Chapter 51-52 WAC

STATE BUILDING CODE ADOPTION AND AMENDMENT OF THE 2009 EDITION OF THE INTERNATIONAL MECHANICAL CODE

(Formerly chapter 51-42 WAC)

WAC

51-52-001 Authority.
51-52-002 Purpose.
51-52-003 International Mechanical Code.
51-52-004 Conflict between International Mechanical Code and State Energy Code chapter 51-11 WAC.
51-52-005 Reserved.
51-52-007 Exceptions.
51-52-008 Implementation.
51-52-0101 Section 101—General.
51-52-0202 Section 202—General definitions.
51-52-0306 Section 306—Access and service space.
51-52-0401 Section 401—General.
51-52-0403 Section 403—Mechanical ventilation.
51-52-0404 Section 404—Enclosed parking garages and automobile repair facilities.
51-52-0501 Section 501—General.
51-52-0504 Section 504—Clothes dryer exhaust.
51-52-0505 Section 505—Domestic kitchen exhaust equipment.
51-52-0506 Section 506—Commercial kitchen hood ventilation system ducts and exhaust equipment.
51-52-0507 Section 507—Commercial kitchen hoods.
51-52-0601 Section 601—General.
51-52-0603 Section 603—Duct construction and installation.
51-52-0606 Section 606—Smoke detection systems control.
51-52-1000 Chapter 10—Boilers, water heaters and pressure vessels.
51-52-1500 Chapter 15—Referenced standards.
51-52-21000 International Fuel Gas Code.
51-52-21101 Section 101—General.
51-52-22000 National Fuel Gas Code.
51-52-22006 Chapter 6—Gas piping installation.

DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

51-52-21404 Section 404—Piping system installation. [Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-104, § 51-52-21404, filed 12/17/03, effective 7/1/04.] Repealed by 07-01-092, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW.

WAC 51-52-001 Authority. These rules are adopted under the authority of chapter 19.27 RCW.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-104, § 51-52-001, filed 12/17/03, effective 7/1/04.]

WAC 51-52-002 Purpose. The purpose of these rules is to implement the provisions of chapter 19.27 RCW, which provides that the state building code council shall maintain the State Building Code in a status which is consistent with the purpose as set forth in RCW 19.27.020. In maintaining the codes the council shall regularly review updated versions of the codes adopted under the act, and other pertinent information, and shall amend the codes as deemed appropriate by the council.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-104, § 51-52-002, filed 12/17/03, effective 7/1/04.]

WAC 51-52-003 International Mechanical Code. The 2009 edition of the *International Mechanical Code* published by the International Code Conference is hereby adopted by reference with the exceptions noted in this chapter of the Washington Administrative Code (WAC).

[Statutory Authority: RCW 19.27.190, 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-099, § 51-52-003, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-092, § 51-52-003, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-104, § 51-52-003, filed 12/17/03, effective 7/1/04.]

WAC 51-52-004 Conflict between International Mechanical Code and State Energy Code chapter 51-11 WAC. In the case of conflict between the duct sealing or insulation requirements of Section 603 or Section 604 of this code and the duct sealing or insulation requirements of chapter 51-11 WAC, the Washington State Energy Code, or where applicable, a local jurisdiction's energy code, the provisions of such energy codes shall govern.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-104, § 51-52-004, filed 12/17/03, effective 7/1/04.]

WAC 51-52-005 Reserved.

[Statutory Authority: RCW 19.27.190, 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-099, § 51-52-005, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-104, § 51-52-005, filed 12/17/03, effective 7/1/04.]

WAC 51-52-007 Exceptions. The exceptions and amendments to the International Mechanical Code contained in the provisions of chapter 19.27 RCW shall apply in case of conflict with any of the provisions of these rules.

The provisions of this code do not apply to temporary growing structures used solely for the commercial production of horticultural plants including ornamental plants, flowers, vegetables, and fruits. "Temporary growing structure" means a structure that has the sides and roof covered with polyethylene, polyvinyl, or similar flexible synthetic material and is used to provide plants with either frost protection or increased heat retention. A temporary growing structure is not considered a building for purposes of this code.

Codes referenced which are not adopted through RCW 19.27.031 or chapter 19.27A RCW shall not apply unless specifically adopted by the authority having jurisdiction.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-104, § 51-52-007, filed 12/17/03, effective 7/1/04.]

WAC 51-52-008 Implementation. The International Mechanical Code adopted by chapter 51-52 WAC shall become effective in all counties and cities of this state on July 1, 2010.

[Statutory Authority: RCW 19.27.190, 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-099, § 51-52-008, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-092, § 51-52-008, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-104, § 51-52-008, filed 12/17/03, effective 7/1/04.]

WAC 51-52-0101 Section 101—General.

101.2 Scope. This code shall regulate the design, installation, maintenance, alteration and inspection of mechanical systems that are permanently installed and utilized to provide control of environmental conditions and related processes within buildings. This code shall also regulate those mechanical systems, system components, equipment and appliances specifically addressed herein. The installation of fuel gas distribution piping and equipment, fuel gas-fired appliances and fuel gas-fired appliance venting systems shall be regulated by the *International Fuel Gas Code*.

EXCEPTIONS: 1. Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories high with separate means of egress and their accessory structures shall comply with the *International Residential Code*.

2. The standards for liquefied petroleum gas installations shall be the 2008 Edition of NFPA 58 (Liquefied Petroleum Gas Code) and the 2009 Edition of ANSI Z223.1/NFPA 54 (National Fuel Gas Code).

[Statutory Authority: RCW 19.27.190, 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-099, § 51-52-0101, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-092, § 51-52-0101, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-104, § 51-52-0101, filed 12/17/03, effective 7/1/04.]

WAC 51-52-0202 Section 202—General definitions.

SOURCE SPECIFIC VENTILATION. A mechanical ventilation system including all fans, controls, and ducting, which is dedicated to exhausting contaminant-laden air to the exterior of the building from the room or space in which the contaminant is generated.

UNUSUALLY TIGHT CONSTRUCTION. Construction meeting the following requirements:

1. Walls exposed to the outdoor atmosphere having a continuous water vapor retarder with a rating of 1 perm (57 ng/s·m²·Pa) or less with openings gasketed or sealed; and

2. Operable windows and doors meeting the air leakage requirements of the *International Energy Conservation Code,* Section 502.1.4; and

3. Caulking or sealants are applied to areas such as joints around window and door frames, between sole plates and floors, between wall-ceiling joints, between wall panels, at penetrations for plumbing, electrical and gas lines, and at other openings; or

4. Buildings built in compliance with the 1986 or later editions of the Washington State Energy Code, chapter 51-11 WAC, Northwest Energy Code, or Super Good Cents weatherization standards or equivalent.

