

- a. **Life Cycle Cost.** Use the OFM Life Cycle Cost [Analysis tool](#) to estimate the life cycle cost of the proposal using one or more typical examples. Reference these [Instructions](#); use these [Inputs](#). Webinars on the tool can be found [Here](#) and [Here](#)). If the tool is used, submit a copy of the excel file with your proposal submission. If preferred, you may submit an alternate life cycle cost analysis.
- b. **Construction Cost.** Provide your best estimate of the construction cost (or cost savings) of your code change proposal.

For residential projects there is a cost savings of \$500-\$1000 per residential unit to not provide “snorkel” outdoor air duct up to the floor above. Cost savings include ductwork, duct insulation, rated enclosure to separate duct from floor above or fire damper in floor above.

Costs due not include lost revenue due to loss of floor space within the residential unit.

- c. **Code Enforcement.** List any code enforcement time for additional plan review or inspections that your proposal will require, in hours per permit application:

Provide cost savings for cost enforcement as code alternates do not need to be reviewed for alternate compliance with 62.1.

- d. ***Small Business Impact.*** Describe economic impacts to small businesses:
- e. ***Housing Affordability.*** Describe economic impacts on housing affordability:
- f. ***Other.*** Describe other qualitative cost and benefits to owners, to occupants, to the public, to the environment, and to other stakeholders that have not yet been discussed:

Please send your completed proposal to: sbcc@des.wa.gov

All questions must be answered to be considered complete. Incomplete proposals will not be accepted.

Description of Code Alternate:

This project includes three 4-story multifamily apartment buildings where the majority of the ground floor is residential parking in an open, naturally ventilated garage with residential units on the levels above. The floor heights do not allow for either 25 feet vertical or 10 feet horizontal separation as required by 2018 WSMC Section 404.4.2 without the outdoor air intakes for Level 2 units being located on Level 3 above.

The code alternate request is to reduce separation requirements between mechanical outdoor air intake and parking places/garage entries below on the basis of ASHRAE Standard 62.1-2016. These outdoor air intakes are for individual residential dwelling units that are connected to energy recovery ventilators (ERVs) that draw less than 100 CFM of intake air.

Description of Code Requirement:

2018 WSMC Section 404.4.2 currently requires 25 feet vertical or 10 feet horizontal separation between mechanical outdoor air intakes and parking lots.

401.4 Intake opening location. Air intake openings shall comply with all of the following:

1. Intake openings shall be located not less than 10 feet (3048 mm) from lot lines or buildings on the same lot. Lot lines shall not be defined as a separation from a street or public way.
2. Mechanical and gravity outdoor air intake openings shall be located not less than 10 feet (3048 mm) horizontally from any hazardous or noxious contaminant source, such as vents, streets, alleys, parking lots and loading docks, except as specified in Item 3 or Section 501.3.1. Outdoor air intake openings shall be permitted to be located less than 10 feet (3048 mm) horizontally from streets, alleys, parking lots and loading docks provided that the openings are located not less than 25 feet (7620 mm) vertically above such locations. Where openings front on a street or public way, the distance shall be measured from the closest edge of the street or public way.

Justification:

2018 WSMC Section 403.2 Exception 2 states that “Alternate systems design in accordance with ASHRAE Standard 62.1[-2016], Ventilation Rate Procedure, shall be permitted.”

403.2 Outdoor air required. The minimum outdoor airflow rate shall be determined in accordance with Section 403.3.

Exceptions:

1. Where the registered design professional demonstrates that an engineered ventilation system design will prevent the maximum concentration of contaminants from exceeding that obtainable by the rate of outdoor air ventilation determined in accordance with Section 403.3, the minimum required rate of outdoor air shall be reduced in accordance with such engineered system design.
2. Alternate systems designed in accordance with ASHRAE Standard 62.1 Section 6.2, Ventilation Rate Procedure, shall be permitted.

