RM1–07/08
M1307.3.1

Proponent: John Stelzenmueller, City of Tualatin, OR, representing the Oregon Mechanical Officials Association

Revise as follows:

M1307.3.1 Protection from Impact. Appliances located in a garage or carport shall be protected from impact by automobiles in accordance with one of the types of protection shown in Figure M1307.2.

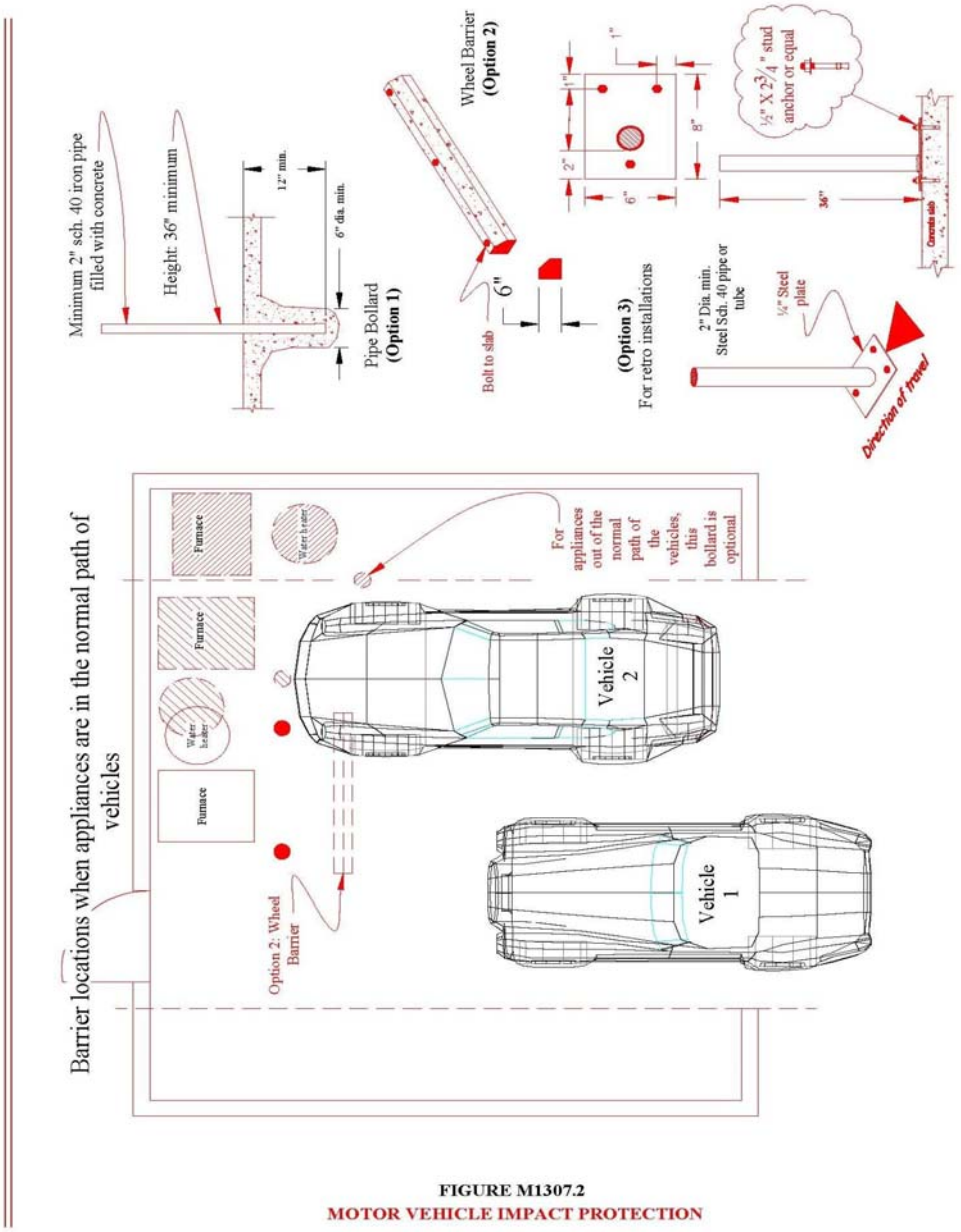

FIGURE M1307.2
MOTOR VEHICLE IMPACT PROTECTION

Reason: There are many scenarios associated with the installation of appliances in a garage and the exception to Section M1307.3.1 is unclear as to the type or location of appropriate protection. The addition of this figure will give the user of the code, whether an installer or inspector, some prescriptive guidance as to the type and location of suitable appliance protection.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

RM2–07/08
M1307.3.1

Proponent: Lawrence Suggars, South Salt Lake City, UT, representing the Utah Chapter of ICC

Revise as follows:

M1307.3.1 Protection from impact. ~~Appliances located in a garage or carport shall be protected from impact by automobiles.~~ Appliances shall not be installed in a location subject to mechanical vehicle damage except where protected by approved barriers.

Reason: The proposed new language is basically the same language found in the IMC 303.4 for protection from impact. This change is needed because mechanical equipment that needs protection is not always located in a garage or carport as understood in the current language of the IRC M1307.3.1

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

RM3–07/08
M1309 (New), M1309.1 (New), Chapter 43 (New)

Proponent: Wesley R. Davis, Air Conditioning Contractors of America and American Society of Heating, Refrigerating and Air Conditioning Engineers

1. Add new text as follows:

SECTION 1309
MECHANICAL SYSTEM MAINTENANCE

1309.1 General. Maintenance of mechanical systems shall be in accordance with ACCA 7 and the manufacturer's maintenance instructions.