WHOLE HOUSE VENTILATION SYSTEM. A mechanical ventilation system, including fans, controls, and ducts, which replaces, by direct or indirect means, air from the habitable rooms with outdoor air.

[Statutory Authority: RCW 19.27.190, 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-099, § 51-52-0202, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-092, § 51-52-0202, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-104, § 51-52-0202, filed 12/17/03, effective 7/1/04.]

WAC 51-52-0306 Section 306—Access and service space.

306.5 Equipment and appliances on roofs or elevated structures. Where equipment requiring access and appliances are installed on roofs or elevated structures at a height exceeding 16 feet (4877 mm), such access shall be provided by a permanent approved means of access, the extent of which shall be from grade or floor level to the equipment and appliances' level service space. Such access shall not require climbing over obstructions greater than 30 inches (762 mm) high or walking on roofs having a slope greater than 4 units vertical in 12 units horizontal (33 percent slope). Where access involves climbing over parapet walls, the height shall be measured to the top of the parapet wall.

Permanent ladders installed to provide the required access shall comply with the following minimum design criteria:

1. The side railing shall extend above the parapet or roof edge not less than 42 inches (1067 mm).

2. Ladders shall have rung spacing not to exceed 12 inches (305 mm) on center.

3. Ladders shall have a toe spacing not less than 7 inches (178 mm) deep.

4. There shall be a minimum of 18 inches (457 mm) between rails.

5. Rungs shall have a minimum 0.75-inch (19 mm) diameter and be capable of withstanding a 300-pound (136.1 kg) load.

6. Ladders over 30 feet (9144 mm) in height shall be provided with offset sections and landings capable of withstanding 100 pounds (488.2 kg/m²) per square foot.

7. Ladders shall be protected against corrosion by approved means.

Catwalks installed to provide the required access shall be not less than 24 inches (610 mm) wide and shall have railings as required for service platforms.

EXCEPTION: This section shall not apply to Group R-3 occupancies.

[Statutory Authority: RCW 19.27.190, 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-099, § 51-52-0306, filed 1/20/10, effective 7/1/10.]

WAC 51-52-0401 Section 401—General.

401.2 Ventilation required. Every occupied space other than enclosed parking garages and buildings used for repair of automobiles shall be ventilated in accordance with Section 402.2.1 or 401.2.2. Enclosed parking garages and buildings used for repair of automobiles shall be ventilated by mechanical means in accordance with Sections 403 and 404.

401.2.1 Group R occupancies. Ventilation in Group R occupancies shall be provided in accordance with Section 403.8.

401.2.2 All other occupancies. Ventilation in all other occupancies shall be provided by natural means in accordance with Section 402 or by mechanical means in accordance with Sections 403.1 to 403.7.

401.7 Testing and balancing. At the discretion of the building official, flow testing may be required to verify that the mechanical system(s) satisfies the requirements of this chapter. Flow testing may be performed using flow hood measuring at the intake or exhaust points of the system, in-line pitot tube, or pitot-traverse type measurement systems in the duct, short term tracer gas measurements, or other means approved by the building official.

[Statutory Authority: RCW 19.27.190, 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-099, § 51-52-0401, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-092, § 51-52-0401, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-01-015, § 51-52-0401, filed 12/2/04, effective 7/1/05.]

WAC 51-52-0403 Section 403—Mechanical ventilation.

403.2 Outdoor air required. The minimum ventilation rate of outdoor air 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.

403.2.1 Recirculation of air. The air required by Section 403.3 shall not be recirculated. Air in excess of that required by Section 403.3 shall not be prohibited from being recirculated as a component of supply air to building spaces, except that:

1. Ventilation air shall not be recirculated from one dwelling to another or to dissimilar occupancies.

2. Supply air to a swimming pool and associated deck areas shall not be recirculated unless such air is dehumidified to maintain the relative humidity of the area at 60 percent or less. Air from this area shall not be recirculated to other spaces where 10 percent or more of the resulting supply airstream consists of air recirculated from these spaces.

3. Where mechanical exhaust is required by Note b in Table 403.3, recirculation of air from such spaces shall be prohibited. All air supplied to such spaces shall be exhausted, including any air in excess of that required by Table 403.3.

(Item 4 is not adopted.)

403.3 Outdoor airflow rate. Ventilation systems shall be designed to have the capacity to supply the minimum outdoor airflow rate determined in accordance with this section. The occupant load utilized for design of the ventilation system shall not be less than the number determined from the estimated maximum occupant load rate indicated in Table 403.3. Ventilation rates for occupancies not represented in Table 403.3 shall be those for a listed occupancy classification that is most similar in terms of occupant density, activities and building construction; or shall be determined by an approved engineering analysis. The ventilation system shall be designed to supply the required rate of ventilation air continuously during the period the building is occupied, except as otherwise stated in other provisions of the code.

With the exception of smoking lounges, the ventilation rates in Table 403.3 are based on the absence of smoking in occupiable spaces. Where smoking is anticipated in a space other than a smoking lounge, the ventilation system serving the space shall be designed to provide ventilation over and above that required by Table 403.3 in accordance with accepted engineering practice.

EXCEPTION: Where occupancy density is known and documented in the plans, the outside air rate may be based on the design occupant density. Under no circumstance shall the occupancies used result in outside air less than one-half that resulting from application of Table 403.3 estimated maximum occupancy rates.

Table 403.3
Required Outdoor Ventilation Air

Occupancy Classification	People Outdoor Airflow Rate in Breathing Zone cfm/Person	Area Outdoor Airflow Rate in Breathing Zone R_a cfm/ft^{2a}	Default Occupant Density #/1000 ft^{2a}	Exhaust Airflow Rate cfm/ft^2
Correctional facilities				
Cells				
without plumbing fixtures	5	0.12	25	—
with plumbing fixtures	5	0.12	25	1.0
Dining halls (see food and beverage service)	—	—	—	—
Guard stations	5	0.06	15	—
Day room	5	0.06	30	—
Booking/waiting	7.5	0.06	50	—
Dry cleaners, laundries				
Coin-operated dry cleaner	15	—	20	—
Coin-operated laundries	7.5	0.06	20	—
Commercial dry cleaner	30	—	30	—
Commercial laundry	25	—	10	—
Storage, pick up	7.5	0.12	30	—
Education				
Art classroom	10	0.18	20	0.7
Auditoriums	5	0.06	150	—

