Minutes

Mechanical Board of Appeals and Examiners

Building Services Conference Room, June 10, 2015, 12 noon

Members Present

Ryan Van Der Bill, Rich Boesel, Mark Weber, , and Roger Nikolas

Members Absent

Mark Schmidtbauer

Guests Present

Ron Bell

Approval of Minutes of Last Meeting

A motion was made by Mr. Weber and a second was made by Mr. Nikolas to approve the minutes of May 13, 2015. Yeses, 4. Noes, 0.

Unfinished Business

Continue discussion regarding adoption of the 2015 International Mechanical, Fuel Gas, and Residential Codes.

1. Mr. Van Der Bill's draft of the proposed amendment to IRC section 1507.3 and IMC section 403.3 regarding whole house ventilation were presented to the Board. Black text is From 2015 IRC, green text is proposed local amendment.

IRC M1507.3 Whole-house mechanical ventilation system. Whole-house mechanical ventilation systems shall be designed in accordance with Sections M1507.3.1 through M1507.3.3.

IRC M1507.3.1 System design. The whole-house ventilation system shall consist of one or more supply or exhaust fans, or a combination of such, and associated ducts and controls. Local exhaust or supply fans are permitted to serve as such a system. Outdoor air ducts connected to the return side of an air handler shall be considered as providing supply ventilation.

Outside Air Supplied Direct to Habitable Spaces. When outdoor air is supplied directly to habitable spaces it shall be tempered to a minimum of 40 deg. F. at the local ASHRAE 99.6% heating design temperature.

Outdoor Air Supplied to Forced Air Supply Systems. When outdoor air is supplied to a forced air system the mixed air temperature shall not be less than allowed by the heating equipment manufacturer's installation instructions. The system's blower shall be in operation whenever the whole-house ventilation system is in operation. No interlock with an exhaust fan is required when outdoor air is supplied to a forced air system.

Passive Outdoor Air. Outdoor air shall be allowed to be transferred into a dwelling when the outdoor air and exhaust terminations are separated with one on the uppermost level and one on the lowest level of the dwelling. For single level dwellings, the outdoor air and exhaust terminations shall be separated by 1/2 the diagonal dimension of the largest room. Such outdoor air shall circulate through the dwelling from the outdoor air termination to the exhaust termination through permanent openings. Supply, return, and transfer ducts, open stairwells, or wall openings shall be considered permanent openings. The outdoor air intake duct shall be sized in accordance with table 1507.3.3(3) and air shall not be required to be tempered.

Fans. Fans used as part of the whole-house ventilation system shall be certified by the equipment manufacturer to be capable of continuous operation at the maximum fan-rated CFM. Surface mounted fans shall have a sound rating of 1.0 sone or less. Fans used as whole-house ventilation fans shall be clearly marked at rough-in inspection as such.

Motorized Dampers. Motorized dampers shall be installed in outdoor intake ducts and shall be interlocked with whole-house ventilation fan(s). Gravity or motorized dampers shall be installed in exhaust ducts.

Exception: Listed HRV/ERV systems shall be installed in accordance with the manufacturer's installation instructions. The distance between the exhaust and inlet termination of an individual system shall be allowed to be in accordance with the equipment manufacturer's instructions. HRV/ERVs shall be capable of balanced airflow operation at the ASHRAE 99.6% heating design temperature. Unit cycling for defrost is allowed.

IRC M1507.3.2 System controls. The whole-house mechanical ventilation system shall be provided with controls that enable manual override. The controls shall be labeled "Whole-House Ventilation System" and shall be located near the thermostat or in the mechanical room. For whole-house ventilation fans which also function as bathroom exhaust fans, a local control switch shall be required in the bathroom to allow operation of the fan when the whole-house ventilation system is switched off.

Table M1507.3.3(3) PASSIVE MAKEUP AIR DUCT SIZE

Passive duct size	Exhaust fan CFM
4"	35
5"	50
6"	80
7"	110
8"	130
9"	165

Board recommendation: approve proposed amendment to IRC M1507.3.2 and IMC 403.

2. Mr. Weber moved to revisit Table M1506.2, with a second from Mr. Boesel. Current 2015 IRC language and table are in black, proposed new table is in green.

