

1.1 **Department of Labor and Industry**

1.2 **Proposed Permanent Rules Adopting the International Mechanical and Fuel Gas**
 1.3 **Codes**

1.4 **1346.0050 TITLE; INCORPORATION BY REFERENCE.**

1.5 ~~This chapter is~~ Parts 1346.0050 to 1346.1500 are known and may be cited as the
 1.6 "Minnesota Mechanical Code." ~~As used in this chapter, "the code" and "this code" refer~~
 1.7 ~~to this chapter.~~

1.8 Chapters 2 to 15 of the ~~2006~~ 2012 edition of the International Mechanical Code
 1.9 ("IMC"), promulgated by the International Code Council, Inc., ~~500 New Jersey Avenue~~
 1.10 ~~NW, 6th Floor, Washington, DC 20001-2070~~, are incorporated by reference as part of the
 1.11 Minnesota Mechanical Code except as qualified by the applicable provisions in Minnesota
 1.12 Rules, chapter 1300, and as amended in this chapter. Portions of this chapter reproduce
 1.13 ~~text and tables excerpts~~ excerpts from the ~~International Mechanical Code.~~ ~~The International~~
 1.14 ~~Mechanical Code is copyright 2006 by the~~ 2012 IMC, International Code Council, Inc.,
 1.15 Washington, DC, copyright 2012, reproduced with permission, all rights reserved. ~~As used~~
 1.16 ~~in this chapter, "IMC" means the International Mechanical Code incorporated in this part.~~

1.17 The IMC is not subject to frequent change and a copy of the IMC, with amendments
 1.18 for use in Minnesota, is available in the office of the commissioner of labor and industry.

1.19 Chapters 1 to 10 and 12 to 15 of the ~~2008~~ 2014 edition of NFPA 96 Standard for
 1.20 Ventilation Control and Fire Protection of Commercial Cooking Operations, promulgated
 1.21 by the National Fire Protection Association, 1 Batterymarch Park, Quincy, MA
 1.22 02169-7471, are incorporated by reference as part of the Minnesota Mechanical Code as
 1.23 amended in this chapter. As used in this code, "NFPA 96" means the NFPA 96 Standard
 1.24 for Ventilation Control and Fire Protection of Commercial Cooking Operations chapters
 1.25 that are incorporated into this code. Portions of this chapter reproduce text and tables ~~for~~
 1.26 from the NFPA 96. The NFPA 96 is ~~copyright 2008~~ copyrighted, 2014, by the National
 1.27 Fire Protection Association. All rights reserved. ~~As used in this chapter, "NFPA 96"~~

2.1 ~~means the NFPA 96 Standard for Ventilation Control and Fire Protection of Commercial~~
2.2 ~~Cooking Operations incorporated into this part.~~

2.3 The NFPA 96 is not subject to frequent change and a copy of the NFPA 96, with
2.4 amendments for use in Minnesota, is available in the office of the commissioner of labor
2.5 and industry.

2.6 **1346.0060 REFERENCES TO OTHER INTERNATIONAL CODE COUNCIL**
2.7 **(ICC) CODES.**

2.8 Subpart 1. **General.** References to other codes and standards promulgated by the
2.9 International Code Council in the IMC and IFGC are modified in subparts 2 to 11.

2.10 Subp. 2. **Building code.** References to the International Building Code ~~in this code~~
2.11 mean the Minnesota Building Code, ~~adopted pursuant to Minnesota Rules, chapter 1305~~
2.12 ~~and, adopted pursuant to Minnesota Statutes, section 326B.106, subdivision 1.~~

2.13 Subp. 3. **Residential code.** References to the International Residential Code ~~in this~~
2.14 ~~code~~ mean the Minnesota Residential Code, ~~adopted pursuant to Minnesota Rules, chapter~~
2.15 ~~1309 and, adopted pursuant to Minnesota Statutes, section 326B.106, subdivision 1.~~

2.16 Subp. 4. **Electrical code.** References to the International Code Council Electrical
2.17 Code ~~in this code~~ mean the Minnesota Electrical Code, ~~adopted pursuant to Minnesota~~
2.18 ~~Rules, chapter 1315 and, adopted pursuant to Minnesota Statutes, section 326B.35.~~

2.19 Subp. 5. **Fuel gas code.** References to the International Fuel Gas Code ~~in this code~~
2.20 mean the Minnesota Fuel Gas Code, ~~adopted pursuant to chapter 1346 and Minnesota~~
2.21 ~~Rules, parts 1346.5050 to 1346.6014, adopted pursuant to Minnesota Statutes, section~~
2.22 ~~326B.106, subdivision 1.~~

2.23 Subp. 6. [See repealer.]

3.1 Subp. 7. **Plumbing code.** References to the International Plumbing Code ~~in this code~~
3.2 mean the Minnesota Plumbing Code, ~~adopted pursuant to~~ Minnesota Rules, chapter 4715
3.3 ~~and, adopted pursuant to~~ Minnesota Statutes, section 326B.106, subdivisions 1 and 2.

3.4 Subp. 8. **Private sewage disposal code.** References to the International Private
3.5 Sewage Disposal Code ~~in this code~~ mean the Minnesota Pollution Control Agency's
3.6 minimum standards and criteria for individual sewage treatment systems ~~adopted pursuant~~
3.7 ~~to~~ Minnesota Rules, chapter 7080 ~~and, adopted pursuant to~~ Minnesota Statutes, chapters
3.8 103F, 103G, 115, and 116.

3.9 Subp. 9. **Energy conservation code.** References to the International Energy
3.10 Conservation Code ~~in this code~~ mean the Minnesota Residential Energy Code, ~~adopted~~
3.11 ~~pursuant to~~ Minnesota Rules, chapter 1322, and the Minnesota Commercial Energy Code,
3.12 Minnesota Rules, chapter 1323, ~~adopted pursuant to~~ Minnesota Statutes, section 326B.115.

3.13 Subp. 10. **Property maintenance code.** References to the International Property
3.14 Maintenance Code ~~in this code do not apply~~ are deleted.

3.15 Subp. 11. **Fire code.** References to the International Fire Code ~~in this code~~ mean
3.16 the Minnesota State Fire Code, ~~adopted pursuant to~~ Minnesota Rules, chapter 7511 ~~and,~~
3.17 ~~adopted pursuant to~~ Minnesota Statutes, chapter 299F.

3.18 **1346.0101 SECTION 101 SCOPE.**

3.19 ~~IMC Section 101 is amended to read as follows:~~

3.20 **101 Scope.** This code shall regulate the design, installation, maintenance, alteration,
3.21 and inspection of mechanical systems that are permanently installed and utilized to
3.22 provide control of environmental conditions and related processes within buildings. Fuel
3.23 gas piping systems, fuel gas utilization equipment and appliances, and related accessories
3.24 shall be regulated by parts 1346.5050 through 1346.6000.

3.25 This code shall also regulate those mechanical systems, system components,
3.26 equipment, and appliances specifically addressed in the IMC ~~and IFGC~~ as amended in this

4.1 chapter. This code shall also regulate process piping installed within, or in conjunction
4.2 with, buildings or structures. For the purposes of this section, the term "process piping"
4.3 includes piping or tubing which conveys gas, liquid, or fluidized solids and which
4.4 is used directly in research, laboratory, or production processes. Process piping and
4.5 tubing shall be installed in accordance with ASME B31.3-2006, Process Piping Code,
4.6 or ASME ~~B31.9-2008~~ B31.9, Building Services Piping Code, as applicable. Refer to
4.7 Minnesota Rules, chapter 1300, for additional administrative provisions of the Minnesota
4.8 State Building Code. ~~For purposes of this section, Refer to Minnesota Statutes, section~~
4.9 ~~13.37, subdivision 1, paragraph (b), on disclosure of nonpublic data~~ 13.7911, for data
4.10 classification of biotechnology process piping systems.

4.11 **1346.0102 SECTION ~~102~~ EXISTING INSTALLATIONS.**

4.12 ~~IMC Section 102 is amended to read as follows:~~

4.13 ~~**102 Existing installations.**~~ Except as otherwise provided for in this chapter, a
4.14 provision in this code shall not require the removal, alteration, or abandonment of, nor
4.15 prevent the continued utilization and maintenance of, a mechanical system lawfully in
4.16 existence at the time of the adoption of this code.

4.17 **1346.0103 SECTION ~~103~~ MAINTENANCE.**

4.18 ~~IMC Section 103 is amended to read as follows:~~

4.19 ~~**103 Maintenance.**~~ Mechanical systems, both existing and new, and parts of those
4.20 systems, shall be maintained in proper operating condition in accordance with the original
4.21 design and in a safe and sanitary condition. Devices or safeguards which are required by
4.22 this code shall be maintained in compliance with the code edition under which they were
4.23 installed. The owner or the owner's designated agent shall be responsible for maintenance
4.24 of mechanical systems. To determine compliance with this provision, the building official
4.25 shall have the authority to require a mechanical system to be reinspected.

5.1 **1346.0104 SECTION 104 ADDITIONS, ALTERATIONS, RENOVATIONS, OR**
5.2 **REPAIRS.**

5.3 ~~IMC Section 104 is amended to read as follows:~~

5.4 ~~**104 Additions, alterations, renovations, or repairs.**~~ Additions, alterations,
5.5 renovations, or repairs to a mechanical system shall conform to ~~that required~~ this code
5.6 for a new mechanical system without requiring the remainder of the existing mechanical
5.7 system to comply with all of the requirements of this code. Additions, alterations,
5.8 renovations, or repairs shall not cause an existing mechanical system to become unsafe,
5.9 hazardous, or overloaded.

5.10 ~~Minor additions, alterations, renovations, and repairs to existing mechanical systems~~
5.11 ~~shall meet the provisions for new construction, unless that work is done in the same~~
5.12 ~~manner and arrangement as was in the existing system, is not hazardous, and is approved.~~

5.13 **1346.0105 SECTION 105 WORK EXEMPT FROM PERMIT.**

5.14 ~~IMC Section 105 is amended to read as follows:~~

5.15 ~~**105 Work exempt from permit.**~~ Permits shall not be required for the following:

5.16 Work performed under this code shall be exempted from a permit in accordance with
5.17 Minnesota Rules, chapter 1300.

5.18 ~~1. portable heating, cooking, or clothes drying appliances not connected to a~~
5.19 ~~permanent fuel supply, excluding a factory power supply cord;~~

5.20 ~~2. portable ventilation appliances and equipment;~~

5.21 ~~3. portable cooling units;~~

5.22 ~~4. steam, hot water, or chilled water piping within any heating or cooling equipment~~
5.23 ~~or appliances regulated by this code;~~

5.24 ~~5. replacement of any minor part that does not alter the approval of equipment or an~~
5.25 ~~appliance or make such equipment or appliance unsafe;~~

5.26 ~~6. portable evaporative coolers; and~~

6.1 ~~7. self-contained refrigeration systems that contain 10 pounds (4.5 kg) or less of~~
6.2 ~~refrigerant, or that are actuated by motors of 1 horsepower (0.75 kW) or less.~~

6.3 **1346.0106 SECTION 106 REQUIRED INSPECTIONS.**

6.4 ~~IMC Section 106 is amended to read as follows:~~

6.5 **106-Required inspections.** The building official, upon notification from the permit
6.6 holder or the permit holder's agent, shall make the following inspections and other such
6.7 inspections as necessary, and shall either release that portion of the construction or shall
6.8 notify the permit holder or the permit holder's agent of violations that must be corrected.
6.9 The holder of the permit shall be responsible for the scheduling of these inspections.

6.10 1. Underground inspection shall be made after trenches or ditches are excavated and
6.11 bedded, piping installed, and before backfill is put in place. When excavated soil contains
6.12 rocks, broken concrete, frozen chunks, and other rubble that would damage or break the
6.13 piping or cause corrosive action, clean backfill shall be on the job site used.

6.14 2. Rough-in inspection shall be made after the roof, framing, fireblocking, and
6.15 bracing are in place and all ducting and other components to be concealed are complete,
6.16 and prior to the installation of wall or ceiling membranes.

6.17 3. Final inspection shall be made upon completion of the mechanical system.

6.18 **Exception:** Ground-source heat pump loop systems tested in accordance with this
6.19 code shall be permitted to be backfilled prior to inspection.

6.20 **1346.0108 SECTION 108 AUTHORITY TO CONDEMN MECHANICAL**
6.21 **SYSTEMS.**

6.22 ~~IMC Section 108 is amended to read as follows:~~

6.23 **108 Authority to condemn mechanical systems.** Whenever the building official
6.24 determines that any mechanical system or portion of a system regulated by this code
6.25 has become hazardous to life, health, or property, or has become ~~insanitary~~ unsanitary,
6.26 the building official shall issue an order in writing to the building's owner or owner's
6.27 agent. This order shall require that the system either be removed or restored to a safe

7.1 condition. A time limit for compliance with the building official's order shall be specified
 7.2 in the written order. A person shall not use or maintain a defective mechanical system
 7.3 after receiving a notice under this section.

7.4 When a mechanical system is to be disconnected, written notice shall be given to
 7.5 the building's owner or owner's agent in accordance with Minnesota Rules, chapter
 7.6 1300. In cases of immediate danger to life or property, the disconnection shall be made
 7.7 immediately without notice.

7.8 **1346.0109 SECTION 109 AUTHORITY TO ORDER DISCONNECTION OF**
 7.9 **ENERGY SOURCES.**

7.10 ~~IMC Section 109 is amended to read as follows:~~

7.11 ~~109 Authority to order disconnection of energy sources.~~ The building official
 7.12 shall have the authority to order disconnection of energy sources supplied to a building,
 7.13 structure, or mechanical system regulated by this code, when it is determined that the
 7.14 mechanical system or any portion of the system has become hazardous or unsafe. Written
 7.15 notice of an order to disconnect service and the causes of the order shall be given within
 7.16 24 hours to the owner and occupant of the building, structure, or premises, provided,
 7.17 however, that in cases of immediate danger to life or property, the disconnection shall be
 7.18 made immediately without notice. Where energy sources are provided by a public utility,
 7.19 the building official shall immediately notify the serving utility in writing of the issuance
 7.20 of an order to disconnect.

7.21 **1346.0110 SECTION 110 CONNECTION AFTER ORDER TO DISCONNECT.**

7.22 ~~IMC Section 110 is amended to read as follows:~~

7.23 ~~110 Connection after order to disconnect.~~ A person shall not make energy source
 7.24 connections to mechanical systems regulated by this code which have been:

7.25 1. disconnected; or

7.26 2. ordered to be disconnected by the building official; or

7.27 3. the use of which has been ordered to be discontinued by the building official

8.1 until the building official authorizes the reconnection and use of such mechanical systems.

8.2 When a mechanical system is maintained in violation of this code, and in violation of
8.3 a notice issued pursuant to this ~~section~~ part, the building official shall institute appropriate
8.4 action to prevent, restrain, correct, or abate the violation.

8.5 **1346.0202 SECTION 202 GENERAL DEFINITIONS.**

8.6 IMC section 202 is amended by adding or amending the following definitions:

8.7 **APPROVED.** "Approved" means approval by the building official, pursuant to the
8.8 Minnesota State Building Code, by reason of: inspection, investigation, or testing;
8.9 accepted principles; computer simulations; research reports; or testing performed by either
8.10 a licensed engineer or by a locally or nationally recognized testing laboratory.

8.11 **CODE.** For purposes of parts 1346.0050 to 1346.1500, "the code" or "this code" means
8.12 the Minnesota Mechanical Code.

8.13 **CLOSED COMBUSTION SOLID FUEL BURNING APPLIANCE.** A heat producing
8.14 appliance that employs a combustion chamber having no openings other than the flue
8.15 collar, fuel charging door, and adjustable openings provided to control the amount of
8.16 combustion air that enters the combustion chamber and includes doors with gaskets or
8.17 flanges that permit tight closure and glass or ceramic panels which must be tightly sealed
8.18 or gasketed at their frames.

8.19 **DECORATIVE SOLID FUEL BURNING APPLIANCE.** A natural draft appliance,
8.20 usually a fireplace, intended primarily for viewing of the fire and which may or may not
8.21 incorporate doors that substantially close off the firebox opening when the appliance
8.22 is in operation.

8.23 **EXHAUST SYSTEM.** An assembly of connected ducts, plenums, fittings, registers,
8.24 grilles and hoods, including domestic kitchen exhaust hoods, domestic kitchen and
8.25 bathroom exhaust fans, clothes dryers, ~~central vacuums~~, and ~~radon~~ subslab soil exhaust
8.26 systems through which air is conducted from the space or spaces and exhausted to the
8.27 outside atmosphere ~~or an attached residential garage.~~

9.1 **Exception:** Central vacuum systems are allowed to exhaust into an attached
 9.2 residential garage.

9.3 **FAN-ASSISTED APPLIANCE.** An appliance equipped with an integral mechanical
 9.4 means to either draw or force products of combustion through the combustion chamber
 9.5 or heat exchanger.

9.6 **POWER VENT APPLIANCE.** An appliance with a venting system which uses a fan
 9.7 or other mechanical means to cause the removal of flue or vent gases under positive
 9.8 static vent pressure.

9.9 **POWERED MAKEUP AIR.** Air which must be brought in from the outdoors by means
 9.10 of a fan to replenish the air expelled by a mechanical exhausting device.