ASHRAE Standard 62.1-2016 Table 5.5.1: Air Intake Minimum Separation Distance lists 5 feet for “driveway, street, or parking place.” ASHRAE Standard 62.1-2016 distinguishes between *garage entry* locations where cars may be idling and *parking places* where cars are parked on off, whereas the International Mechanical Code (IMC) does not make this distinction. Additionally footnote “d” clarifies that the distance is measured to the anticipated exhaust termination location on the vehicle, whereas IMC measures to the surface level.

TABLE 5.5.1 Air Intake Minimum Separation Distance

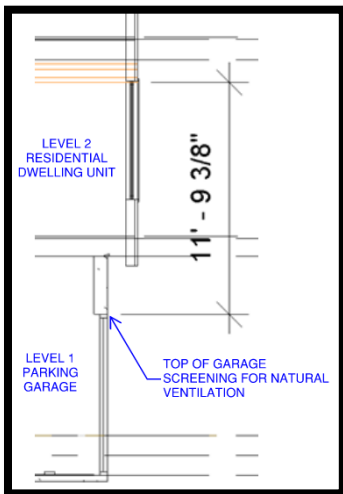
Object	Minimum Distance, ft (m)
Class 2 air exhaust/relief outlet ^a	10 (3)
Class 3 air exhaust/relief outlet ^a	15 (5)
Class 4 air exhaust/relief outlet ^b	30 (10)
Plumbing vents terminating less than 3 ft (1 m) above the level of the outdoor air intake	10 (3)
Plumbing vents terminating at least 3 ft (1 m) above the level of the outdoor air intake	3 (1)
Vents, chimneys, and flues from combustion appliances and equipment ^c	15 (5)
Garage entry, automobile loading area, or drive-in queue ^d	15 (5)
Truck loading area or dock, bus parking/idling area ^d	25 (7.5)
Driveway, street, or parking place ^d	5 (1.5)
Thoroughfare with high traffic volume	25 (7.5)
Roof, landscaped grade, or other surface directly below intake ^{e,f}	1 (0.30)
Garbage storage/pick-up area, dumpsters	15 (5)
Cooling tower intake or basin	15 (5)
Cooling tower exhaust	25 (7.5)

- a. This requirement applies to the distance from the outdoor air intakes for one ventilation system to the exhaust outlets and relief outlets for any other ventilation system.
- b. Minimum distance listed does not apply to laboratory fume hood exhaust air outlets. Separation criteria for fume hood exhaust shall be in compliance with ANSI/AIHA Z9.5 ⁶. Informative Appendix J contains sources of additional information on separation criteria. These include the *ACGIH Industrial Ventilation Manual* ¹¹, *ASHRAE Handbook—HVAC Applications* ¹², *ASHRAE Laboratory Design Guide* ¹³, and NSF/ANSI 49 ¹⁴.
- c. The minimum distances relative to fuel-fired appliances shall be as required by ANSI Z223.1/NFPA 54 ⁷ for fuel gas burning appliances and equipment, NFPA 31 ⁸ for oil burning appliances and equipment, and NFPA 211 ⁹ for other combustion appliances and equipment.
- d. Distance measured to closest place that vehicle exhaust is likely to be located
- e. The minimum separation distance shall not apply where outdoor surfaces below the air intake are sloped more than 45 degrees from horizontal or where such surfaces are less than 1 in. (30 mm) in width.
- f. Where snow accumulation is expected, the surface of the snow at the expected average snow depth shall be considered to be a surface directly below an intake.