IRC M1506.2 Duct length. The length of exhaust and supply ducts used with ventilating equipment shall not exceed the lengths determined in accordance with Table M1506.2.
Exception: Duct length shall not be limited where the duct system complies with the manufacturer's design criteria or where the flow rate of the installed ventilating equipment is verified by the installer or approved third party using a flow hood, flow grid or other airflow measuring device.

TABLE M1506.2
DUCT LENTH

DUCT TYPE	FLEX DUCT								SMOOTH-WALL DUCT							
Fan airflow rating (CFM @ 0.25 inch wc[a])	50	80	100	125	150	200	250	300	50	80	100	125	150	200	250	300
Diameter[b] (inches)	Maximum length[c, d, e] (feet)															
3	X	X	X	X	X	X	X	X	5	X	X	X	X	X	X	X
4	56	4	X	X	X	X	X	X	114	31	10	X	X	X	X	X
5	NL	81	42	16	2	X	X	X	NL	152	91	51	28	4	X	X
6	NL	NL	158	91	55	18	1	X	NL	NL	NL	168	112	53	25	9
7	NL	NL	NL	NL	161	78	40	19	NL	NL	NL	NL	NL	148	88	54
8 and above	NL	NL	NL	NL	NL	189	111	69	NL	NL	NL	NL	NL	NL	198	133

For SI: 1 foot = 304.8 mm.

a. Fan airflow rating shall be in acordance with ANSI/AMCA 210-ANSI/ASHRAE 51.

b. For noncircular ducts, calculate the diameter as four times the cross-sectional area divided by the perimeter.

c. This table assumes that elbows are not used. Fifteen feet of allowable duct length shall be deducted for each elbow installed in the duct run.

d. NL = no limit on duct length of this size.

e. X = not allowed. Any length of duct of this size with assumed turns and fittings will exceed the rated pressure drop.

TABLE M1506.2

DUCT SIZE

Fan Airflow Rating (CFM)	0-80	81-125	126-200	201-300	Over 300
Minimum duct diameter (inches)	4	5	6	7	8

a. Increase duct one size if equivalent length is over 60 feet. Fifteen feet of allowable duct length shall be deducted for each elbow installed in the duct run.

Board recommendation: approve modified table M1506.2 with added footnote a.

3. Review current local amendments to IMC/IFGC and mechanical section of IRC. ICC wording is in black, current local amendment is in purple, proposed new amendments are in green.

IMC 301.13 Vibration isolation. Where vibration isolation of equipment and appliances is employed, an approved means of supplemental restraint shall be used to accomplish the support and restraint.

Piping, electrical conduit, ductwork, vents and the like shall not be used to provide support or restraint of equipment.

Where other portions of this code or provisions of the building code require noncombustible construction or supports, noncombustible materials shall also be used to meet the requirements of this section.

Board recommendation: Eliminate existing amendment. Provisions of amendment are already covered elsewhere in the code.

IMC 306.2/IFGC 306.2 Appliances in rooms. Rooms containing appliances shall be provided with a door and an unobstructed passageway to the service area of the appliance measuring not less than 36 inches (914 mm) wide and 80 inches (2032 mm) high.

Board recommendation: Approve proposed new amendment (in green). Code wording did not require the passageway to go to the portion of the appliance that service personnel need to access.

IMC 306.5/IFGC 306.5 Equipment and appliances on roofs or elevated structures. Where equipment requiring access or appliances are located on an elevated structure or the roof of a building such that personnel will have to climb higher than 16 feet (4877 mm) above grade or floor level to access such equipment or appliances, an interior or exterior means of access shall be provided. Such access shall not require climbing over obstructions greater than 30 inches (762 mm) in height or walking on roofs having a slope greater than 4 units vertical in 12 units horizontal (33-percent slope). Such access shall not require the use of portable ladders. Where access involves climbing over parapet walls, the height shall be measured to the top of the parapet wall.

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

1. The side railing shall extend above the parapet or roof edge not less than 30 inches (762 mm) when the ladder is located on the exterior of the building. The side railing shall extend within 6 inches of the roof access hatch, and the side railing shall terminate within 1 inch from the side of the roof curb or wall the ladder is attached when the ladder is located in the building.