9.11 **READY ACCESS (TO).** That which enables a device, appliance or equipment to be
 9.12 directly reached, without requiring the removal or movement of any panel, door or similar
 9.13 obstruction, and without requiring the use of portable access equipment (see "Access").

9.14 **SEALED.** Secured with a product meeting UL 181 or equivalent.

9.15 **SOLID FUEL APPLIANCE.** A natural draft appliance that is either a closed combustion
 9.16 solid fuel burning appliance or a decorative solid fuel burning appliance.

9.17 **1346.0301 SECTION 301 GENERAL.**

9.18 IMC section ~~301.4~~ 301.7 is amended to read as follows:

9.19 ~~301.4~~ 301.7 **Listed and labeled.** Appliances regulated by this code shall be listed and
 9.20 labeled to an appropriate standard by a nationally recognized testing laboratory which
 9.21 is qualified to evaluate the appliance, unless otherwise approved in accordance with the
 9.22 administrative provisions of the Minnesota State Building Code, Minnesota Rules, chapter
 9.23 1300. The approval of unlisted appliances shall be based upon engineering evaluation.
 9.24 Unlisted appliances shall be installed with clearances to combustibles in accordance
 9.25 with NFPA 211-2006 Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning
 9.26 Fuel-burning Appliances; NFPA 31-2006 Standard for the Installation of ~~Oil-Burning~~
 9.27 Oil-burning Equipment; or NFPA 90B-2009 Standard for the Installation of Warm Air

10.1 Heating and Air-Conditioning Systems, as applicable to the unlisted appliances. Unlisted
10.2 appliances with a fuel input rating of less than 12,500,000 Btu/hr (3,660 kW) shall have
10.3 fuel trains, controls, and safety devices installed in accordance with Part CF, Combustion
10.4 Side Control, of ASME CSD-1-2006. Unlisted appliances with a fuel input rating of
10.5 12,500,000 Btu/hr (3,660 kW) or greater shall have fuel trains, controls, and safety devices
10.6 installed in accordance with NFPA 85-2007.

10.7 **1346.0306 SECTION 306 ACCESS AND SERVICE SPACE.**

10.8 Subpart 1. Section 306.5, Mechanical equipment and appliances on roofs or
10.9 elevated structures. IMC section 306.5 is amended and a subsection is added to read
10.10 as follows:

10.11 **306.5 Mechanical equipment and appliances on roofs or elevated structures.** Where
10.12 mechanical equipment or appliances requiring periodic inspection, service, or maintenance
10.13 are installed on roofs or elevated structures, a permanent stair shall be provided for access.

10.14 **Exception:** A portable ladder may be used for dwellings, replacement equipment and
10.15 appliances, on existing buildings, and exterior roof access points not exceeding 16
10.16 feet (4.9 m) above grade, unless the building official determines that the unique shape
10.17 of the roof does not allow safe access with a portable ladder.

10.18 The permanent stair shall ~~be as required by relevant safety regulations, but shall not be~~
10.19 ~~less than~~, at a minimum, meet the following:

10.20 1. The stair shall be installed at an angle of not more than 60 degrees measured
10.21 from the horizontal plane.

10.22 2. The stair shall have flat treads at least 6 inches (152 mm) deep and a clear width of
10.23 at least 18 inches (457 mm) with equally spaced risers at least 10.5 inches (267 mm) high
10.24 and not exceeding 14 inches (356 mm).

10.25 3. The stair shall have intermediate landings not exceeding 18 feet (5.5 m) vertically.

10.26 4. Continuous handrails shall be installed on both sides of the stair.

11.1 5. Interior stairs shall terminate at the under side of the roof at a hatch or scuttle of at
11.2 least 8 square feet (0.74 m²) with a minimum dimension of 20 inches (508 mm).

11.3 6. When a roof access hatch or scuttle is located within 10 feet (3.0 m) of a roof edge,
11.4 a guard shall be installed in accordance with IMC section ~~304.10~~ 304.11.

11.5 7. Exterior stairs shall terminate at the roof access point or at a level landing of at
11.6 least 8 square feet (0.74 m²) with a minimum dimension of 20 inches (508 mm). The
11.7 landing shall have a guard installed in accordance with IMC section ~~304.10~~ 304.11.

11.8 **306.5.1 Permanent ladders.** Where a change in roof elevation greater than 30 inches
11.9 (762 mm) but not exceeding 16 feet (4.9 m) exists, a permanent ladder shall be provided.
11.10 The ladder may be vertical ~~and shall be as required by relevant safety regulations, but shall~~
11.11 ~~not be less than~~. The ladder must, at a minimum, meet the following:

- 11.12 1. Width shall be at least 16 inches (406 mm).
- 11.13 2. Rung spacing shall be a maximum of 14 inches (356 mm).
- 11.14 3. Toe space shall be at least 6 inches (152 mm).
- 11.15 4. Side railings shall extend at least 30 inches (762 mm) above the roof or parapet wall.

11.16 Subp. 2. **306.5.2 Electrical requirements.** A receptacle outlet shall be provided
11.17 at or near the equipment or appliance location in accordance with the ~~ICC~~ Minnesota
11.18 Electrical Code.

11.19 Subp. 3. **306.5.3 Sloped roofs.** Where appliances, equipment, fans, or other
11.20 components that require service are installed on a roof having a slope of ~~three~~ 3 units
11.21 vertical in 12 units horizontal (25-percent slope) or greater and having an edge more than
11.22 30 inches (762 mm) above grade at such edge, a level platform shall be provided on each
11.23 side of the appliance to which access is required for service, repair, or maintenance. The
11.24 platform shall be at least 30 inches (762 mm) in any dimension and shall be provided
11.25 with guards. The guards shall extend at least 42 inches (1067 mm) above the platform,
11.26 shall be constructed so as to prevent the passage of a 21-inch-diameter (533 mm) sphere

12.1 and shall comply with the loading requirements for guards specified in ~~the International~~
12.2 ~~Building Code~~ Minnesota Rules, chapter 1305.

12.3 **1346.0309 SECTION 309 TEMPERATURE CONTROL.**

12.4 IMC section 309 is amended by adding a section and subsections to read as follows:

12.5 **309.2 Balancing.** All mechanical ventilation and hydronic systems shall be capable of
12.6 being balanced in accordance with this section.

12.7 **309.2.1 Mechanical ventilation system balancing.** Mechanical ventilation systems shall
12.8 provide airflow rates within +/-10 percent of design capacities and fan speed shall be
12.9 adjusted to meet design airflow conditions.

12.10 **Exceptions** Exception:

12.11 ~~1.~~ Speed adjustment is not required for fan motors rated at one horsepower (0.746
12.12 kW) or less.

12.13 ~~2. Residential exhaust-only ventilation systems shall be capable of exhausting the~~
12.14 ~~minimum ventilation rate required in the Minnesota Energy Code, Minnesota Rules,~~
12.15 ~~chapter 7670 or 7672.~~

12.16 **309.2.2 Hydronic system balancing.** Hydronic systems shall provide flow rates within
12.17 +/-10 percent of design capacities and pump impellers shall be trimmed or pump speed
12.18 shall be adjusted to meet design flow conditions.

12.19 **Exception:** Impeller trimming or speed adjustment is not required for pump motors
12.20 rated at five horsepower (3.73 kW) or less.

12.21 **309.2.3 Systems balancing reports.** Systems balancing reports shall verify system
12.22 performance and shall specify that the minimum amount of outdoor air required in
12.23 ~~amended~~ IMC chapter 4, as amended, is provided to the ventilation system. Systems
12.24 balancing reports shall be submitted to the building official upon request.

12.25 **1346.0401 SECTION 401 GENERAL.**

12.26 IMC section 401.1, Scope, is amended by adding the following exception to the
12.27 end of the section:

13.1 **Exception:** Residential buildings complying with the ventilation requirements in
13.2 Minnesota Rules, chapter 1322.

13.3 ~~IMC Section 401.4 is amended to read as follows:~~

13.4 ~~**401.4 Opening location.** Outside air exhaust and intake openings, in buildings other than~~
13.5 ~~dwelling and Group R-3 occupancies, shall be located a minimum of 10 feet (3048 mm)~~
13.6 ~~from lot lines or buildings on the same lot. Where openings front on a street or public~~
13.7 ~~way, the distance shall be measured to the centerline of the street or public way.~~

13.8 ~~**401.4.1 Intake openings.** Mechanical outside air intake openings shall be located a~~
13.9 ~~minimum of 10 feet (3048 mm) from any hazardous or noxious contaminant, such as~~
13.10 ~~chimneys, plumbing vents, streets, alleys, parking lots, and loading docks, except as~~
13.11 ~~otherwise specified in this code. Where a source of contaminant is located within 10 feet~~
13.12 ~~(3048 mm) of an intake opening, the intake opening shall be located a minimum of 3 feet~~
13.13 ~~(914 mm) below the contaminant source, unless the intake opening is a combustion air~~
13.14 ~~intake of a direct-vent appliance.~~

13.15 ~~**401.4.2 Exhaust openings.** Outside exhaust openings, including bathroom exhaust, toilet~~
13.16 ~~exhaust, domestic kitchen range exhaust, and domestic clothes dryer exhaust, shall be~~
13.17 ~~located at least 3 feet (914 mm) from doors, operable windows, and nonmechanical intake~~
13.18 ~~openings. Exhaust air shall not be directed onto public walkways.~~

13.19 ~~**401.4.3 Flood hazard.** For structures located in flood hazard areas, outdoor exhaust~~
13.20 ~~openings shall be at or above the design flood elevation.~~

13.21 ~~**401.4.4 Venting system terminations.** Venting system terminations shall comply with~~
13.22 ~~IMC Section 804 and IFGC Section 503.8.~~

13.23 **1346.0404 SECTION 404 GARAGES.**

13.24 Subpart 1. **Section 404.1.** IMC section 404.1 is amended to read as follows:

13.25 ~~**404.1 Enclosed parking garages.** Mechanical ventilation systems for enclosed parking~~
13.26 ~~garages shall provide a minimum exhaust rate of 0.75 cfm per square foot (0.228m³ per~~
13.27 ~~minute per square meter) of floor area. Mechanical ventilation systems are not required to~~

14.1 ~~operate continuously where the system is arranged to operate automatically upon detection~~
14.2 ~~of a concentration of carbon monoxide of 25 parts per million (ppm) by approved~~
14.3 ~~automatic detection devices.~~ Mechanical ventilation systems shall operate automatically
14.4 upon detection of certain gas concentrations. If the parking garage will house vehicles that
14.5 emit carbon monoxide (CO), the parking garage must be equipped with a CO detection
14.6 device that will trigger the mechanical system to operate automatically upon detection of
14.7 a CO level of 25 parts per million (ppm). If the parking garage will house vehicles that
14.8 emit nitrogen dioxide (NO₂), the parking garage shall be equipped with a NO₂ detection
14.9 device that triggers the mechanical system to operate automatically upon detection of a
14.10 NO₂ level of 3 ppm. If the parking garage will house vehicles that emit both CO and NO₂,
14.11 the parking garage shall be equipped with both types of detection devices.

14.12 Subp. 2. **Section 404.2.** IMC section 404.2 is amended to read as follows:

14.13 **404.2 Minimum exhaust.** The mechanical ventilation system shall be capable of producing
14.14 a minimum exhaust rate of 0.75 cfm per square foot (0.0038 m³/s·m²) of floor area.

14.15 ~~**404.2 Motor vehicle repair garages.** Mechanical ventilation systems for motor vehicle~~
14.16 ~~repair garages shall provide a minimum exhaust rate of 0.75 cfm per square foot (0.228m³~~
14.17 ~~per minute per square meter) of floor area.~~

14.18 Subp. 3. **Section 404.3.** IMC section 404.3 is amended to read as follows:

14.19 **404.3 Occupied spaces accessory to public garages.** Connecting offices, waiting rooms,
14.20 ticket booths, elevator lobbies, and similar uses that are accessory to a public garage shall
14.21 be maintained at a positive pressure and shall be provided with ventilation in accordance
14.22 with the Ventilation Rate Procedure, Section 6.2 of ASHRAE 62.1-2004, or the Indoor Air
14.23 Quality Procedure, Section 6.3 of ASHRAE 62.1-2004 IMC section 403.3.

14.24 [For text of subp 4, see M.R.]

15.1 **1346.0501 SECTION 501 GENERAL.**

15.2 Subpart 1. **Section ~~501.2~~ 501.3**. IMC section ~~501.2~~ 501.3 is amended to read as
15.3 follows:

15.4 **~~501.2~~ 501.3 Exhaust discharge.** The air removed by every mechanical exhaust system
15.5 shall be discharged outdoors at a point where it will not cause a nuisance and not less than
15.6 the distances specified in IMC section ~~501.2.1~~ 501.3.1. The air shall be discharged to a
15.7 location from which it cannot again be readily drawn in by a ventilating system. Air shall
15.8 not be exhausted into an attic or crawl space and the exhaust system shall be equipped
15.9 with a backdraft damper at the point of discharge.

15.10 **Exception:**

15.11 ~~±~~ Commercial cooking recirculating systems.

15.12 IMC subsections 501.3.1, 501.3.1.1, and 501.3.2 still apply.

15.13 Subp. 2. **Section ~~501.3~~ 501.4**. IMC section ~~501.3~~ 501.4 is amended and subsections
15.14 added to read as follows:

15.15 **~~501.3~~ 501.4 Pressure equalization.** Mechanical exhaust systems shall be sized and
15.16 operated to remove the quantity of air required by this chapter. If a greater quantity of air
15.17 is supplied by a mechanical ventilating supply system than is removed by a mechanical
15.18 exhaust system for a room, adequate means shall be provided for the natural exit of the
15.19 excess air supplied.

15.20 **~~501.3.1~~ 501.4.1 Makeup air in new dwellings dwelling units.** Makeup air quantity for
15.21 new ~~dwellings~~ dwelling units shall be determined by using IMC Table ~~501.3.1~~ 501.4.1 and
15.22 shall be supplied in accordance with IMC section ~~501.3.2~~ 501.4.2.

15.23 **Exception.** Makeup air provisions of IMC section ~~501.3.1~~ 501.4.1 are not required
15.24 when any of the following are demonstrated:

15.25 1. A test is performed according to ASTM Standard E1998-02 (~~2007~~), Standard
15.26 Guide for Assessing Depressurization-Induced Backdrafting and Spillage from

16.1 Vented Combustion Appliances, and documentation is provided that the vented
16.2 combustion appliances continue to operate within established parameters of the test.

16.3 2. A test approved by the building official verifies proper operation of vented
16.4 combustion appliances.

16.5 **~~501.3.2~~ 501.4.2 Makeup air supply.** Makeup air shall be provided by one of the
16.6 following methods:

16.7 1. Passive makeup air shall be provided by passive openings according to the
16.8 following:

16.9 1.1 Passive makeup air openings from the outdoors shall be sized according to
16.10 IMC Table ~~501.3.2~~ 501.4.2.

16.11 1.2 Barometric dampers are prohibited in passive makeup air openings when any
16.12 atmospherically vented appliance is installed.

16.13 1.3 Single passive openings larger than 8 inches (204 mm) diameter, or
16.14 equivalent, shall be provided with a motorized damper that is electrically
16.15 interlocked with the largest exhaust system.

16.16 2. Powered makeup air shall be provided if the size of a single opening or multiple
16.17 openings exceeds 11 inches (280 mm) diameter, or equivalent, when sized according
16.18 to IMC Table ~~501.3.2~~ 501.4.2. Powered makeup air shall comply with the following:

16.19 2.1 Powered makeup air shall be electrically interlocked with the largest exhaust
16.20 system.

16.21 2.2 Powered makeup air shall be matched to the airflow of the largest exhaust
16.22 system.

16.23 3. Makeup air shall be provided by a combination of passive openings and powered
16.24 means according to IMC Table ~~501.3.2~~ 501.4.2 and the following:

16.25 3.1 Passive makeup air openings shall comply with item 1.

17.1 3.2 Powered makeup air shall be supplied for the quantity of airflow in excess of
17.2 the passive makeup air opening provided, and it shall be electrically interlocked
17.3 with the exhaust system.

17.4 ~~501.3.2.1~~ 501.4.2.1 **Makeup air ducts.** Makeup air ducts shall be constructed and
17.5 installed according to IMC chapter 6 and section ~~501.3.2~~ 501.4.2.

17.6 ~~501.3.2.2~~ 501.4.2.2 **Makeup air intake.** Makeup air intake openings shall be located to
17.7 avoid intake of exhaust air in accordance with IMC section ~~401.5.2~~ 401.4 and IFGC
17.8 section 503.8, and shall be covered with corrosion resistant screen of not less than 1/4
17.9 inch (6.4 mm) mesh. Makeup air intake openings shall be located at least 12 inches (305
17.10 mm) above adjoining grade level.

17.11 ~~501.3.2.3~~ 501.4.2.3 **Makeup air location.** Makeup air requirements of 175 cubic feet
17.12 per minute (cfm) (0.084 m³/s) and greater shall be introduced to the dwelling in one of
17.13 the following locations:

- 17.14 1. In the space containing the vented combustion appliances.
- 17.15 2. In the space containing the exhaust system.
- 17.16 3. In a space that is freely communicating with the exhaust system and is approved
17.17 by the building official.