Occupancy Classification	People Outdoor Airflow Rate in Breathing Zone cfm/Person	Area Outdoor Airflow Rate in Breathing Zone R_a cfm/ft^{2a}	Default Occupant Density #/1000 ft^{2a}	Exhaust Airflow Rate cfm/ft^2
Classrooms (ages 5-8)	10	0.12	25	—
Classrooms (ages 9 plus)	10	0.12	35	—
Computer lab	10	0.12	25	—
Corridors (see public spaces)	—	—	—	—
Day care (through age 4)	10	0.18	25	—
Lecture classroom	7.5	0.06	65	—
Lecture hall (fixed seats)	7.5	0.06	150	—
Locker/dressing room	—	—	—	0.25
Media center	10	0.12	25	—
Multiuse assembly	7.5	0.06	100	—
Music/theater/dance	10	0.06	35	—
Science laboratories	10	0.18	25	1.0
Smoking lounges[b]	60	—	70	—
Sports locker rooms	—	—	—	0.5
Wood/metal shops	10	0.18	20	0.5
Food and beverage service				
Bars, cocktail lounges	7.5	0.18	100	—
Cafeteria, fast food	7.5	0.18	100	—
Dining rooms	7.5	0.18	70	—
Kitchens (cooking)[b]	—	—	—	0.7
Hospitals, nursing and convalescent homes				
Autopsy rooms[b]	—	—	—	0.5
Medical procedure rooms	15	—	20	
Operating rooms	30	—	20	
Patient rooms	25	—	10	
Physical therapy	15	—	20	
Recovery and ICU	15	—	20	
Hotels, motels, resorts and dormitories				
Multipurpose assembly	5	0.06	120	—
Bathrooms/toilet—private	—	—	—	25/50[f]
Bedroom/living room	5	0.06	10	—
Conference/meeting	5	0.06	50	—
Dormitory sleeping areas	5	0.06	20	—
Gambling casinos	7.5	0.18	120	—
Kitchens	—	—	—	25/100[f]
Lobbies/prefunction	7.5	0.06	30	—
Offices				
Conference rooms	5	0.06	50	—
Office spaces	5	0.06	5	—
Reception areas	60	0.06	30	—
Telephone/data entry	5	0.06	60	—
Main entry lobbies	5	0.06	10	—
Private dwellings, single and multiple				
Garages, common for multiple units[b]	—	—	—	0.75
Garages, separate for each dwelling[b]	—	—	—	100 cfm per car
Kitchens[b]	—			25/100[f]
Living areas[c]	See Tables 403.8.5.1 and 403.8.5.2	—	Based on the number of bedrooms. First bedroom: 2; each additional bedroom, 1	—
Toilet rooms, bathrooms and laundry areas[i]	—			20/50[f]
Public spaces				
Corridors	—	0.06	—	—
Elevator car	—	—	—	1.0
Shower room (per shower head)	—	—	—	50/20[f]
Smoking lounges[b]	60	—	70	—
Toilet rooms - public	—	—	—	50/70[e]
Places of religious worship	5	0.06	120	—
Courtrooms	5	0.06	70	—
Legislative chambers	5	0.06	50	—
Libraries	5	0.12	10	—
Museums (children's)	7.5	0.12	40	—
Museums/galleries	7.5	0.06	40	—

Occupancy Classification	People Outdoor Airflow Rate in Breathing Zone cfm/Person	Area Outdoor Airflow Rate in Breathing Zone R_a cfm/ft^{2a}	Default Occupant Density #/1000 ft^{2a}	Exhaust Airflow Rate cfm/ft^2
Retail stores, sales floors and showroom floors				
Sales (except as below)	7.5	0.12	15	—
Dressing rooms	—	—	—	0.25
Mall common areas	7.5	0.06	40	—
Shipping and receiving	—	0.12	—	—
Smoking lounges[b]	60	—	70	—
Storage rooms	—	0.12	—	—
Warehouses (see storage)	—	—	—	—
Specialty shops				
Automotive motor-fuel-dispensing stations[b]	—	—	—	1.5
Barber	7.5	0.06	25	0.5
Beauty and nail salons[b,h]	20	0.12	25	0.6
Embalming room[b]	—	—	—	2.0
Pet shops (animal areas)[b]	7.5	0.18	10	0.9
Supermarkets	7.5	0.06	8	—
Sports and amusement				
Disco/dance floors	20	0.06	100	—
Bowling alleys (seating areas)	10	0.12	40	—
Game arcades	7.5	0.18	20	—
Ice arenas, without combustion engines	—	0.30	—	0.5
Gym, stadium arena (play area)	—	0.30	—	—
Spectator areas	7.5	0.06	150	—
Swimming pools (pool and deck area)	—	0.48	—	—
Health club/aerobics room	20	0.06	40	—
Health club/weight room	20	0.06	10	—
Storage				
Repair garages, enclosed parking garage[b,d]	—	—	—	0.75
Warehouses	—	0.06	—	—
Theaters				
Auditoriums (see education)			—	—
Lobbies	5	0.06	150	—
Stages, studios	10	0.06	70	—
Ticket booths	5	0.06	60	—
Transportation				
Platforms	7.5	0.06	100	—
Transportation waiting	7.5	0.06	100	—
Workrooms				
Bank vaults/safe deposit	5	0.06	5	—
Darkrooms	—	—	—	1.0
Copy, printing rooms	5	0.06	4	0.5
Meat processing[c]	15	—	10	—
Pharmacy (prep area)	5	0.18	10	—
Photo studios	5	0.12	10	—
Computer (without printing)	5	0.06	4	—

For SI: 1 cubic foot per minute = 0.0004719 m^3/s, 1 ton = 908 kg, 1 cubic foot per minutes per square foot = 0.00508 $m^3/(s \cdot m^2)$, °C = [(°F) -32]/1.8, 1 square foot - 0.0929 m^2.

a. Based upon net occupiable floor area.

b. Mechanical exhaust required and the recirculation of air from such spaces is prohibited (see Section 403.2.1, Item 3).

c. Spaces unheated or maintained below 50°F are not covered by these requirements unless the occupancy is continuous.

d. Ventilation systems in enclosed parking garages shall comply with Section 404.

e. Rates are per water closet or urinal. The higher rate shall be provided where periods of heavy use are expected to occur, such as toilets in theaters, schools and sports facilities. The lower rate shall be permitted where periods of heavy use are not expected.

f. Rates are per room unless otherwise indicated. The higher rate shall be provided where the exhaust system is designed to operate intermittently. The lower rate shall be permitted where the exhaust system is designed to operate continuously during normal hours of use.

g. Reserved.

h. For nail salons, the required exhaust shall include ventilation tables or other systems that capture the contaminants and odors at their source and are capable of exhausting a minimum of 50 cfm per station.

i. A laundry area within a kitchen or bathroom is not required to have source specific exhaust. Where there are doors that separate the laundry area from the kitchen or bathroom the door shall be louvered.