2. Add standard to Chapter 43 as follows:

ACCA
7-2007 Residential HVAC Maintenance

Reason: To safeguard the health and safety of occupants in residential structures and premises it is necessary that mechanical systems be maintained for safe and healthy delivery of conditioned air. When there is no routine inspection and subsequent adjustment or maintenance of system components, the system is typically found operating outside its performance parameters. This change also provides recourse to building department officials accused of approving poor design or installation. Though the approved design and installation may have met code requirements a lack of maintenance can cause health and safety issues which give the impression of faulty design or installation.

Mechanical systems require routine monitoring, adjustments, periodic cleaning, and eventually replacement of components. ACCA 7 *Maintenance of Residential HVAC Systems* was written to establish a minimum level of acceptable compliance for HVAC equipment maintenance inspections. This standard prescribes the base level of maintenance inspection tasks, recommended corrective actions, and the necessary documentation.

ACCA 7 *Residential HVAC Maintenance* is the standard practice for the inspection and maintenance of residential mechanical systems endorsed by many equipment manufacturers and industry stake-holders.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ACCA 7-2007, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before January 15, 2008.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

RM4–07/08
M1401.3, Chapter 43 (New)

Proponent: Wesley R. Davis, Air Conditioning Contractors of America and American Society of Heating, Refrigerating and Air Conditioning Engineers

1. Revise as follows:

M1401.3 Sizing. Heating and cooling equipment shall be sized in accordance with ACCA Manual S based on building loads calculated in accordance with ACCA Manual J or other approved heating and cooling calculation methodologies.

2. Add standard to Chapter 43 as follows:

ANSI/ACCA
Manual S3-2004 Residential Equipment Selection

Reason: ACCA Manual J8 does not address equipment selection (sizing), it documents the procedures for calculating heating and cooling loads. ACCA Manual S documents the procedures for selecting residential HVAC equipment using manufacturer's performance data to meet the heating and cooling loads calculated with ACCA Manual J.

Equipment is often selected based on the capacity rating from Air Conditioning Refrigeration Institutes (ARI) or the input capacity from the Gas Appliance Manufacturers Association (GAMA). Manual S explains the procedure of using the original manufacturer's expanded performance data to determine:

- A cooling unit's capacity in different climates (e.g, Phoenix, Boston, Miami, Seattle) or
- A heating unit's actual output capacity.

The country has many different climates and operating conditions. If oversized cooling equipment were selected, conditions in the home could develop that would affect the occupants health, e.g., oversized equipment in a humid climate would inadequately remove moisture vapor and promote the growth of unhealthy organisms.

If undersized heating equipment were selected because of insufficient understanding of altitude corrections or input capacity instead of output capacity (e.g., in Denver, an 80,000 Btu/h Furnace, with a 78% AFUE, delivers about 58,200 Btu/h, 29% less than nameplate) the selected equipment could fail to meet the requirements of IRC R303.8.

ANSI/ACCA Manual S 3-2004 is the ANSI standard for residential equipment sizing and selection. The International Code Council's requirements for sizing and selecting residential equipment should be consistent with the official ANSI standard.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ANSI/ACCA Manual S3-2004, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before January 15, 2008.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

RM5–07/08
M1411.3.1

Proponent: Kenneth J. Kaminski, Elliott Air Conditioning and Heating

Revise as follows:

M1411.3.1 (Supp) Auxiliary and secondary drain systems. In addition to the requirements of Section M1411.3, a secondary drain or auxiliary drain pan shall be required for each cooling or evaporator coil where damage to any building components will occur as a result of overflow from the equipment drain pan or stoppage in the condensate drain piping. Such piping shall maintain a minimum horizontal slope in the direction of discharge of not less than 1/8 unit vertical in 12 units horizontal (1-percent slope). Drain piping shall be a minimum of 3/4-inch (19 mm) nominal pipe size. One of the following methods shall be used:

1. An auxiliary drain pan with a separate drain shall be installed under the coils on which condensation will occur. The auxiliary pan drain shall discharge to a conspicuous point of disposal to alert occupants in the event of a stoppage of the primary drain. The pan shall have a minimum depth of 1.5 inches (38 mm), shall not be less than 3 inches (76 mm) larger than the unit or the coil dimensions in width and length and shall be constructed of corrosion-resistant material. The bottom panel of the pan shall be contoured or sloped to the center or side bottom outlet. Metallic pans shall have a minimum thickness of not less than 0.0276-inch (0.7 mm) galvanized sheet metal. Nonmetallic pans shall have a minimum thickness of not less than 0.0625 inch (1.6 mm).

2. A separate overflow drain line shall be connected to the drain pan provided with the equipment. This overflow drain shall discharge to a conspicuous point of disposal to alert occupants in the event of a stoppage of the primary drain. The overflow drain line shall connect to the drain pan at a higher level than the primary drain connection.
3. An auxiliary drain pan without a separate drain line shall be installed under the coils on which condensate will occur. This pan shall be equipped with a water level detection device conforming to UL 508 that will shut off the equipment served prior to overflow of the pan. The pan shall be equipped with a fitting to allow for drainage. The auxiliary drain pan shall be constructed in accordance with Item 1 of this section.
4. A water level detection device conforming to UL 508 shall be provided that will shut off the equipment served in the event that the primary drain is blocked. The device shall be installed in the primary drain line, the overflow drain line or the equipment-supplied drain pan, located at a point higher than the primary drain line connection and below the overflow rim of such pan.