17.18 ~~501.3.2.4~~ 501.4.2.4 **Makeup air termination restriction.** A makeup air opening shall
17.19 not terminate in the return air plenum of a forced air heating system unless it is installed
17.20 according to the heating ~~equipment~~ appliance manufacturer's installation instructions.

17.21 ~~501.3.2.5~~ 501.4.2.5 **Separate makeup air and combustion air openings.** When both
17.22 makeup air and combustion air openings are required, they shall be provided through
17.23 separate openings to the outdoors. ~~Refer,~~ subject to IFGC section 304, to determine
17.24 requirements for air for combustion and ventilation.;

17.25 **Exception:** Combination makeup air and combustion air systems may be approved
17.26 by the building official where they are reasonably equivalent in terms of health,
17.27 safety, and durability.

18.1 **~~501.3.2.6~~ 501.4.2.6 Makeup air effectiveness.** The makeup air shall not reduce the
18.2 effectiveness of exhaust systems or performance of vented combustion appliances, and
18.3 makeup air shall not adversely affect the heating or cooling capability of the mechanical
18.4 ~~equipment~~ appliances.

18.5 **~~501.3.3~~ 501.4.3 Additions, alterations, or installations of mechanical systems in**
18.6 **~~existing dwellings~~ dwelling units.** Makeup air shall be supplied to existing ~~dwellings~~
18.7 dwelling units when any of the following conditions occur:

18.8 1. If a dwelling unit was constructed after 2003 using the makeup air provisions of
18.9 IMC section ~~501.3.2~~ 501.4.2, makeup air quantity shall be determined by using IMC
18.10 Table ~~501.3.1~~ 501.4.1 and shall be supplied according to IMC section ~~501.3.2~~ 501.4.2
18.11 when any of the following conditions occur:

18.12 1.1 A vented combustion appliance, including a solid fuel appliance, is installed
18.13 or replaced.

18.14 1.2 An exhaust system is installed or replaced.

18.15 **Exception:** If powered makeup air is electrically interlocked and matched to the
18.16 airflow of the exhaust system, additional makeup air is not required.

18.17 2. If a dwelling unit was constructed after 1999 using the provisions of the Minnesota
18.18 Energy Code, Minnesota Rules, chapter 7672, makeup air quantity shall be
18.19 determined by using IMC Table ~~501.3.1~~ 501.4.1 and shall be supplied in accordance
18.20 with IMC section ~~501.3.2~~ 501.4.2 when any of the following conditions occur:

18.21 2.1 A vented combustion appliance, including a solid fuel appliance, is installed
18.22 or replaced.

18.23 2.2 An exhaust system is installed or replaced.

18.24 **Exception:** If powered makeup air is electrically interlocked and matched to the
18.25 airflow of the exhaust system, additional makeup air is not required.

18.26 3. When a solid fuel appliance is installed in a dwelling unit constructed during
18.27 or after 1994 under the Minnesota Energy Code, Minnesota Rules, chapter 7670,

19.1 makeup air quantity shall be determined by using ~~IMC Table 501.3.1~~ 501.4.1 and
19.2 shall be supplied according to ~~IMC section 501.3.2~~ 501.4.2.

19.3 **Exception.** If a closed combustion solid fuel burning appliance is installed with
19.4 combustion air in accordance with the manufacturer's installation instructions,
19.5 additional makeup air is not required.

19.6 4. When an exhaust system with a rated capacity greater than 300 cfm (0.144
19.7 m³/s) is installed in a dwelling unit constructed during or after 1994 under the
19.8 Minnesota Energy Code, Minnesota Rules, chapter 7670, makeup air quantity shall
19.9 be determined by using ~~IMC Table 501.3.3(1)~~ 501.4.3(1) and shall be supplied
19.10 according to ~~IMC section 501.3.2~~ 501.4.2.

19.11 **Exception:** If powered makeup air is electrically interlocked and matched to the
19.12 airflow of the exhaust system, additional makeup air is not required.

19.13 5. When an exhaust system with a rated capacity greater than 300 cfm (0.144 m³/s) is
19.14 installed in a dwelling unit constructed prior to 1994, makeup air quantity shall be
19.15 determined by using ~~IMC Table 501.3.3(2)~~ 501.4.3(2) and shall be supplied according
19.16 to ~~IMC section 501.3.2~~ 501.4.2.

19.17 **Exception:** If powered makeup air is electrically interlocked and matched to the
19.18 airflow of the exhaust system, additional makeup air is not required.

19.19 6. When a solid fuel appliance is installed in a dwelling unit constructed prior to 1994,
19.20 makeup air quantity shall be determined by using ~~IMC Table 501.3.3(3)~~ 501.4.3(3)
19.21 and shall be supplied according to ~~IMC section 501.3.2~~ 501.4.2.

19.22 **Exception:** If a closed combustion solid fuel burning appliance is installed with
19.23 combustion air in accordance with the manufacturer's installation instructions,
19.24 additional makeup air is not required.

19.25 **Exception:** Makeup air is not required in items 1 to 6 when any of the following
19.26 are demonstrated:

- 20.1 1. A test is performed according to ASTM Standard E1998-02-(2007), Standard
- 20.2 Guide for Assessing Depressurization-Induced Backdrafting and Spillage from
- 20.3 Vented Combustion Appliances, and documentation is provided that the vented
- 20.4 combustion appliances continue to operate within established parameters of the test.
- 20.5 2. A test approved by the building official verifies proper operation of vented
- 20.6 combustion appliances.

Table ~~501.3.1~~ 501.4.1

Procedure to Determine Makeup Air Quantity for Exhaust ~~Equipment~~ Appliances in ~~Dwellings~~ Dwelling Units

20.10				Multiple
20.11				<u>appliances</u>
20.12	One or multiple	One or multiple	One	<u>that are</u>
20.13	power vent	fan-assisted	atmospherically	atmospherically
20.14	or direct vent	appliances and	vented gas or	vented gas or
20.15	appliances or	power vent	oil appliance or	oil appliances
20.16	no combustion	or direct vent	one solid fuel	or solid fuel
20.17	appliances ^A	appliances ^B	appliance ^C	appliances ^D

20.18 1. Use the Appropriate Column to Estimate House Infiltration

20.19 a) pressure factor

20.20 (cfm/sf)	0.15	0.09	0.06	0.03
----------------	------	------	------	------

20.21 b) conditioned

20.22 floor area (sf)	_____	_____	_____	_____
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20.23 (including unfinished basements)

20.24 Estimated House

20.25 Infiltration

20.26 (cfm): [1a x 1b]

_____	_____	_____	_____
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20.27 2. Exhaust Capacity

20.28 ~~a) continuous~~

20.29 ~~exhaust-only~~

20.30 ~~ventilation~~

20.31 ~~system (cfm):~~

=====	=====	=====	=====
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20.32 (not applicable to balanced ventilation systems such as HRV)

21.1	b) <u>a)</u> clothes				
21.2	dryer	135	135	135	135
21.3	e) <u>b)</u> 80% of				
21.4	largest exhaust				
21.5	rating (cfm):	_____	_____	_____	_____
21.6	(not applicable if recirculating system or if powered makeup air is electrically interlocked				
21.7	and matched to exhaust)				
21.8	d) <u>c)</u> 80% of next				
21.9	largest exhaust	not			
21.10	rating (cfm):	applicable	_____	_____	_____
21.11	(not applicable if recirculating system or if powered makeup air is electrically interlocked				
21.12	and matched to exhaust)				
21.13	Total Exhaust				
21.14	Capacity (cfm):				
21.15	[2a+2b+2c+2d]	_____	_____	_____	_____
21.16	3. Makeup Air Requirement				
21.17	a) Total Exhaust				
21.18	Capacity (from				
21.19	above)	_____	_____	_____	_____
21.20	b) Estimated				
21.21	House				
21.22	Infiltration (from				
21.23	above)	_____	_____	_____	_____
21.24	Makeup Air				
21.25	Quantity (cfm):				
21.26	[3a - 3b]	_____	_____	_____	_____
21.27	(if value is negative, no makeup air is needed)				

21.28 4. For Makeup Air Opening Sizing, refer to Table ~~501.3.2~~ 501.4.2

21.29 ^AUse this column if there are other than fan-assisted or atmospherically vented gas or
21.30 oil appliances or if there are no combustion appliances.

21.31 ^BUse this column if there is one fan-assisted appliance per venting system. Other than
21.32 atmospherically vented appliances may also be included.

22.1 ^CUse this column if there is one atmospherically vented (other than fan-assisted) gas
 22.2 or oil appliance per venting system or one solid fuel appliance.

22.3 ^DUse this column if there are multiple atmospherically vented gas or oil appliances
 22.4 using a common vent or if there are atmospherically vented gas or oil appliances and
 22.5 solid fuel appliances.

22.6 ~~Table 501.3.2~~ 501.4.2

22.7 ~~Makeup Air Opening Sizing Table for New and Existing Dwellings~~ Dwelling Units

22.8				Multiple appliances that are		
22.9				atmospher- ically vented	Passive	
22.10		One or multiple	One or multiple	atmospher- ically vented	makeup	
22.11		power vent	fan-assisted	ically vented	air	
22.12		or direct vent	appliances and	gas or oil	opening	
22.13		appliances or	power vent	appliance or	duct	
22.14		no combustion	or direct vent	one solid fuel	diameter ^{E,F,G}	
22.15		appliances ^A	appliances ^B	appliance ^C		
22.16				appliances ^D		
22.17	Type of opening					
22.18	or system	(cfm)	(cfm)	(cfm)	(inches)	
22.19	Passive Opening	1-36	1-22	1-15	1-9	3
22.20	Passive Opening	37-66	23-41	16-28	10-17	4
22.21	Passive Opening	67-109	42-66	29-46	18-28	5
22.22	Passive Opening	110-163	67-100	47-69	29-42	6
22.23	Passive Opening	164-232	101-143	70-99	43-61	7
22.24	Passive Opening	233-317	144-195	100-135	62-83	8
22.25	Passive Opening					
22.26	with Motorized					
22.27	Damper	318-419	196-258	136-179	84-110	9
22.28	Passive Opening					
22.29	with Motorized					
22.30	Damper	420-539	259-332	180-230	111-142	10

23.1	Passive Opening					
23.2	with Motorized					
23.3	Damper	540-679	333-419	231-290	143-179	11
23.4	Powered Makeup					Not
23.5	Air ^H	>679	>419	>290	>179	Applicable

23.6 ^AUse this column if there are other than fan-assisted or atmospherically vented gas or
 23.7 oil appliances or if there are no combustion appliances.

23.8 ^BUse this column if there is one fan-assisted appliance per venting system. Other than
 23.9 atmospherically vented appliances may also be included.

23.10 ^CUse this column if there is one atmospherically vented (other than fan-assisted) gas
 23.11 or oil appliance per venting system or one solid fuel appliance.

23.12 ^DUse this column if there are multiple atmospherically vented gas or oil appliances
 23.13 using a common vent or if there are atmospherically vented gas or oil appliances and
 23.14 solid fuel appliance(s).

23.15 ^EAn equivalent length of 100 feet of round smooth metal duct is assumed. Subtract 40
 23.16 feet for the exterior hood and ten feet for each 90-degree elbow to determine the remaining
 23.17 length of straight duct allowable.

23.18 ^FIf flexible duct is used, increase the duct diameter by one inch. Flexible duct shall
 23.19 be stretched with minimal sags.

23.20 ^GBarometric dampers are prohibited in passive makeup air openings when any
 23.21 atmospherically vented appliance is installed.

23.22 ^HPowered makeup air shall be electrically interlocked with the largest exhaust system.

23.23 Table 501.3.3(1) 501.4.3(1)

23.24 Procedure to Determine Makeup Air Quantity for Exhaust Equipment Appliances in
 23.25 Existing Dwellings Dwelling Units

23.26 (Refer to item 4 in section 501.3.3 501.4.3 to determine applicability of this table)

24.1					Multiple
24.2					<u>appliances</u>
24.3		One or multiple	One or multiple	One	<u>that are</u>
24.4		power vent	fan-assisted	atmospherically	atmospherically
24.5		or direct vent	appliances and	vented gas or	vented gas or
24.6		appliances or	power vent	oil appliance or	oil appliances
24.7		no combustion	or direct vent	one solid fuel	or solid fuel
24.8		appliances ^A	appliances ^B	appliance ^C	appliances ^D

24.9 1. Use the Appropriate Column to Estimate House Infiltration

24.10 a) pressure factor

24.11 (cfm/sf)	0.15	0.09	0.06	0.03
----------------	------	------	------	------

24.12 b) conditioned

24.13 floor area (sf)	_____	_____	_____	_____
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24.14 Estimated House

24.15 Infiltration

24.16 (cfm): [1a x 1b]	_____	_____	_____	_____
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24.17 2. Exhaust Capacity

24.18 80% of exhaust

24.19 rating = Exhaust

24.20 Capacity (cfm):	_____	_____	_____	_____
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24.21 (not applicable if recirculating system or if powered makeup air is electrically interlocked
24.22 and matched to exhaust)

24.23 3. Makeup Air Requirement

24.24 a) Exhaust

24.25 Capacity (from

24.26 above)	_____	_____	_____	_____
--------------	-------	-------	-------	-------

24.27 b) Estimated

24.28 House

24.29 Infiltration (from

24.30 above)	_____	_____	_____	_____
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24.31 Makeup Air

24.32 Quantity (cfm):

24.33 [3a - 3b]	_____	_____	_____	_____
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24.34 (if value is negative, no makeup air is needed)

24.35 4. For Makeup Air Opening Sizing, refer to Table ~~501.3.2~~ 501.4.2

25.1 ^AUse this column if there are other than fan-assisted or atmospherically vented gas or
 25.2 oil appliances or if there are no combustion appliances.

25.3 ^BUse this column if there is one fan-assisted appliance per venting system. Other than
 25.4 atmospherically vented appliances may also be included.

25.5 ^CUse this column if there is one atmospherically vented (other than fan-assisted) gas
 25.6 or oil appliance per venting system or one solid fuel appliance.

25.7 ^DUse this column if there are multiple atmospherically vented gas or oil appliances
 25.8 using a common vent or if there are atmospherically vented gas or oil appliances and
 25.9 solid fuel appliances.

25.10 Table ~~501.3.3(2)~~ 501.4.3(2)

25.11 Procedure to Determine Makeup Air Quantity for Exhaust Equipment Appliances in
 25.12 Existing Dwellings Dwelling Units

25.13 (Refer to item 5 in section ~~501.3.3~~ 501.4.3 to determine applicability of this table)

25.14					Multiple
25.15					<u>appliances</u>
25.16		One or multiple	One or multiple	One	<u>that are</u>
25.17		power vent	fan-assisted	atmospherically	atmospherically
25.18		or direct vent	appliances and	vented gas or	vented gas or
25.19		appliances or	power vent	oil appliance or	oil appliances
25.20		no combustion	or direct vent	one solid fuel	or solid fuel
25.21		appliances ^A	appliances ^B	appliance ^C	appliances ^D

25.22 1. Use the Appropriate Column to Estimate House Infiltration

25.23	a) pressure factor				
25.24	(cfm/sf)	0.25	0.15	0.10	0.05
25.25	b) conditioned				
25.26	floor area (sf)	_____	_____	_____	_____
25.27	(including unfinished basements)				
25.28	Estimated House				
25.29	Infiltration				
25.30	(cfm): [1a x 1b]	_____	_____	_____	_____

26.1	or				
26.2	Alternative				
26.3	Calculation (by				
26.4	using blower				
26.5	door test) ^E				
26.6	c) conversion				
26.7	factor	0.75	0.45	0.30	0.15
26.8	d) CFM50 value				
26.9	(from blower				
26.10	door test)	_____	_____	_____	_____
26.11	Estimated House				
26.12	Infiltration				
26.13	(cfm): [1c x 1d]	_____	_____	_____	_____
26.14	2. Exhaust Capacity				
26.15	80% of exhaust				
26.16	rating = Exhaust				
26.17	Capacity (cfm):	_____	_____	_____	_____
26.18	(not applicable if recirculating system or if powered makeup air is electrically interlocked				
26.19	with exhaust)				
26.20	3. Makeup Air Requirement				
26.21	a) Exhaust				
26.22	Capacity (from				
26.23	above)	_____	_____	_____	_____
26.24	b) Estimated				
26.25	House				
26.26	Infiltration (from				
26.27	above)	_____	_____	_____	_____
26.28	Makeup Air				
26.29	Quantity (cfm):				
26.30	[3a - 3b]	_____	_____	_____	_____
26.31	(if value is negative, no makeup air is needed)				
26.32	4. For Makeup Air Opening Sizing, refer to Table 501.3.2 <u>501.4.2</u>				
26.33	^A Use this column if there are other than fan-assisted or atmospherically vented gas or				
26.34	oil appliances or if there are no combustion appliances.				

27.1 ^BUse this column if there is one fan-assisted appliance per venting system. Other than
 27.2 atmospherically vented appliances may also be included.

27.3 ^CUse this column if there is one atmospherically vented (other than fan-assisted) gas
 27.4 or oil appliance per venting system or one solid fuel appliance.

27.5 ^DUse this column if there are multiple atmospherically vented gas or oil appliances
 27.6 using a common vent or if there are atmospherically vented gas or oil appliances and
 27.7 solid fuel appliances.