403.8 Ventilation systems for Group R occupancies. Each dwelling unit or guest room shall be equipped with source specific and whole house ventilation systems and shall comply with Sections 403.8.1 through 403.8.11. All public corridors and other than Group R occupied spaces that support the Group R occupancy shall meet the ventilation requirements of Section 402 or Sections 403.1 to 403.7.

403.8.1 Minimum ventilation performance. Ventilation systems shall be designed and installed to satisfy the ventilation requirements of Table 403.3 or Table 403.8.1.

Table 403.8.1
Ventilation Rates for All Group R Private Dwellings, Single and Multiple
(Continuously Operating Systems)

Floor Area (ft^2)	Bedrooms[1]				
	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

[1]Ventilation rates in table are minimum outdoor airflow rates measured in cfm.

403.8.2 Control and operation.

1. Location of controls. Controls for all ventilation systems shall be readily accessible by the occupant.

2. Instructions. Operating instructions for whole house ventilation systems shall be provided to the occupant by the installer of the system.

3. Source specific ventilation systems. Source specific ventilation systems shall be controlled by manual switches, dehumidistats, timers, or other approved means.

4. Continuous whole house ventilation systems. Continuous whole house ventilation systems shall operate continuously. Exhaust fans, forced-air system fans, or supply fans shall be equipped with "fan on" as override controls. Controls shall be capable of operating the ventilation system without energizing other energy-consuming appliances. A label shall be affixed to the controls that reads "Whole House Ventilation (see operating instructions)."

5. Intermittent whole house ventilation systems. Intermittent whole house ventilation systems shall comply with the following:

5.1 They shall be capable of operating intermittently and continuously.

5.2 They shall have controls capable of operating the exhaust fans, forced-air system fans, or supply fans without energizing other energy-consuming appliances.

5.3 The ventilation rate shall be adjusted according to the exception in Section 403.8.5.1.

5.4 The system shall be designed so that it can operate automatically based on the type of control timer installed.

5.5 The intermittent mechanical ventilation system shall operate at least one hour out of every twelve.

5.6 The system shall have a manual control and automatic control, such as a 24-hour clock timer.

5.7 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.

5.8 A label shall be affixed to the control that reads "Whole House Ventilation (see operating instructions)."

403.8.3 Outdoor air intake locations. Outdoor air intakes shall be classified as either operable openings or mechanical air intakes and shall be located per the following criteria. The intake locations for operable openings and mechanical air intakes shall comply with the following:

1. Openings for mechanical air intakes shall comply with Section 401.4. Operable openings shall comply with Section 401.4 items 2 and 4 only.

2. Intake openings shall not be located closer than 10 feet from an appliance vent outlet unless such vent outlet is 3 feet above the outdoor air inlet. The vent shall be permitted to be closer if specifically allowed by Chapter 8 or by the International Fuel Gas Code.

3. Intake openings shall be located where they will not pick up objectionable odors, fumes, or flammable vapors.

4. Intake openings shall be located where they will not take air from a hazardous or unsanitary location.

5. Intake openings shall be located where they will not take air from a room or space having a fuel-burning appliances.

6. Intake openings shall not be located closer than 10 feet from a vent opening of a plumbing drainage system unless the vent opening is at least 3 feet above the air inlet.

7. Intake openings shall not be located where they will take air from an attic, crawl space, or garage.

403.8.4 Source specific ventilation requirements. Source specific exhaust ventilation systems shall exhaust at least the volume of air required for exhaust in Table 403.3. Exhaust shall be provided in each kitchen, bathroom, water closet, laundry area, indoor swimming pool, spa, and other room where water vapor or cooking odor is produced.

403.8.4.1 Source specific exhaust systems. Exhaust systems shall be designed and installed to meet all of the criteria below:

1. Source specific exhaust shall be discharged outdoors.

2. Exhaust outlets shall comply with Section 501.2.

3. Pressure equalization shall comply with Section 501.3.

4. Exhaust ducts in systems which are designed to operate intermittently shall be equipped with back-draft dampers.

5. All exhaust ducts in unconditioned spaces shall be insulated to a minimum of R-4.

6. Terminal outlet elements shall have at least the equivalent net free area of the ductwork.

7. Terminal outlet elements shall be screened or otherwise protected as required by Section 501.2.2.

8. Exhaust fans in separate dwelling units or guest rooms shall not share common exhaust ducts unless the system is engineered for this operation.

9. Where permitted by Chapter 5, multiple source specific exhaust ducts may be combined. If more than one of the exhaust fans in a dwelling unit or guest room shares a common exhaust duct then each exhaust fan shall be equipped with a back-draft damper to prevent the recirculation of exhaust air from one room to another room via the exhaust ducting system.

403.8.4.2 Source specific exhaust fans. Exhaust fan construction and sizing shall meet the following criteria.

1. 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 Airflow Test Procedure, and HVI 920, HVI Product Performance Certification Procedure).

EXCEPTION: Where a range hood or down draft exhaust fan is used for source specific exhaust for a kitchen, the device is not required to be rated per these standards.

2. Installation of the system or equipment shall be carried out in accordance with manufacturers' installation instructions.

3. Fan airflow rating and duct system shall be designed and installed to deliver at least the exhaust airflow required by Table 403.3. The airflows required refer to the delivered airflow of the system as installed and tested using a flow hood, flow grid, or other airflow measurement device.

EXCEPTIONS: 1. An exhaust airflow rating at a pressure of 0.25 in. w.g. may be used, provided the duct sizing meets the prescriptive requirements of Table 403.8.4.2.
2. Where a range hood or down draft exhaust fan is used to satisfy the source specific ventilation requirements for kitchens, the range hood or down draft exhaust shall not be less than 100 cfm at 0.10 in. w.g.

Table 403.8.4.2
Prescriptive Exhaust Duct Sizing

Fan Tested cfm at 0.25 inches w.g.	Minimum Flex Diameter	Maximum Length in Feet	Minimum Smooth Diameter	Maximum Length in Feet	Maximum Elbows[1]
50	4 inches	25	4 inches	70	3
50	5 inches	90	5 inches	100	3
50	6 inches	No Limit	6 inches	No Limit	3
80	4 inches[2]	NA	4 inches	20	3
80	5 inches	15	5 inches	100	3
80	6 inches	90	6 inches	No Limit	3
100	5 inches[2]	NA	5 inches	50	3
100	6 inches	45	6 inches	No Limit	3
125	6 inches	15	6 inches	No Limit	3
125	7 inches	70	7 inches	No Limit	3

1. For each additional elbow, subtract 10 feet from length.
2. Flex ducts of this diameter are not permitted with fans of this size.