Reason: The purpose of the code to is to clarify and add a new requirement upon the existing code as written. Residences today, have HVAC systems installed in the attics. The modification above will address a recurring problem which many homeowners face today. That is it will eliminate "flat bottomed pans" that do not necessarily allow for the drainage of condensate through the side outlet (which incidentally is on the side of the pan approximately ¼ to ½ inch above the bottom panel). The proposed change will eliminate pooling of residual condensate, corrosion and in some instances microbial growth. To ensure complete drainage, pans must possess an "a contoured or sloped lower bottom surface with a drain outlet on its bottom panel".

See Figures 1 and 2 for details.

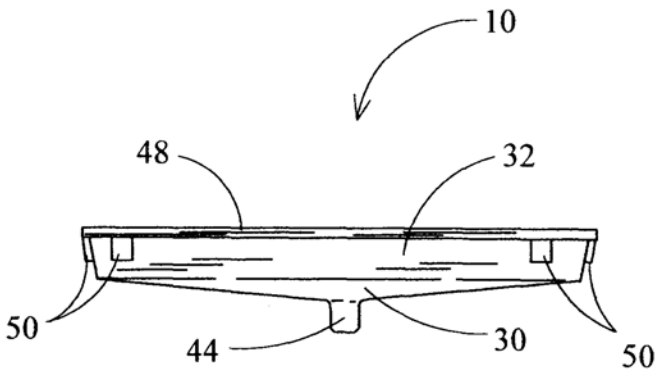

FIGURE 1

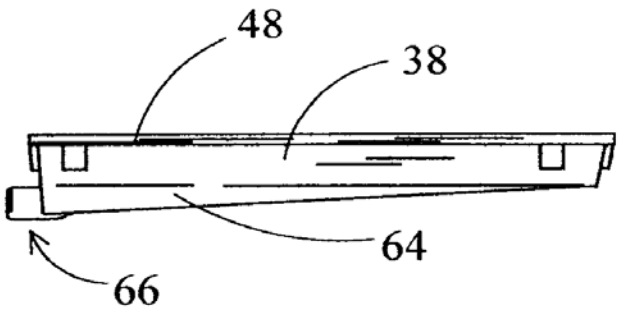

FIGURE 2

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

RM6–07/08
M1411.5

Proponents: Michael J. Resetar, Armacell LLC; Roger Schmidt, Nomaco K Flex

Delete without substitution:

~~**M1411.5 Insulation of refrigerant piping.** Piping and fittings for refrigerant vapor (suction) lines shall be insulated with insulation having a thermal resistivity of at least R-4 and having external surface permeance not exceeding 0.05 perm [2.87ng/(s·m2·Pa)] when tested in accordance with ASTM E 96.~~

Reason: This section should be removed from the code or the title of the section should be changed. As insulation manufacturers, we are not aware of any refrigerant piping in residential building. Leaving this paragraph in the code is confusing at best. Chilled water, and cold water insulation is covered in other sections of the code.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Section M1411.5 addresses the vapor (suction) lines that connect the evaporators to the condensing units in split-system HVAC installations.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

RM7 –07/08
M1416 (New)

Proponent: Craig Conner, Building Quality, representing himself

Add new section as follows:

SECTION M1416
UNVENTED LIQUID FUEL APPLIANCES

M1416.1 Installation restrictions. Unvented liquid-fuel burning heating appliances shall not be installed in a dwelling.

Reason: An apparently new type of appliance, a decorative unvented liquid fuel fossil fired appliance is being marketed as a safe and environmental product. (http://www.ecosmartfire.com/USA/home.php) It is not apparent that this appliance is regulated by the code; however there would appear to be significant potential problems. Witness one of their FAQ:

"*How are EcoSmart™ Fires different?*
Unlike traditional fireplaces, EcoSmart™ Fires do not require any form of permanent fixture or fitting, such as a flue for ventilation or a permanent connection for fuel delivery. They are very user friendly and are specifically engineered with maximum safety and fuel efficiency in mind. It takes just seconds to start generating heat almost instantaneously through an open flame fuelled by an environmentally friendly renewable energy commonly known as Denatured Ethanol."

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

RM8–07/08
M1502.5

Proponent: Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Revise as follows:

M1502.5 Duct construction. Exhaust ducts shall be constructed of minimum 0.016-inch- thick (0.4 mm) ridged metal ducts, having smooth interior surfaces with joints running in the direction of flow. ~~Exhaust~~ Ducts shall not be connected ~~with sheet metal screws or fastening means which extend into the duct~~ or installed with sheet metal screws or other fasteners that will obstruct the flow.