27.8 ^EAs an alternative, the Estimated House Infiltration may be calculated by performing
 27.9 a blower door test and multiplying the conversion factor by the CFM50 value.

27.10 Table ~~501.3.3(3)~~ 501.4.3(3)

27.11 Procedure to Determine Makeup Air Quantity for Exhaust Equipment Appliances in
 27.12 Existing Dwellings Dwelling Units

27.13 (Refer to item 6 in section ~~501.3.3~~ 501.4.3 to determine applicability of this table)

	One or multiple power vent or direct vent appliances or no combustion appliances ^A	One or multiple fan-assisted appliances and power vent or direct vent appliances ^B	One atmospherically vented gas or oil appliance or one solid fuel appliance ^C	Multiple <u>appliances</u> <u>that are</u> atmospherically vented gas or oil appliances or solid fuel appliances ^D
--	--	--	--	--

27.22 1. Use the Appropriate Column to Estimate House Infiltration

27.23 a) pressure factor (cfm/sf) 0.25 0.15 0.10 0.05

27.24 b) conditioned floor area (sf) _____

27.25 (including unfinished basements)

27.26 Estimated House Infiltration

27.27 (cfm): [1a x 1b] _____

27.28 or

27.29 Alternative Calculation (by
 27.30 using blower door test)^E

27.31 c) conversion factor 0.75 0.45 0.30 0.15

28.1	d) CFM50 value (from				
28.2	blower door test)	_____	_____	_____	_____
28.3	Estimated House Infiltration				
28.4	(cfm): [1c x 1d]	_____	_____	_____	_____
28.5	2. Exhaust Capacity				
28.6	a) continuous exhaust only				
28.7	ventilation system (cfm)	_____	_____	_____	_____
28.8	(not applicable to balanced ventilation systems)				
28.9	b) a) clothes dryer (cfm)	135	135	135	135
28.10	e) b) 80% of largest exhaust				
28.11	rating (cfm):	_____	_____	_____	_____
28.12	(not applicable if recirculating system or if powered makeup air is electrically interlocked				
28.13	and with exhaust)				
28.14	d) c) 80% of next largest	Not			
28.15	exhaust rating (cfm)	applicable	_____	_____	_____
28.16	(not applicable if recirculating system or if powered makeup air is electrically interlocked				
28.17	with exhaust)				
28.18	Total Exhaust Capacity				
28.19	(cfm): [2a+2b+2c+2d]	_____	_____	_____	_____
28.20	3. Makeup Air Requirement				
28.21	a) Total Exhaust Capacity				
28.22	(from above)	_____	_____	_____	_____
28.23	b) Estimated House				
28.24	Infiltration (from above)	_____	_____	_____	_____
28.25	Makeup Air Quantity (cfm):				
28.26	[3a - 3b]	_____	_____	_____	_____
28.27	(if value is negative, no makeup air is needed)				

28.28 4. For Makeup Air Opening Sizing, refer to Table ~~501.3.2~~ 501.4.2

28.29 ^AUse this column if there are other than fan-assisted or atmospherically vented gas or
 28.30 oil appliances or if there are no combustion appliances.

28.31 ^BUse this column if there is one fan-assisted appliance per venting system. Other than
 28.32 atmospherically vented appliances may also be included.

29.1 ^CUse this column if there is one atmospherically vented (other than fan-assisted) gas
29.2 or oil appliance per venting system or one solid fuel appliance.

29.3 ^DUse this column if there are multiple atmospherically vented gas or oil appliances
29.4 using a common vent or if there are atmospherically vented gas or oil appliances and
29.5 solid fuel appliances.

29.6 ^EAs an alternative, the Estimated House Infiltration may be calculated by performing
29.7 a blower door test and multiplying the conversion factor by the CFM50 value.

29.8 **1346.0502 REQUIRED SYSTEMS.**

29.9 IMC section 502.14 is amended by adding exception 4 to read as follows:

29.10 4. A source capture system is not required for any engine repair stall having an exhaust
29.11 pipe extension duct less than 10 feet (3048 mm) in length, connected directly to the
29.12 motor vehicle exhaust system and discharging directly to the outside of the building.

29.13 **1346.0505 SECTION 505 DOMESTIC KITCHEN EXHAUST EQUIPMENT**
29.14 **APPLIANCES.**

29.15 IMC section 505.1 is amended to read as follows:

29.16 **505.1 Domestic systems.** Where domestic range hoods and domestic appliances equipped
29.17 with downdraft exhaust are located within dwellings, the hoods and appliances shall
29.18 discharge to the outdoors through ducts constructed of galvanized steel, stainless steel,
29.19 aluminum, or copper. The ducts shall have smooth inner walls and shall be air tight and
29.20 equipped with a backdraft damper. Domestic kitchen exhaust hoods ducted to the outdoors
29.21 shall have makeup air provided according to Minnesota Rules, part 1346.0501. Refer to
29.22 ~~Appendix C~~ part 1346.6010 for Table C-1, "Recommended Capacities for Domestic
29.23 Kitchen Exhaust Hoods."

29.24 **Exceptions:**

29.25 1. Where installed according to the manufacturer's installation instructions and where
29.26 mechanical or natural ventilation is otherwise provided according to IMC chapter

30.1 4, listed and labeled ductless range hoods shall not be required to discharge to the
30.2 outdoors.

30.3 2. Ducts for domestic kitchen cooking appliances equipped with downdraft exhaust
30.4 systems shall be permitted to be constructed of Schedule 40 PVC pipe provided that
30.5 the installation complies with all of the following:

30.6 2.1. The duct shall be installed under a concrete slab poured on grade.

30.7 2.2. The underfloor trench in which the duct is installed shall be completely
30.8 backfilled with sand or gravel.

30.9 2.3. The PVC duct shall extend not greater than 1 inch (25 mm) above the indoor
30.10 concrete floor surface.

30.11 2.4. The PVC duct shall extend not greater than 1 inch (25 mm) above grade
30.12 outside of the building.

30.13 2.5. The PVC ducts shall be primed and solvent cemented in accordance with
30.14 ASTM D2564.

30.15 **1346.0506 SECTION 506 COMMERCIAL KITCHEN HOOD VENTILATION**
30.16 **SYSTEM DUCTS AND EXHAUST EQUIPMENT APPLIANCES.**

30.17 Subpart 1. Section 506.1. IMC section 506.1 is amended by adding a sentence to
30.18 the end of the section to read as follows:

30.19 For additional requirements for commercial kitchen hoods licensed and inspected by
30.20 the Department of Agriculture, Department of Health, or local authorities that conduct
30.21 inspections of food establishments, refer to the Minnesota Food Code, Minnesota Rules,
30.22 chapter 4626.

30.23 ~~Subpart 1.~~ Subp. 1a. **Section 506.3.** IMC section 506.3 is amended to read as follows:
30.24 **506.3 Ducts serving Type I hoods.** Commercial kitchen exhaust systems serving Type
30.25 I hoods shall be designed, constructed and installed in accordance with NFPA 96-2008,
30.26 Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations.

31.1 Subp. 2. ~~Sections 506.3.1 to 506.3.12.3~~ 506.3.2.4. IMC sections 506.3.1 to
31.2 ~~506.3.12.3~~ 506.3.2.4 are deleted and replaced with NFPA 96-2008, sections 5.1.1 and
31.3 7.5.2, with the following amendments: chapters 1 to 10 and 12 to 15 of NFPA 96.
31.4 ~~5.1.1~~ The hood or that portion of a primary collection means designed for collecting
31.5 cooking vapors and residues shall be constructed of stainless steel not less than 0.94 mm
31.6 (0.037 in.) (No. 20 MSG) in thickness or other approved material of equivalent strength
31.7 and fire and corrosion resistance. Refer to the Minnesota Food Code, Minnesota Rules,
31.8 chapter 4626, for additional requirements for commercial kitchen hoods licensed and
31.9 inspected by the Department of Agriculture, Department of Health, or local authorities
31.10 that conduct inspections of food establishments.
31.11 ~~7.5.2.1~~ All seams, joints, penetrations, and duct-to-hood collar connections shall have a
31.12 liquid tight continuous external weld. Listed grease ducts and ducts complying with
31.13 7.5.1 through 7.5.5.5 that are installed within a concealed enclosure shall maintain an air
31.14 pressure test of at least 1.0 inch water column positive pressure for a minimum of 20
31.15 minutes, unless an equivalent alternate test is specified by the building official.

31.16 Subp. 2a. Section 506.3.2.5. IMC section 506.3.2.5 is deleted in its entirety and
31.17 replaced with the following:
31.18 506.3.2.5 Grease duct leakage performance test. Prior to the use or concealment of
31.19 any portion of a grease duct system, a leakage test shall be performed to determine that
31.20 all welded joints and seams are liquidtight. Ducts shall be considered to be concealed
31.21 where they are installed in shafts or covered by coatings or wraps that prevent the duct
31.22 from being visually inspected on all sides. It is permissible to test the duct in sections,
31.23 provided that, after the duct system is completely assembled, all field-assembled joints
31.24 are tested, including the duct-to-hood connection. When the testing is performed in this
31.25 manner, only the field-assembled joints of listed factory-built grease ducts are required
31.26 to be tested. The leakage test shall consist of a light, air, or water test, or an approved

32.1 equivalent test. The permit holder shall be responsible to provide the necessary equipment
32.2 and perform the grease duct leakage test.

32.3 **506.3.2.5.1 Light test.** The light test shall be performed by passing a lamp having a power
32.4 rating of not less than 100 watts through the entire section of ductwork to be tested. The
32.5 lamp shall be open so as to emit light equally in all directions perpendicular to the duct
32.6 walls. No light from the duct interior shall be visible through any exterior surface.

32.7 **506.3.2.5.2 Air test.** The air test shall be performed by sealing the entire duct system from
32.8 the hood exhaust opening(s) to the duct termination. The sealed duct system shall then
32.9 be pressurized to a minimum pressure of 1.0 inch water column and shall be required to
32.10 hold the initial set pressure for a minimum of 20 minutes.

32.11 **506.3.2.5.3 Water test.** The water test shall be performed by use of a pressure washer
32.12 operating at a minimum of 1,500 psi, simulating cleaning operations. The water shall be
32.13 applied directly to all areas to be tested. No water applied to the duct interior shall be
32.14 visible on any exterior surface in any volume during the test.

32.15 Subp. 2b. **Sections 506.3.3 to 506.3.13.3.** IMC sections 506.3.3 to 506.3.13.3 are
32.16 deleted in their entirety.

32.17 Subp. 3. **Section 506.4.2.** IMC section 506.4.2 is amended to read as follows:

32.18 **506.4.2 Ducts.** Ducts and plenums serving Type II hoods shall be constructed of rigid
32.19 metallic materials. Duct construction, installation, bracing, and supports shall comply
32.20 with IMC chapter 6, as amended in this chapter. Ducts conveying moisture-laden or waste
32.21 heat-laden air shall comply with the following requirements:

32.22 1. Ducts shall be constructed, joined, and sealed to prevent drips and leaking.

32.23 2. Ducts shall slope not less than one-fourth unit vertical in 12 units horizontal (2
32.24 percent slope) toward the hood or toward an approved reservoir.

32.25 3. ~~Horizontal ducts exceeding 75 feet (22,860 mm) in length shall slope not less than~~
32.26 ~~one unit vertical in 12 units horizontal (8.3 percent slope).~~

33.1 4. Ducts subject to positive pressure shall maintain an air pressure test of 1.0 inch
 33.2 water column positive pressure for a minimum of 20 minutes, unless an equivalent
 33.3 alternate test is specified by the building official.

33.4 Subp. 4. Sections 506.5 to 506.5.5. IMC sections 506.5 to 506.5.5 are deleted in
 33.5 their entirety.

33.6 **1346.0507 SECTION 507 COMMERCIAL KITCHEN HOODS.**

33.7 [For text of subp 1, see M.R.]

33.8 Subp. 2. **Section 507.2.** IMC section 507.2 is amended to read as follows:

33.9 **507.2 Where required.** A Type I or Type II hood shall be installed at or above all
 33.10 commercial cooking appliances in accordance with ~~sections 507.2.1 and 507.2.2~~ ASHRAE
 33.11 standard 154. Where any cooking appliance under a single hood requires a Type I hood,
 33.12 a Type I hood shall be installed. Where a Type II hood is required, a Type I or Type II
 33.13 hood shall be installed.

33.14 ~~**507.2.1 Type I hoods.** Type I hoods shall be installed where cooking appliances produce~~
 33.15 ~~grease or smoke, such as occurs with griddles, fryers, broilers, ovens, ranges, and wok~~
 33.16 ~~ranges.~~

33.17 ~~**507.2.1.1 Operation.** Type I hood systems shall be designed and installed to automatically~~
 33.18 ~~activate the exhaust fan whenever cooking operations occur. The activation of the exhaust~~
 33.19 ~~fan shall occur through an interlock with the cooking appliances, by means of heat sensors~~
 33.20 ~~or by means of other approved methods.~~

33.21 ~~**507.2.2 Type II hoods.** Type II hoods shall be installed where cooking or dishwashing~~
 33.22 ~~appliances produce heat, steam, or products of combustion and do not produce grease or~~
 33.23 ~~smoke, such as steamers, kettles, pasta cookers, and dishwashing machines.~~

33.24 **Exceptions:**

33.25 ~~1. Under-counter-type commercial dishwashing machines.~~

34.1 ~~2. A Type II hood is not required for dishwashers and potwashers that are provided~~
34.2 ~~with heat and water vapor exhaust or recovery systems that are supplied by the~~
34.3 ~~appliance manufacturer and are installed in accordance with the manufacturer's~~
34.4 ~~instructions. The additional heat and moisture loads generated by such appliances~~
34.5 ~~shall be accounted for in the design of the HVAC system. The HVAC system shall~~
34.6 ~~maintain a maximum relative humidity of 65 percent in the space.~~

34.7 ~~3. A single light-duty electric convection, bread, retherm, or microwave oven that are~~
34.8 ~~rated at 3.7 kW or less. The additional heat and moisture loads generated by such~~
34.9 ~~appliances shall be accounted for in the design of the HVAC system. The HVAC~~
34.10 ~~system shall maintain a maximum relative humidity of 65 percent in the space.~~

34.11 ~~4. A Type II hood is not required for the following electrically heated appliances:~~
34.12 ~~toasters, steam tables, popcorn poppers, hot dog cookers, coffee makers, rice cookers,~~
34.13 ~~egg cookers, and holding/warming ovens that are rated at 3.7 kW or less. The~~
34.14 ~~additional heat and moisture loads generated by such appliances shall be accounted~~
34.15 ~~for in the design of the HVAC system. The HVAC system shall maintain a maximum~~
34.16 ~~relative humidity of 65 percent in the space.~~

34.17 Subp. 3. [Repealed, 34 SR 537]

34.18 Subp. 4. [See repealer.]

34.19 Subp. 5. [Repealed, 34 SR 537]

34.20 Subp. 6. **Section 507.4.** IMC section 507.4 is deleted.

34.21 Subp. 7. **Section 507.5.** IMC section 507.5 is amended to read as follows:

34.22 **507.5 Type II hood materials.** Type II hood materials shall be constructed of stainless
34.23 steel not less than 0.024 inch (0.61 mm) (No. 24 Gage) in thickness, copper sheets
34.24 weighing not less than 24 ounces per square foot (7.3 kg/m²), or of other approved
34.25 material and gage. Refer to the Minnesota Food Code, Minnesota Rules, chapter 4626,
34.26 for additional requirements for commercial kitchen hoods licensed and inspected by

35.1 ~~the Department of Agriculture, Department of Health, or local authorities that conduct~~
35.2 ~~inspections of food establishments.~~

35.3 Subp. 8. **Section 507.7.** IMC section 507.7 is amended to read as follows:
35.4 **507.7 Hood joints, seams, and penetrations.** Hood joints, seams, and penetrations shall
35.5 comply with amended IMC ~~section~~ sections 507.7.1 and ~~IMC section~~ 507.7.2.

35.6 Subp. 9. **Section 507.7.1.** IMC section 507.7.1 is amended to read as follows:
35.7 **507.7.1 Type I hoods.** Type I hoods shall be designed, constructed, and installed in
35.8 accordance with Chapter 5 of NFPA 96-2008.

35.9 Subp. 10. **Sections 507.8 to 507.11.2.** IMC sections 507.8 ~~through~~ to 507.11.2
35.10 are deleted.

35.11 Subp. 11. [Repealed, 34 SR 537]

35.12 Subp. 12. **Section 507.14.** IMC section 507.14 is deleted.

35.13 Subp. 13. [Repealed, 34 SR 537]

35.14 **1346.0508 SECTION 508 COMMERCIAL KITCHEN MAKEUP AIR.**

35.15 Subpart 1. **Section 508.1.** IMC section 508.1 is amended to read as follows:
35.16 **508.1 Makeup air.** Makeup air shall be supplied during the operation of commercial
35.17 kitchen exhaust systems that are provided for commercial food heat-processing appliances.
35.18 The amount of makeup air supplied shall be approximately equal to the exhaust air. ~~A~~
35.19 ~~minimum of 80 percent of the makeup air shall be supplied into the space where the~~
35.20 ~~exhaust hood is located.~~ The makeup air shall not reduce the effectiveness of the exhaust
35.21 system. Makeup air shall be provided by mechanical means and the exhaust and makeup
35.22 air systems shall be electrically interlocked to insure that makeup air is provided whenever
35.23 the exhaust system is in operation. Makeup air intake openings shall comply with IMC
35.24 ~~section~~ sections 401.4 and ~~amended IMC section 401.4.1~~ 401.5.