403.8.5 Whole house ventilation requirements. Each dwelling unit or guest room shall be equipped with one of the following four types of mechanical whole house ventilation systems: A system using exhaust fans (see Section 403.8.6); a system integrated with forced-air systems (see Section 403.8.7); a system using supply fans (see Section 403.8.8); or a heat or energy recovery ventilation system (see Section 403.8.9).

403.8.5.1 Outdoor air. Outdoor air shall be distributed to each habitable space.

Where outdoor air supply intakes are separated from exhaust vents by doors, means shall be provided to ensure airflow to all separated habitable spaces by installing distribution ducts, installed grilles, transoms, doors undercut to a minimum of 1/2-inch above the surface of the finish floor covering, or other similar means where permitted by the International Building Code.

The mechanical system shall operate continuously to supply at least the volume of outdoor air required in Table 403.3 or Table 403.8.1.

EXCEPTION: Intermittently operating ventilation systems: The mechanical system shall have controls for intermittent operation per Section 403.8.2 and shall supply at least the volume of outdoor air required for intermittent operation based on the combination of its delivered capacity (from Table 403.3 or Table 403.8.1), its ventilation effectiveness (from Table 403.8.5.1) and its daily fractional operation time (from Table 403.8.5.1) using the formula:

$$Qf = Qr/(\in f)$$

Where:

Qf = outdoor air flow rate

Qr = ventilation air requirement (from Table 403.3 or 403.8.1)

$\in$ = ventilation effectiveness (from Table 403.8.5.1)

f = fractional operation time (from Table 403.8.5.1)

Table 403.8.5.1
Ventilation Effectiveness for Intermittent Fans

Daily Fractional Operation Time, f	Ventilation Effectiveness, $\in$
$f \leq 35\%$	0.33
$35\% \leq f < 60\%$	0.50
$60\% \leq f < 80\%$	0.75
$80\% \leq f$	1.0

403.8.5.2 Whole house supply system general requirements. Whole house ventilation systems integrated with a forced-air system, systems using supply fans and systems using a heat or energy recovery ventilation system shall comply with the following.

1. Outdoor air louvers shall be adequately sized for the required airflow and shall comply with Section 401.5. Outdoor air intake locations shall comply with mechanical air intakes requirements of Section 403.8.3.

2. Outdoor air ducts for dedicated or central supply systems and exhaust ducts for heat or energy recovery systems shall be provided with a means for balancing the system to the required airflow via balance dampers or other devices.

3. Outdoor air ducts, for dedicated or central systems shall be provided with motorized dampers.

EXCEPTION: Outdoor air ducts at heat or energy ventilation systems are not required to have motorized dampers.

4. Ducts in the conditioned space shall be insulated to a minimum of R-4. In heat or energy recovery ventilation systems, ducts upstream of the heat exchanger shall also be insulated to at least R-4.

5. All outdoor air ducts shall be designed and installed to deliver at least the outdoor airflow required by Section 403.8.5.1. The airflows required refer to the delivered airflow of the system as installed and tested using a flow hood, flow grid, or other airflow measurement device.

EXCEPTION: The outdoor air duct for supply fan systems and heat or energy recovery systems may be prescriptively sized per Table 403.8.5.2 for dedicated outdoor air ducts upstream of the supply fan. Supply fans shall have the capacity to provide the amount of outdoor air required by Section 403.8.5.1 at 0.40 in. w.g. as per HVI 916 (April 1995). When prescriptively sized the system shall be tested and balanced using a flow hood, flow-grid, or other airflow measurement device.

6. Whole house ventilation controls for continuous and intermittent operation shall be provided at both the forced-air fan and the motorized damper.

Table 403.8.5.2
Prescriptive Supply Fan Duct Sizing

Supply Fan Tested cfm at 0.40" w.g.		
Specified Volume from Table 408.1	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

403.8.6 Whole house ventilation with exhaust fan systems. This section establishes minimum requirements for mechanical whole house ventilation systems using exhaust fans.

403.8.6.1 Outdoor air. Exhaust fan only ventilation systems shall provide outdoor air through one of the following methods:

1. Outdoor air may be drawn through air inlets installed in exterior walls or windows. For interior spaces without openings to the outdoor, air inlets cannot be used unless a transfer fan is provided in compliance with Section 403.8.6.1 Item 3. The air inlets shall comply with all of the following:

a. Inlets shall have controllable, secure openings and shall be designed to not compromise the thermal properties of the building envelope.

b. Inlets shall be accessible to occupants.

c. Inlets shall be screened or otherwise protected from entry by insects, leaves, or other material.

d. Inlets shall provide not less than 4 square inches of net free area of opening for each 10 cfm of outdoor air required in Table 403.3 or Table 403.8.1.

e. Any inlet or combination of inlets which provide 10 cfm at 10 Pascals as determined by the Home Ventilation Institute Air Flow Test Standard (HVI 901 (November 1996)) are deemed equivalent to 4 square inches of net free area.

f. Each occupiable space shall have a minimum of one air inlet that has a minimum of 4 square inches of net free area.

2. In high-rise buildings, outdoor air may be drawn in through operable windows, doors, louvers or other operable openings to the outdoors. Exterior spaces shall have a minimum openable area of 4 percent of the total floor area being ventilated. Doors exiting to a corridor, court or public way shall not be used to provide outdoor air. For interior spaces without openings to the outdoors, the opening to the adjoining room shall be unobstructed and shall have an area of not less than 8 percent of the floor area of the interior room or space, but not less than 25 square feet. The operable openings shall comply with the following:

a. Openings shall be controllable, securable, and shall be designed to not compromise the thermal properties of the building envelope.

b. Openings shall be accessible to occupants.

3. For interior spaces, in buildings with air inlets in accordance with Section 403.8.6.1 Item 1 or in high-rise building without operable openings in accordance with Section 403.8.6.1 Item 2 shall have a whole house transfer fan sized to provide a minimum of the ventilation rate required per Section 403.8.5.1. The transfer fan shall circulate air between the interior room or space and the adjacent habitable space. The transfer fan may operate continuously or intermittently using controls per Section 403.8.2.

403.8.6.2 Outside air intake locations. All outside air intake opening types described in Section 403.8.6.1 shall be classified operable openings and shall not be classified as mechanical air intakes. The intake locations shall comply with Section 403.8.3.