Board recommendation: Eliminate local amendment and follow wording of the national model code.

IMC 501.3.1 Location of exhaust outlets. The termination point of exhaust outlets and ducts discharging to the outdoors shall be located with the following minimum distances:

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

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

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

Exception. Bathroom exhaust fans serving individual dwelling units or sleeping units in Group Rs may be 3 feet from property lines, operable openings, and mechanical air intakes. Minimum clearance between the exhaust and intake openings of a HRV/ERV system shall be in accordance with the manufacturer's installation instructions.

Board recommendation: Add HRV/ERV systems to the exception since they are listed and labeled pieces of equipment.

IMC 506.3.6 Grease duct clearances. Where enclosures are not required, grease duct systems and exhaust equipment serving a Type I hood shall have a clearance to combustible construction of not less than 18 inches (457 mm), and shall have a clearance to noncombustible construction and gypsum wallboard attached to noncombustible structures of not less than 3 inches (76 mm).

Exceptions:

1. Factory-built commercial kitchen grease ducts listed and labeled in accordance with UL 1978.

2. Listed and labeled exhaust equipment installed in accordance with Section 304.1.

3. Where commercial kitchen grease ducts are continuously covered on all sides with a listed and labeled field-applied grease duct enclosure material, system, product or method of construction specifically evaluated for such purpose in accordance with ASTM E 2336, the required clearance shall be in accordance with the listing of such material, system, product or method.

4. The 18-inch (457 mm) clearance to combustible construction is allowed to be reduced to 3 inches (76 mm) where the combustible construction is protected with materials as required for a one-hour fire-resistive construction for hood replacements only where the existing adjacent construction is combustible.

Board recommendation: Eliminate local amendment (Exception #4). Field applied duct enclosures allow zero clearance to grease duct, and the new UL 710 standard recognizes a zero clearance standard for Type I hoods.

IMC 506.3.11 Grease duct enclosures. A commercial kitchen grease duct serving a Type I hood that penetrates a ceiling, wall, floor or any concealed space shall be enclosed from the point of penetration to the outlet terminal. In-line exhaust fans not located outdoors shall be enclosed as required for grease ducts. A duct shall penetrate exterior walls only at locations where unprotected openings are permitted by the International Building Code. The duct enclosure shall serve a single grease duct and shall not contain other ducts, piping or wiring systems. Duct enclosures shall be a shaft enclosure in accordance with Section 506.3.11.1, a field-applied enclosure assembly in accordance with Section 506.3.11.2 or a factory-built enclosure assembly in accordance with Section 506.3.11.3. Duct enclosures shall have a fire-resistance rating of not less than that of the assembly penetrated and not less than 1 hour. Fire dampers and smoke dampers shall not be installed in grease ducts.

~~Exception: A duct enclosure shall not be required for a grease duct that penetrates only a nonfire-resistance rated roof/ceiling assembly.~~

Board recommendation: Eliminate local strikeout of exception and reinstate national model code wording. Clearance to combustibles must still be maintained and the duct will be wrapped to the hood.

507.3 Type II hoods. Type II hoods shall be installed above dishwashers and appliances that produce heat or moisture and do not produce grease or smoke as a result of the cooking process~~., except~~ Exclusive of above counter high temperature dishwashers, a Type II hood may not be required where the heat and moisture loads from such appliances are incorporated into the HVAC system design or into the design of a separate removal system. Type II hoods shall be installed above all appliances that produce products of combustion and do not produce grease or smoke as a result of the cooking process. Spaces containing cooking appliances that do not require Type II hoods shall be provided with exhaust at a rate of 0.70 cfm per square foot (0.00033 m3/s). For the purpose of determining the floor area required to be exhausted, each individual appliance that is not required to be installed under a Type II hood shall be considered as occupying not less than 100 square feet (9.3 m2). Such additional square footage shall be provided with exhaust at a rate of 0.70 cfm per square foot [.00356 m3/(s × m2)].

Board recommendation: Keep local amendment in place.

IMC 507.2.6 Clearances for Type I hood. A Type I hood shall be installed with a clearance to combustibles of not less than 18 inches (457 mm).