35.25 **Exception:** This section shall not apply to dwelling units.

36.1 **508.1.1 Makeup air temperature.** Makeup air shall be not less than 50°F (10°C),
 36.2 measured at the flow of air from the supply diffuser into the space.

36.3 **508.1.2 Makeup and ventilation air distribution.** Makeup and ventilation air supply
 36.4 diffusers located within 12 feet (3.7 m) of an exhaust hood shall be directed away from
 36.5 the hood.

36.6 **Exception:** Perimeter perforated supply plenums installed in accordance with the
 36.7 manufacturer's installation instructions.

36.8 [For text of subp 2, see M.R.]

36.9 **1346.0510 SECTION 510 HAZARDOUS EXHAUST SYSTEMS.**

36.10 Subpart 1. **Section 510.1.** IMC section 510.1 is amended by adding an exception to
 36.11 the end of this section as follows:

36.12 **Exception:** Other than IMC sections 510.4 and 510.7, this section shall not apply to
 36.13 laboratory ventilation systems that comply with NFPA 45-2004.

36.14 Subp. 2. [Repealed, 34 SR 537]

36.15 Subp. 3. [Repealed, 34 SR 537]

36.16 **1346.0512 SECTION 512 SUBSLAB SOIL EXHAUST SYSTEMS.**

36.17 IMC section 512.1, General, is amended by adding an exception to the end of this section
 36.18 as follows:

36.19 **Exception:** For radon gas control in residential occupancies, see Minnesota Rules,
 36.20 parts 1303.2400 to 1303.2403.

36.21 **1346.0603 SECTION 603 DUCT CONSTRUCTION AND INSTALLATION.**

36.22 Subpart 1. [Repealed, 34 SR 537]

36.23 Subp. 2. **Section Table 603.4.** IMC section Table 603.4 is amended to read as follows:

36.24 Table 603.4 Duct Construction Minimum Sheet Metal Thicknesses for Single Dwelling

36.25 Units

37.1 37.2 37.3 37.4	<u>GALVANIZED</u>		<u>ALUMINUM</u>
			<u>MINIMUM</u>
			<u>THICKNESS</u>
			<u>Gauge</u>
37.5 37.6 37.7	<u>DUCT SIZE</u>	<u>Minimum thickness</u> <u>(in.)</u>	<u>Equivalent</u> <u>galvanized gauge</u> <u>no.</u>
37.8 37.9	<u>Round ducts and enclosed</u> <u>rectangular ducts</u>		
37.10	<u>14 inches or less</u>	<u>0.013</u>	<u>30</u>
37.11	<u>Over 14 inches</u>	<u>0.016</u>	<u>28</u>
37.12	<u>Exposed rectangular ducts</u>		
37.13	<u>14 inches or less</u>	<u>0.016</u>	<u>28</u>
37.14	<u>Over 14 inches</u>	<u>0.019</u>	<u>26</u>

37.15 For SI: 1 inch = 25.4 mm, 1 inch water gauge = 249 Pa.

37.16 Subp. 2a. Section 603.4. IMC section 603.4 is amended to read as follows:

37.17 **603.4 Metallic ducts.** All metallic ducts shall be constructed as specified in the SMACNA
37.18 HVAC Duct Construction Standards - Metal and Flexible.

37.19 **Exception:** Ducts installed within a single dwelling unit shall have a minimum
37.20 thickness as specified in IMC Table 603.4 as amended in this part.

37.21 **603.4.1 Minimum fasteners.** Round metallic ducts shall be mechanically fastened by
37.22 means of at least three sheet metal screws or rivets spaced equally around the joint.

37.23 **Exception:** Where a duct connection is made that is partially inaccessible, three screws
37.24 or rivets shall be equally spaced on the exposed portion so as to prevent a hinge effect.

37.25 ~~603.4.1~~ **603.4.2 Elbows.** Radius elbows with velocities exceeding 1,000 feet per minute
37.26 (fpm) (~~76.2 m/min~~) (5 m/sec) shall have an inside radius not less than the width of the
37.27 duct or shall have turning vanes. Square throat elbows with velocities exceeding 1,000
37.28 feet per minute (fpm) (~~76.2 m/min~~) (5 m/sec) shall have turning vanes.

37.29 **Exception:** Ducts installed within a single dwelling unit.

38.1 ~~603.4.2~~ **603.4.3 Transition fittings.** Transition fittings shall be constructed with a
38.2 maximum slope of 45 degrees.

38.3 ~~603.4.3~~ **603.4.4 Obstructions.** Where a pipe or other obstruction passes through a duct, a
38.4 streamlined sleeve must be constructed equal in type and gage to the duct. The area of
38.5 the duct, at the point of obstruction, must be increased by an amount equal to the area
38.6 of the streamlined sleeve.

38.7 [For text of subps 3 to 8, see M.R.]

38.8 Subp. 9. **Section 603.9.** IMC section 603.9 is amended to read as follows:

38.9 ~~**603.9 Joints, seams, and connections.** Pressure sensitive tape shall not be used as the~~
38.10 ~~primary sealant for ducts designed to operate at static pressure of one inch water gauge~~
38.11 ~~or greater.~~

Duct Sealing

Location	Design Static Pressure	Minimum Required Sealing
All locations	Greater than 3.0 inches (750 Pa) water gauge	All transverse joints, longitudinal seams, and duct wall penetrations shall be sealed. Ductwork shall be equal to or less than Leakage Class 6 as defined in Section 4 of the <i>SMACNA HVAC Duct Leakage Test Manual</i> *.
Portions of ducts not completely inside the vapor retarder/air barrier enclosing conditioned space	3.0 inches (750 Pa) water gauge and less	All transverse joints, longitudinal seams, and duct wall penetrations shall be sealed.
Portions of return air ducts in the same space as an atmospherically vented or fan-assisted appliance.	3.0 inches (750 Pa) water gauge and less	All transverse joints, longitudinal seams, and duct wall penetrations shall be sealed.

39.1	All locations	Greater than 0.50 to 3.0	All transverse joints and duct
39.2		inches (125 to 750 Pa)	wall penetrations shall be
39.3		water gauge	sealed.
39.4	All locations	0.50 inches (125 Pa) water	All transverse joints,
39.5		gauge and less	longitudinal seams, and
39.6			duct wall penetrations shall
39.7			have no visible gaps and
39.8			shall be sufficiently airtight
39.9			in accordance with Section
39.10			1.7 of the <i>SMACNA HVAC</i>
39.11			<i>Duct Construction Standards</i>
39.12			-Metal & Flexible

39.13 *Representative sections totaling no less than 25 percent of the total installed duct area for
 39.14 the designated pressure class shall be tested. Duct systems with pressure ratings in excess
 39.15 of three inches water column shall be identified in the construction documents.

39.16 **603.9 Joints, seams, and connections.** All longitudinal and transverse joints, seams, and
 39.17 connections in metallic and nonmetallic ducts shall be constructed as specified in SMACNA
 39.18 HVAC Duct Construction Standards - Metal and Flexible and NAIMA Fibrous Glass Duct
 39.19 Construction Standards. All joints, longitudinal and transverse seams, and connections in
 39.20 ductwork shall be securely fastened and sealed with welds, gaskets, mastics (adhesives),
 39.21 mastic-plus-embedded-fabric systems, liquid sealants, or tapes. Closure systems used to
 39.22 seal ductwork listed and labeled in accordance with UL 181A shall be marked "181A-P"
 39.23 for pressure-sensitive tape, "181 A-M" for mastic, or "181 A-H" for heat-sensitive tape.
 39.24 Closure systems used to seal flexible air ducts and flexible air connectors shall comply
 39.25 with UL 181B and shall be marked "181B-FX" for pressure-sensitive tape or "181B-M"
 39.26 for mastic. Duct connections to flanges of air distribution system equipment shall be
 39.27 sealed and mechanically fastened. Mechanical fasteners for use with flexible nonmetallic
 39.28 air ducts shall comply with UL 181B and shall be marked "181B-C." Closure systems
 39.29 used to seal metal ductwork shall be installed in accordance with the manufacturer's
 39.30 installation instructions. Pressure-sensitive tape shall not be used as the primary sealant on

40.1 ducts, unless it has been certified to comply with UL-181A or UL-181B by a nationally
 40.2 recognized testing laboratory and the tape is used in accordance with that certification.
 40.3 Unlisted duct tape is not permitted as a sealant on any duct.

40.4 **Exception:** Continuously welded and locking-type longitudinal joints and seams in
 40.5 ducts operating at static pressures less than 2 inches of water column (500 Pa) pressure
 40.6 classification shall not require additional closure systems.

40.7 Subp. 10. **Section ~~603.17~~ 603.18.** IMC section ~~603.17~~ 603.18 is amended by adding
 40.8 a subsection to read as follows:

40.9 **~~603.17.3~~ 603.18.3 Adjustment of volume dampers.** Volume dampers shall be adjusted
 40.10 to the required airflow of the system and locked in place. In finished or inaccessible
 40.11 locations, a friction-type register box may be used.

40.12 **1346.0604 SECTION 604 INSULATION.**

40.13 IMC section 604.1 is amended to read as follows:

40.14 **604.1 General.** Duct insulation shall conform to the ~~thickness required by this section~~
 40.15 ~~and Sections 604.2 through 604.13~~ requirements in Minnesota Rules, chapter 1322 or
 40.16 1323, as applicable.

40.17 **Exception:** ~~Except as required to prevent condensation, ducts for which heat gain or~~
 40.18 ~~loss, without insulation, will not increase the energy requirements of the building.~~

40.19 **~~Minimum Required Duct Insulation~~** (see notes for explanations)

Duct Location	Requirements
40.21 Attics, garages, and ventilated crawl spaces	R-8 and V
40.22 Exterior of building	R-8, V and W
40.23 Inside of building and in unconditioned spaces	
40.24 TD less than or equal to 15°F	None required
40.25 TD greater than 15°F and less than or equal to 40°F	R-3.3 and V
40.26 TD greater than 40°F	R-5 and V
40.27 Within conditioned spaces, in basements with insulated walls, and in	
40.28 plenums within conditioned spaces	None required

41.1 ~~Intake and exhaust ducts within conditioned spaces*~~ R-3.3 and V

41.2 ~~Within cement slab or within ground (also see IMC Section 603.7)~~ R-3.5

41.3 Notes:

41.4 * ~~Insulation required for a distance of 3 feet (914 mm) from the exterior.~~

41.5 ~~TD = Design temperature differential between the air in the duct and the ambient~~
41.6 ~~temperature outside of the duct.~~

41.7 ~~V = Vapor retarder required in accordance with IMC Section 604.11. When a vapor~~
41.8 ~~retarder is required, duct insulation required by this section shall be installed without~~
41.9 ~~respect to other building envelope insulation.~~

41.10 ~~W = Approved weatherproof barrier.~~

41.11 **1346.0607 SECTION 607, DUCT AND TRANSFER OPENINGS.**

41.12 IMC section 607.6.1 is amended to read as follows:

41.13 **607.6.1 Through penetrations.** In occupancies other than Group I-2 and I-3, a duct
41.14 constructed of approved materials in accordance with this code that penetrates a
41.15 fire-resistance-rated floor or floor/ceiling assembly that connects not more than two stories
41.16 is permitted without a shaft enclosure protection, provided a listed fire damper is installed
41.17 at the floor line or the duct is protected in accordance with IBC section 714.4, as amended.
41.18 For air transfer openings, see IBC section 712.1.8, as amended.

41.19 **Exceptions:**

41.20 1. A duct is permitted to penetrate three floors or less without a fire damper at each
41.21 floor, provided such duct meets all of the following requirements:

41.22 a. The duct shall be contained and located within the cavity of a wall and shall be
41.23 constructed of steel having a minimum wall thickness of 0.0187 inches (0.4712
41.24 mm) (No. 26 gage).

41.25 b. The duct shall open into only one dwelling unit or sleeping unit and the duct
41.26 system shall be continuous from the unit to the exterior of the building.

- 42.1 c. The duct shall not exceed 4-inch (102 mm) nominal diameter and the total
 42.2 area of such ducts shall not exceed 100 square inches (0.065 m²) in any 100
 42.3 square feet (64,516 mm² per 9.3 m²) of the floor area.
- 42.4 d. The annular space around the duct is protected with materials that prevent the
 42.5 passage of flame and hot gases sufficient to ignite cotton waste where subjected
 42.6 to ASTM E 119 or UL 263 time-temperature conditions under a minimum
 42.7 positive pressure differential of 0.01 inch (2.49 Pa) of water at the location of
 42.8 the penetration for the time period equivalent to the fire-resistance rating of
 42.9 the construction penetrated.
- 42.10 e. Grille openings located in a ceiling of a fire-resistance-rated floor/ceiling or
 42.11 roof/ceiling assembly shall be protected with a listed ceiling radiation damper
 42.12 installed in accordance with IBC section 717.6.2.1, as amended.
- 42.13 2. In Group I-2 and I-3 occupancies, a duct constructed of approved materials in
 42.14 accordance with this code that penetrates a fire-resistance-rated floor or floor/ceiling
 42.15 assembly that connects not more than two stories is permitted without a shaft
 42.16 enclosure protection, if a listed smoke/fire damper is installed at the floor line.

42.17 **1346.1001 SECTION 1001 GENERAL.**

42.18 Subpart 1. ~~Department of Labor and Industry boilers~~ **Section 1001.1, Scope.**
 42.19 Pursuant to ~~chapter 5225 and Minnesota Statutes, sections 326B.952 to 326B.998,~~ the
 42.20 installation, inspection, alteration, and repair of pressure vessels and individual boilers or
 42.21 boilers connected to a common circulation manifold shall be regulated by the Department
 42.22 of Labor and Industry if the individual or combined BTU input exceeds:

- 42.23 A. ~~100,000 BTUs for steam boilers;~~
- 42.24 B. ~~500,000 BTUs for hot water supply boilers; or~~
- 42.25 C. ~~750,000 BTUs for hot water heating boilers.~~

42.26 **Exceptions:**

43.1 ~~1. Boilers in buildings occupied solely for residential purposes with accommodations~~
43.2 ~~for not more than five families.~~
43.3 ~~2. Any boiler or pressure vessel under the direct jurisdiction of the United States.~~
43.4 ~~3. Boiler or pressure vessels located on farms used solely for agricultural or~~
43.5 ~~horticultural purposes; for the purposes of this section, boilers used for mint oil~~
43.6 ~~extraction are considered used for agricultural or horticultural purposes, provided that~~
43.7 ~~the owner or lessee complies with the inspection requirements contained in Minnesota~~
43.8 ~~Statutes, section 326B.958. IMC section 1001.1 is amended as follows:~~

43.9 **1001.1, Scope.** This chapter shall govern the installation, alteration, and repair of
43.10 boilers, water heaters, and pressure vessels.

43.11 **Exceptions:**

- 43.12 1. Pressure vessels used for unheated water supply.
- 43.13 2. Portable unfired pressure vessels and Interstate Commerce Commission containers.
- 43.14 3. Containers for bulk oxygen and medical gas.
- 43.15 4. Unfired pressure vessels having a volume of 5 cubic feet (0.14 m³) or less operating
43.16 at pressures not exceeding 250 pounds per square inch (psi) (1724 kPa) and located
43.17 within occupancies of Groups B, F, H, M, R, S, and U.
- 43.18 5. Pressure vessels used in refrigeration systems that are regulated by IMC chapter 11.
- 43.19 6. Pressure tanks used in conjunction with coaxial cables, telephone cables, power
43.20 cables, and other similar humidity control systems.
- 43.21 7. Any boiler pressure vessel under the direct jurisdiction of the United States.

43.22 Subp. 1a. **Section 1001.2, Scope; boilers; labor and industry.** IMC section 1001 is
43.23 amended by adding a section to read as follows:

43.24 **1001.2, Scope; boilers; labor and industry.** Anyone who installs a boiler must
43.25 ensure that the boiler is inspected by the Department of Labor and Industry after
43.26 installation is complete and before the boiler is placed in operation if the individual or
43.27 combined Btu input exceeds:

44.1 A. 100,000 Btu/hr for steam boilers;

44.2 B. 500,000 Btu/hr for hot water supply boilers; or

44.3 C. 750,000 Btu/hr for hot water heating boilers.

44.4 Boilers utilizing fuel gas systems with Btu/hr inputs that are rated at or below items

44.5 A to C shall comply with section 631 of the 2012 IFGC.

44.6 **Exceptions:** Boilers identified in Minnesota Statutes, section 326B.988, including
44.7 the following, are not subject to this section:

44.8 1. Boilers in buildings occupied solely for residential purposes with accommodations
44.9 for not more than five families.

44.10 2. Boilers under the direct jurisdiction of the United States.

44.11 3. Boilers located on farms used solely for agricultural or horticultural purposes; for
44.12 the purposes of this subpart, boilers used for mint oil extraction are considered used
44.13 for agricultural or horticultural purposes, provided that the owner or lessee complies
44.14 with the inspection requirements contained in Minnesota Statutes, section 326B.958.