403.8.6.3 Whole house exhaust system. Whole house exhaust system shall be designed and installed to meet all of the applicable criteria below:

1. Whole house ventilation exhaust shall be discharged outdoors.

2. Exhaust outlets shall comply with Section 501.2.

3. Exhaust ducts in systems which are designed to operate intermittently shall be equipped with back-draft dampers.

4. All exhaust ducts in unconditioned spaces shall be insulated to a minimum of R-4.5. Terminal outlet elements shall have at least the equivalent net free area of the ductwork.

5. Terminal outlet elements shall be screened or otherwise protected as required by Section 501.2.2.

6. One of the required source specific exhaust fans for the laundry room or bathroom may be designated as the whole house exhaust fan.

7. Exhaust fans in separate dwelling units or guest rooms shall not share common exhaust ducts unless the system is engineered for this operation.

8. Where permitted by Chapter 5 whole house exhaust ducts may be combined with other source specific exhaust ducts. If more than one of the exhaust fans in a dwelling unit or guest room shares a common exhaust duct then each exhaust fan shall be equipped with a back-draft damper to prevent the recirculation of exhaust air from one room to another room via the exhaust ducting system.

403.8.6.4 Whole house exhaust and transfer fans. Exhaust fan construction and sizing shall meet the following criteria.

1. Exhaust and transfer 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).

2. Installation of system or equipment shall be carried out in accordance with manufacturers' design requirements and installation instructions.

3. Fan airflow rating and duct system shall be designed and installed to deliver at least the outdoor airflow required by Table 403.3 or Table 403.8.1. The airflows required refer to the delivered airflow of the system as installed and tested using a flow hood, flow grid, or other airflow measurement device.

EXCEPTION: An airflow rating at a pressure of 0.25 in. w.g. may be used, provided the duct sizing meets the prescriptive requirements of Table 403.8.5.2.

403.8.6.5 Fan noise. Whole house exhaust and transfer fans located 4 feet or less from the interior grille shall have a sone rating of 1.0 or less measured at 0.10 inches water gauge. Manufacturer's noise ratings shall be determined as per HVI 915. Remotely mounted fans shall be acoustically isolated from the structural elements of the building and from attached ductwork using insulated flexible duct or other approved material.

403.8.7 Whole house ventilation integrated with forced-air systems. This section establishes minimum requirements for mechanical whole house ventilation systems using forced-air system fans.

403.8.7.1 Outdoor air. Forced-air system fan ventilation systems shall provide outdoor air through one of the following methods:

1. A dedicated outdoor air louver and outdoor air duct for each dwelling unit or guest room shall supply outdoor air to the return side of the forced-air system fan; or

2. A central outdoor air delivery system that supplies multiple dwelling units or guest rooms shall supply outdoor air to the return side of the forced air system fan.

403.8.7.2 Whole house forced-air system. Where outdoor air is provided to each habitable dwelling unit or guest room by a forced-air system, the outdoor air duct shall be connected to the return air stream at a point within 4 feet upstream of the forced-air unit. It shall not be connected directly to the forced-air unit cabinet in order to prevent thermal shock to the heat exchanger. At a minimum, filtration of the outdoor air shall be provided at the forced-air unit. The filter shall be accessible for regular maintenance and replacement. The filter shall have a Minimum Efficiency Rating Value (MERV) of at least 6.

403.8.8 Whole house ventilation with supply fan systems. This section establishes minimum requirements for mechanical whole house ventilation systems using supply fan systems.

403.8.8.1 Outdoor air. Supply fan ventilation systems shall provide outdoor air through one of the following methods:

1. A dedicated outdoor air louver and outdoor air duct for each dwelling unit or guest room shall supply outdoor air to a supply fan; or

2. A central outdoor air supply fan system shall distribute unconditioned or conditioned air to multiple dwelling units or guest rooms.

403.8.8.2 Whole house supply system. Where outdoor air is provided to each habitable dwelling unit or guest room by supply fan systems the outdoor air shall be filtered.

The system filter may be located at the intake device or inline with the fan. The filter shall be accessible for regular maintenance and replacement. The filter shall have a Minimum Efficiency Rating Value (MERV) of at least 6.

403.8.9 Whole house ventilation with heat recovery or energy recovery ventilation systems. This section establishes minimum requirements for mechanical whole house ventilation systems using heat recovery or energy recovery ventilation systems.

403.8.9.1 Outdoor air. Heat recovery or energy recovery ventilation systems shall provide outdoor air through one of the following methods:

1. A dedicated outdoor air louver and outdoor air duct for each dwelling unit or guest room shall supply outdoor air to the heat recovery or energy recovery ventilator; or

2. A central outdoor air heat recovery or energy recovery unit shall distribute conditioned air to multiple dwelling units or guest rooms.

403.8.9.2 Whole house heat recovery ventilator system. Where outdoor air is provided to each habitable dwelling unit or guest room by heat recovery or energy recovery ventilator the outdoor air shall be filtered. The filter shall be located on the upstream side of the heat exchanger in both the intake and exhaust airstreams with a Minimum Efficiency Rating Value (MERV) of at least 6. The system filter may be located at the intake device or inline with the fan. The filter shall be accessible for regular maintenance and replacement.

403.8.10 Source specific exhaust ventilation and whole house ventilation alternate performance or design requirements. In lieu of complying with Sections 403.8.4 or 403.8.5 compliance with the section shall be demonstrated through engineering calculations by an engineer licensed to practice in the state of Washington or by performance testing. Documentation of calculations or performance test results shall be submitted to and approved by the building official. Performance testing shall be conducted in accordance with approved test methods.

403.8.11 Alternate systems. When approved by the code official, systems designed in accordance with ASHRAE Standard 62.2-2007 shall be permitted.

[Statutory Authority: RCW 19.27.190, 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-099, § 51-52-0403, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-092, § 51-52-0403, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-01-015, § 51-52-0403, filed 12/2/04, effective 7/1/05.]

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency.

WAC 51-52-0404 Section 404—Enclosed parking garages and automobile repair facilities.

404.5 Automobile repair facilities. In buildings used for the repair of automobiles, each repair stall shall be equipped with an exhaust extension duct, extending to the outside of the building. Exhaust extension duct over 10 feet in length shall mechanically exhaust at least 300 cfm. Connecting offices and waiting rooms shall be supplied with conditioned air under positive pressure.

[Statutory Authority: RCW 19.27.190, 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-099, § 51-52-0404, filed 1/20/10, effective 7/1/10.]

WAC 51-52-0501 Section 501—General.