Exception: 1. Clearance shall not be required from gypsum wallboard or 1/2-inch (12.7 mm) or thicker cementitious wallboard attached to noncombustible structures provided that a smooth, cleanable, nonabsorbent and noncombustible material is installed between the hood and the gypsum or cementitious wallboard over an area extending not less than 18 inches (457 mm) in all directions from the hood.

2. The 18-inch (457 mm) clearance to combustible construction is allowed to be reduced to 3 inches (76 mm) where the combustible construction is protected with materials as required for a one-hour fire-resistive construction for hood replacements only where the existing adjacent construction is combustible.

2. Hoods that are listed and labeled for a reduced clearance in accordance with UL 710 shall be allowed with clearances in accordance with the listing of the hood, provided that a smooth, cleanable, nonabsorbent and noncombustible material is installed between the hood and the combustible material over an area extending not less than 18 inches (457 mm) in all directions from the hood.

Board recommendation: Eliminate current local amendment and replace with a new exception #2. The new UL 710 standard now has a section regarding zero clearance hoods.

IMC **603.4 Metallic ducts.** Metallic ducts shall be constructed as specified in the SMACNA HVAC Duct Construction Standards—Metal and Flexible.

Exception: 1. Ducts installed within single dwelling units shall have a minimum thickness as specified in Table 603.4.

2. "Ductmate Standards" shall be allowed when using "Ductmate" connections.

Board recommendation: Eliminate exception #2. The current edition of SMACNA recognizes manufacturer's ratings for slip-on flange systems.

IMC 802.3/IFGC 502.5 Installation. Vent systems shall be sized, installed and terminated in accordance with the vent and appliance manufacturer's installation instructions. Type L vents shall not be installed with offsets in concealed spaces.

Board recommendation: Eliminate local amendment and the corresponding amendment regarding B vent offsets in the IFGC/IRC. Vent systems are required to be adequately supported, including all offsets.

IFGC 304.6/ IRC G2407.6 Outdoor combustion air. Outdoor combustion air shall be provided through opening(s) to the outdoors in accordance with Section 304.6.1, or 304.6.2, or 304.6.3. The minimum dimension of air openings shall be not less than 3 inches (76 mm).

IFGC 304.6.3/IRC G2407.6.3 Alternate combustion air sizing (IFGC). As an alternate, the net free area of openings, ducts, or plenums supplying air to an area containing gas- and oil-burning appliances shall be in accordance with B149.1-10, Natural Gas and Propane Installation Code, published by the Canadian Standards Association (CSA).

When all air is taken from the outdoors for appliances, one outside air duct may be used and shall terminate below the draft hood. An exterior opening may be used in place of a duct provided that it terminates within 1 foot (300 mm) above, and within 2 feet (600 mm) horizontally from, the burner level of the appliance having the largest input.

The combustion air duct is required to be upsized one diameter size when a dryer is installed in the same room as the combustion air.

Board recommendation: Eliminate second paragraph of the local amendment. Location is already covered within the Canadian Standard.

IFGC310.1.1/IRC G2411.1.1 CSST. Corrugated stainless steel tubing (CSST) gas piping systems and piping systems containing one or more segments of CSST shall be bonded to the electrical service grounding electrode system at the point where the gas service enters the building or, where provided, the lightning protection grounding electrode system.

Board recommendation: Eliminate local amendment. Wording in the upcoming Plumbing code will match current wording in the IFGC.

IFGC503.4.1.1/ IRC G2427.4.1.1 Plastic vent joints. Plastic pipe and fittings used to vent appliances shall be installed in accordance with the appliance manufacturer's instructions. Solvent cement joints between CPVC and PVC pipe and fittings shall be primed. ~~Where a~~ The primer ~~is required, it~~ shall be of a contrasting color.

Plastic pipe and fittings used to vent appliances shall be installed in accordance with the pipe manufacturer's installation instructions and the appliance manufacturer's installation instructions. Solvent cement joints between ABS pipe and fittings shall be cleaned. Solvent cement joints between CPVC and PVC pipe and fittings shall be primed.

Exception: Where compliance with this section would conflict with the appliance manufacturer's installation instructions.

Board Recommendation: Eliminate current amended paragraphs and add the one sentence to the existing IFGC language and keep the current wording change to the last IFGC sentence. This achieves the same result with much less change to the original code language. The exception is already covered by the fact that the manufacturer's listing cannot be violated.

IRC M1411.6 Insulation of refrigerant piping. Piping and fittings for refrigerant vapor (suction) lines shall be insulated with insulation having a thermal resistivity of not less than R-2 ~~R-4~~ and having external surface permeance not exceeding 0.05 perm [2.87 ng/(s • m2 • Pa)] when tested in accordance with ASTM E 96.

Board recommendation: Eliminate local amendment. New linesets that meet these standards are now readily available at little to no increased cost. This was originally changed because the new product was not yet readily available.

IRC M1411.9 Minimum duct size. The minimum unobstructed total area of the outside and return air ducts or openings and supply air ducts to a heat pump and/or air conditioners shall be not less than 6 square inches per 1,000 Btu/h (13,208 mm2/kW) output rating or as indicated by the conditions of the listing of the heat pump or air conditioner.

Board recommendation: The code section that used to include this requirement has been changed. Since a duct design layout is not required on every house, this ensures a minimum size for proper operation of cooling equipment. Section 1411 is the logical place because it is the section for "Heating and Cooling Equipment". Minimum duct size for furnaces is already covered in the section for warm air furnaces.

IRC M1506.3 Exhaust openings. Air exhaust openings shall terminate not less than 3 feet (914 mm) from property lines; 3 feet (914 mm) from operable and nonoperable openings into the building and 10 feet (3048 mm) from mechanical air intakes except where the opening is located 3 feet (914 mm) above the air intake. Openings shall comply with Sections R303.5.2 and R303.6. Minimum clearance between the exhaust and intake openings of a HRV/ERV system shall be in accordance with the manufacturer's installation instructions.

Board recommendation: Approve proposed amendment. These are UL listed, tested, and engineer designed pieces of equipment.

4. Mr. Klarenbeek presented a letter from the Sioux Falls HVAC association requesting an exception to the code requirement of programmable thermostats for appliance replacements only.

N1103.1.1 (R403.1.1) Programmable thermostat. The thermostat controlling the primary heating or cooling system of the dwelling unit shall be capable of controlling the heating and cooling system on a daily schedule to maintain different temperature set points at different times of the day. This thermostat shall include the capability to set back or temporarily operate the system to maintain *zone* temperatures down to 55°F (13°C) or up to 85°F (29°C). The thermostat shall initially be programmed by the manufacturer with a heating temperature set point no higher than 70°F (21°C) and a cooling temperature set point no lower than 78°F (26°C).

Exception: This section shall not apply to appliance only replacements.

Board recommendation: approve proposed new amendment.

5. Mr. Boesel proposed removing the requirement for a vapor barrier for internally insulated ducts in residential applications. This would make the requirement consistent with requirement in the IMC. After discussion, the following amendment was proposed:

M1601.4.6 Duct insulation. Duct insulation shall be installed in accordance with the following requirements:
1. Where ducts used for cooling are externally insulated, ~~A~~ a vapor retarder having a maximum permeance of 0.05 perm [2.87 ng/(s · m^2 · Pa)] in accordance with ASTM E 96, or aluminum foil with a minimum thickness of 2 mils (0.05 mm), shall be installed on the exterior of insulation on cooling supply ducts that pass through unconditioned spaces conducive to condensation except where the insulation is spray polyurethane foam with a maximum water vapor permeance of 3 perm per inch [1722 ng/(s · m^2 · Pa)] `at the installed thickness.

Board recommendation: Accept proposed new amendment to make the IRC consistent with the IMC.

A motion was made by Mr. Van Der Bill with a second from Mr. Boesel to approve all board recommendations regarding changes and amendments to the 2015 International Mechanical, Fuel Gas, and Residential Codes. Yeses, 4. Noes, 0.

Adjournment

A motion was made by Mr. Van Der Bill and a second was made by Mr. Weber to adjourn the meeting at 2:25 p.m. Yeses, 5. Noes, 0.

***An audio tape of the meeting will be available at the City of Sioux Falls.**

Gary Klarenbeek

Secretary