Reason: The IRC and the IMC should be consistent in their approach as to how to fasten together dryer ducts. Merely taping a joint together is not an approved joining method according to the 1995 edition of the SMACNA Duct Construction Manual, Figure 3-2. The standard requires a minimum of three fasteners for ducts 14 inches and smaller. To require fasteners not to penetrate the duct would leave tape as the only means of joining. **Tape is a sealant, not a recognized means of joining in the standard.** If a jurisdiction wants to permit tape only, they have the right to do so. The IMC does not prohibit penetrating the duct, as long as it doesn't "obstruct" the flow. The presence of a ¼ inch pop-rivet will not clog or obstruct the flow of a 4-inch duct, however, clogging is proportional to maintenance. Is it possible to collect a fragment of lint? Quite possible, but not enough to "obstruct" the flow. On the other hand, three 1" long screws in each joint would obstruct the flow as a result of excessive lint build-up. Would 1" fasteners in a 14-inch industrial spiral dryer duct block the flow? Very doubtful. The possibility of blockage is proportional to the size of the duct as it relates to the size of the fasteners used. The language in this section should read the same as the IMC regardless of the size of the duct in question. **Not changing this text is in direct conflict with the standard.**

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

RM9–07/08
M1502.6

Proponent: Julius Ballanco, PE, JB Engineering and Code Consulting, P.C., representing In-O-Vate Technologies

Revise as follows:

M1502.6 (Supp) Duct length. The maximum length of a clothes dryer exhaust duct shall not exceed ~~35 feet (10 668 mm)~~ 25 feet (7620 mm) from the dryer location to the wall or roof termination. The maximum length of the duct shall be reduced 2.5 feet (762 mm) for each 45-degree (0.8 rad) bend and 5 feet (1524 mm) for each 90-degree (1.6 rad) bend. The maximum length of the exhaust duct does not include the transition duct.

Exceptions:

1. Where the make and model of the clothes dryer to be installed is known and the manufacturer's installation instructions for the dryer are provided to the building official, the maximum length of the exhaust duct, including any transition duct, shall be permitted to be in accordance with the dryer manufacturer's installation instructions.
2. Where large-radius 45-degree (0.8 rad) and 90-degree (1.6 rad) bends are installed, the equivalent length of the clothes dryer exhaust duct for each bend shall be as provided in the fitting manufacturer's installation instructions. The engineering calculation used by the manufacturer of such fittings shall be in accordance with the ASHRAE Fundamentals Handbook.

Reason: While I supported the change last cycle to increase the dryer exhaust vent length to 35 feet, I have since encountered a situation where the dryer manufacturer listed a 25 foot distance. A developer specified a stacked washer dryer for a townhouse. While reviewing the manufacturer's installation instructions, I found that the dryer vent length was limited to 25 feet. When I checked another manufacturer, the length was also 25 feet. Since the code cannot assume the type of dryer to be installed, the limitation on length of vent must use the most conservative value of the published manufacturer's instructions.

Cost Impact: The code change proposal may increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

RM10–07/08
M1502.6

Proponent: Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Revise as follows:

M1502.6 (Supp) Duct length. The maximum length of a clothes dryer exhaust duct shall not exceed 35 feet (10 668 mm) from the dryer location to the wall or roof termination. The maximum length of the duct shall be reduced 2.5 feet (762 mm) for each 45-degree (0.8 rad) bend and 5 feet (1524 mm) for each 90-degree (1.6 rad) bend. The maximum length of the exhaust duct does not include the transition duct.

Exceptions:

1. Where the make and model of the clothes dryer to be installed is known and the manufacturer's installation instructions for the dryer are provided to the building official, the maximum length of the exhaust duct, including any transition duct, shall be permitted to be in accordance with the dryer manufacturer's installation instructions. Where exhaust ducts are installed in concealed locations, the developed length of the system shall be indicated by permanent signs, labels or tags installed in an observable location near the dryer connection point.
2. Where large-radius 45-degree (0.8 rad) and 90-degree (1.6 rad) bends are installed, the equivalent length of the clothes dryer exhaust duct for each bend shall be as provided in the fitting manufacturer's installation instructions. The engineering calculation used by the manufacturer of such fittings shall be in accordance with the ASHRAE Fundamentals Handbook.

Reason: This was approved as submitted by the Mechanical code committee. When this exception is employed and the exhaust duct is concealed, it is impossible to match the correct dryer to the correct venting system if it is not identified as to its developed length. What's more important, giving the installation half a chance of working correctly or painting over the sign after it's installed. The term observable location is not vague at all. It does provide flexibility as to its location. The mechanical inspector cannot legislate ignorance, stupidity or bad intent. If someone paints over the sign so be it, they have been informed and that is all the code official is required to do. Besides, signs are not the only way to identify the duct, tags or bands work just as well. As long as the identification is posted near the dryer connection to the exhaust duct, the end user will have a good chance to see. Prescriptive language as to the size of the lettering or the size of signs has been intentionally left out to provide some flexibility to code officials.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

RM11–07/08
M1503.1

Proponent: Guy Tomberlin, Fairfax County, VA, representing the Virginia Plumbing & Mechanical Inspectors Association/Virginia Building and Code Officials Association

Revise as follows:

M1503.1 General. A range hood shall be installed above each range located in one- and two-family dwellings. Range hoods shall discharge to the outdoors through a single-wall duct. The duct serving the hood shall have a smooth interior surface, shall be air tight and shall be equipped with a backdraft damper. Ducts serving range hoods shall not terminate in an attic or crawl space or areas inside the building.

> **Exception:** Where installed in accordance with the manufacturer's installation instructions, and where mechanical or natural ventilation is otherwise provided, listed and labeled ductless range hoods shall not be required to discharge to the outdoors.