501.2 Exhaust discharge. The air removed by every mechanical exhaust system shall be discharged outdoors at a point where it will not cause a nuisance and not less than the distances specified in Section 501.2.1. The air shall be discharged to a location from which it cannot again be readily drawn in by a ventilating system. Air shall not be exhausted into an attic or crawlspace.

EXCEPTIONS:
1. Whole-house cooling fans shall be permitted to discharge into the attic space of dwelling units having private attics.
2. Commercial cooking recirculating systems.

501.2.1 Location of exhaust outlets. The termination point of exhaust outlets and ducts discharging to the outdoors shall be located with the following minimum distances:

1. **For ducts conveying explosive or flammable vapors, fumes or dusts:** 30 feet (9144 mm) from the property line; 10 feet (3048 mm) from operable openings into the building; 6 feet (1829 mm) from exterior walls and roofs; 30 feet (9144 mm) from combustible walls and operable openings into the building which are in the direction of the exhaust discharge; 10 feet (3048 mm) above adjoining grade.

2. **For other product-conveying outlets:** 10 feet (3048 mm) from property lines; 3 feet (914 mm) from exterior walls and roofs; 10 feet (3048 mm) from operable openings into the building; 10 feet (3048 mm) above adjoining grade.

3. **For environmental air exhaust other than enclosed parking garage and transformer vault exhaust:** 3 feet (914 mm) from property lines, 3 feet (914 mm) from operable openings into buildings for all occupancies other that Group U, and 10 feet (3048 mm) from mechanical air intakes. Such exhaust shall not be considered hazardous or noxious.

EXCEPTIONS:
1. The separation between an air intake and exhaust outlet on a single listed package HVAC unit.
2. Exhaust from environmental air systems other than garages may be discharged into an open parking garage.
3. Except for Group I occupancies, where ventilation system design circumstances require building HVAC air to be relieved, such as during economizer operation, such air may be relieved into an open or enclosed parking garage within the same building.

4. Exhaust outlets serving structures in flood hazard areas shall be installed at or above the design flood level.

5. For enclosed parking garage exhaust system outlets and transformer vault exhaust system outlets: 10 feet (3048 mm) from property lines which separate one lot from another; 10 feet (3048 mm) from operable openings into buildings; 10 feet (3048 mm) above adjoining grade.

6. For elevator machinery rooms in enclosed or open parking garages: Exhaust outlets may discharge air directly into the parking garage.

7. For specific systems see the following sections:

7.1 Clothes dryer exhaust, Section 504.4.

7.2 Kitchen hoods and other kitchen exhaust equipment, Sections 506.3, 506.4 and 506.5.

7.3 Dust stock and refuse conveying systems, Section 511.

7.4 Subslab soil exhaust systems, Section 512.4.

7.5 Smoke control systems, Section 513.10.3.

7.6 Refrigerant discharge, Section 1105.7.

7.7 Machinery room discharge, Section 1105.6.1.

[Statutory Authority: RCW 19.27.190, 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-099, § 51-52-0501, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-092, § 51-52-0501, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-01-015, § 51-52-0501, filed 12/2/04, effective 7/1/05.]

WAC 51-52-0504 Section 504—Clothes dryer exhaust.

504.6.4.1 Specified length. The maximum length of the exhaust duct shall be 35 feet (10668 mm) from the connection to the transition duct from the dryer to the outlet terminal. Where fittings are used, the maximum length of the exhaust duct shall be reduced in accordance with Table 504.6.4.1.

The maximum length of the duct may be increased in an engineered exhaust system when a listed and labeled exhaust booster fan is installed in accordance with the manufacturer's installation instructions.

[Statutory Authority: RCW 19.27.190, 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-099, § 51-52-0504, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-092, § 51-52-0504, filed 12/19/06, effective 7/1/07.]

WAC 51-52-0505 Section 505—Domestic kitchen exhaust equipment.

505.1 Domestic systems. Where domestic range hoods and domestic appliances equipped with downdraft exhaust are located within dwelling units, such hoods and appliances shall discharge to the outdoors through sheet metal ducts constructed of galvanized steel, stainless steel, aluminum or copper. Such ducts shall have smooth inner walls and shall be air tight and equipped with a backdraft damper. Domestic range hood duct systems shall not be combined with other environmental air exhaust systems.

Listed and labeled exhaust booster fans shall be permitted when installed in accordance with the manufacturer's installation instructions.

EXCEPTIONS:
1. Where installed in accordance with the manufacturer's installation instructions and where mechanical ventilation is otherwise provided in accordance with Chapter 4, listed and labeled ductless range hoods shall not be required to discharge to the outdoors.
2. Ducts for domestic kitchen cooking appliances equipped with downdraft exhaust systems shall be permitted to be constructed of Schedule 40 PVC pipe and fittings provided that the installation complies with all of the following:
2.1. The duct shall be installed under a concrete slab poured on grade.

2.2. The underfloor trench in which the duct is installed shall be completely backfilled with sand or gravel.
2.3. The PVC duct shall extend not more than 1 inch (25 mm) above the indoor concrete floor surface.
2.4. The PVC duct shall extend not more than 1 inch (25 mm) above grade outside of the building.
2.5. The PVC ducts shall be solvent cemented.

[Statutory Authority: RCW 19.27.190, 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-099, § 51-52-0505, filed 1/20/10, effective 7/1/10.]

WAC 51-52-0506 Section 506—Commercial kitchen hood ventilation system ducts and exhaust equipment.

506.3.9 Grease duct cleanout location, spacing and installation.

506.3.9.1 Grease duct horizontal cleanout. Cleanouts located on horizontal sections of ducts shall be spaced not more than 20 feet (6096 mm) apart. The cleanouts shall be located on the side of the duct with the opening not less than 1 1/2 inches (38 mm) above the bottom of the duct, and not less than 1 inch (25 mm) below the top of the duct. The opening minimum dimensions shall be 12 inches (305 mm) on each side. Where the dimensions of the side of the duct prohibit the cleanout installation prescribed herein, the openings shall be on the top of the duct or the bottom of the duct. Where located on the top of the duct, the opening edges shall be a minimum of 1 inch (25 mm) from the edges of the duct. Where located in the bottom of the duct, cleanout openings shall be designed to provide internal damming around the opening, shall be provided with gasketing to preclude grease leakage, shall provide for drainage of grease down the duct around the dam and shall be approved for the application. Where the dimensions of the sides, top or bottom of the duct preclude the installation of the prescribed minimum-size cleanout opening, the cleanout shall be located on the duct face that affords the largest opening dimension and shall be installed with the opening edges at the prescribed distances from the duct edges as previously set forth in this section.