44.15 Subp. 1b. **Section 1001.3, Scope; pressure vessels; labor and industry.** IMC

44.16 section 1001 is amended by adding a section to read as follows:

44.17 **1001.3 Scope; pressure vessels; labor and industry.** The owner of a pressure vessel
44.18 not specifically exempted by Minnesota Statutes, section 326B.988, must ensure that the
44.19 pressure vessel is inspected by an insurance company authorized to do business in the state
44.20 or the Department of Labor and Industry at least every two years.

44.21 **Exceptions:** Pressure vessels identified in Minnesota Statutes, section 326B.988,
44.22 including the following, are not subject to this subpart:

44.23 1. Pressure vessels in buildings occupied solely for residential purposes with
44.24 accommodations for not more than five families.

44.25 2. Pressure vessels under the direct jurisdiction of the United States.

45.1 3. Pressure vessels located on farms used solely for agricultural or horticultural
 45.2 purposes; for the purposes of this section, boilers used for mint oil extraction are
 45.3 considered used for agricultural or horticultural purposes, provided that the owner or
 45.4 lessee complies with the inspection requirements contained in Minnesota Statutes,
 45.5 section 326B.958.

45.6 Subp. 2. ~~High pressure~~ High-pressure piping for boilers. Pursuant to Minnesota
 45.7 Rules, chapter 5230₂, and Minnesota Statutes, sections 326B.90 to 326B.925, ~~high pressure~~
 45.8 high-pressure piping for boilers shall be regulated by the Department of Labor and
 45.9 Industry for the following operating conditions:

45.10 A. Steam systems operating over 15 psi; or

45.11 B. Hot water or other heating medium operating over 30 psi and 250° F.

45.12 Subp. 3. ~~IMC Section 1001.~~ IMC Section 1001.1 is amended to read as follows:

45.13 ~~**1001.1 Scope.** This rule shall govern system piping with pressures of 15 psi or less,~~
 45.14 ~~boilers, water heaters, heat exchangers, and pressure vessels that are not regulated by the~~
 45.15 ~~Department of Labor and Industry's Boiler and High Pressure Piping Sections.~~

45.16 **Exceptions:**

45.17 1. ~~Pressure vessels used for unheated water supply.~~

45.18 2. ~~Portable unfired pressure vessels and Interstate Commerce Commission containers.~~

45.19 3. ~~Containers for bulk oxygen and medical gas.~~

45.20 4. ~~Unfired pressure vessels having a volume of 5 cubic feet (0.14 m³) or less operating~~

45.21 ~~at pressures not exceeding 100 pounds per square inch (psi) (1724 kPa) that are~~

45.22 ~~equipped with an ASME code stamped safety valve set at a maximum of 100 pounds~~

45.23 ~~per square inch and located within occupancies of Groups B, F, H, M, R, S and U.~~

45.24 5. ~~Pressure vessels used in refrigeration systems that are regulated by Chapter 11~~

45.25 ~~of this code.~~

46.1 ~~6. Pressure tanks used in conjunction with coaxial cables, telephone cables, power~~
46.2 ~~cables, and other similar humidity control systems.~~

46.3 ~~7. Any boiler or pressure vessel under the direct jurisdiction of the United States.~~

46.4 **1346.1004 SECTION 1004 BOILERS.**

46.5 Subpart 1. **Section 1004.1.** IMC section 1004.1 is amended to read as follows:

46.6 **1004.1 Standards.** Oil-fired boilers and their control systems shall be listed and labeled in
46.7 accordance with UL 726 or shall utilize burner assemblies and control systems listed and
46.8 labeled in accordance with UL 296 and shall be installed in accordance with NFPA 31
46.9 and the manufacturer's installation instructions. Electric boilers and their control systems
46.10 shall be listed and labeled in accordance with UL 834. Boilers with an input rating
46.11 above 400,000 Btu/hr (3,660 kW) shall be designed and constructed in accordance with
46.12 the requirements of the ~~BPVC-2007 ASME Boiler and Pressure Vessel Code, Sections~~
46.13 ~~I, II, IV, V, VIII and IX~~ standards referenced in Minnesota Statutes, section 326B.964,
46.14 ~~as applicable. Boilers with an input rating above 400,000 Btu/hr (117 kW) and less than~~
46.15 ~~12,500,000 Btu/hr (3,660 kW) shall comply with ASME CSD-1-2006, and boilers with an~~
46.16 ~~input rating of 12,500,000 Btu/hr (3,660 kW) or greater shall comply with NFPA 85-2007,~~
46.17 ~~Boiler and Combustion Systems Hazards Code.~~

46.18 Subp. 2. **Section 1004.2.** IMC section 1004.2 is amended to read as follows:

46.19 **1004.2 Installation.** In addition to the requirements of this code, the installation of boilers
46.20 shall conform to the manufacturer's instructions. Operating instructions of a permanent
46.21 type shall be attached to the boiler. Boilers shall have all controls set, adjusted, and tested
46.22 by the installer in accordance with ~~amended IMC Chapter 16~~ Minnesota Rules, parts
46.23 1346.1601 to 1346.1606. A complete control diagram together with complete boiler
46.24 instructions shall be furnished by the installer. The manufacturer's rating data and the
46.25 nameplate shall be attached to the boiler.

47.1 **1346.1006 SECTION 1006 SAFETY AND PRESSURE RELIEF VALVES AND**
47.2 **CONTROLS.**

47.3 Subpart 1. **Section 1006.4.** IMC section 1006.4 is amended to read as follows:

47.4 **1006.4 Approval of safety and safety relief valves.** Safety and safety relief valves
47.5 shall meet the requirements of Section I, IV or VIII of the ASME Boiler and Pressure
47.6 Vessel Code, as applicable. All boilers and pressure vessels shall have a safety relief
47.7 valve stamped with the ASME code symbol and shall be set no higher than the maximum
47.8 allowable working pressure of the pressure vessel. Safety relief valves shall have a rated
47.9 volumetric capacity greater than the boiler or pressure vessel can produce at nameplate
47.10 pressure and shall have a nonadjustable pressure set point below the rating of the boiler or
47.11 pressure vessel capable of relieving all excess pressure at its pressure set point. Safety and
47.12 safety relief valves shall have a manual method of ~~lifting the seat~~ to test the valve, without
47.13 endangering the operator, to ensure proper mechanical operation of the valve.

47.14 [For text of subp 2, see M.R.]

47.15 Subp. 3. **Section 1006.9.** IMC section 1006 is amended by adding a section to
47.16 read as follows:

47.17 **1006.9 Boiler shutdown switch.** A manually operated remote shutdown switch shall be
47.18 located as required by ASME CSD-1-2006.

47.19 **Exception:** A single hot water boiler with a rated input of less than 400,000 Btu/hr
47.20 (117 kW).

47.21 **1346.1007 SECTION 1007 BOILER LOW-WATER CUTOFF.**

47.22 Subpart 1. **Section 1007.1.** IMC section 1007.1 is amended to read as follows:

47.23 **1007.1 General.** Steam and hot water boilers shall be protected with a low-water fuel
47.24 cutoff control to stop the combustion operation when the water level drops below the
47.25 lowest safe permissible water level in accordance with the following items:

48.1 1. An automatically fired hot water boiler or group of boilers piped together having
48.2 a rated input of 400,000 Btu/hr (117 kW) or above shall be equipped with an automatic
48.3 low-water fuel cutoff to stop the combustion operation ~~when~~ before the water level drops
48.4 below the lowest safe permissible water level established by the boiler manufacturer.

48.5 2. A boiler installed at an elevation where all radiation in the system is below the
48.6 lowest safe permissible water level shall be equipped with an automatic low-water fuel
48.7 cutoff to stop the combustion operation when the water level drops below the lowest safe
48.8 permissible water level established by the boiler manufacturer.

48.9 3. A low-water fuel cutoff shall be installed when recommended by the manufacturer's
48.10 installation instructions or listing and when special consideration and installations will
48.11 require a low-water fuel cutoff to protect a hot water or steam boiler.

48.12 4. A means shall be provided for testing the operation of the low-water fuel cutoff
48.13 without requiring the entire system to be drained.

48.14 5. A watertube or coil-type boiler requiring forced circulation to prevent overheating
48.15 of the tubes or coils shall have a flow-sensing device installed, in lieu of the low-water
48.16 fuel cutoff, to automatically stop the combustion operation when the circulating flow
48.17 is interrupted.

48.18 Subp. 2. [Repealed, 34 SR 537]

48.19 **1346.1011 SECTION 1011 TESTS.**

48.20 IMC section 1011.1 is amended to read as follows:

48.21 **1011.1 Tests.** Upon completion of the assembly and installation of boilers and pressure
48.22 vessels, acceptance tests shall be conducted in accordance with the requirements of the
48.23 ~~ASME Boiler and Pressure Vessel Code.~~ Minnesota Statutes, sections 326B.958 and
48.24 326B.966. Where field assembly of pressure vessels or boilers is required, a copy of the
48.25 completed Manufacturer's Data Report required by the ASME Boiler and Pressure Vessel
48.26 Code shall be submitted to the building official.

49.1 **1346.1101 SECTION 1101 GENERAL.**49.2 IMC section 1101.1 is amended by adding an exception to read as follows:49.3 **Exception:** For all ammonia refrigeration systems, refer to Minnesota Rules, chapter
49.4 5230.49.5 **1346.1500 CHAPTER 15, REFERENCED STANDARDS.**49.6 Subpart 1. [See repealer.]49.7 Subp. 2. **Supplemental standards.** The standards listed in this part shall supplement
49.8 the list of referenced ~~documents~~ standards in chapter 15 of the ~~2006~~ 2012 IMC. The
49.9 standards referenced in this rule shall be considered part of the requirements of this rule
49.10 ~~shall be considered part of the requirements of this rule to the extent prescribed in each~~
49.11 rule or reference.49.12 ~~A. ASHRAE 2005 Handbook - Fundamentals;~~49.13 ~~B. ASHRAE 15-2007 Safety Standard for Refrigeration Systems;~~49.14 ~~C. ASHRAE 34-2007 Designation and Safety Classification of Refrigerants;~~49.15 ~~D. ASHRAE 62.1-2004 Ventilation for Acceptable Indoor Air Quality;~~49.16 A. ASHRAE 154-2011 Ventilation for Commercial Cooking Operations;49.17 E B. ASME BPVC-2007 (Sections I, II, IV, V, VIII & IX) Boiler and Pressure
49.18 Vessel Code;49.19 ~~F. ASME CSD-1-2006 Controls and Safety Devices for Automatically Fired~~
49.20 ~~Boilers;~~49.21 G C. ASME B31.3-2006 B31.3-2008 Process Piping Code;49.22 ~~H. ASME B31.9-2008 Building Services Piping Code;~~49.23 I D. ASTM E1998-02 ~~2007~~ 2014 Standard Guide for Assessing49.24 Depressurization-Induced Backdrafting and Spillage from Vented Combustion Appliances;

- 50.1 J. ~~NFPA 58-2008 Liquefied Petroleum Gas Code;~~
- 50.2 ~~K E.~~ NFPA ~~96-2008~~ 96-2014 *Standard for Ventilation Control and Fire*
- 50.3 *Protection of Commercial Cooking Operations;*
- 50.4 ~~L F.~~ NFPA ~~85-2007~~ 85-2011 *Boiler and Combustion Systems Hazards Code;*
- 50.5 M. ~~UL 555-2006 Standard for Fire Dampers;~~
- 50.6 N. ~~UL 555C-2006 Standard for Ceiling Dampers;~~
- 50.7 O. ~~UL 555S-1999 Standard for Smoke Dampers;~~
- 50.8 P G. NFPA ~~45-2004~~ 45-2011 *Standard on Fire Protection for Laboratories*
- 50.9 *Using Chemicals;*
- 50.10 Q. ~~NFPA 211-2006 Standard for Chimneys, Fireplaces, Vents, and Solid~~
- 50.11 ~~Fuel-Burning Appliances;~~
- 50.12 R. ~~NFPA 31-2006 Standard for the Installation of Oil Burning Appliances;~~
- 50.13 S H. NFPA ~~90B-2006~~ 90B-2012 *Standard for the Installation of Warm Air*
- 50.14 ~~Heating and Air-Conditioning~~ Air-Conditioning Systems; and
- 50.15 T. ~~NFPA 85-2007 Boiler and Combustion Systems Hazards Code;~~ and
- 50.16 U I. NFPA ~~54-2009~~ 54-2012 *National Fuel Gas Code.*

50.17 **1346.5050 TITLE; INCORPORATION BY REFERENCE.**

50.18 ~~This section is~~ Parts 1346.5050 to 1346.6014 are known and may be cited as the

50.19 "Minnesota Fuel Gas Code." As used in this section, "the code" and "this code" refer

50.20 ~~to this section.~~

50.21 Chapters 2 to 8 of the ~~2006~~ 2012 edition of the International Fuel Gas Code ("IFGC"),

50.22 as promulgated by the International Code Council, Inc., 500 New Jersey Avenue NW,

50.23 6th Floor, Washington, DC 20001-2070, are incorporated by reference as part of the

50.24 Minnesota Fuel Gas Code ~~with the amendments~~ except as qualified by the applicable

51.1 provisions in Minnesota Rules, chapter 1300, and as amended in this section code.
 51.2 Portions of this chapter code reproduce text and tables excerpts from the International
 51.3 Fuel Gas Code. The International Fuel Gas Code is copyright 2006 by the 2012 IFGC,
 51.4 International Code Council, Inc., Washington, DC, copyright 2012, reproduced with
 51.5 permission, all rights reserved. As used in this section, "IFGC" means the International
 51.6 Fuel Gas Code incorporated in this part.

51.7 The IFGC is not subject to frequent change and a copy of the IFGC, with amendments
 51.8 for use in Minnesota, is available in the office of the commissioner of labor and industry.

51.9 **1346.5060 REFERENCES TO OTHER INTERNATIONAL CODE COUNCIL**
 51.10 **(ICC) CODES.**

51.11 Subpart 1. **General.** References to other codes and standards promulgated by the
 51.12 International Code Council in the IMC and IFGC are modified in subparts 2 to 11.

51.13 Subp. 2. **Building code.** References to the International Building Code mean the
 51.14 Minnesota Building Code, Minnesota Rules, chapter 1305, adopted pursuant to Minnesota
 51.15 Statutes, section 326B.106, subdivision 1.

51.16 Subp. 3. **Residential code.** References to the International Residential Code mean
 51.17 the Minnesota Residential Code, Minnesota Rules, chapter 1309, adopted pursuant to
 51.18 Minnesota Statutes, section 326B.106, subdivision 1.

51.19 Subp. 4. **Electrical code.** References to the International Code Council Electrical
 51.20 Code mean the Minnesota Electrical Code, Minnesota Rules, chapter 1315, adopted
 51.21 pursuant to Minnesota Statutes, section 326B.35.

51.22 Subp. 5. **Mechanical code.** References to the International Mechanical Code mean
 51.23 the Minnesota Mechanical Code, Minnesota Rules, parts 1346.0050 to 1346.1500, adopted
 51.24 pursuant to Minnesota Statutes, section 326B.106, subdivision 1.

52.1 Subp. 6. **Plumbing code.** References to the International Plumbing Code mean
 52.2 the Minnesota Plumbing Code, Minnesota Rules, chapter 4715, adopted pursuant to
 52.3 Minnesota Statutes, section 326B.106, subdivisions 1 and 2.

52.4 Subp. 7. **Private sewage disposal code.** References to the International Private
 52.5 Sewage Disposal Code mean the Minnesota Pollution Control Agency's minimum
 52.6 standards and criteria for individual sewage treatment systems, Minnesota Rules, chapter
 52.7 7080, adopted pursuant to Minnesota Statutes, chapters 103F, 103G, 115, and 116.

52.8 Subp. 8. **Energy conservation code.** References to the International Energy
 52.9 Conservation Code mean the Minnesota Residential Energy Code, Minnesota Rules,
 52.10 chapter 1322, and the Minnesota Commercial Energy Code, Minnesota Rules, chapter
 52.11 1323, adopted pursuant to Minnesota Statutes, section 326B.115.

52.12 Subp. 9. **Property maintenance code.** References to the International Property
 52.13 Maintenance Code are deleted.

52.14 Subp. 10. **Fire code.** References to the International Fire Code mean the Minnesota
 52.15 State Fire Code, Minnesota Rules, chapter 7511, adopted pursuant to Minnesota Statutes,
 52.16 chapter 299F.

52.17 **1346.5101 SECTION 101 (IFGC) GENERAL ADMINISTRATION.**

52.18 Subpart 1. **Scope.** IFGC Section 101 is amended to read as follows:

52.19 **101 Scope.** The Minnesota Fuel Gas Code This code shall apply to the installation of fuel
 52.20 gas piping systems, fuel gas utilization equipment appliances, gaseous hydrogen systems,
 52.21 and related accessories in accordance with this part code.

52.22 Subp. 2. **101.1 Gaseous hydrogen systems.** Gaseous hydrogen systems shall be
 52.23 regulated by IFGC chapter 7, as amended.