Reason: This section as written provides all the criteria for the installation of range hoods in a residential application but fails to ever actually require the hood itself to be installed. The suggested new wording is consistent with most range manufacturer's recommendations.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

RM12–07/08
M1503.1, M1503.3, M1507, M1507.1, M1507.3, Table M1507.3

Proponent: Steve Ferguson, American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE)

Revise as follows:

M1503.1 General. Range hoods shall discharge to the outdoors through a single-wall duct. The duct serving the hood shall have a smooth interior surface, shall be air tight and shall be equipped with a backdraft damper. Ducts serving range hoods shall not terminate in an attic or crawl space or areas inside the building.

> **Exception:** Where installed in accordance with the manufacturer's installation instructions, and where mechanical ~~or natural ventilation~~ exhaust is otherwise provided in accordance with Section M1503.3, listed and labeled ductless range hoods shall not be required to discharge to the outdoors.

M1503.3 Required kitchen exhaust rates. Where domestic kitchen cooking appliances are equipped with ducted range hoods or down-draft exhaust systems, the fans shall be sized in accordance with Section M1507.3. Not less than one ducted range hood that complies with Section M1507 shall be provided in each dwelling unit except where other mechanical exhaust systems provide not less than 5 air changes per hour based on the total kitchen volume.

SECTION M1507
MECHANICAL EXHAUST ~~VENTILATION~~

M1507.1 General. ~~Where~~ Kitchens, toilet rooms and bathrooms ~~are~~ shall be provided with ~~mechanical ventilated~~ mechanical exhaust systems. The ~~ventilation~~ exhaust equipment shall be installed in accordance with this section.

M1507.3 ~~Ventilation~~ Exhaust rate. ~~Ventilation~~ Exhaust systems shall be designed to have the capacity to exhaust the minimum air flow rate determined in accordance with Table M1507.3.

TABLE M1507.3
MINIMUM REQUIRED EXHAUST RATES FOR ONE- AND TWO-FAMILY DWELLINGS

AREA ~~TO BE VENTILATED~~ REQUIRING EXHAUST	~~VENTILATION~~ EXHAUST RATES
Kitchens	100 cfm intermittent or 5 air changes per hour continuous based on total kitchen volume ~~25 cfm continuous~~
Bathrooms, Toilet Rooms	Mechanical exhaust capacity of 50 cfm intermittent or 20 cfm continuous

For SI: 1 cubic foot per minute = 0.0004719 m^3/s.

Reason: The purpose of this proposal is to strengthen the requirement for kitchen ventilation by increasing the stringency for allowable systems.

The existing provisions allow the use of windows for the intended purpose of exhausting contaminants produced by kitchen appliances. These systems are not able to remove kitchen contaminants from new housing. This change will improve the code by assuring that kitchen contaminants are exhausted outdoors and not simply redistributed in the home. It allows the use of ductless range hoods when either a down-draft or other wall- or ceiling-mounted fan that provides at least 5 ACH is installed.

Cooking and other kitchen activities produce large quantities of indoor air quality contaminants such as moisture, organic compounds and a wide spectrum of particles. These contaminants can lead to condensation on cold building materials, leading to mold, discoloration, and damage. Modern houses with low infiltration and window use rates do not have sufficient ventilation to be able to cope with kitchen contaminants being dispersed throughout the home These contaminants cannot be filtered out and must be removed to avoid health problems and damage to the home. Windows do not always exhaust air; air just as often comes in as goes out. So for roughly half the time windows do not exhaust kitchen contaminants but push them into the rest of the house. Windows are generally not used often enough to be depended upon and many occupants never open their windows for a number of reasons. Similarly, down-draft appliances of 50-100 cfm cannot capture significant amounts of contaminants, which rise due to buoyancy. The values in Table M1507.3 are effective when used with vented range hoods, which have good capture efficiency because of their shape. For down-draft or room-based exhaust systems, the capture efficiency is poor and five room air changes of exhaust are necessary to keep contaminants from dispersing into other rooms. The 25 cfm continuous rate that has been in ASHRAE 62 since 1989, the UBC since 1991, and the IRC since 2003 works well in small apartments, but is not sufficient for larger kitchens. ASHRAE 62.2 adopted the 5 ACH rate for kitchens in its 2003 edition.

Bibliography:
ASHRAE Standard 62.2-2007 *Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings*

Cost Impact: This proposal will increase the cost of construction in those cases where a vented range hood costs more to install than a ductless range hood or if down-draft ventilation capacity needs to be increased to meet the 5 ACH requirement. However, during the development of ASHRAE 62.2-2007, NAHB has indicated that 70-80% of new homes have ducted range hoods or down-draft fans, so the overall cost impact is minimal.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

RM13–07/08

R202 (New), R303.3, M1507, M1507.1, M1507.3, Table M1507.3

Proponent: Steve Ferguson, American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE)

1. Add new definition as follows:

SECTION R202
GENERAL DEFINITIONS

BATHROOM. A room containing a bathtub, shower, spa, hot tub, or other bathing fixture.

2. Revise as follows:

R303.3 Bathrooms. Bathrooms, water closet compartments and other similar rooms shall be provided with aggregate glazing area in windows of not less than 3 square feet (0.3 m^2), one-half of which must be openable. Bathrooms shall be provided with mechanical exhaust systems in accordance with Section M1507.