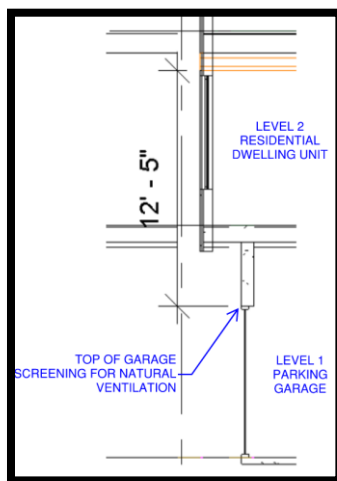
Parking garages are each an Open Parking Garage as classified in 2018 WSBC Section 406.5.2 and will be naturally ventilated. The top of the garage screening for natural ventilation is located the following vertical distance (by building) from the mechanical intake on Level 2 above, which all exceed the 5 ft separation distance as required by ASHRAE Standard 62.1-2016:

- Building 1: 11'-9"
- Building 2: 12'-5"
- Building 3: 12'-4"

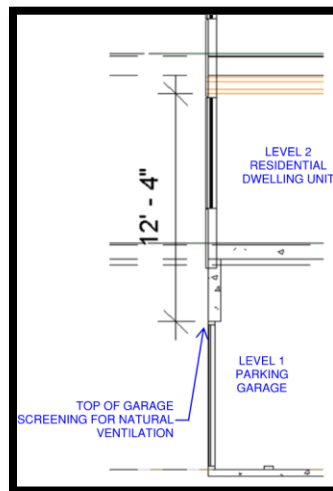
Building 1:



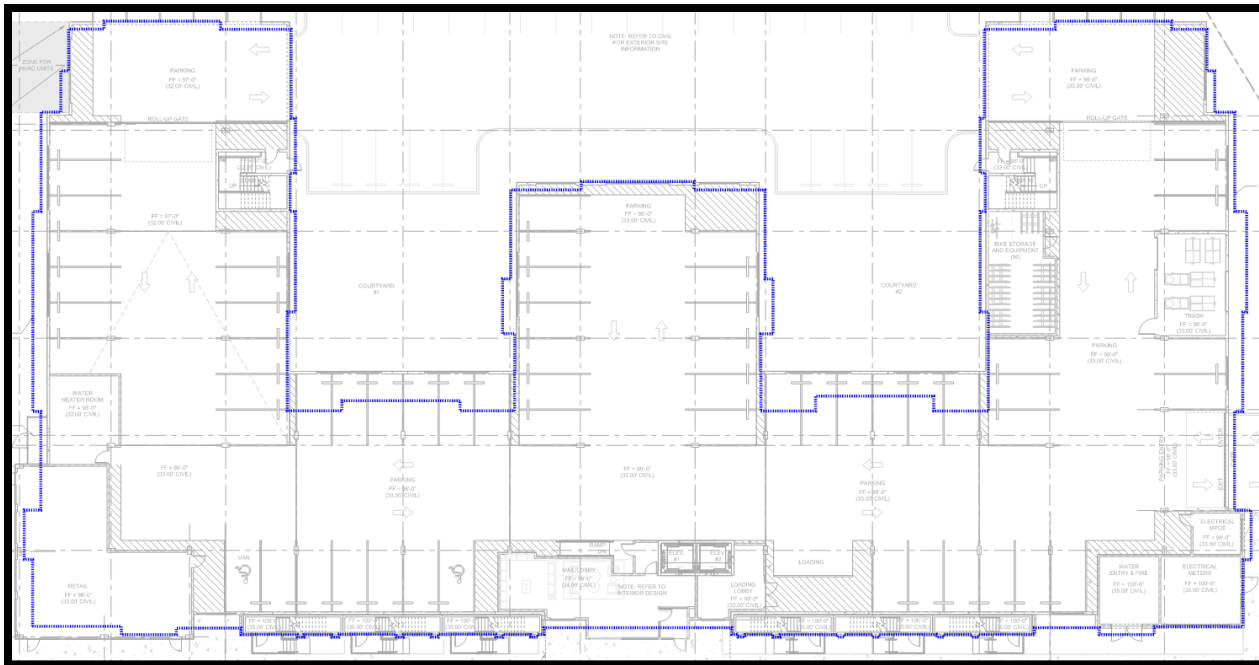
Building 2:



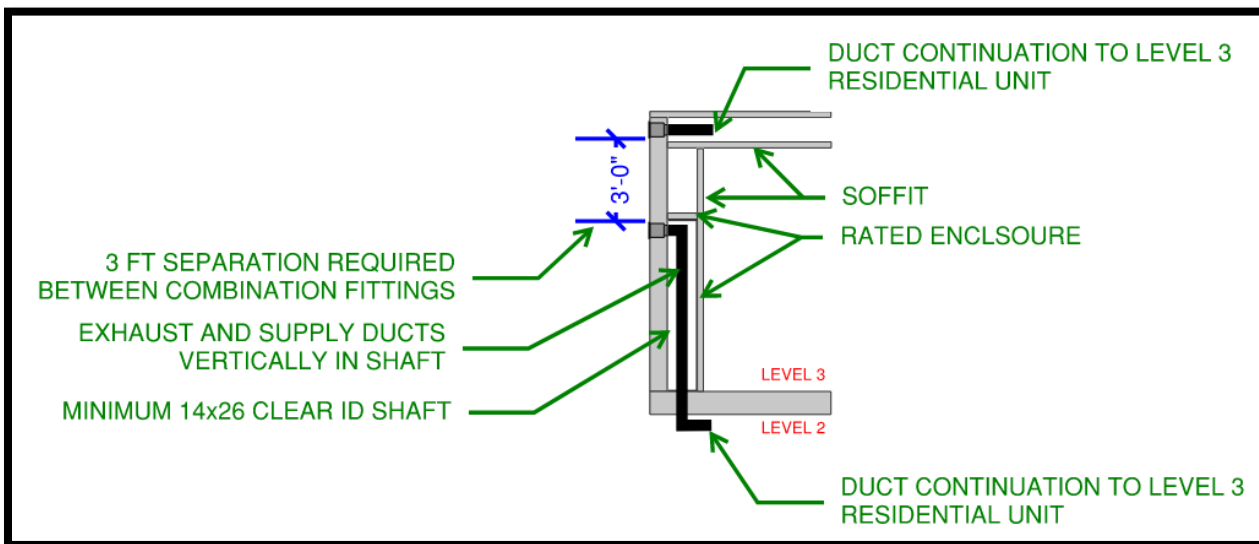
Building 3:



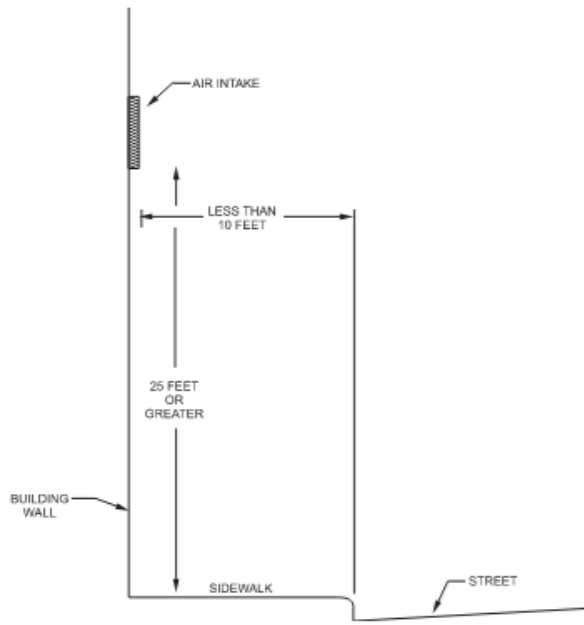
Plan view of parking garage layout with outline of residential units above (dashed line) illustrating 10 ft horizontal separation cannot be met:



Detail of outdoor air intake for Level 2 unit from Level 3 above to achieve IMC 25 feet vertical separation:



IMC code commentary diagram for reference:



For SI: 1 foot = 304.8 mm.

Figure 401.4(2)
INTAKE OPENING