52.24 Subp. 3. **101.2 Piping systems.** These regulations cover This code applies to piping
 52.25 systems for natural gas with an operating pressure of 125 pounds per square inch gauge

53.1 (psig) (862 kPa gauge) or less, and for LP-gas with an operating pressure of 20 psig (140
 53.2 kPa gauge) or less, except as provided in IFGC section 402.6.1. Coverage shall extend
 53.3 from the point of delivery to the outlet of the ~~equipment~~ appliance shutoff valves. Piping
 53.4 system requirements shall include design, materials, components, fabrication, assembly,
 53.5 installation, testing, inspection, operation, and maintenance.

53.6 Subp. 4. ~~101.3 Gas utilization equipment appliances.~~ Requirements for This code
 53.7 applies to gas utilization equipment appliances and related accessories on the side of the
 53.8 meter that ~~supplies~~ supply gas to the building piping system and shall include installation,
 53.9 combustion, and ventilation air and venting and connections to piping systems.

53.10 Subp. 5. ~~101.4 Systems, appliances, and equipment outside the scope.~~ This code
 53.11 shall not apply to the following:

- 53.12 1. Portable LP-gas appliances and equipment of all types that is not connected to a
 53.13 fixed fuel piping system.
- 53.14 2. Installation of farm appliances and equipment such as brooders, dehydrators,
 53.15 dryers, and irrigation equipment.
- 53.16 3. Raw material (feedstock) applications except for piping to special atmosphere
 53.17 generators.
- 53.18 4. Oxygen-fuel gas cutting and welding systems.
- 53.19 5. Industrial gas applications using gases such as acetylene and acetylenic
 53.20 compounds, hydrogen, ammonia, carbon monoxide, oxygen, and nitrogen.
- 53.21 6. Petroleum refineries, pipeline compressor or pumping stations, loading terminals,
 53.22 compounding plants, refinery tank farms, and natural gas processing plants.
- 53.23 7. Integrated chemical plants or portions of such plants where flammable or
 53.24 combustible liquids or gases are produced by, or used in, chemical reactions.
- 53.25 8. LP-gas installations at utility gas plants.
- 53.26 9. Liquefied natural gas (LNG) installations.
- 53.27 10. Fuel gas piping in power and atomic energy plants.

- 54.1 11. Proprietary items of equipment, apparatus, or instruments such as gas-generating
54.2 sets, compressors, and calorimeters.
- 54.3 12. LP-gas equipment for vaporization, gas mixing, and gas manufacturing.
- 54.4 13. Temporary LP-gas piping for buildings under construction or renovation that is
54.5 not to become part of the permanent piping system.
- 54.6 14. Installation of LP-gas systems for railroad switch heating.
- 54.7 15. Installation of hydrogen gas, LP-gas, and compressed natural gas (CNG) systems
54.8 on vehicles.
- 54.9 16. Except as provided in IFGC section 401.1.1, gas piping, meters, gas pressure
54.10 regulators, and other appurtenances used by the serving gas supplier in the distribution
54.11 of gas, other than undiluted LP-gas.
- 54.12 17. Building design and construction, except as specified in this rule.
- 54.13 18. Piping systems for mixtures of gas and air within the flammable range with an
54.14 operating pressure greater than 10 psig (69 kPa gauge).
- 54.15 19. Portable fuel cell appliances that are neither connected to a fixed piping system
54.16 nor interconnected to a power grid.

54.17 Subp. 6. ~~101.5~~ Other fuels. The requirements for the design, installation,
54.18 maintenance, alteration, and inspection of mechanical systems operating with fuels other
54.19 than fuel gas shall be regulated by the Minnesota Mechanical Code, parts 1346.0050
54.20 to 1346.1500.

54.21 **1346.5202 SECTION 202 (IFGC) GENERAL DEFINITIONS.**

54.22 Subpart 1. **Section 202.** IFGC section 202 is amended by adding the following
54.23 definitions:

54.24 **APPROVED.** "Approved" means approval by the building official, pursuant to the
54.25 Minnesota State Building Code, by reason of: inspection, investigation, or testing;

55.1 accepted principles; computer simulations; research reports; or testing performed by either
55.2 a licensed engineer or by a locally or nationally recognized testing laboratory.

55.3 **CODE.** For purposes of parts 1346.5050 to 1346.6014, "the code" or "this code" means the
55.4 portion of this rule that adopts the 2012 International Fuel Gas Code, with amendments.

55.5 **GAS PIPING SYSTEM - LOW PRESSURE.** A system that operates at a pressure not
55.6 exceeding 14 inches of water column. LPG is a pressure not exceeding 14 inches of
55.7 water column.

55.8 **GAS PIPING SYSTEM - MEDIUM PRESSURE.** A system that operates at a pressure
55.9 exceeding 14 inches of water column but not exceeding ~~five (5)~~ psig. LPG is a pressure
55.10 exceeding 14 inches of water column but not exceeding ~~twenty (20)~~ psig.

55.11 **GAS PIPING SYSTEM - HIGH PRESSURE.** A system that operates at a pressure
55.12 exceeding ~~five (5)~~ psig. LPG is a pressure exceeding ~~twenty (20)~~ psig.

55.13 **POWER VENT APPLIANCE.** An appliance with a venting system that uses a fan or
55.14 other mechanical means to cause the removal of flue or vent gases under positive static
55.15 vent pressure.

55.16 [For text of subp 2, see M.R.]

55.17 **1346.5301 SECTION 301 (IFGC) GENERAL.**

55.18 IFGC section 301.3 is amended to read as follows:

55.19 **301.3 Listed and labeled.** Appliances regulated by this code shall be listed and labeled to
55.20 an appropriate standard by a nationally recognized testing laboratory which is qualified to
55.21 evaluate the appliance, unless otherwise approved in accordance with the administrative
55.22 provisions of the Minnesota State Building Code, Minnesota Rules, chapter 1300. The
55.23 approval of unlisted appliances shall be based upon engineering evaluation. Unlisted
55.24 appliances shall be installed with clearances to combustibles in accordance with NFPA
55.25 ~~54-2009~~. Unlisted appliances with a fuel input rating of less than 12,500,000 Btu/hr (3,660
55.26 kW) shall have fuel gas trains, controls and safety devices installed in accordance with
55.27 Part CF, Combustion Side Control, of ASME CSD-1-~~2006~~. Unlisted appliances with a

56.1 fuel input rating of 12,500,000 Btu/hr (3,660 kW) or greater shall have fuel gas trains,
56.2 controls and safety devices installed in accordance with NFPA 85-2007.

56.3 **1346.5303 SECTION 303, (IFGC) APPLIANCE LOCATION.**

56.4 IFGC section 303.3, Prohibited locations, is amended by deleting items 3 and 4 from the
56.5 list of exceptions.

56.6 **1346.5304 SECTION 304 (IFGC) COMBUSTION, VENTILATION AND**
56.7 **DILUTION AIR.**

56.8 Subpart 1. **Section 304.1.** IFGC section 304 is amended by adding language to the
56.9 end of the first paragraph and additional exceptions to read as follows:

56.10 **304.1 General.** Refer to IFGC Appendix E for Worksheet E-1, "Residential Combustion
56.11 Air Calculation Method" and Table E-1, "Residential Combustion Air Required Volume."

56.12 **Exceptions:**

56.13 1. Direct vent appliances.

56.14 2. Type 1 clothes dryers that are provided with makeup air in accordance with the
56.15 manufacturer's installation instructions.

56.16 3. Replacement of a fuel gas utilization equipment appliance that complies with
56.17 all of the following conditions:

56.18 3.1 Replacement equipment appliance has a Btu/hr (kW) input rating not greater
56.19 than 30 percent above the original equipment appliance input rating.

56.20 3.2 Combustion air provisions meet the code requirements in effect at the time of
56.21 the original installation.

56.22 3.3 Replacement equipment appliance shall not cause an existing mechanical
56.23 system to become unsafe, hazardous, or overloaded.

56.24 Subp. 2. [Repealed, 34 SR 537]

56.25 Subp. 2a. **Section 304.6.1.** IFGC section 304.6.1, Two-permanent-openings method,
56.26 is deleted in its entirety.

57.1 Subp. 3. **Section 304.6.2.** IFGC section 304.6.2 is amended to read as follows:
57.2 **304.6.2 One permanent opening method.** When any natural draft ~~equipment is~~
57.3 appliances are installed, one permanent opening, commencing within 12 inches (300 mm)
57.4 of the bottom of the enclosure, shall be provided. When other than natural draft ~~equipment~~
57.5 is appliances are installed, one permanent opening, commencing within 12 inches (300) of
57.6 the top of the enclosure, shall be provided. The ~~equipment~~ appliances shall have clearances
57.7 of at least 1 inch (25 mm) from the sides and back and 6 inches (160 mm) from the front
57.8 of the appliance. The opening shall directly communicate with the outdoors or shall
57.9 communicate through a vertical or horizontal duct to the outdoors or spaces that freely
57.10 communicate with the outdoors and shall have a minimum free area of 1 inch²/3,000 Btu/hr
57.11 (700 mm²/kW) of the total input rating of all ~~equipment~~ appliances located in the enclosure.

57.12 Subp. 4. [Repealed, 34 SR 537]

57.13 [For text of subps 5 to 9, see M.R.]

57.14 **1346.5306 SECTION 306 (IFGC) ACCESS AND SERVICE SPACE.**

57.15 Subpart 1. **Section 306.5.** IFGC section 306.5 is amended to read as follows:
57.16 **306.5 Mechanical equipment and appliances on roofs or elevated structures.** Where
57.17 mechanical equipment or appliances requiring periodic inspection, service or maintenance
57.18 are installed on roofs or elevated structures, a permanent stair shall be provided for access.

57.19 **Exception:** A portable ladder may be used for dwellings, replacement equipment and
57.20 appliances on existing buildings, and for exterior roof access points not exceeding 16
57.21 feet (4.9 m) above grade, unless the building official determines that the unique shape
57.22 of the roof does not allow safe access with a portable ladder.

57.23 The permanent stair shall be as required by relevant safety regulations, but shall not
57.24 be less than the following:

57.25 1. The stair shall be installed at an angle of not more than 60 degrees measured
57.26 from the horizontal plane.

- 58.1 2. The stair shall have flat treads at least 6 inches (152 mm) deep and a clear width of
58.2 at least 18 inches (457 mm) with equally spaced risers at least 10.5 inches (267 mm)
58.3 high and not exceeding 14 inches (356 mm).
- 58.4 3. The stair shall have intermediate landings not exceeding 18 feet (5.5 m) vertically.
- 58.5 4. Continuous handrails shall be installed on both sides of the stair.
- 58.6 5. Interior stairs shall terminate at the under side of the roof at a hatch or scuttle of at
58.7 least 8 square feet (0.74 m²) with a minimum dimension of 20 inches (508 mm).
- 58.8 6. When a roof access hatch or scuttle is located within 10 feet (3.0 m) of a roof edge,
58.9 a guard shall be installed in accordance with IFGC section 306.6.
- 58.10 7. Exterior stairs shall terminate at the roof access point or at a level landing of at
58.11 least 8 square feet (0.74 m²) with a minimum dimension of 20 inches (508 mm). The
58.12 landing shall have a guard installed in accordance with IFGC section 306.6.

58.13 [For text of subp 2, see M.R.]

58.14 **1346.5403 SECTION 403 (IFGC) PIPING MATERIALS.**

58.15 [For text of subp 1, see M.R.]

58.16 Subp. 1a. Section 403.10.1. IFGC section 403.10.1 is amended to read as follows:
58.17 **403.10.1 Pipe joints.** Pipe joints shall be threaded, flanged, brazed, welded, or made with
58.18 press-connect fittings complying with ANSI LC-4. Where nonferrous pipe is brazed, the
58.19 brazing materials shall have a melting point in excess of 1,000°F (538°C). Brazing alloys
58.20 shall not contain more than 0.05 percent phosphorus.

58.21 Subp. 1a 1b. Section 403.10.2. IFGC section 403.10.2 is amended to read as follows:
58.22 **403.10.2 Tubing joints.** Tubing joints shall be either made with approved gas tubing
58.23 fittings or brazed with a material having a melting point in excess of 1,000°F (538°C), or
58.24 made by press connect fittings complying with ANSI LC-4, Press-Connect Copper and
58.25 Copper Alloy, Fittings for Use in Fuel Gas Distribution Systems. Brazing alloys shall not
58.26 contain more than 0.05-percent phosphorus.

59.1 [For text of subp 2, see M.R.]

59.2 **1346.5404 SECTION 404 (IFGC) PIPING SYSTEM INSTALLATION.**

59.3 Subpart 1. **Section ~~404.4~~ 404.6.** IFGC section ~~404.4~~ 404.6 is amended to read as
59.4 follows:

59.5 **~~404.4~~ 404.6 Piping through foundation wall Underground penetrations prohibited.**

59.6 ~~Underground piping shall not be installed below grade through the outer foundation or~~
59.7 ~~basement wall of a building. Gas piping shall not penetrate building foundation walls at~~
59.8 ~~any point below grade. Gas piping shall enter and exit a building at a point above grade~~
59.9 ~~and the annular space between the pipe and the wall shall be sealed. If necessary due~~
59.10 ~~to structural conditions, underground piping may be installed with prior approval from~~
59.11 ~~the building official.~~

59.12 Subp. 2. **Section ~~404.6~~ 404.8.** IFGC section ~~404.6~~ 404.8 is amended to read as
59.13 follows:

59.14 **~~404.6~~ 404.8 Piping in solid floors.** Piping in solid floors shall be laid in channels in
59.15 the floor and covered in a manner that will allow access to the piping with a minimum
59.16 amount of damage to the building. Where such piping is subject to exposure to excessive
59.17 moisture or corrosive substances, the piping shall be protected in an approved manner.
59.18 As an alternative to installation in channels, the piping shall be installed in a conduit of
59.19 Schedule 40 steel, wrought iron, PVC, or ABS pipe in accordance with IFGC section
59.20 404.8.1 or 404.8.2. If necessary due to structural conditions, piping may be installed in
59.21 other locations with prior approval from the building official.

59.22 Subp. 3. [Repealed, 34 SR 537]

59.23 Subp. 4. [Repealed, 34 SR 537]

59.24 Subp. 5. **Section ~~404.11~~ 404.14.** IFGC section ~~404.11~~ 404.14 is amended to read
59.25 as follows:

60.1 ~~404.11~~ **404.14 Piping underground beneath buildings.** Piping installed underground
60.2 beneath buildings is prohibited except where the piping is encased in a conduit of wrought
60.3 iron, plastic pipe, or steel pipe designed to withstand the superimposed loads and with
60.4 prior approval from the building official. Such conduit shall extend into an occupiable
60.5 portion of the building and, at the point where the conduit terminates in the building,
60.6 the space between the conduit and the gas piping shall be sealed to prevent the possible
60.7 entrance of any gas leakage. Where the end sealing is capable of withstanding the full
60.8 pressure of the gas pipe, the conduit shall be designed for the same pressure as the pipe.
60.9 Such conduit shall extend not less than 4 inches (102 mm) outside the building, shall be
60.10 vented above grade to the outdoors, and shall be installed so as to prevent the entrance of
60.11 water and insects. Such conduit shall be identified with a yellow label marked "Gas" in
60.12 black letters, spaced at intervals not exceeding 5 feet (1,524 mm), and shall be located a
60.13 minimum of 6 inches (152 mm) below the bottom of the concrete floor. The conduit shall
60.14 be protected from corrosion in accordance with IFGC section ~~404.8~~ 404.11.

60.15 Subp. 6. [See repealer.]

60.16 **1346.5406 SECTION 406 (IFGC) INSPECTION, TESTING AND PURGING.**

60.17 Subpart 1. **Section 406.1.2.** IFGC section 406.1.2 is amended to read as follows:

60.18 **406.1.2 Alterations, repairs and additions.** In the event alterations, repairs or additions
60.19 are made following the pressure test, the affected piping shall be tested.

60.20 **Exception:** Equipment or appliance replacement, minor alterations, repairs,
60.21 or additions, provided the work is inspected and connections are tested with a
60.22 noncorrosive leak-detecting fluid or other leak-detecting methods approved by the
60.23 building official.

60.24 [For text of subps 2 to 5, see M.R.]

60.25 **1346.5408 SECTION 408 (IFGC) DRIPS AND SLOPED PIPING.**

60.26 IFGC section 408.4 is amended to read as follows:

61.1 **408.4 Sediment trap.** A sediment trap shall be installed before all automatically
61.2 controlled gas ~~utilization equipment~~ appliances where a sediment trap is not incorporated
61.3 as part of the ~~equipment~~ appliance. The sediment trap shall be installed as close to the
61.4 inlet of the ~~equipment~~ appliance as practical, before any regulator or automatic gas valve,
61.5 and ahead of all pounds-to-inches pressure regulators. The sediment trap shall be either a
61.6 tee fitting with a capped nipple, a minimum of 3 inches (80 mm) in length, in the bottom
61.7 opening of the run of the tee, or other device approved as an effective sediment trap. If a
61.8 tee fitting is used, it shall provide a 90-degree change of direction of gas flow and the cap
61.9 shall be at an elevation lower than the tee fitting.