Exception: The glazed areas shall not be required where artificial light and a mechanical ventilation system sized in accordance with Section M1507 are provided. ~~The minimum ventilation rates shall be 50 cubic feet per minute (24 L/s) for intermittent ventilation or 20 cubic feet per minute (10 L/s) for continuous ventilation. Ventilation air from the space shall be exhausted directly to the outside.~~

SECTION M1507
MECHANICAL EXHAUST ~~VENTILATION~~

M1507.1 General. ~~Where~~ Kitchens, toilet rooms and bathrooms ~~are~~ shall be provided with ~~mechanical ventilated~~ mechanical exhaust systems. The ~~ventilation~~ exhaust equipment shall be installed in accordance with this section.

M1507.3 ~~Ventilation~~ Exhaust rate. ~~Ventilation~~ Exhaust systems shall be designed to have the capacity to exhaust the minimum air flow rate determined in accordance with Table M1507.3.

TABLE M1507.3
MINIMUM REQUIRED EXHAUST RATES FOR ONE- AND TWO-FAMILY DWELLINGS

AREA ~~TO BE VENTILATED~~ REQUIRING EXHAUST	**~~VENTILATION~~ EXHAUST RATES**
Kitchens	100 cfm intermittent or 5 air changes per hour continuous based on total kitchen volume ~~25 cfm continuous~~
Bathrooms, Toilet Rooms	Mechanical exhaust capacity of 50 cfm intermittent or 20 cfm continuous

For SI: 1 cubic foot per minute = 0.0004719 m^3/s.

Reason: The purpose of this proposal is to strengthen the requirement for bathroom exhaust ventilation by disallowing the use of windows as the primary exhaust means. Water closet rooms and similar rooms do not have to be mechanically exhausted if they have operable windows.

The existing provisions allow the use of windows for the intended purpose of exhausting of moisture created by the bath, shower or other activities. Windows are not able to directly remove moisture from new housing. This change will improve the code by assuring that bathroom moisture is exhausted outdoors and not simply redistributed in the home. Odors can sometimes be vented using windows, depending on the design of the house, the weather, and the occupants, and is "self-induced". But moisture is a much bigger concern.

Bathing and other bathroom activities produce large quantities of moisture, as well as a wide spectrum of other contaminants. Modern houses with low infiltration and low-window use rates do not have sufficient ventilation to be able to cope with moisture being dispersed throughout the home, especially the moisture created due to bathing. This is especially true in humid climates and severe climates. Moisture must be removed to avoid health problems and damage to the home such as those that might be caused by molds. Windows do not always exhaust air; air just as often comes in as goes out. So for roughly half the time windows do not exhaust moisture but push it into the rest of the house.

Bibliography:
ASHRAE Standard 62.2-2007 *Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings*

Cost Impact: This proposal will increase the cost of construction in those cases where bathroom exhaust fans are not currently installed.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

RM14–07/08
M1601.3.1

Proponent: Wesley R. Davis, Air Conditioning Contractors of America and American Society of Heating, Refrigerating and Air Conditioning Engineers

Revise as follows:

M1601.3.1 (Supp) Joints and seams. Joints of duct systems shall be made substantially airtight by means of tapes, mastics, liquid sealants, gasketing or other approved closure systems. Closure systems used with rigid fibrous glass ducts shall comply with UL181A and shall be marked "181A-P" for pressure-sensitive tape, "181A-M" for mastic or "181 A-H" for heat-sensitive tape. Closure systems used with flexible air ducts and flexible air connectors shall comply with UL 181B and shall be marked "181B-FX" for pressure-sensitive tape or "181B-M" for mastic. Duct connections to flanges of air distribution system equipment or sheet metal fittings shall be mechanically fastened. Mechanical fasteners for use with flexible nonmetallic air ducts shall comply with UL 181B and shall be marked "181B-C." Crimp joints for round metal ducts shall have a contact lap of at least 1 1/2 inches (38 mm) and shall be mechanically fastened by means of at least three sheet-metal screws or rivets equally spaced around the joint.

Exceptions:

1. Spray polyurethane foam shall be permitted to be applied without additional joint seals.
2. Where a duct connection is made that is partially inaccessible, three screws or rivets shall be equally spaced on the exposed portion of the joint so as to prevent a hinge effect.
3. Where 8 inch diameter and smaller rigid round metal duct is installed parallel to and between floor joists, two screws or rivets spaced 90 degrees apart shall be an alternative to the fastener requirement of this section..

Reason: To provide a reasonable alternative to mechanically joining 8 inch and smaller diameter round metal ductwork.

The three screw requirement, while appropriate for flexible ducts and connectors, can be physically impossible for rigid round metal ducts that are installed between floor joists.

Some installations require the rigid round metal duct to be installed between parallel floor joists, these ducts are then supported in accordance with IRC M1601.3.2 and SMACNA HVAC Duct Construction Standards. The floor joists, however, restrict access around the metal pipe and physically prevents the requirement for "at least three sheet-metal screws or rivets equally spaced around the joint". In this installation application, two screws spaced ninety degrees apart are sufficient for mechanically joining properly supported round metal ducts which have the required $1^1/_2$ inch contact laps.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

RM15–07/08

M1601.3.7.1 (New), Chapter 43 (New)

Proponent: Steve Ferguson, American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE)

1. Add new text as follows:

M1601.3.7.1 Duct leakage. HVAC systems that include air handlers or return ducts located in garages shall have a total air leakage of not more than 6% of the total fan flow when measured at 0.1 in. w.c. (25 Pa), using test method B of ANSI/ASTM E 1554. The test shall be conducted with the garage door open to the outdoors and the supply and return air leakage results shall be added to determine the total system leakage.