506.3.9.2 Grease duct vertical cleanouts. Where ducts pass vertically through floors, cleanouts shall be provided. A minimum of one cleanout shall be provided on each floor. Cleanout openings shall be not less than 1 1/2 inches (38 mm) from all outside edges of the duct or welded seams.

[Statutory Authority: RCW 19.27.190, 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-099, § 51-52-0506, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-092, § 51-52-0506, filed 12/19/06, effective 7/1/07.]

WAC 51-52-0507 Section 507—Commercial kitchen hoods.

507.2.1 Type I hoods. Type I hoods shall be installed where cooking appliances produce grease or smoke. Type I hoods shall be installed over medium-duty, heavy-duty and extra-heavy-duty cooking appliances. Type I hoods shall be installed over light-duty cooking appliances that produce grease or smoke.

EXCEPTION: A Type I hood shall not be required in an R-2 type occupancy with not more than 16 residents.

[Statutory Authority: RCW 19.27.190, 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-099, § 51-52-0507, filed 1/20/10, effective 7/1/10.]

WAC 51-52-0601 Section 601—General.

601.2 Air movement in egress elements. Corridors shall not serve as supply, return, exhaust, relief or ventilation air ducts.

EXCEPTIONS:
1. Use of a corridor as a source of makeup air for exhaust systems in rooms that open directly onto such corridors, including toilet rooms, bathrooms, dressing rooms, smoking lounges and janitor closets, shall be permitted provided that each such corridor is directly supplied with outdoor air at a rate greater than the rate of makeup air taken from the corridor.
2. Where located within a dwelling unit, the use of corridors for conveying return air shall not be prohibited.
3. Where located within tenant spaces of one thousand square feet (93 m^2) or less in area, utilization of corridors for conveying return air is permitted.
4. Incidental air movement from pressurized rooms within health care facilities, provided that the corridor is not the primary source of supply or return to the room.
5. Where such air is part of an engineered smoke control system.
6. Air supplied to corridors serving residential occupancies shall not be considered as providing ventilation air to the dwelling units subject to the following:
6.1 The air supplied to the corridor is one hundred percent outside air; and
6.2 The units served by the corridor have conforming ventilation air independent of the air supplied to the corridor; and
6.3 For other than high-rise buildings, the supply fan will automatically shut off upon activation of corridor smoke detectors which shall be spaced at no more than thirty feet (9,144 mm) on center along the corridor; or
6.4 For high-rise buildings, corridor smoke detector activation will close required smoke/fire dampers at the supply inlet to the corridor at the floor receiving the alarm.

[Statutory Authority: RCW 19.27.190, 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-099, § 51-52-0601, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-092, § 51-52-0601, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-104, § 51-52-0601, filed 12/17/03, effective 7/1/04.]

WAC 51-52-0603 Section 603—Duct construction and installation.

603.5.1 Gypsum ducts. The use of gypsum boards to form air shafts (ducts) shall be limited to return air systems where the air temperatures do not exceed 125ºF (52ºC) and the gypsum board surface temperature is maintained above the airstream dew-point temperature. Air ducts formed by gypsum boards shall not be incorporated in air-handling systems utilizing evaporative coolers.

EXCEPTION: In other than Group I-2 occupancies, gypsum boards may be used for ducts that are only used for stairwell or elevator pressurization supply air. The gypsum duct shall not attach directly to the equipment.

[Statutory Authority: RCW 19.27.190, 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-099, § 51-52-0603, filed 1/20/10, effective 7/1/10.]

WAC 51-52-0606 Section 606—Smoke detection systems control.

606.2.2 Common supply and return air systems. Where multiple air-handling systems share common supply or return air ducts or plenums with a combined design capacity greater than 2,000 cfm (0.9 m^3/s), the return air system shall be pro-

vided with smoke detectors in accordance with Section 606.2.1.

EXCEPTION: Individual smoke detectors shall not be required for each fan-powered terminal unit, provided that such units do not have an individual design capacity greater than 2,000 cfm (0.9 m^3/s) and will be shut down by activation of one of the following:
1. Smoke detectors required by Sections 606.2.1 and 606.2.3.
2. An approved area smoke detector system located in the return air plenum serving such units.
3. An area smoke detector system as prescribed in the exception to Section 606.2.1.

In all cases, the smoke detectors shall comply with Sections 606.4 and 606.4.1.

The shut down of fan-powered terminal units may be performed by a building automation system upon activation of smoke detection as described in Section 606.2.2, Exception Items 1, 2, or 3. The building automation system is not required to be listed as a smoke control system and is not required to comply with UL Standard 864: Standard for Control Units and Accessories for Fire Alarm Systems.

[Statutory Authority: RCW 19.27.190, 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-099, § 51-52-0606, filed 1/20/10, effective 7/1/10.]

WAC 51-52-1000 Chapter 10—Boilers, water heaters and pressure vessels.

SECTIONS 1003 THROUGH 1011, are not adopted.

Boilers and Unfired Pressure Vessels are regulated by chapter 70.79 RCW.

[Statutory Authority: RCW 19.27.190, 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-099, § 51-52-1000, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-092, § 51-52-1000, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-104, § 51-52-1000, filed 12/17/03, effective 7/1/04.]

WAC 51-52-1500 Chapter 15—Referenced standards.

The following referenced standards are added to Chapter 15.

ASHRAE
62.2-2007 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings

[Statutory Authority: RCW 19.27.190, 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-099, § 51-52-1500, filed 1/20/10, effective 7/1/10.]

WAC 51-52-21000 International Fuel Gas Code.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-104, § 51-52-21000, filed 12/17/03, effective 7/1/04.]

WAC 51-52-21101 Section 101—General.

101.2 Scope. This code shall apply to the installation of fuel gas piping systems, fuel gas utilization equipment, gaseous hydrogen systems and regulated accessories in accordance with Section 101.2.1 through 101.2.5.

EXCEPTIONS: 1. Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories high with separate means of egress and their accessory structures shall comply with the *International Residential Code*.
2. The standards for liquefied petroleum gas installations shall be the 2008 Edition of NFPA 58 (Liquefied Petroleum Gas Code) and the 2009 Edition of ANSI Z223.1/NFPA 54 (National Fuel Gas Code).

[Statutory Authority: RCW 19.27.190, 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-099, § 51-52-21101, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-092, § 51-52-21101, filed 12/19/06, effective 7/1/07.]

WAC 51-52-22000 National Fuel Gas Code.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-104, § 51-52-22000, filed 12/17/03, effective 7/1/04.]

WAC 51-52-22006 Chapter 6—Gas piping installation.

[Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-092, § 51-52-22006, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-104, § 51-52-22006, filed 12/17/03, effective 7/1/04.]