61.10 **1346.5409 SECTION 409 (IFGC) SHUTOFF VALVES.**

61.11 Subpart 1. **Section 409.1.** IFGC section 409.1 is amended by adding subsection
61.12 409.1.4 to read as follows:

61.13 **409.1.4 Main shutoff valve.** Piping systems shall be provided with an approved main
61.14 shutoff valve before the first branch line. The main shutoff valve shall be installed in
61.15 the first available location inside the building that provides ready access and shall have
61.16 a permanently attached handle.

61.17 **Exception:** Gas piping that serves ~~equipment~~ an appliance on the roof of a building
61.18 shall install the shutoff valve on the roof, ten feet or more from the roof's edge, before
61.19 the first branch line.

61.20 Main shutoff valves controlling several gas piping systems shall be protected from
61.21 physical damage and shall be placed an adequate distance from each other so they will
61.22 be easy to operate.

61.23 [For text of subps 2 and 3, see M.R.]

61.24 **1346.5501 SECTION 501 (IFGC) GENERAL.**

61.25 [For text of subp 1, see M.R.]

61.26 Subp. 2. **Section 501.8.** IFGC section 501.8 is amended to read as follows:

- 62.1 **501.8 Equipment Appliances not required to be vented.** The following appliances
62.2 shall not be required to be vented.
- 62.3 1. Ranges.
 - 62.4 2. Built-in domestic cooking units listed and marked for optional venting.
 - 62.5 3. Hot plates and laundry stoves.
 - 62.6 4. Type 1 clothes dryers (Type 1 clothes dryers shall be exhausted in accordance with
62.7 the requirements of IFGC sections 613 and 614).
 - 62.8 5. A single booster-type automatic instantaneous water heater, where designed and
62.9 used solely for the sanitizing rinse requirements of a dishwashing machine, provided
62.10 that the heater is installed in a commercial kitchen having a mechanical exhaust system.
62.11 Where installed in this manner, the draft hood, if required, shall be in place and unaltered
62.12 and the draft hood outlet shall be not less than 36 inches (914 mm) vertically and 6 inches
62.13 (152 mm) horizontally from any surface other than the heater.
 - 62.14 6. Refrigerators.
 - 62.15 7. Counter appliances.
 - 62.16 8. Direct-fired make-up air heaters.
 - 62.17 9. ~~Other equipment listed for unvented use and not provided with flue collars.~~
 - 62.18 ~~10.~~ Specialized equipment of limited input such as laboratory burners and gas lights.
62.19 Automatically operated equipment vented with a hood or exhaust system shall comply
62.20 with IFGC section 503.3.4. Where the appliances and equipment listed in items 5 ~~through~~
62.21 to 10 are installed so that the aggregate input rating exceeds 20 Btu/hr per cubic foot (207
62.22 watts per m³) of volume of the room or space in which such appliances and equipment are
62.23 installed, one or more shall be provided with venting systems or other approved means
62.24 for conveying the vent gases to the outdoor atmosphere so that the aggregate input rating
62.25 of the remaining unvented appliances and equipment does not exceed the 20 Btu/hr per
62.26 cubic foot (207 watts per m³) figure. Where the room or space in which the equipment
62.27 or appliance is installed is directly connected to another room or space by a doorway,

63.1 archway, or other opening of comparable size that cannot be closed, the volume of such
63.2 adjacent room or space shall be permitted to be included in the calculations.

63.3 [For text of subp 3, see M.R.]

63.4 **1346.5503 SECTION 503 (IFGC) VENTING OF ~~EQUIPMENT~~ APPLIANCES.**

63.5 [For text of subps 1 and 2, see M.R.]

63.6 Subp. 3. **Section 503.5.5.** IFGC section 503.5.5 is amended to read as follows:

63.7 **503.5.5 Size of chimneys.** The effective area of a chimney venting system serving listed
63.8 appliances with draft hoods, Category I appliances, and other appliances listed for use
63.9 with Type B vents shall be in accordance with IFGC section 504 or other approved
63.10 engineering methods.

63.11 **Exceptions:**

63.12 1. As an alternate method of sizing an individual chimney venting system for a single
63.13 appliance with a draft hood, the effective areas of the vent connector and chimney
63.14 flue shall be not less than the area of the appliance flue collar or draft hood outlet,
63.15 nor greater than four times the draft hood outlet area.

63.16 2. As an alternate method for sizing a chimney venting system connected to two
63.17 appliances with draft hoods, the effective area of the chimney flue shall be not less
63.18 than the area of the larger draft hood outlet plus 50 percent of the area of the smaller
63.19 draft hood outlet, nor greater than four times the smallest draft hood outlet area.

63.20 Where an incinerator is vented by a chimney serving other gas utilization ~~equipment~~
63.21 appliance, the gas input to the incinerator shall not be included in calculating chimney
63.22 size, provided the chimney flue diameter is not less than 1 inch (25.4 mm) larger in
63.23 equivalent diameter than the diameter of the incinerator flue outlet.

63.24 [For text of subps 4 to 6, see M.R.]

63.25 Subp. 7. **Section ~~503.7.8~~ 503.7.9.** IFGC section ~~503.7.8~~ 503.7.9 is amended to
63.26 read as follows:

64.1 ~~503.7.8~~ **503.7.9 Size of single-wall metal pipe.** A venting system constructed of
64.2 single-wall metal pipe shall be sized in accordance with one of the following methods
64.3 and the ~~equipment~~ appliance manufacturer's instructions:

64.4 1. For a draft hood-equipped appliance, in accordance with IFGC section 504.

64.5 2. For a venting system for a single appliance with a draft hood, the areas of the
64.6 connector and the pipe each shall be not less than the area of the appliance flue collar
64.7 or draft hood outlet, whichever is smaller. The vent area shall not be greater than four
64.8 times the draft hood outlet area.

64.9 3. Other approved engineering methods.

64.10 [For text of subp 8, see M.R.]

64.11 Subp. 9. [See repealer.]

64.12 **1346.5504 SECTION 504 (IFGC) SIZING OF CATEGORY 1 APPLIANCE**
64.13 **VENTING SYSTEMS.**

64.14 Subpart 1. **Section 504.2.7.** IFGC section 504.2.7 is amended to read as follows:

64.15 **504.2.7 Liner system sizing.** Listed corrugated metallic chimney liner systems in
64.16 masonry chimneys shall be sized by using IFGC Table 504.2(1) or 504.2(2) for Type B
64.17 vents with the maximum capacity reduced by 20 percent (0.80 x maximum capacity) and
64.18 the minimum capacity as shown in IFGC Table 504.2(1) or 504.2(2). Corrugated metallic
64.19 liner systems installed with bends or offsets shall have their maximum capacity further
64.20 reduced in accordance with IFGC section ~~504.3~~ 504.2.3. Approved metallic liners, other
64.21 than listed corrugated metallic liner systems, installed in accordance with amended IFGC
64.22 section 501.12, shall be sized by using IFGC Table 504.2(1) or 504.2(2) for Type B vents.
64.23 When IFGC Table 504.2(1) or 504.2(2) permits more than one diameter for a connector or
64.24 vent of a fan-assisted appliance, the smallest permitted diameter shall be used.

64.25 Subp. 1a. **Table 504.2(3).** IFGC Table 504.2(3) is amended to read as follows:

65.1 In the row with the heading "Maximum Internal Area of Chimney (square inches),"
 65.2 change the phrase "Seven times" to "Four times."

65.3 Subp. 1b. **Table 504.2(4).** IFGC Table 504.2(4) is amended to read as follows:

65.4 In the row with the heading "Maximum Internal Area of Chimney (square inches),"
 65.5 change the phrase "Seven times" to "Four times."

65.6 [For text of subps 2 to 4, see M.R.]

65.7 **1346.5630 SECTION 630 (IFGC) INFRARED RADIANT HEATERS.**

65.8 Subpart 1. [Repealed, 34 SR 537]

65.9 Subp. 2. [Repealed, 34 SR 537]

65.10 Subp. 3. **Section ~~630~~ 630.3.** IFGC section ~~630~~ 630.3 is amended by ~~adding a~~
 65.11 ~~subsection~~ to read as follows:

65.12 **630.3 Combustion and ventilation air.** Where unvented infrared heaters are installed,
 65.13 mechanical ventilation shall be provided to exhaust at least 4 cubic feet per minute
 65.14 (cfm) (0.0203 m³/s) per 1,000 Btu/hr (0.292 kW) input rating and it shall be electrically
 65.15 interlocked with the heater. Makeup air shall be provided to the space to be heated.

65.16 **1346.5800 CHAPTER 8 REFERENCED STANDARDS.**

65.17 Subpart 1. [See repealer.]

65.18 Subp. 2. **Supplemental standards.** The ~~standards~~ standard listed in this part shall
 65.19 supplement the list of referenced ~~documents~~ standards in chapter 8 of the ~~2006~~ 2012
 65.20 IFGC. The ~~standards~~ standard referenced in this rule shall be considered part of the
 65.21 requirements of this rule to the extent prescribed in each rule or reference.

65.22 A. ~~NFPA 54-2009~~ 54-2012 *National Fuel Gas Code*;

65.23 B. ~~NFPA 85-2007~~ *Boiler and Combustion Systems Hazards Code*; and

65.24 C. ~~ASME CSD-1 2006~~ *Controls and Safety Devices for Automatic Boilers*.

66.1 **1346.6000 SECTION ~~1000~~ CHAPTER 9, MANUFACTURED HOME**
 66.2 **PARK/COMMUNITY FUEL GAS EQUIPMENT AND APPLIANCE**
 66.3 **INSTALLATION.**

66.4 Subpart 1. IFGC chapter 9. The IFGC is amended by adding a chapter to read
 66.5 as follows:

66.6 CHAPTER ~~10~~ 9

66.7 MANUFACTURED HOME PARK/COMMUNITY FUEL GAS

66.8 EQUIPMENT AND APPLIANCE INSTALLATION

66.9 Subp. 2. ~~1001~~ General. Except as otherwise permitted or required by this chapter,
 66.10 all fuel gas equipment and appliance installations in manufactured home parks and
 66.11 communities shall comply with the provisions of this code. The provisions of this chapter
 66.12 shall not apply to manufactured home gas piping, appliances, and equipment.

66.13 Subp. 3. ~~1002~~ Required gas supply. The minimum hourly volume of gas required at
 66.14 each manufactured home lot outlet or any section of the manufactured home gas piping
 66.15 system shall be calculated as shown in IFGC Table ~~1002~~ 902. Required gas supply
 66.16 for buildings or other fuel gas utilization equipment and appliances connected to the
 66.17 manufactured home gas piping system shall be calculated as provided in this code.

66.18 Table ~~1002~~ 902

66.19 Demand Factors for Calculating Gas Piping Systems in Manufactured Home Parks and
 66.20 Communities

66.21	66.22	66.23	66.24
Number of	Demand Factor	Demand Factor (Watts)	
Manufactured Home	(Btu/hr) per	per Manufactured Home	
Sites	Manufactured Home	Site	
	Site		
66.25	1	125,000	36,638
66.26	2	117,000	34,293
66.27	3	104,000	30,482
66.28	4	96,000	28,138
66.29	5	92,000	26,965

67.1	6	87,000	25,500
67.2	7	83,000	24,327
67.3	8	81,000	23,741
67.4	9	79,000	23,155
67.5	10	77,000	22,569
67.6	11-20	66,000	19,345
67.7	21-30	62,000	18,172
67.8	31-40	58,000	17,000
67.9	41-60	55,000	16,121
67.10	Over 60	50,000	14,655

67.11 Subp. 4. ~~1003~~ **Installation.** Gas piping shall not be installed underground beneath
67.12 buildings or that portion of the manufactured home lot reserved for the location of
67.13 manufactured homes, manufactured home accessory buildings or structures, concrete slabs,
67.14 or automobile parking, unless installed in a gas-tight conduit complying with the following:

67.15 1. The conduit shall be of material approved for installation underground beneath
67.16 buildings and not less than Schedule 40 pipe. The interior diameter of the conduit shall be
67.17 not less than 0.5 inch (15 mm) larger than the outside diameter of the gas piping.

67.18 2. The conduit shall extend to a point not less than 12 inches (305 mm) beyond
67.19 any area where it is required to be installed, or the outside wall of a building, and the
67.20 outer ends shall not be sealed. Where the conduit terminates within a building, it shall be
67.21 provided with access, and the space between the conduit and the gas piping shall be sealed
67.22 to prevent leakage of gas into the building.

67.23 **Exception:** A gas piping lateral terminating in a manufactured home lot riser
67.24 surrounded by a concrete slab shall not be required to be installed in a conduit,
67.25 provided the concrete slab is entirely outside the wall line of the manufactured home,
67.26 and is used for stabilizing other utility connections.

68.1 Subp. 5. ~~1004~~ **Manufactured home lot shutoff valve.** Each manufactured home
68.2 lot shall have an approved gas shutoff valve installed upstream of the manufactured
68.3 home lot gas outlet and located on the outlet riser at a height at least 6 inches (152 mm)
68.4 above grade. Such valve shall not be located under a manufactured home. When the
68.5 manufactured home lot is not in use, the outlet shall be equipped with an approved cap or
68.6 plug to prevent accidental discharge of gas.

68.7 Subp. 6. ~~1005~~ **Manufactured home lot gas outlet.** Each manufactured home lot
68.8 piped for gas shall be provided with an individual outlet riser at the manufactured home
68.9 lot. The manufactured home lot gas outlet shall terminate with the point of delivery
68.10 in the rear third section and within 4 feet (1,219 mm) of the proposed location of the
68.11 manufactured home.

68.12 Subp. 7. ~~1007~~ **Mechanical protection.** All gas outlet risers, regulators, meters,
68.13 valves, or other exposed equipment shall be protected from mechanical damage.
68.14 Atmospherically controlled regulators shall be installed in such a manner that moisture
68.15 cannot enter the regulator vent and accumulate above the diaphragm. Where the regulator
68.16 vent may be obstructed due to snow and icing conditions, shields, hoods, or other suitable
68.17 devices shall be provided to guard against closing the vent opening.

68.18 Subp. 8. ~~1008~~ **Meters.** Meters shall not be installed in unvented or inaccessible
68.19 locations or closer than 3 feet (914 mm) from sources of ignition. When meters are installed,
68.20 they shall not depend on the gas outlet riser for support, but shall be adequately supported
68.21 by a post or bracket placed on a firm footing, or other means providing equivalent support.

68.22 Subp. 9. ~~1009~~ **Meter shutoff valve.** All meter installations shall be provided with
68.23 a shutoff valve located adjacent to and on the inlet side of the meter. For installations
68.24 utilizing a liquefied petroleum gas container, the container service valve shall serve as the
68.25 shutoff valve.

69.1 Subp. 10. ~~1010~~ Gas pipe sizing. The size of each section of natural gas or liquefied
 69.2 petroleum gas piping systems shall be determined as specified in this code.

69.3 Subp. 11. ~~1011~~ Maintenance. The manufactured home park/community operator
 69.4 shall be responsible for maintaining all gas piping installations and equipment in good
 69.5 working condition.

69.6 **1346.6010 IMC APPENDIX C, TABLE C-1.**

69.7 IMC Appendix C, Table C-1

69.8 Recommended Capacities for Domestic Kitchen Exhaust Hoods

69.9 69.10 69.11 69.12 69.13	Hood Size Area (Sq. Ft.)	Equipment with Grills or Deep Fryers (Number of Exposed Sides)		Ranges and Ovens (Number of Exposed Sides)	
		Four (CFM)	Three (CFM)	Four (CFM)	Three (CFM)
		Up to 400	Up to 300	Up to 300	Up to 200
69.14	Up to 4	Up to 400	Up to 300	Up to 300	Up to 200
69.15	4	400	300	300	200
69.16	4.5	450	338	338	225
69.17	5	500	375	375	250
69.18	5.5	550	413	413	275
69.19	6	600	450	450	300
69.20	6.5	650	488	488	325
69.21	7	700	525	525	350
69.22	7.5	750	563	563	375
69.23	8	800	600	600	400
69.24	8.5	850	638	638	425
69.25	9	900	675	675	450
69.26	9.5	950	713	713	475
69.27	10	1,000	750	750	500
69.28	10.5	1,050	788	788	525
69.29	11	1,100	825	825	550

70.1	11.5	1,150	863	863	575
70.2	12	1,200	900	900	600
70.3	12.5	1,250	938	938	625
70.4	13	1,300	975	975	650
70.5	13.5	1,350	1,013	1,013	675
70.6	14	1,400	1,050	1,050	700
70.7	14.5	1,450	1,088	1,088	725
70.8	15	1,500	1,125	1,125	750
70.9	15.5	1,550	1,163	1,163	775
70.10	16	1,600	1,200	1,200	800

70.11 **REPEALER.** Minnesota Rules, parts 1346.0060, subpart 6; 1346.0403; 1346.0504;
70.12 1346.0507, subpart 4; 1346.0701; 1346.0703; 1346.0803; 1346.1204; 1346.1500, subpart
70.13 1; 1346.5404, subpart 6; 1346.5503, subpart 9; 1346.5602, subpart 1; 1346.5631; and
70.14 1346.5800, subpart 1, are repealed.

70.15 **EFFECTIVE DATE.** The amendments to parts 1346.0050 to 1346.6010 are effective
70.16 January 24, 2015, or five working days after publication of the amendments' notice of
70.17 adoption in the State Register, whichever is later.