2. Add standard to Chapter 43 as follows:

ASTM

E1554-03 Standard Test Methods for Determining External Air Leakage of Air Distribution Systems by Fan Pressurization

Reason: The purpose of this proposal is to add requirements to prevent the migration of contaminants (including carbon monoxide) from attached garages to occupiable spaces.

Garages attached to residences may contain numerous sources of air contaminants. These contaminants can be transported into the residence through either leaks in the separating walls or through leaky air handlers and ducts. This change will improve the code by reducing the potential for contaminant transport from garages into residences.

Many pollutant sources are commonly stored or used in residential attached garages such as gasoline-fired engines (automobiles, lawnmowers, etc.), paints, and solvents. Pressure differences across air leakage paths between the garage and adjoining living space can result in the transport of these contaminants to the living space. Factors influencing this transport include temperature differences, wind, the placement of the air handler or ducts in the garage, duct leakage, and equipment operation, such as exhaust fans and vented combustion appliances. A recent literature review (Emmerich et al. 2003) found substantial evidence that transport of contaminants from garages has the potential to negatively impact residential indoor air quality in either an acute or chronic manner.

Traditional practice assumed that garages were leaky structures and that infiltration would keep garages adequately ventilated. However, conventional construction practice for garages today result in significantly tighter structures with little infiltration and elevated contaminant concentrations in the garage. In fact, recent field measurements (Emmerich et al. 2003) have found that the envelopes of modern attached garages can be as tight as the envelopes of houses. Additionally, houses with HVAC system air handlers and ducts in the garage provide another potential pathway for pollutants to travel from garages to living spaces. Many studies have found that typical HVAC systems and their ductwork can be very leaky. Limiting the leakage of such systems located in garages will reduce the potential for contaminants to be transported into houses via this pathway. A simple test is needed to verify that air handlers and ductwork in garages is not excessively leaky.

Note that per Interpretation IC 62.2-2004-3 of ANSI/ASHRAE Standard 62.2-2004, test method B of ANSI/ASTM E1554-03 is considered to be an equivalent test method to the California Title 24 method which is currently listed in Standard 62.2.

Bibliography:

ANSI/ASHRAE Standard 62.2-2007 *Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings*

Emmerich, SJ et al.. 2003. *NISTIR 7072 Air and Pollutant Transport from Attached Garages to Residential Living Spaces – Literature Review and Field Measurements.* National Institute of Standards and Technology.

Cost Impact: This proposal will increase the cost of construction in those cases where ducts or air handlers are located in garages thus requiring an air leakage test.

Analysis: A review of the standard proposed for inclusion in the code, ASTM E 1554-03, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before January 15, 2008.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

RM16–07/08
M1601.4

Proponent: Ronald Majette, U.S. Department of Energy

Revise as follows:

M1601.4 Under-floor plenums. An under-floor space used as a supply plenum shall conform to the requirements of this section. Fuel gas lines and plumbing waste cleanouts shall not be located within the space.

> **Exception:** Fuel gas lines and plumbing waste cleanouts shall be permitted to be located in unvented crawl spaces that receive conditioned air in accordance with Section R408.3

Reason: This change is necessary to allow the energy-efficient strategy of placing ductwork and/or HVAC equipment inside the conditioned space by creating an unvented/conditioned crawlspace, wherein the crawlspace is not vented to the outside and insulation is on crawlspace walls rather than in the floor over the crawlspace. To avoid any potential for moisture build-up in such crawlspaces, it is common to provide a small amount of supply and/or return air.

The code currently creates the potential for confusion when conditioned crawlspaces receive supply air. The code as written has been interpreted in some jurisdictions to classify such crawlspaces as under-floor plenums, which prohibits the placement of fuel gas lines and plumbing waste cleanouts therein. This change proposal will ensure that, for these purposes, conditioned crawlspaces are uniformly treated in the same manner as conditioned basements rather than as plenums.

The IRC committee, in disapproving this proposal in the 2006/2007 cycle, cited confusing language and an ambiguous use of the term “plenum” in the proposed text. Those issues have been addressed by the modification in this public comment.

Substantiation: The construction of conditioned crawlspaces is increasingly used as an energy-efficiency strategy because it allows supply ducts to be inside the building thermal envelope. The U.S. Department of Energy’s Building America program, for example, has demonstrated the use of conditioned crawlspaces for locating ducts and mechanical equipment and for improving health, durability, and comfort.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: The term “unvented” refers to combustion appliances that are not vented to the outdoors. The term “unventilated” would better describe the condition.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

RM17–07/08
M1601.4

Proponent: James Ranfone, American Gas Association

Revise as follows:

M1601.4 Under-floor plenums. An under-floor space used as a supply plenum shall conform to the requirements of this section. ~~Fuel gas lines and~~ Plumbing waste cleanouts shall not be located within the space.

Reason: The IFGC covers fuel gas installation requirements and contains coverage for plenums. This would eliminate a scoping conflict between the two codes.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

RM18–07/08
R408.3, M1601.4

Proponent: Chuck Murray, Washington State University Extension Energy Program, representing Northwest Energy Code Group

Revise as follows:

R408.3 (Supp) Unvented crawl space. Ventilation openings in under-floor spaces specified in Sections R408.1 and R408.2 shall not be required where:

1. Exposed earth is covered with a continuous Class I vapor retarder. Joints of the vapor retarder shall overlap by 6 inches (152 mm) and shall be sealed or taped. The edges of the vapor retarder shall extend at least 6 inches (152 mm) up the stem wall and shall be attached and sealed to the stem wall; and
2. One of the following is provided for the under-floor space:
   2.1. Continuously operated mechanical exhaust ventilation at a rate equal to 1 cfm (0.47 L/s) for each 50 ft^2 (4.7m^2) of crawlspace floor area, including an air pathway to the common area (such as a duct or transfer grille), and perimeter walls insulated in accordance with Section N1102.2.8;
   2.2. Conditioned air supply sized to deliver at a rate equal to 1 cfm (0.47 L/s) for each 50 ft^2 (4.7 m^2) of under-floor area, including a return air pathway to the common area (such as a duct or transfer grille), and perimeter walls insulated in accordance with Section N1102.2.8;
   2.3. Plenum <u>in existing structures</u> complying with Section M1601.4, if under-floor space is used as a plenum.

M1601.4 Under-floor plenums. <u>Under-floor plenums shall be prohibited in new structures. Modification or repairs to under-floor plenums in existing structures shall conform to the requirements of this section.</u> ~~An under-floor space used as a supply plenum shall conform to the requirements of this section. Fuel gas lines and plumbing waste cleanouts shall not be located within the space.~~

M1601.4.1 General. The space shall be cleaned of loose combustible materials and scrap, and shall be tightly enclosed. The ground surface of the space shall be covered with a moisture barrier having a minimum thickness or 4 mils (0.1 mm). <u>Fuel gas lines and plumbing waste cleanouts shall not be located within the space.</u>

Reason: This proposal eliminates the use of under-floor plenum systems in new residential construction. It has been preserved for existing construction to provide the needed safety requirements when these systems are modified. This proposal has been submitted to reduce leakage of highly conditioned air in residential structures. It will also reduce the conduction losses from the distribution system, by limiting the area to that of ductwork. This method is prescriptive and is easy to inspect. This will also improve indoor air quality.

There is little discussion of the impacts of under-floor plenum systems in the energy efficiency community. It is because under-floor plenum systems are all but extinct. In interviewing 5 of my colleagues at the WSU Energy Program, each of us had only seen one or two systems in our 15-25 year careers. Each time in response to a high bill investigation requested by a local utility. With all the effort concentrated on duct leakage control, it should be clear that it is time to eliminate this section form the code as it applies to new buildings.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

RM19–07/08
M2005.2

Proponent: Chuck King, Town of Oro Valley, AZ, representing himself

Revise as follows:

M2005.2 Prohibited locations. Fuel-fired water heaters shall not be installed in a room used as a storage<u>, clothes or other similar</u> closet. Water heaters located in a bedroom or bathroom shall be installed in a sealed enclosure so that combustion air will not be taken from the living space. Installation of direct-vent water heaters within an enclosure is not required.

Reason: Installing appliances in closets has been the preferred location for an untold number of years. Using the verbiage of "storage closets" as a prohibition is very open ended and subject to a wide range of interpretation. The primary purpose of **any** closet is to provide storage of some kind. In the IRC "closet" is defined as "a small room or chamber used for **storag**e". If this literal interpretation were used, appliances would be prohibited

from every closet. It is understandable why fuel-burning appliances are prohibited from the other rooms that are listed, since they could create a serious risk to the occupants. In addition clothes closets provide a high fuel source and would pose a significant life safety hazard. This has been demonstrated in the IRC section E3605.7 #3 and NEC section 240.24(D) as hazardous locations.

Installing water heaters and furnaces in closets has been the preferred location for an untold number of years. Using the verbiage of "storage closets" as a prohibition is very open ended and subject to a wide range of interpretation. The primary purpose of **any** closet is to provide storage of some kind. In fact, the very definition of "closet" in the IRC states that it is a small room or chamber used for **storag**e". If this literal interpretation were used, fuel-fired appliances would be prohibited from every closet. It is understandable why fuel-burning appliances are prohibited from the other rooms that are listed, since they could create a serious risk to the occupants; and it seems appropriate to prohibit these types of appliances from closets that open directly into these rooms; however, it is overly restrictive and without justification to wholly prohibit their installation from closets, as currently written.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

RM20–07/08
Chapter 43

Proponent: Standards writing organizations as listed below.

Revise standards as follows:

ASTM — ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959

Standard reference number	Title
D 1784-<u>06a</u> ~~05~~	Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
D 2464-<u>06</u> ~~99e01~~	Specification for Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80

Reason: The *CP 28 Code Development Policy,* Section 4.5* requires the updating of referenced standards to be accomplished administratively, and be processed as a Code Change Proposal. In May 2007, a letter was sent to each developer of standards that are referenced in the International Codes, asking them to provide ICC with a list of their standards in order to update to the current edition. Above is the received list of the referenced standards that are under the maintenance responsibility of the IRC Committee.

***4.5 Updating Standards:** The updating of standards referenced by the Codes shall be accomplished administratively by the appropriate code development committee in accordance with these full procedures except that multiple standards to be updated may be included in a single proposal.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF
