INTERNATIONAL CODE COUNCIL
2012/2013 CODE DEVELOPMENT CYCLE
Group A (2012)

PROPOSED CHANGES TO THE 2012 EDITIONS OF THE

INTERNATIONAL BUILDING CODE®

INTERNATIONAL FUEL GAS CODE®

INTERNATIONAL MECHANICAL CODE®

INTERNATIONAL PLUMBING CODE®

INTERNATIONAL PRIVATE SEWAGE DISPOSAL CODE®

April 29th – May 8th, 2012
Sheraton Dallas Hotel
Dallas, TX

First Printing

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INTRODUCTION

The proposed changes published herein have been submitted in accordance with established procedures and are distributed for review. The publication of these changes constitutes neither endorsement nor question of them but is in accordance with established procedures so that any interested individuals may make their views known to the relevant code committee and others similarly interested. In furtherance of this purpose, the committee will hold an open public hearing at the date and place shown below for the purpose of receiving comments and arguments for or against such proposed changes. Those who are interested in testifying on any of the published changes are expected to be represented at these hearings.

This compilation of code change proposals is available in electronic form only. As part of ICC's green initiative, ICC will no longer print and distribute this document. The compilation of code change proposals will be posted on the ICC website, and CD copies will be distributed to all interested parties on our list.

2012 ICC CODE DEVELOPMENT HEARINGS

These proposed changes will be discussed in public hearings to be held on April 29th, 2012 through May 8th, 2012 at the Sheraton Dallas Hotel, Dallas, Texas. The code committees will conduct their public hearings in accordance with the schedule shown on page xxix.

REGISTRATION AND VOTING

All members of ICC may vote on any assembly motion on proposed code changes to all International Codes. **For identification purposes, eligible voting members must register, at no cost, in order to vote.** The registration desk will be open in the lobby of the convention center according to the following schedule:

Saturday, April 28th	4:00 pm to 6:00 pm
Sunday, April 29th through Tuesday, May 8th	7:30 am to 5:00 pm

Council Policy #28-Code Development (page xii) requires that ICC's membership records regarding ICC members reflect the eligible voters 10 days prior to the start of the Code Development Hearings. This process includes new as well as changes to voting status. Section 5.7.4 of CP #28 (page xix) reads as follows:

> **5.7.4 Eligible Voters:** All members of ICC in attendance at the public hearing shall be eligible to vote on floor motions. Each member is entitled to one vote, except that each Governmental Member Voting Representative in attendance may vote on behalf of its Governmental Member. Code Development Committee members shall be eligible to vote on floor motions. Application, whether new or updated, for ICC membership must be received by the Code Council ten days prior to the commencement of the first day of the public hearing.

As such, new membership applications as well as renewal applications must be received by ICC's Member Services Department by April 18th, 2012. These records will be used to verify eligible voter status for the Code Development Hearings. Members are strongly encouraged to review their membership records for accuracy well in advance of the hearings so that any necessary changes are made prior to the April 18th, 2012 deadline. For information on application for new membership and membership renewal, please go to www.iccsafe.org/membership/join.html or call ICC Member Services at 1-888-ICC SAFE (422-7233)

It should be noted that a corporate member has a single vote. Only one representative of a corporate member will be issued a voting badge. ICC Staff will be contacting corporate members regarding who the designated voting representative will be.

ADVANCED REGISTRATION

You are encouraged to advance register by filling out the registration form available at www.iccsafe.org/springhearings.

CODE DEVELOPMENT PROCESS CHANGES

As noted in the posted Advisory Statement of February 4, 2009, the revised Code Development Process includes maintaining the current 3-year publication cycle with a single cycle of code development between code editions. The schedule for the 2012/2013 Code Development Cycle is the first schedule for the revised code development process (see page ix).

PROCEDURES

The procedures for the conduct of the public hearing are published in *Council Policy #28-Code Development (CP#28)* ("Procedures") on page xii. The attention of interested parties is specifically directed to Section 5.0 of the Procedures. These procedures indicate the conduct of, and opportunity to participate in the ICC Code Development Process. Please review these procedures carefully to familiarize yourself with the process.

There have been a number of revisions to the procedures. Included among these revisions are the following:

Section 1.6: **Recording.** This section was revised to clarify that ICC maintains sole ownership in the content of the hearings and has the right to control its subsequent distribution. In addition, the technology references were updated, using the term "recording" to replace "videotaping".

Section 2.4 **Emergency Procedures.** This section was revised create a 'metric' to aid in the determination of when an issue rises to the level of concern appropriate to an emergency amendment. Furthermore, it now stipulates a process by which a proposed Emergency Amendment is reviewed by the ICC Codes and Standards Council who is responsible for the implementation and oversight of ICC's Code Development Process.

Section 3.3.1 & Section 6.4.1 **Proponent.** An e-mail address for each code change/public comment proponent will be published in the monograph, unless the proponent requests otherwise.

Section 3.3.5.3 & Section 6.4.5 **Substantiation.** ICC evaluates whether substantiating material is germane, but the amendment makes it clear that ICC does not in all circumstances evaluate substantiating material for quality or accuracy.

Section 3.3.5.6 **Cost Impact.** The proponent should submit information that supports their claim regarding cost impact. Any information submitted will be considered by the code development committee. This language is intended to emphasize the need to provide information on how the proposed change will affect the cost of construction.

Section 3.6.3.1 If a proposed new standard is not submitted in at least draft form, the corresponding code change proposal shall be considered incomplete and shall not be processed.

Section 4.5.1 **Standards referenced in the I-Codes.** The deadline for availability of updated referenced standards and receipt by the Secretariat is December 1st of the third year of each code cycle. For the 2012/2013 cycle, the deadline is December 1st, 2014.

Section 5.2.2	**Conflict of interest.** The original language, “Violation thereof shall result in the immediate removal of the committee member from the committee.” was removed because there was no mechanism to enforce it. The recourse for someone who feels this section has been violated is to appeal.
Section 5.4.2	**Open meetings.** A provision has been added that stipulates that participants shall not advocate a position on specific code changes with Committee Members other than through the methods provided in this policy.
Section 5.4.3 & Section 7.3.3	**Presentation of Material at the Public Hearing.** All participants are to make it clear what interests they are representing. This disclosure provides additional information upon which to evaluate the testimony.
Section 5.7	**Assembly consideration.** A successful assembly action will no longer be the initial motion at the Final Action Consideration.
Section 5.7.3	**Assembly action.** A successful assembly action shall be a majority vote of the votes cast by eligible voters, rather than a 2/3 majority (see below).
Section 5.7.4	**Eligible voters.** This section is revised to clarify that each member, including Governmental Member Voting Representatives, gets only one vote.
Section 7.4	**Eligible voters.** This section requires that all Governmental Membership applications must be received by April 1 of the year of the Final Actions for a Governmental Member to be eligible to vote at the Final Action Hearings.

ASSEMBLY ACTION

The procedures regarding assembly action at the Code Development Hearings have been revised (see Section 5.7 of CP #28 on page xix). Some important items to note regarding assembly action are:

- A successful assembly action now requires a simple majority rather than a 2/3 majority.
- After the committee decision on a code change proposal is announced by the moderator, any one in the assembly may make a motion for assembly action.
- After a motion for assembly action is made and seconded, the moderator calls for a floor vote in accordance with Section 5.7.2. *No additional testimony will be permitted.*
- A code change proposal that receives a successful assembly action will be placed on the Final Action Hearing Agenda for individual consideration.

MULTIPLE PART CODE CHANGE PROPOSALS

It is common for ICC to receive code change proposals for more than one code or more than 1 part of a code that is the responsibility of more than one committee. For instance, a code change proposal could be proposing related changes to the text of IBC Chapter 4 (IBC-General), IBC Chapter 7 (IBC-Fire Safety), and the IFC Chapter 27 (IFC). When this occurs, a single committee will now hear all of the parts, unless one of the parts is a change to the IRC, in which case the respective IRC committee will hear that part separately.

GROUP A AND GROUP B CODE CHANGES

Starting with this 2012/2013 Code Development Cycle, for the development of the 2015 Edition of the I-Codes, there are two groups of code development committees and they will meet in separate years. The groupings are as follows:

Group A Codes (Heard in 2012)	***Group B Codes (Heard in 2013)***
International Building Code Committees: *IBC-Fire Safety (Chapters: 7, 8, 9, 14, 26 and App. D)* *IBC-General (Chapters: 2-6, 12, 13, 27-34, App. A, B, C, F, H, K)* *IBC-Means of Egress (Chapters: 10, 11 and App. E)* *IBC-Structural (Chapters: 15-25 and App. G,I, J, L, M)*	*Administrative Provisions (Chapter 1 all codes except IRC and IECC, referenced standards administrative updates, and designated definitions)* *Administrative Code Committee*
International Fuel Gas Code *IFGC Committee*	*International Energy Conservation Code (see note 1)* *Commercial Energy Committee* *Residential Energy Committee*
International Mechanical Code *IMC Committee*	*International Existing Building Code* *IEBC Committee*
International Plumbing Code *IPC Committee*	*International Fire Code* *IFC Committee*
International Private Sewage Disposal Code *IPC Committee*	*International Green Construction Code Committees:* *IGCC—Energy/Water Committee (Chapters: 6 and 7)* *IGCC—General Committee (Chapters:2-5, 8-11 and Append)*
	International Performance Code (see note 2) *ICC Performance Code Committee*
	International Property Maintenance Code *IPMC/IZC Committee*
	International Wildland-Urban Interface Code *IFC Committee*
	International Zoning Code *IPMC/IZC Committee*
	International Residential Code Committees: *IRC-B (Chapters: 1-10 and App. E, F, G,H, J, K, L, M, O)* *IRC-M/P (Chapters: 12-33 and App. I, P)*
	International Swimming Pool and Spa Code *ISPSC Committee*

NOTE:

1. Residential Energy Committee is responsible for Chapter 11 of the IRC and the Residential Provisions of the IECC.
2. In anticipation of minimal code change activity, a ICC Performance Committee has not been appointed. Any changes will be considered by the IFC Committee.

GROUP A CODE DEVELOPMENT COMMITTEE RESPONSIBILITIES

Some sections of the International Codes have a letter designation in brackets in front of them. For instance, Section 301.1.4 of the IEBC has a [B] in front of it, meaning that this section is the responsibility of one of the IBC Code Development Committees (in this case, IBC-S).

Code change proposals submitted for such code sections that have a bracketed letter designation in front of them will be heard by the respective committee responsible for such code sections. Because different committees will meet in different years, some proposals for a given code will be heard by a committee in a different year than the year in which the primary committee for this code meets.

Note that there are several code change proposals in the IBC-Structural hearing order that are changes to the International Existing Building Code (marked with prefix "EB"). These are proposed changes to sections of the existing building code that are the responsibility of the IBC-Structural Code Development Committee.
A complete summary of the Group A and Group B Code Development Committees' responsibilities can be view at the ICC Website: http://www.iccsafe.org/cs/codes/Documents/2012-13cycle/GroupA-B_CDC-Responsibilities.pdf.

ANALYSIS STATEMENTS

Various proposed changes published herein contain an "analysis" that appears after the proponent's reason. These comments do not advocate action by the code committees or the voting membership for or against a proposal. The purpose of such comments is to identify pertinent information that is relevant to the consideration of the proposed change by all interested parties, including those testifying, the code committees and the voting membership. Staff analyses customarily identify such things as: conflicts and duplication within a proposed change and with other proposed changes and/or current code text; deficiencies in proposed text and/or substantiation; text problems such as wording defects and vagueness; background information on the development of current text; and staff's review of proposed reference standards for compliance with the Procedures. Lack of an analysis indicates neither support for, nor opposition to a proposal.

REFERENCE STANDARDS

Proposed changes that include the addition of a reference to a new standard (i.e. a standard that is not currently referenced in the I-Codes.) will include in the proposal the number, title and edition of the proposed standard. This identifies to all interested parties the precise document that is being proposed and which would be included in the referenced standards chapter of the code if the proposed change is approved. Section 3.6.3.1 of CP #28 now requires that a code change proposal will not be processed unless a consensus draft of the standard has been provided. Proponents of code changes which propose a new standard have been directed to forward copies of the standard to the Code Committee. An analysis statement will be posted on the ICC website providing information regarding standard content, such as enforceable language, references to proprietary products or services, and references to consensus procedure. The analysis statements for referenced standards will be posted on or before March 28th, 2012. This information will also be published and made available at the hearings.

REFERENCED STANDARDS UPDATES

Administrative updates of any standards already referenced in any of the I-Codes will be contained in a code change proposal for consideration by the Administrative Code Development Committee. The Administrative Code Development Committee is a Group B committee which will conduct hearings on the administrative provisions (Chapter 1 and certain definitions) of all I-Codes, and the referenced standards update. Therefore, this committee will conduct its code development hearing during the code development hearings in 2013.

It should be noted that, in accordance with Section 4.5.1 of CP #28 (see page xvi), standards promulgators will have until December 1, 2014 to finalize and publish any updates to standards in the administrative update. If the standard update is not finalized and published by December 1, 2014, the respective I-Codes will be revised to reference the previously listed year edition of the standard.

MODIFICATIONS

Those who are submitting a modification for consideration by the respective Code Development Committee are required to submit a Copyright Release in order to have their modifications considered (Section 3.3.4.5 of CP #28). It is preferred that such release be executed in advance – the form is at http://www.iccsafe.org/cs/codes/publicforms.htm. Copyright release forms will also be available at the hearings. Please note that an individual need only sign one copyright release for submittals of all code change proposals, modifications, and public comments in this code change cycle for which the individual might be responsible. **Please be sure to review Section 5.5.2 of CP #28 for the modification process.** The Chair of the respective code development committee rules a modification in or out of order. That ruling is final, with no challenge allowed. The proponent submitting a modification is required to supply 20 printed copies. The minimum font size must be 16 point.

Example:

Original code change proposal.

The original code change proposal requested the following change to Section 305.3 of one of our I-Codes: (Note that the example is fictional.)

G10-12
305.13

Proponent: John West representing self

Revise as follows:

305.3 Interior surfaces. All interior surfaces, including windows and doors, shall be maintained in good and clean condition. Peeling, chipping, flaking or abraded paint shall be repaired, removed or covered. Cracked or loose plaster~~,~~ ~~decayed wood~~ and other defective surface conditions shall be corrected. Surfaces of porous materials made of or containing organic materials, such as but not limited to wood, textiles, paint, cellulose insulation, and paper, including paper-faced gypsum board, that have visible signs of mold or mildew shall be removed and replaced or remediated in an approved manner.

Exception: Porous materials that do not contain organic materials, such as clean unpainted bricks and concrete.

Proposed modification:

A modification to the code change proposal is proposed:

1. To add “and sanitary” after “clean” in the first sentence.
2. To add “or water permeable” after “porous” in the third sentence.
3. Delete “in an approved manner.” in the last sentence.
4. Delete the proposed new exception.

The modification should read as follows. Note that the font style is Ariel, and the font size is 16 pt. The ~~cross out,~~ underline format is removed from the text of the original proposal and the requested revisions in the original proposal are made and shown as original text. The modification to the original proposal is shown with ~~cross out,~~ underline format applied to the changes proposed in the modification.

Example of proposed modification:

G10-12
305.13

Proponent: Sam Sumter representing self

Modify the proposal as follows:

305.3 Interior surfaces. All interior surfaces, including windows and doors, shall be maintained in good, ~~and~~ clean and sanitary condition. Peeling, chipping, flaking or abraded paint shall be repaired, removed or covered. Cracked or loose plaster and other defective surface conditions shall be corrected. Surfaces of porous or water permeable materials made of or containing organic materials, such as but not limited to wood, textiles, paint, cellulose insulation, and paper, including paper-faced gypsum board, that have visible signs of mold or mildew shall be removed and replaced or remediated ~~in an approved manner~~.

> ~~**Exception:** Porous materials that do not contain organic materials, such as clean unpainted bricks and concrete.~~

Note: *The modification should be able to be shown on the overhead screen on a single page. Only show the pertinent part of the code change proposal that shows the intended revisions. The entire code change proposal need not be shown.*

CODE CORRELATION COMMITTEE

In every code change cycle, there are code change proposals that are strictly editorial. The Code Correlation Committee approves all proposals deemed editorial. A list of code correlation committee actions are shown at the end of this document (CCC-1).

ICC WEBSITE – WWW.ICCSAFE.ORG

This document is posted on the ICC Website, www.iccsafe.org. While great care has been exercised in the publication of this document, errata to proposed changes may occur. Errata, if any, will be identified in updates posted prior to the Code Development Hearings on the ICC website at http://www.iccsafe.org. Users are encouraged to periodically review the ICC Website for updates to the 2012/2013 Code Development Cycle-Group A (2012) Proposed Changes. Additionally, analysis statements for code changes which propose a new referenced standard will be updated to reflect the staff review of the standard for compliance with Section 3.6 of the Procedures.

PROPONENT CONTACT INFORMATION

For most of the code change proposals, an e-mail address for the proponent has been provided.

2012/2013 ICC CODE DEVELOPMENT SCHEDULE

STEP IN CODE DEVELOPMENT CYCLE	DATE	
	2012 – Group A Codes IBC, IFGC, IMC, IPC, IPSDC (See Notes)	**2013 – Group B Codes Admin, ICCPC, IEBC, IECC, IFC, IgCC, IPMC, ISPSC, IRC, IWUIC, IZC (See Notes)**
2012 EDITION OF I-CODES PUBLISHED	April 30, 2011	
DEADLINE FOR RECEIPT OF APPLICATIONS FOR ALL CODE COMMITTEES	June 1, 2011 (updated to July 1 for IECC and IRC – Energy; August 1 for IgCC and ISPSC)	
DEADLINE FOR RECEIPT OF CODE CHANGE PROPOSALS	January 3, 2012	January 3, 2013
WEB POSTING OF "PROPOSED CHANGES TO THE I-CODES"	March 12, 2012	March 11, 2013
DISTRIBUTION DATE OF "PROPOSED CHANGES TO THE I-CODES" (CD only)	April 2, 2012	April 1, 2013
CODE DEVELOPMENT HEARING (CDH)	April 29 – May 6, 2012 Sheraton Dallas Hotel Dallas, TX	April 21 – 28, 2013 Sheraton Dallas Hotel Dallas, TX
WEB POSTING OF "REPORT OF THE PUBLIC HEARING"	June 8, 2012	May 31, 2013
DISTRIBUTION DATE OF "REPORT OF THE PUBLIC HEARING" (CD only)	June 29, 2012	June 21, 2013
DEADLINE FOR RECEIPT OF PUBLIC COMMENTS	August 1, 2012	July 15, 2013
WEB POSTING OF PUBLIC COMMENTS "FINAL ACTION AGENDA"	September 10, 2012	August 28, 2013
DISTRIBUTION DATE OF PUBLIC COMMENTS "FINAL ACTION AGENDA" (CD only)	October 1, 2012	September 16, 2013
FINAL ACTION HEARING (FAH)	October 24 – 28, 2012 Oregon Convention Center Portland, OR	October 2 – 9, 2013 Atlantic City Convention Center Atlantic City, NJ
ANNUAL CONFERENCES	October 21 – 24, 2012 Oregon Convention Center Portland, OR	September 29 – October 2, 2013 Atlantic City Convention Center Atlantic City, NJ

Notes:

- Be sure to review the "Group A and Group B Code Development Committee Responsibilities" posted at www.iccsafe.org/responsibilities which identifies committee responsibilities which are different than Group A and Group B codes which may impact the applicable code change cycle and resulting code change deadline.
- The International Green Construction Code (IgCC) and International Swimming Pool and Spa Code (ISPSC) to undergo a full cycle of code development in 2011 resulting in 2012 editions published in March/2012
- Group B "Admin" includes code change proposals submitted to Chapter 1 of all the I-Codes except the ICCPC, IECC and IRC and the administrative update of referenced standards in the 2012 I-Codes
- Start 2015/2016 Code Development Cycle with Group A code change proposals due January 5, 2015

2012/2013 STAFF SECRETARIES

GROUP A (2012)

IBC-Fire Safety Chapters 7, 8, 9, 14, 26	IBC-General Chapters 1-6, 12, 13, 27-34	IBC-Means of Egress Chapters 10, 11	IBC-Structural Chapters 15-25
Ed Wirtschoreck ICC Chicago District Office 1-888-ICC-SAFE, ext 4317 FAX: 708/799-0320 ewirtschoreck@iccsafe.org	BethTubbs ICC Northbridge Field Office 1-888-ICC-SAFE, ext 7708 FAX: 419/ 730-6531 btubbs@iccsafe.org	Kim Paarlberg ICC Indianapolis Field Office 1-888-ICC-SAFE, ext 4306 FAX: 708/799-0320 kpaarlberg@iccsafe.org	Alan Carr ICC NW Resource Center 1-888-ICC-SAFE, ext 7601 FAX: 425/637-8939 acarr@iccsafe.org
IFGC	**IMC**	**IPC/IPSDC**	
Gregg Gress ICC Chicago District Office 1-888-ICC-SAFE, ext 4343 FAX: 708/799-0320 ggress@iccsafe.org	Gregg Gress ICC Chicago District Office 1-888-ICC-SAFE, ext 4343 FAX: 708/799-0320 ggress@iccsafe.org	Fred Grable ICC Chicago District Office 1-888-ICC-SAFE, ext 4359 FAX: 708/799-0320 fgrable@iccsafe.org	

GROUP B (2013)

ADMINISTRATIVE Chapter 1 All Codes Except IRC	IEBC	IECC-Commercial	IECC-Residential
Kim Paarlberg ICC Indianapolis Field Office 1-888-ICC-SAFE, ext 4306 FAX: 708/799-0320 kpaarlberg@iccsafe.org	BethTubbs ICC Northbridge Field Office 1-888-ICC-SAFE, ext 7708 FAX: 419/ 730-6531 btubbs@iccsafe.org	Dave Bowman ICC Chicago District Office 1-888-ICC-SAFE, ext 4323 FAX: 708/799-0320 dbowman@iccsafe.org	Dave Bowman ICC Chicago District Office 1-888-ICC-SAFE, ext 4323 FAX: 708/799-0320 dbowman@iccsafe.org
IFC	**IgCC-General**	**IgCC-Energy/Water**	**ICC PC**
Bill Rehr/ Beth Tubbs ICC Chicago District Office 1-888-ICC-SAFE, ext 4342 FAX: 708/799-0320 brehr@iccsafe.org btubbs@iccsafe.org	Allan Bilka ICC Chicago District Office 1-888-ICC-SAFE, ext 4326 FAX: 708/799-0320 abilka@iccsafe.org	Fred Grable ICC Chicago District Office 1-888-ICC-SAFE, ext 4359 FAX: 708/799-0320 fgrable@iccsafe.org	BethTubbs ICC Northbridge Field Office 1-888-ICC-SAFE, ext 7708 FAX: 419/ 730-6531 btubbs@iccsafe.org
IPMC	**IRC-Building**	**IRC Mechanical**	**IRC Plumbing**
Ed Wirtschoreck ICC Chicago District Office 1-888-ICC-SAFE, ext 4317 FAX: 708/799-0320 ewirtschoreck@iccsafe.org	Larry Franks/ Dave Bowman ICC Birmingham District Office 1-888-ICC-SAFE, ext 5279 FAX: 205/592-7001 lfranks@iccsafe.org dbowman@iccsafe.org	Gregg Gress ICC Chicago District Office 1-888-ICC-SAFE, ext 4343 FAX: 708/799-0320 ggress@iccsafe.org	Fred Grable ICC Chicago District Office 1-888-ICC-SAFE, ext 4359 FAX: 708/799-0320 fgrable@iccsafe.org
ISPSC	**IWUIC**	**IZC**	
Fred Grable ICC Chicago District Office 1-888-ICC-SAFE, ext 4359 FAX: 708/799-0320 fgrable@iccsafe.org	Bill Rehr ICC Chicago District Office 1-888-ICC-SAFE, ext 4342 FAX: 708/799-0320 brehr@iccsafe.org	Ed Wirtschoreck ICC Chicago District Office 1-888-ICC-SAFE, ext 4317 FAX: 708/799-0320 ewirtschoreck@iccsafe.org	

COMMITTEE A
ASSIGNMENT CROSSOVER LIST—WITHIN THE IBC

The 2012/2013 Staff Secretaries assignments on page x indicate which chapters of the International Building Code are generally within the responsibility of each IBC Code Committee. However, within each of these IBC Chapters are subjects that are most appropriately maintained by another IBC Code Committee. For example, the provisions of Section 403.5 deal with means of egress from high-rise buildings. Therefore, even though Chapter 4 is within the responsibility of the IBC – General Committee, this section would most appropriately be maintained by the IBC – Means of Egress Committee. The following table indicates responsibilities by IBC Code Committees other than the main committee for those chapters, for code changes submitted for the 2012 portion (Group A) of the 2012/2013 Cycle.

SECTION	CHAPTER MAINTAINED BY	SECTION MAINTAINED BY	CODE CHANGE PROPOSALS
403.5	IBC-General	IBC-Means of Egress	E4, E7
405.7.1	IBC-General	IBC-Means of Egress	E3
411.7	IBC-General	IBC-Means of Egress	E3
1508.1	IBC-Structural	IBC-Fire Safety	FS178
3401.2	IBC-General	IBC-Structural	S90
3406.1.3	IBC-General	IBC-Means of Egress	E4
3406.4	IBC-General	IBC-Means of Egress	E4
3411.8.4	IBC-General	IBC-Means of Egress	E4
3411.8.15	IBC-General	IBC-Means of Egress	E211

CP# 28-05 CODE DEVELOPMENT

Approved: 9/24/05
Revised: 10/29/11

CP # 28-05 is an update to *ICC's Code Development Process for the International Codes* dated May 15, 2004.

1.0 Introduction

1.1 Purpose: The purpose of this Council Policy is to prescribe the Rules of Procedure utilized in the continued development and maintenance of the International Codes (Codes).

1.2 Objectives: The ICC Code Development Process has the following objectives:

1.2.1 The timely evaluation and recognition of technological developments pertaining to construction regulations.

1.2.2 The open discussion of proposals by all parties desiring to participate.

1.2.3 The final determination of Code text by public officials actively engaged in the administration, formulation or enforcement of laws, ordinances, rules or regulations relating to the public health, safety and welfare and by honorary members.

1.3 Code Publication: The ICC Board of Directors (ICC Board) shall determine the title and the general purpose and scope of each Code published by the ICC.

1.3.1 Code Correlation: The provisions of all Codes shall be consistent with one another so that conflicts between the Codes do not occur. Where a given subject matter or code text could appear in more than one Code, the ICC Board shall determine which Code shall be the primary document, and therefore which code development committee shall be responsible for review and maintenance of the code text. Duplication of content or text between Codes shall be limited to the minimum extent necessary for practical usability of the Codes, as determined in accordance with Section 4.4.

1.4 Process Maintenance: The review and maintenance of the Code Development Process and these Rules of Procedure shall be by the ICC Board. The manner in which ICC codes are developed embodies core principles of the organization. One of those principles is that the final content of ICC codes is determined by a majority vote of the governmental and honorary members. It is the policy of the Board that there shall be no change to this principle without the affirmation of two-thirds of the governmental and honorary members responding.

1.5 Secretariat: The Chief Executive Officer shall assign a Secretariat for each of the Codes. All correspondence relating to code change proposals and public comments shall be addressed to the Secretariat.

1.6 Recording: Individuals requesting permission to record any meeting or hearing, or portion thereof, shall be required to provide the ICC with a release of responsibility disclaimer and shall acknowledge that ICC shall retain sole ownership of the recording, and that they have insurance coverage for liability and misuse of recording materials. Equipment and the process used to record shall, in the judgment of the ICC Secretariat, be conducted in a manner that is not disruptive to the meeting. The ICC shall not be responsible for equipment, personnel or any other provision necessary to accomplish the recording. An unedited copy of the recording shall be forwarded to ICC within 30 days of the meeting. Recordings shall not otherwise be copied, reproduced or distributed in any manner. Recordings shall be returned to

ICC or destroyed upon the request of ICC.

2.0 Code Development Cycle

2.1 Intent: The code development cycle shall consist of the complete consideration of code change proposals in accordance with the procedures herein specified, commencing with the deadline for submission of code change proposals (see Section 3.5) and ending with publication of final action on the code change proposals (see Section 7.6).

2.2 New Editions: The ICC Board shall determine the schedule for publishing new editions of the Codes. Each new edition shall incorporate the results of the code development activity since the last edition.

2.3 Supplements: The results of code development activity between editions may be published.

2.4 Emergency Procedures:

2.4.1 Scope: Emergency actions are limited to those issues representing an immediate threat to health and safety that warrant a more timely response than allowed by the Code Development Process schedule.

2.4.2 Initial Request: A request for an emergency action shall be based upon perceived threats to health and safety and shall be reviewed by the ICC Codes and Standards Council for referral to the Board of Directors for action with their analysis and recommendation.

2.4.3 Board and Member Action: In the event that the ICC Board determines that an emergency amendment to any Code is warranted, the same may be adopted by the ICC Board. Such action shall require an affirmative vote of at least two-thirds of the ICC Board.

The ICC membership shall be notified within ten days after the ICC Boards' official action of any emergency amendment. At the next Annual Business Meeting, any emergency amendment shall be presented to the members for ratification by a majority of the ICC Governmental Member Representatives and Honorary Members present and voting.

All code revisions pursuant to these emergency procedures and the reasons for such corrective action shall be published as soon as practicable after ICC Board action. Such revisions shall be identified as an emergency amendment.

Emergency amendments to any Code shall not be considered as a retro-active requirement to the Code. Incorporation of the emergency amendment into the adopted Code shall be subjected to the process established by the adopting authority.

3.0 Submittal of Code Change Proposals

3.1 Intent: Any interested person, persons or group may submit a code change proposal which will be duly considered when in conformance to these Rules of Procedure.

3.2 Withdrawal of Proposal: A code change proposal may be withdrawn by the proponent (WP) at any time prior to Final Action Consideration of that proposal. A withdrawn code change proposal shall not be subject to a public hearing, motions, or Final Action Consideration.

3.3 Form and Content of Code Change Submittals: Each code change proposal shall be submitted separately and shall be complete in itself. Each submittal shall contain the following information:

3.3.1 Proponent: Each code change proposal shall include the name, title, mailing address, telephone number, and email address of the proponent. Email addresses shall be published with the code change proposals unless the proponent otherwise requests on the submittal form.

3.3.1.1 If a group, organization or committee submits a code change proposal, an individual with prime responsibility shall be indicated.

3.3.1.2 If a proponent submits a code change on behalf of a client, group, organization or committee, the name and mailing address of the client, group, organization or committee shall be indicated.

3.3.2 **Code Reference:** Each code change proposal shall relate to the applicable code sections(s) in the latest edition of the Code.

3.3.2.1 If more than one section in the Code is affected by a code change proposal, appropriate proposals shall be included for all such affected sections.

3.3.2.2 If more than one Code is affected by a code change proposal, appropriate proposals shall be included for all such affected Codes and appropriate cross referencing shall be included in the supporting information.

3.3.3 **Multiple code change proposals to a code section.** A proponent shall not submit multiple code change proposals to the same code section. When a proponent submits multiple code change proposals to the same section, the proposals shall be considered as incomplete proposals and processed in accordance with Section 4.3. This restriction shall not apply to code change proposals that attempt to address differing subject matter within a code section.

3.3.4 **Text Presentation:** The text proposal shall be presented in the specific wording desired with deletions shown struck out with a single line and additions shown underlined with a single line.

3.3.4.1 A charging statement shall indicate the referenced code section(s) and whether the proposal is intended to be an addition, a deletion or a revision to existing Code text.

3.3.4.2 Whenever practical, the existing wording of the text shall be preserved with only such deletions and additions as necessary to accomplish the desired change.

3.3.4.3 Each proposal shall be in proper code format and terminology.

3.3.4.4 Each proposal shall be complete and specific in the text to eliminate unnecessary confusion or misinterpretation.

3.3.4.5 The proposed text shall be in mandatory terms.

3.3.5 **Supporting Information:** Each code change proposal shall include sufficient supporting information to indicate how the proposal is intended to affect the intent and application of the Code.

3.3.5.1 **Purpose:** The proponent shall clearly state the purpose of the proposed code change (e.g. clarify the Code; revise outdated material; substitute new or revised material for current provisions of the Code; add new requirements to the Code; delete current requirements, etc.)

3.3.5.2 **Reasons:** The proponent shall justify changing the current Code provisions, stating why the proposal is superior to the current provisions of the Code. Proposals which add or delete requirements shall be supported by a logical explanation which clearly shows why the current Code provisions are inadequate or overly restrictive, specifies the shortcomings of the current Code provisions and explains how such proposals will improve the Code.

3.3.5.3 **Substantiation:** The proponent shall substantiate the proposed code change based on technical information and substantiation. Substantiation provided which is reviewed in accordance with Section 4.2 and determined as not germane to the technical issues addressed in the proposed code change may be identified as such. The proponent shall be notified that the proposal is considered an incomplete proposal in accordance with Section 4.3 and the proposal shall be held until the deficiencies are corrected. The proponent shall have the right to appeal this action in accordance with the policy of the ICC Board. The burden of providing substantiating material lies with the proponent of the code change proposal. All substantiating material published by ICC is material that has been provided by the proponent and in so publishing ICC makes no representations or warranties about its quality or accuracy.

3.3.5.4 **Bibliography:** The proponent shall submit a bibliography of any substantiating material submitted with the code change proposal. The bibliography shall be published with the code change and the proponent shall make the substantiating materials available for review at the appropriate ICC office and during the public hearing.

3.3.5.5 **Copyright Release:** The proponent of code change proposals, floor modifications and public comments shall sign a copyright release reading: "I hereby grant and assign to ICC all rights in copyright I may have in any authorship contributions I make to ICC in connection with any proposal and public comment, in its original form submitted or revised form, including written and verbal modifications submitted in accordance Section 5.5.2. I understand that I will have no rights in any ICC publications that use such contributions in the form submitted by me or another similar form and certify that such contributions are not protected by the copyright of any other person or entity."

3.3.5.6 **Cost Impact:** The proponent shall indicate one of the following regarding the cost impact of the code change proposal: 1) the code change proposal will increase the cost of construction; or 2) the code change proposal will not increase the cost of construction. The proponent should submit information that supports their claim. Any information submitted will be considered by the code development committee. This information will be included in the bibliography of the published code change proposal.

3.4 **Number:** One copy of each code change proposal, two copies of each proposed new referenced standard and one copy of all substantiating information shall be submitted. Additional copies may be requested when determined necessary by the Secretariat to allow such information to be distributed to the code development committee. Where such additional copies are requested, it shall be the responsibility of the proponent to send such copies to the respective code development committee. A copy of the code change proposal in electronic form is preferred.

3.5 **Submittal Deadline:** Each code change proposal shall be received at the office of the Secretariat by the posted deadline. Such posting shall occur no later than 120 days prior to the code change deadline. The submitter of a proposed code change is responsible for the proper and timely receipt of all pertinent materials by the Secretariat.

3.6 **Referenced Standards:** In order for a standard to be considered for reference or to continue to be referenced by the Codes, a standard shall meet the following criteria:

3.6.1 **Code References:**

3.6.1.1 The standard, including title and date, and the manner in which it is to be utilized shall be specifically referenced in the Code text.

3.6.1.2 The need for the standard to be referenced shall be established.

3.6.2 **Standard Content:**

3.6.2.1 A standard or portions of a standard intended to be enforced shall be written in mandatory language.

3.6.2.2 The standard shall be appropriate for the subject covered.

3.6.2.3 All terms shall be defined when they deviate from an ordinarily accepted meaning or a dictionary definition.

3.6.2.4 The scope or application of a standard shall be clearly described.

3.6.2.5 The standard shall not have the effect of requiring proprietary materials.

3.6.2.6 The standard shall not prescribe a proprietary agency for quality control or testing.

3.6.2.7 The test standard shall describe, in detail, preparation of the test sample, sample selection or both.

3.6.2.8 The test standard shall prescribe the reporting format for the test results. The format shall identify the key performance criteria for the element(s) tested.

3.6.2.9 The measure of performance for which the test is conducted shall be clearly defined in either the test standard or in Code text.

3.6.2.10 The standard shall not state that its provisions shall govern whenever the referenced standard is in conflict with the requirements of the referencing Code.

3.6.2.11 The preface to the standard shall announce that the standard is promulgated according to a consensus procedure.

3.6.3 Standard Promulgation:

3.6.3.1 Code change proposals with corresponding changes to the code text which include a reference to a proposed new standard or a proposed update of an existing referenced shall comply with this section. The standard shall be completed and readily available prior to Final Action Consideration based on the cycle of code development which includes the proposed code change proposal. In order for a new standard to be considered for reference by the Code, such standard shall be submitted in at least a consensus draft form in accordance with Section 3.4. If a new standard is not submitted in at least draft form, the code change shall be considered incomplete and shall not be processed. Updating of standards without corresponding code text changes shall be accomplished administratively in accordance with Section 4.5.

3.6.3.2 The standard shall be developed and maintained through a consensus process such as ASTM or ANSI.

4.0 Processing of Proposals

4.1 Intent: The processing of code change proposals is intended to ensure that each proposal complies with these Rules of Procedure and that the resulting published proposal accurately reflects that proponent's intent.

4.2 Review: Upon receipt in the Secretariat's office, the code change proposals will be checked for compliance with these Rules of Procedure as to division, separation, number of copies, form, language, terminology, supporting statements and substantiating data. Where a code change proposal consists of multiple parts which fall under the maintenance responsibilities of different code committees, the Secretariat shall determine the code committee responsible for determining the committee action in accordance with Section 5.6.

4.3 Incomplete Proposals: When a code change proposal is submitted with incorrect format, without the required information or judged as not in compliance with these Rules of Procedure, the Secretariat shall notify the proponent of the specific deficiencies and the proposal shall be held until the deficiencies are corrected, with a final date set for receipt of a corrected submittal. If the Secretariat receives the corrected proposal after the final date, the proposal shall be held over until the next code development cycle. Where there are otherwise no deficiencies addressed by this section, a proposal that incorporates a new referenced standard shall be processed with an analysis of referenced standard's compliance with the criteria set forth in Section 3.6.

4.4 Editorial: The Chief Executive Officer shall have the authority at all times to make editorial and format changes to the Code text, or any approved changes, consistent with the intent, provisions and style of the Code. An editorial or format change is a text change that does not affect the scope or application of the code requirements.

4.5 Updating Standards:

4.5.1 Standards referenced in the I-Codes: The updating of standards referenced by the Codes shall be accomplished administratively by the Administrative code development committee in accordance with these full procedures except that the deadline for availability of the updated standard and receipt by the Secretariat shall be December 1 of the third year of each code cycle. The published version of the new edition of the Code which references the standard will refer to the updated edition of the standard. If the standard is not available by the deadline, the edition of the standard as referenced by the newly published Code shall revert back to the reference contained in the previous edition and an errata to the Code issued Multiple standards to be updated may be included in a single proposal.

4.6 Preparation: All code change proposals in compliance with these procedures shall be prepared in a standard manner by the Secretariat and be assigned separate, distinct and consecutive numbers. The Secretariat shall coordinate related proposals submitted in accordance with Section 3.3.2 to facilitate the hearing process.

4.7 Publication: All code change proposals shall be posted on the ICC website at least 30 days prior to the public hearing on those proposals and shall constitute the agenda for the public hearing. Code change proposals which have not been published shall not be considered.

5.0 Public Hearing

5.1 Intent: The intent of the public hearing is to permit interested parties to present their views including the cost and benefits on the code change proposals on the published agenda. The code development committee will consider such comments as may be presented in the development of their action on the disposition of such proposals. At the conclusion of the code development committee deliberations, the committee action on each code change proposal shall be placed before the hearing assembly for consideration in accordance with Section 5.7.

5.2 Committee: The Code Development Committees shall be appointed by the Board of Directors.

5.2.1 Chairman/Moderator: The Chairman and Vice-Chairman shall be appointed by the Steering Committee on Councils from the appointed members of the committee. The ICC President shall appoint one or more Moderators who shall act as presiding officer for the public hearing.

5.2.2 Conflict of Interest: A committee member shall withdraw from and take no part in those matters with which the committee member has an undisclosed financial, business or property interest. The committee member shall not participate in any committee discussion on the matter or any committee vote. A committee member who is a proponent of a proposal shall not participate in any committee discussion on the matter or any committee vote. Such committee member shall be permitted to participate in the floor discussion in accordance with Section 5.5 by stepping down from the dais.

5.2.3 Representation of Interest: Committee members shall not represent themselves as official or unofficial representatives of the ICC except at regularly convened meetings of the committee.

5.2.4 Committee Composition: The committee may consist of representation from multiple interests. A minimum of thirty-three and one-third percent (33.3%) of the committee members shall be regulators.

5.3 Date and Location: The date and location of each public hearing shall be announced not less than 60 days prior to the date of the public hearing.

5.4 General Procedures: *The Robert's Rules of Order* shall be the formal procedure for the conduct of the public hearing except as a specific provision of these Rules of Procedure may otherwise dictate. A quorum shall consist of a majority of the voting members of the committee.

5.4.1 Chair Voting: The Chairman of the committee shall vote only when the vote cast will break a tie vote of the committee.

5.4.2 Open Meetings: Public hearings of the Code Development Committees are open meetings. Any interested person may attend and participate in the Floor Discussion and Assembly Consideration portions of the hearing. Only eligible voters (see Section 5.7.4) are permitted to vote on Assembly Considerations. Only Code Development Committee members may participate in the Committee Action portion of the hearings (see Section 5.6). Participants shall not advocate a position on specific code changes with Committee Members other than through the methods provided in this policy.

5.4.3 Presentation of Material at the Public Hearing: Information to be provided at the hearing shall be limited to verbal presentations and modifications submitted in accordance with Section 5.5.2. Each individual presenting information at the hearing shall state their name and affiliation, and shall identify any entities or individuals they are representing in connection with their testimony. Audio-visual presentations are not permitted. Substantiating material submitted in accordance with Section 3.3.4.4 and other material submitted in response to a code change proposal shall be located in a designated area in the hearing room and shall not be distributed to the code development committee at the public hearing.

5.4.4 Agenda Order: The Secretariat shall publish an agenda for each public hearing, placing individual code change proposals in a logical order to facilitate the hearing. Any public hearing attendee may move to revise the agenda order as the first order of business at the public hearing, or at any time during the hearing except while another proposal is being discussed. Preference shall be given to grouping like subjects together, and for moving items back to a later position on the agenda as opposed to moving items forward to an earlier position. A motion to revise the agenda order is subject to a 2/3 vote of those present and voting.

5.4.5 Reconsideration: There shall be no reconsideration of a proposed code change after it has been voted on by the committee in accordance with Section 5.6; or, in the case of assembly consideration, there shall be no reconsideration of a proposed code change after it has been voted on by the assembly in accordance with Section 5.7.

5.4.6 Time Limits: Time limits shall be established as part of the agenda for testimony on all proposed changes at the beginning of each hearing session. Each person requesting to testify on a change shall be given equal time. In the interest of time and fairness to all hearing participants, the Moderator shall have limited authority to modify time limitations on debate. The Moderator shall have the authority to adjust time limits as necessary in order to complete the hearing agenda.

5.4.6.1 Time Keeping: Keeping of time for testimony by an individual shall be by an automatic timing device. Remaining time shall be evident to the person testifying. Interruptions during testimony shall not be tolerated. The Moderator shall maintain appropriate decorum during all testimony.

5.4.6.2 Proponent Testimony: The Proponent is permitted to waive an initial statement. The Proponent shall be permitted to have the amount of time that would have been allocated during the initial testimony period plus the amount of time that would be allocated for rebuttal. Where the code change proposal is submitted by multiple proponents, this provision shall permit only one proponent of the joint submittal to be allotted additional time for rebuttal.

5.4.7 Points of Order: Any person participating in the public hearing may challenge a procedural ruling of the Moderator or the Chairman. A majority vote of the eligible voters as determined in Section 5.7.4 shall determine the decision.

5.5 Floor Discussion: The Moderator shall place each code change proposal before the hearing for discussion by identifying the proposal and by regulating discussion as follows:

5.5.1 Discussion Order:

1. *Proponents.* The Moderator shall begin by asking the proponent and then others in support of the proposal for their comments.
2. *Opponents.* After discussion by those in support of a proposal, those opposed hereto, if any, shall have the opportunity to present their views.
3. *Rebuttal in support.* Proponents shall then have the opportunity to rebut points raised by the opponents.
4. *Re-rebuttal in opposition.* Opponents shall then have the opportunity to respond to the proponent's rebuttal.

5.5.2 Modifications: Modifications to proposals may be suggested from the floor by any person participating in the public hearing. The person proposing the modification is deemed to be the proponent of the modification.

5.5.2.1 Submission and Written Copies. All modifications must be written, unless determined by the Chairman to be either editorial or minor in nature. The modification proponent shall provide 20 copies to the Secretariat for distribution to the committee.

5.5.2.2 Criteria. The Chairman shall rule proposed modifications in or out of order before they are discussed on the floor. A proposed modification shall be ruled out of order if it:

1. is not legible, unless not required to be written in accordance with Section 5.5.2.1; or

2. changes the scope of the original proposal; or
3. is not readily understood to allow a proper assessment of its impact on the original proposal or the code.

The ruling of the Chairman on whether or not the modification is in or out of order shall be final and is not subject to a point of order in accordance with Section 5.4.7.

5.5.2.3 **Testimony.** When a modification is offered from the floor and ruled in order by the Chairman, a specific floor discussion on that modification is to commence in accordance with the procedures listed in Section 5.5.1.

5.6 **Committee Action:** Following the floor discussion of each code change proposal, one of the following motions shall be made and seconded by members of the committee.

1. Approve the code change proposal as submitted (AS) or
2. Approve the code change proposal as modified with specific modifications (AM), or
3. Disapprove the code change proposal (D)

Discussion on this motion shall be limited to Code Development Committee members. If a committee member proposes a modification which had not been proposed during floor discussion, the Chairman shall rule on the modification in accordance with Section 5.5.2.2 If a committee member raises a matter of issue, including a proposed modification, which has not been proposed or discussed during the floor discussion, the Moderator shall suspend the committee discussion and shall reopen the floor discussion for comments on the specific matter or issue. Upon receipt of all comments from the floor, the Moderator shall resume committee discussion.

The Code Development Committee shall vote on each motion with the majority dictating the committee's action. Committee action on each code change proposal shall be completed when one of the motions noted above has been approved. Each committee vote shall be supported by a reason.

The Code Development Committee shall maintain a record of its proceedings including the action on each code change proposal.

5.7 **Assembly Consideration:** At the conclusion of the committee's action on a code change proposal and before the next code change proposal is called to the floor, the Moderator shall ask for a motion from the public hearing attendees who may object to the committee's action. If a motion in accordance with Section 5.7.1 is not brought forward on the committee's action, the results of the public hearing shall be established by the committee's action. If a motion in accordance with Section 5.7.1 is brought forward and is sustained in accordance with Section 5.7.3, both the committee's action and the assemblies' action shall be reported as the results of the public hearing.

5.7.1 **Floor Motion:** Any attendee may raise an objection to the committee's action in which case the attendee will be able to make a motion to:

1. Approve the code change proposal as submitted from the floor (ASF), or
2. Approve the code change proposal as modified from the floor (AMF) with a specific modification that has been previously offered from the floor and ruled in order by the Chairman during floor discussion (see Section 5.5.2) or has been offered by a member of the Committee and ruled in order by the Chairman during committee discussion (see Section 5.6), or
3. Disapprove the code change proposal from the floor (DF).

5.7.2 **Discussion:** On receipt of a second to the floor motion, the Moderator shall place the motion before the assembly for a vote. No additional testimony shall be permitted.

5.7.3 **Assembly Action:** A successful assembly action shall be a majority vote of the votes cast by eligible voters (See 5.7.4).

5.7.4 **Eligible Voters:** All members of ICC in attendance at the public hearing shall be eligible to vote on floor motions. Each member is entitled to one vote, except that each Governmental Member Voting Representative in attendance may vote on behalf of its Governmental Member. Code Development Committee members shall be eligible to vote on floor motions. Application, whether new or updated, for ICC membership must be received by the Code Council ten days prior to the commencement of the first day of the public hearing.

5.8 **Report of the Public Hearing:** The results of the public hearing, including committee action and successful assembly action, shall be posted on the ICC website not less than 60 days prior to Final Action Consideration except as approved by the ICC Board.

6.0 Public Comments

6.1 **Intent:** The public comment process gives attendees at the Final Action Hearing an opportunity to consider specific objections to the results of the public hearing and more thoughtfully prepare for the discussion for Final Action Consideration. The public comment process expedites the Final Action Consideration at the Final Action Hearing by limiting the items discussed to the following:

6.1.1 Consideration of items for which a public comment has been submitted; and

6.1.2 Consideration of items which received a successful assembly action at the public hearing.

6.2 **Deadline:** The deadline for receipt of a public comment to the results of the public hearing shall be announced at the public hearing but shall not be less than 30 days from the availability of the report of the results of the public hearing (see Section 5.8).

6.3 **Withdrawal of Public Comment:** A public comment may be withdrawn by the public commenter at any time prior to Final Action Consideration of that comment. A withdrawn public comment shall not be subject to Final Action Consideration. If the only public comment to a code change proposal is withdrawn by the public commenter prior to the vote on the consent agenda in accordance with Section 7.3.4, the proposal shall be considered as part of the consent agenda. If the only public comment to a code change proposal is withdrawn by the public commenter after the vote on the consent agenda in accordance with Section 7.3.4, the proposal shall continue as part of the individual consent agenda in accordance with Section 7.3.5, however the public comment shall not be subject to Final Action Consideration.

6.4 **Form and Content of Public Comments:** Any interested person, persons, or group may submit a public comment to the results of the public hearing which will be considered when in conformance to these requirements. Each public comment to a code change proposal shall be submitted separately and shall be complete in itself. Each public comment shall contain the following information:

6.4.1 **Public comment:** Each public comment shall include the name, title, mailing address, telephone number and email address of the public commenter. Email addresses shall be published with the public comments unless the commenter otherwise requests on submittal form. If group, organization, or committee submits a public comment, an individual with prime responsibility shall be indicated. If a public comment is submitted on behalf a client, group, organization or committee, the name and mailing address of the client, group, organization or committee shall be indicated. The scope of the public comment shall be consistent with the scope of the original code change proposal, committee action or successful assembly action. Public comments which are determined as not within the scope of the code change proposal, committee action or successful assembly action shall be identified as such. The public commenter shall be notified that the public comment is considered an incomplete public comment in accordance with Section 6.5.1 and the public comment shall be held until the deficiencies are corrected. A copyright release in accordance with Section 3.3.4.5 shall be provided with the public comment.

6.4.2 **Code Reference:** Each public comment shall include the code change proposal number and the results of the public hearing, including successful assembly actions, on the code change proposal to which the public comment is directed.

6.4.3 **Multiple public comments to a code change proposal.** A proponent shall not submit multiple public comments to the same code change proposal. When a proponent submits multiple public comments to the same code change proposal, the public comments shall be considered as incomplete public comments and processed in accordance with Section 6.5.1. This restriction shall not apply to public comments that attempt to address differing subject matter within a code section.

6.4.4 Desired Final Action: The public comment shall indicate the desired final action as one of the following:

1. Approve the code change proposal as submitted (AS), or
2. Approve the code change proposal as modified (AM) by one or more specific modifications published in the Results of the Public Hearing or published in a public comment, or
3. Disapprove the code change proposal (D)

6.4.5 Supporting Information: The public comment shall include in a statement containing a reason and justification for the desired final action on the code change proposal. Reasons and justification which are reviewed in accordance with Section 6.4 and determined as not germane to the technical issues addressed in the code change proposal or committee action may be identified as such. The public commenter shall be notified that the public comment is considered an incomplete public comment in accordance with Section 6.5.1 and the public comment shall be held until the deficiencies are corrected. The public commenter shall have the right to appeal this action in accordance with the policy of the ICC Board. A bibliography of any substantiating material submitted with a public comment shall be published with the public comment and the substantiating material shall be made available at the Final Action Hearing. All substantiating material published by ICC is material that has been provided by the proponent and in so publishing ICC makes no representations or warranties about its quality or accuracy.

6.4.6 Number: One copy of each public comment and one copy of all substantiating information shall be submitted. Additional copies may be requested when determined necessary by the Secretariat. A copy of the public comment in electronic form is preferred.

6.5 Review: The Secretariat shall be responsible for reviewing all submitted public comments from an editorial and technical viewpoint similar to the review of code change proposals (See Section 4.2).

6.5.1 Incomplete Public Comment: When a public comment is submitted with incorrect format, without the required information or judged as not in compliance with these Rules of Procedure, the public comment shall not be processed. The Secretariat shall notify the public commenter of the specific deficiencies and the public comment shall be held until the deficiencies are corrected, or the public comment shall be returned to the public commenter with instructions to correct the deficiencies with a final date set for receipt of the corrected public comment.

6.5.2 Duplications: On receipt of duplicate or parallel public comments, the Secretariat may consolidate such public comments for Final Action Consideration. Each public commenter shall be notified of this action when it occurs.

6.5.3 Deadline: Public comments received by the Secretariat after the deadline set for receipt shall not be published and shall not be considered as part of the Final Action Consideration.

6.6 Publication: The public hearing results on code change proposals that have not been public commented and the code change proposals with public commented public hearing results and successful assembly actions shall constitute the Final Action Agenda. The Final Action Agenda shall be posted on the ICC website at least 30 days prior to Final Action consideration.

7.0 Final Action Consideration

7.1 Intent: The purpose of Final Action Consideration is to make a final determination of all code change proposals which have been considered in a code development cycle by a vote cast by eligible voters (see Section 7.4).

7.2 Agenda: The final action consent agenda shall be comprised of proposals which have neither an assembly action nor public comment. The agenda for public testimony and individual consideration shall be comprised of proposals which have a successful assembly action or public comment (see Sections 5.7 and 6.0).

7.3 Procedure: *The Robert's Rules of Order* shall be the formal procedure for the conduct of the Final Action Consideration except as these Rules of Procedure may otherwise dictate.

7.3.1 Open Meetings: Public hearings for Final Action Consideration are open meetings. Any interested person may attend and participate in the Floor Discussion.

7.3.2 Agenda Order: The Secretariat shall publish an agenda for Final Action Consideration, placing individual code change proposals and public comments in a logical order to facilitate the hearing. The proponents or opponents of any proposal or public comment may move to revise the agenda order as the first order of business at the public hearing, or at any time during the hearing except while another proposal is being discussed. Preference shall be given to grouping like subjects together and for moving items back to a later position on the agenda as opposed to moving items forward to an earlier position. A motion to revise the agenda order is subject to a 2/3 vote of those present and voting.

7.3.3 Presentation of Material at the Public Hearing: Information to be provided at the hearing shall be limited to verbal presentations. Each individual presenting information at the hearing shall state their name and affiliation, and shall identify any entities or individuals they are representing in connection with their testimony. Audio-visual presentations are not permitted. Substantiating material submitted in accordance with Section 6.4.4 and other material submitted in response to a code change proposal or public comment shall be located in a designated area in the hearing room.

7.3.4 Final Action Consent Agenda: The final action consent agenda (see Section 7.2) shall be placed before the assembly with a single motion for final action in accordance with the results of the public hearing. When the motion has been seconded, the vote shall be taken with no testimony being allowed. A simple majority (50% plus one) based on the number of votes cast by eligible voters shall decide the motion.

7.3.5 Individual Consideration Agenda: Upon completion of the final action consent vote, all proposed changes not on the final action consent agenda shall be placed before the assembly for individual consideration of each item (see Section 7.2).

7.3.6 Reconsideration: There shall be no reconsideration of a proposed code change after it has been voted on in accordance with Section 7.3.8.

7.3.7 Time Limits: Time limits shall be established as part of the agenda for testimony on all proposed changes at the beginning of each hearing session. Each person requesting to testify on a change shall be given equal time. In the interest of time and fairness to all hearing participants, the Moderator shall have limited authority to modify time limitations on debate. The Moderator shall have the authority to adjust time limits as necessary in order to complete the hearing agenda.

7.3.7.1 Time Keeping: Keeping of time for testimony by an individual shall be by an automatic timing device. Remaining time shall be evident to the person testifying. Interruptions during testimony shall not be tolerated. The Moderator shall maintain appropriate decorum during all testimony.

7.3.8 Discussion and Voting: Discussion and voting on proposals being individually considered shall be in accordance with the following procedures:

7.3.8.1 Allowable Final Action Motions: The only allowable motions for final action are Approval as Submitted, Approval as Modified by one or more modifications published in the Final Action Agenda, and Disapproval.

7.3.8.2 Initial Motion: The Code Development Committee action shall be the initial motion considered.

7.3.8.3 Motions for Modifications: Whenever a motion under consideration is for Approval as Submitted or Approval as Modified, a subsequent motion and second for a modification published in the Final Action Agenda may be made (see Section 6.4.3). Each subsequent motion for modification, if any, shall be individually discussed and voted before returning to the main motion. A two-thirds majority based on the number of votes cast by eligible voters shall be required for a successful motion on all modifications.

7.3.8.4 Voting: After dispensing with all motions for modifications, if any, and upon completion of discussion on the main motion, the Moderator shall then ask for the vote on the main motion. If the motion fails to receive the majority required in Section 7.5, the Moderator shall ask for a new motion.

7.3.8.5 **Subsequent Motion:** If the initial motion is unsuccessful, a motion for one of the other allowable final actions shall be made (see Section 7.3.8.1) and dispensed with until a successful final action is achieved. If a successful final action is not achieved, Section 7.5.1 shall apply.

7.3.9 **Proponent testimony:** The Proponent of a public comment is permitted to waive an initial statement. The Proponent of the public comment shall be permitted to have the amount of time that would have been allocated during the initial testimony period plus the amount of time that would be allocated for rebuttal. Where a public comment is submitted by multiple proponents, this provision shall permit only one proponent of the joint submittal to waive an initial statement.

7.3.10 **Points of Order:** Any person participating in the public hearing may challenge a procedural ruling of the Moderator. A majority vote of the eligible voters as determined in Section 5.7.4 shall determine the decision.

7.4 **Eligible voters:** ICC Governmental Member Representatives and Honorary Members in attendance at the Final Action Hearing shall have one vote per eligible attendee on all International Codes. Applications for Governmental Membership must be received by the ICC by April 1st of the applicable year in order for its designated representatives to be eligible to vote at the Final Action Hearing. Applications, whether new or updated, for governmental member voting representative status must be received by the Code Council thirty (30) days prior to the commencement of the first day of the Final Action Hearing in order for any designated representative to be eligible to vote. An individual designated as a Governmental Member Voting Representative shall provide sufficient information to establish eligibility as defined in the ICC Bylaws. The Executive Committee of the ICC Board, in its discretion, shall have the authority to address questions related to eligibility. Decisions of the Executive Committee shall be final and not appealable pursuant to CP 1, other than claims of fraud or misrepresentation, supported by reasonably credible evidence, that were material to the outcome of the Final Action Hearing.

7.5 **Majorities for Final Action:** The required voting majority based on the number of votes cast of eligible voters shall be in accordance with the following table:

Committee Action (see note)	**Desired Final Action**		
	AS	**AM**	**D**
AS	Simple Majority	2/3 Majority	Simple Majority
AM	2/3 Majority	Simple Majority to sustain the Public Hearing Action or; 2/3 Majority on additional modifications and 2/3 on overall AM	Simple Majority
D	2/3 Majority	2/3 Majority	Simple Majority

7.5.1 **Failure to Achieve Majority Vote:** In the event that a code change proposal does not receive any of the required majorities for final action in Section 7.5, final action on the code change proposal in question shall be disapproval.

7.6 **Publication:** The Final action on all proposed code changes shall be published as soon as practicable after the determination of final action. The exact wording of any resulting text modifications shall be made available to any interested party.

8.0 Appeals

8.1 **Right to Appeal:** Any person may appeal an action or inaction in accordance with CP-1.

2012 ICC CODE DEVELOPMENT CYCLE
CROSS INDEX OF PROPOSED CODE CHANGES

Some of the proposed code changes include sections that are outside of the scope of the chapters or the code listed in the table of 2012/2013 Staff Secretaries on page x. This is done in order to facilitate coordination among the International Codes which is one of the fundamental principles of the International Codes.

Listed in this cross index are proposed code changes that include sections of codes or codes other than those listed on page ix. For example, IBC Section 703.2.3 is proposed for revision in code change S70-12, which is to be heard by the IBC Structural Committee. This section of the IBC is typically the responsibility of the IBC Fire Safety Committee as listed in the table of 2012/2013 Staff Secretaries. It is therefore identified in this cross index. Another example is Section 905.4 of the International Fire Code. The International Fire Code is normally maintained by the IFC Committee, but Section 905.4 will be considered for revision in proposed code change E4-12 which will be placed on the IBC Means of Egress Committee agenda. In some instances, there are other subsections that are revised by an identified code change that is not included in the cross index. For example, numerous sections in Chapter 10 of the International Fire Code would be revised by the proposed changes to Chapter 10 of the IBC. This was done to keep the cross index brief enough for easy reference.

This information is provided to assist users in locating all of the proposed code changes that would affect a certain section or chapter. For example, to find all of the proposed code changes that would affect Chapter 7 of the IBC, review the proposed code changes in the portion of the monograph for the IBC Fire Safety Committee (listed with a FS prefix) then review this cross reference for Chapter 7 of the IBC for proposed code changes published in other code change groups. While care has been taken to be accurate, there may be some omissions in this list.

Letter prefix: Each proposed change number has a letter prefix that will identify where the proposal is published. The letter designations for proposed changes and the corresponding publications are as follows:

PREFIX	PROPOSED CHANGE GROUP (see monograph table of contents for location)
ADM	Administrative
E	International Building Code - Means of Egress
EB	International Existing Building Code
CE	International Energy Conservation Code – Commercial
RE	International Energy Conservation Code – Energy
F	International Fire Code
FG	International Fuel Gas Code
FS	International Building Code - Fire Safety
G	International Building Code – General
GEW	International Green Construction Code – Energy/Water
GG	International Green Construction Code – General
M	International Mechanical Code
PC	ICC Performance Code
P	International Plumbing Code
PSD	International Private Sewage Disposal Code
PM	International Property Maintenance Code
RE	International Residential Code - Building
RM	International Residential Code - Mechanical
RP	International Residential Code - Plumbing
S	International Building Code – Structural
SP	International Swimming Pool and Spa Code
WUIC	International Wildland-Urban Interface Code
Z	International Zoning Code

International Building Code		907.2.10.1	G71
		907.2.13.2	E4
101.4	G201	907.5.2.2	E4
101.4.7 (New)	G201	909.4.6	G32 Part II
104.11.3 (New)	FS73	909.9	S70
107.2.6	G198	909.18	S113, S117
110.3.5	S304	909.20	E4, E5
116.5	G201	909.21.7	S113
202	P27, P29	911.1.5	E4
403.5	E4, E7	1003.2	G62
404.6	FS41, FS99	Table 1004.1.2	G193
405.7.1	E3	1004.3	S90
410.6.1	E3	1005.7.2	G73
411.7	E3	1007.1	G237
414.7.2	E3	1007.6	G57
505.2.3	E7	1009.3	FS51, FS99
505.3	E101	1015.2.1	G85
703.2.3	S70	1015.4	G57
706.1	G103	1015.5	G57
707.5.1	E7	Table 1016.2	G32 Part I, G87
707.6	E4	1018.1	G31 Part I
707.7.1	E4	Table 1018.1	G32 Part I
709.5	G31 Part I	Table 1018.2	G32 part I
710.8	G32 Part I	1018.4	G32 Part I
711.4	E7	Table 1021.2(2)	G57
712.1.8	G32 Part I, G54, E7	1022.7	G85
712.1.12	E7	1027.1	G175
713.1	E4, E7	1203.1	M36, M37, M38, M39
713.14.1	G32 Part I, E110	1205.4	E4
713.14.1.2 (new)	G174 Part III	1207.1	E4
Table 716.5	G51, E4	1403.7	S102, S103
716.5.3	E3	1404.13 (New)	S309
717.5.5	G32 Part I	1507.16	G98
718.2.4	E4	1507.16.1	G98
722.5	S238	1508.1	FS178
Table 803.9	E4	1609.1.2	G199
901.5	S90	1808.7.3	G193
903.2.6	G31 Part II, G32 Part II	2103.15(New)	FS177
903.2.8	G31 Part II	2110.1.1	E4
903.2.8.1	G31 Part II	2303.1.4 (new)	G142 Part II
903.2.8.2 (new)	G31 Part II	2308.12.7	E4
903.2.8.2	G31 Part II	2405.3	G199
903.2.8.3 (new)	G31 Part II	2406.4	G193
903.3.1.3	G31 Part II	2406.4.5	G193
903.3.2	G32 Part II	2406.4.6	E4
905.3.3	E4	2406.4.7	E4
905.4	E4	2607.4	G199
906.2	G71	2609.4	G193, G199
Table 906.3(1)	G71	Table 2902.1.2 (New)	P27
Table 906.3(2)	G71	2902.2	P34
907.2.6	G32 Part II, G71	2902.3	P35
907.2.6.1	G31 Part II	2902.3.1	P36
907.2.6.4 (new)	G32 Part II	2902.3.5	P37

International Building Code (continued)	
2902.4.1	P39
2902.6 (New)	P30
Table 2902.1.2 (New)	P27
3007.7	E110
3007.9	FS138
3008.7	E110
3008.9	FS138
3111.1	S3
3306.8	S90
3311.1	E4
3401.2	S90
3406.1.3	E4
3406.4	E4
3411.8.4	E4
3411.8.15	E211
International Fire Code	
202	G1, G2, G11, G13, G31 Part I, G32 Part I, G43, G70
Definition of Group A	G27
Definition of Group B	G28, G29, G30
Definition of Group E	G27
Definition of Group I	G31 Part I, G32 Part I, G33, G34, G35, G36, G37
Definition of Group R	G31 Part I, G34, G36, G38, G39, G40, G41
Definition of Group S	G42
508.1.5	E4
604.2.16 (new)	G77
903.2.6	G31 Part II, G32 Part II
903.2.8	G31 Part II
903.2.8.1	G31 Part II
903.2.8.2 (new)	G31 Part II
903.2.8.2	G31 Part II
905.3.3	E4
905.4	E4
903.2.8.3 (new)	G31 Part II
903.3.1.3	G31 Part II
903.3.2	G32 Part II
906.2	G71
Table 906.3(1)	G71
Table 906.3(2)	G71
907.2.6	G32 Part II, G71
907.2.6.1	G31 Part II
907.2.6.4 (new)	G32 Part II
907.2.10.1	G71
907.2.13.2	E4
907.5.2.2	E4
909.4.6	G32 Part II
1003.2	G62
Table 1004.1.2	G193
1005.7.2	G73
1007.1	G237
1007.6	G57
1015.2.1	G85
1015.4	G57
1015.5	G57
Table 1016.2	G32 Part I, G87
1018.1	G31 Part I
Table 1018.1	G32 Part I
Table 1018.2	G32 part I
1018.4	G32 Part I
Table 1021.2(2)	G57
1022.7	G85
1027.1	G175
1104.6.1	E4
1104.9	E4
1104.10	E4
1104.12	E4
1104.16	E4
1104.20	E4
1104.21	E4
1104.23	E4
3313.1	E4
5005.4.4	E3
5704.2.9.4	E4
5706.5.1.12	E4
INTERNATIONAL PLUMBING CODE	
202	G8, G193 Part IV, P3(HEARD BY IBC-S)
309.2	P20 (HEARD BY IBC-S)
403.3.3	G71
403.3.4	G71
403.5	G71
423.1	G193 Part IV
612.1	G193 Part IV
801.1	G193 Part IV
802.1.4	G193 Part IV
INTERNATIONAL MECHANICAL CODE	
202	G8
304.11	E108
306.5.1	E4
403.2.1	G193 Part II
Table 403.3	G193 Part II
601.3	E228, E229
901.5	FG3

INTERNATIONAL MECHANICAL CODE (continued)	
901.6	FG3
926.2	FG38
926.3	FG38
1107.2	E4
1401.1	G193 Part II
INTERNATIONAL FUEL GAS CODE	
202	G8
306.5.1	E4
614.6	M71
Section 617	G193 Part III
617.1	G193 Part III
629.1	M169
INTERNATIONAL PRIVATE SEWAGE DISPOSAL CODE	
202	G8, P228 (HEARD BY IBC-S)
401.3.2	G193 Part IV
Table 406.1	G193 Part IV
Table 604.1(2)	G193 Part IV
Table 802.7.2	G193 Part IV
Table 802.8	G193 Part IV
INTERNATIONAL EXISTING BUILDING CODE	
Chapters 3 through 14	G205
202	G23, G24
402.1	G210
402.4	G211
403.1	G210, G212
403.3 (new)	G213 Part I
403.3.1 (new)	G213 Part I
403.3.2 (new)	G213 Part I
403.3.3 (new)	G213 Part I
403.4	G211
403.4.1(new)	G214
403.4.5 (new)	G215, G216, G217
403.5 (new)	G218
403.7 (new)	G219
403.7.1(new)	G219
403.7.2(new)	G219
403.7.3(new)	G219
404.1	G212
404.2 (new)	G220
404.2	G221 Part I
404.2.1	G211
404.2.2	G222
404.3	G223
404.3.1	G224 Part I
404.4	G222
404.2.3	G211, G212
404.5	G212
406.1	G225, G226
410.5.1(new)	G235
410.6	G235, G236, G237
410.7	G237, G238, G240
410.7.1	G240
410.8	G239, E211
410.8 (new)	G237
410.8.1 (new)	G237
410.8.4	G241
410.8.6	G242
410.8.9	G235, G236
410.8.11	G243
606.2.2	G221 Part II
606.2.3.1	G224 Part II
907.2	G213 Part II
907.2.1	G213 Part II
907.2.2	G213 Part II
1401.2	G244
1401.2.5	G245
1401.3.2	G246
Table 1401.3.2(new)	G246
1401.6	G244
1401.6.1	G101
1401.6.1.1	G101
1401.6.2	G101, G244
1401.6.2.1	G101
1401.6.4	G244
Table 1401.6.4	G244
1401.6.5	G244
Table 1401.6.5	G57, G244
1401.6.6	G51
1401.6.7	G244
1401.6.8	G244
Table 1401.6.8	G244
1401.6.8.1	G244
1401.6.9	G244
Table 1401.6.9	G244
1401.6.10	G244
Table 1401.6.10	G244
1401.6.11	G244
Table 1401.6.11	G244
1401.6.12	G244
Table 1401.6.12	G244
1401.6.12.1	G244
1401.6.16	G244
1401.6.16.1	G244
1401.6.17	G244
Table 1401.6.17	G244
1401.6.18	G244
Table 1401.6.18	G244
1401.6.20 (new)	G244
Table 1401.6.20 (new)	G244
1401.6.21 (new)	G244

INTERNATIONAL EXISTING BUILDING CODE (continued)	
Table 1401.6.21.1 (new)	G244
1401.6.21.1.1(new)	G244
1401.6.21.2(new)	G244
Table 1401.6.21.2(new)	G244
1401.6.21.2.1(new)	G244
1401.6.21.3(new)	G244
Table 1401.6.21.3	G244
1401.6.21.3.1(new)	G244
Table 1401.7	G244
1401.8	G244
Table 1401.8	G244

2012 GROUP A CODE DEVELOPMENT HEARING SCHEDULE
April 29 – May 8, 2012
Sheraton Dallas Hotel

Unless noted by "Start no earlier than X am," each Code Committee will begin immediately upon completion of the hearings for the prior Committee. Thus the actual start times for the various Code Committees are tentative. The hearing volume is higher than previous cycles. The schedule anticipates that the hearings will finish by the times noted as "Finish" for each track.

Please note that the hearing start on Sunday, April 29th has been revised from 10:00 am to 12:00 pm from the originally posted version. Prior to the hearings starting at noon on Sunday, the following is also scheduled:

- Membership Councils: 8:00 am – 10:00 am
- CDP ACCESS update (Expanding code development participation): 10:15 am – 11:15 am

For more information on the scheduling of these two activities, be sure to check the link to the Member Committees page on the ICC Website: http://www.iccsafe.org/membership/pages/committees.aspx

	Sunday April 29	Monday April 30	Tuesday May 1	Wednesday May 2	Thursday May 3
TRACK 1	Start 12 pm IBC - FS End 9 pm	Start 8 am IBC - FS End 9 pm	Start 8 am IBC - FS IBC – G (Start no earlier than 8 am) End 9 pm	Start 8 am IBC - G End 9 pm	Start 8 am IBC – G IBC - E (Start no earlier than 8 am) End 9 pm
TRACK 2	Start 12 pm IFGC IPC/IPSDC End 9 pm	Start 8 am IPC/IPSDC End 9 pm	Start 8 am IPC/IPSDC IMC (Start no earlier than 8 am) End 9 pm	Start 8 am IMC End 9 pm	Start 8 am IMC IEBC – S (Start no earlier than 8 am) IBC – S End 9 pm

	Friday May 4	Saturday May 5	Sunday May 6	Monday May 7	Tuesday May 8
TRACK 1	Start 8 am IBC - E End 9 pm	Start 8 am IBC – E End 9 pm	Start 8 am IBC – E Finish 12 pm		
TRACK 2	Start 8 am IBC - S End 9 pm	Start 8 am IBC - S End 9 pm	Start 8 am IBC - S End 9 pm	Start 8 am IBC - S End 9 pm	Start 8 am IBC – S Finish 12 pm

Notes:

1. IEBC – S: Structural provisions in the IEBC to be heard by the IBC – Structural Code Committee.
2. Hearing times may be modified at the discretion of the Chairman.
3. Breaks will be announced. Lunch and dinner breaks planned for each track. There will not be a lunch break on Sunday, April 29th.

2012 PROPOSED CHANGES TO THE INTERNATIONAL CODES

2012 PROPOSED CHANGES TO THE INTERNATIONAL MECHANICAL CODE

MECHANICAL CODE COMMITTEE

Mark Riley, *Chair*
Mechanical Inspector
Safebuilt of Michigan – Inspecting City of Troy, Michigan
Troy, MI

Joseph R. Crum, CBO - *Vice Chair*
Deputy Building Official
City of DeLand
DeLand, FL

Wm. Scott Copp
Sr. Project Manager
T. Y. Lin International
Rochester, NY

David F. Hall, CFM
Director of Inspection Services – Building Official – Floodplain Administrator
City of Georgetown
Georgetown, TX

Dolan (Lanny) Huffman, Jr.
Rep: Air Conditioning Contractors of America
Vice President
Hickory Sheet Metal Co. Inc.
Hickory, NC

Dennis Martinelli
Supervising Combination Inspector
Fairfax County Government
Fairfax, VA

Antoine (Tony) Nassimos
Plumbing/Mechanical Subcode Official/
Construction Official
State of New Jersey-Treasury
Trenton, NJ

James Paschal, PE
Rep: American Society of Plumbing Engineers
Principle Engineer
Paschal Engineering & Forensic Consulting, Inc.
Ypsilanti, MI

Gary L. Scribner
Rep: Jurisdictional Members of the National Board Of Boiler & Pressure Vessel Inspectors
Deputy Chief
Missouri Division of Fire Safety
Jefferson City, MO

Frank Shingleton
Mgr. – Regulatory Management
Viega, LLC
Wichita, KS

Loren Swanson
Rep: NAHB
President
Southern Michigan Heating
Jackson, MI

John K. Taecker, PE
Senior Regulatory Engineer
Underwriters Laboratories, Inc.
San Jose, CA

Richard Vrana
Division Manager, Code Enforcement HVAC
City of Houston
Houston, TX

Staff Liaisons:
Gregg Gress
Senior Technical Staff
International Code Council
Country Club Hill, IL

TENTATIVE ORDER OF DISCUSSION
2012 PROPOSED CHANGES TO THE INTERNATIONAL MECHANICAL CODE

The following is the tentative order in which the proposed changes to the code will be discussed at the public hearings. Proposed changes which impact the same subject have been grouped to permit consideration in consecutive changes.

Proposed change numbers that are indented are those which are being heard out of numerical order. Indentation **does not** necessarily indicate that one change is related to another. Proposed changes may be grouped for purposes of discussion at the hearing at the discretion of the chair. Note that some IMC code change proposals may not be included on this list, as they are being heard by other committees. Please consult the Cross Index of Proposed Changes.

    G7-12
M1-12
M2-12
M3-12
M4-12
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M6-12
M7-12
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M208-12
M209-12
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M214-12

M1– 12
202

Proponent: Thomas Peterson, Brigham City, UT, Brigham City Corporation, representing the Utah Chapter of ICC
(Tpeterson@brighamcity.utah.gov)

Revise as follows:

CONDITIONED SPACE. An area, room or space enclosed within the building thermal envelope that is heated or cooled ~~by any equipment or appliance~~.

Reason: The change provides clarification that conditioned space is required to be inside the building thermal envelope. It also allows an unfinished basement to be considered conditioned space, if enclosed in the building thermal envelope, without the requirement of supply and return air by radiant heat transfer supplied by the non-insulated ductwork system.

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

M1-12

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

202-CONDITIONED SPACE-M-PETERSON.DOC

M2 – 12
202

Proponent: Brent Ursenbach, Salt Lake City, UT, Salt Lake County Planning and Development representing the Utah Chapter ICC
(bursenbach@slco.org)

Revise as follows:

CONDITIONED SPACE. An area, room or space that is ~~being heated or cooled by any *equipment* or *appliance*.~~ enclosed within the building thermal envelope and that is directly heated or cooled or that is indirectly heated or cooled. Spaces are indirectly heated or cooled where they communicate thru openings with conditioned spaces, where they are separated from conditioned spaces by un-insulated walls, floors or ceilings and where they contain un-insulated ducts, piping or other sources of heating or cooling.

Reason: Confusion exists between the two different definitions in the IMC and IECC. The IECC attempts to define how a space may be indirectly conditioned; however, further clarification is needed. This proposed change is similar to the definition in ASHRAE 90.1 – 2010.

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

M2-12

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

202-CONDITIONED SPACE-M-URSENBACH.DOC

M3–12
202

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

EXTRA-HEAVY-DUTY COOKING APPLIANCE. Extra-heavy-duty cooking appliances are those ~~include appliances~~ utilizing open flame combustion of solid fuel at any time. ~~such as wood, charcoal and briquettes. and mesquite to provide all or part of the heat source for cooking.~~

HEAVY-DUTY COOKING APPLIANCE. Heavy-duty cooking *appliances* include electric under-fired broilers, electric chain (conveyor) broilers, gas under-fired broilers, gas chain (conveyor) broilers, gas open-burner ranges (with or without oven), electric and gas wok ranges, smokers, smoker ovens, and electric and gas over-fired (upright) broilers and salamanders.

Reason: The definition of Extra-heavy-duty appliances does not appear to address smokers and smoker grills. The wood is not burned to contribute heat for cooking in these appliances, so these appliances seem to fall through the crack. Smokers would appear to require hoods based on Section 507.2.4. By defining smokers as “Heavy-duty” instead of “Extra-heavy-duty,” they can be placed under a Type I hood with other heavy-, medium- and light-duty appliances. There is no apparent reason for them to be under an independent exhaust system as is required for appliances that have open flame combustion. As revised, the definition distinguishes between appliances that produce only smoke and those that actually combust the solid fuel for heat.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M3-12

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

202-HEAVY DUTY COOKING APPLIANCES (NEW)-M-STRAUSBAUGH.PMGCAC.DOC

M4–12
202, Chapter 15

Proponent: Marcelo M. Hirschler, GBH International (gbhint@aol.com)

Add new definition as follows:

FIRE-RETARDANT TREATED WOOD. A homogeneous wood product that is impregnated with chemicals by a pressure process or other means during manufacture and that complies with the requirements of ASTM E2768.

Add new standard to Chapter 15 as follows:

ASTM E2768-11
Standard Test Method for Extended Duration Surface Burning Characteristics of Building Materials (30 min Tunnel Test) (2011), to Chapter 35, on Referenced Standards.

Reason: The IMC contains a reference to fire-retardant treated wood but no definition. This definition is added, which is consistent with section 2303.2 of the IBC. Note that ASTM has now issued a test method, ASTM E2768, which contains the three requirements discussed in section 2303.2, namely that a product be tested in accordance with ASTM E84 or UL 723, and exhibit a flame spread index of 25 or less, show no evidence of significant progressive combustion when the test is continued for 30 minutes (i.e. an additional 20-minute period over the standard ASTM E84 duration of 10 minutes) and that the flame front not progress more than 101/2 feet (3200 mm) beyond the centerline of the burners at any time during the test.

The existing definition of "fire-retardant treated wood" in chapter 2 of the IBC is inconsistent with the requirements within section 2303.2 of the IBC in two respects: (a) it can be met by a material that has minimal amount of fire retardant treatment and (b) it requires the fire retardant treatment to be incorporated by a "pressure treatment" and not, as in 2303.2, by a "pressure process or other means during manufacture". During the 2012 ICC code development process this issue was discussed, in proposal S201 (to the IBC and IRC) and associated comments, and the requirements in 2303.2 were upheld. The definition of fire-retardant treated wood in the IMC and in the IBC needs to be a stand-alone definition that contains the requirements and that is consistent with section 2303.2 of the IBC.

Moreover, the addition of the requirement that fire-retardant treated wood must be a "homogeneous" product is necessary to ensure that products that are coated or only partially impregnated with chemicals are not considered "fire-retardant treated wood" as they are not.

The IMC reference to fire-retardant treated wood can be found in section 1402.4.1.

Cost Impact: None

Analysis: A review of the standard proposed for inclusion in the code, [ASTM E2768-11] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M4-12

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

202-FIRE RETARDANT TREATED WOOD-M-HIRSCHLER.DOC

M5–12
202

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Add new definition as follows:

<u>**FLEXIBLE AIR CONNECTOR**. Flexible air connectors are tested for compliance with UL 181 with the exception of the fire penetration, puncture and impact tests of that standard. Flexible air connectors are labeled as such and are used to connect sections of ductwork, connect ductwork to equipment and connect ductwork to inlet and outlet terminals. The UL181 standard limits the length of flexible air connectors to 14 feet or less.</u>

Reason: The code does not define "flexible air connector." As seen in the field, flexible air connectors are often indistinguishable from flexible ducts and the only way to tell them apart is to look at their labels. It is the product listing and label that dictates whether the product is an air connector or an air duct.

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Cost Impact: None

M5-12

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

202-FLEXIBLE AIR CONNECTOR-M-STRAUSBAUGH-PMGCAC.DOC

M6–12
202

Proponent: Ken Sagan, NRG Code Advocates, representing Reflective Insulation Manufacturers Association International

Revise as follows:

GROUND SOURCE HEAT PUMP LOOP SYSTEM. Piping ~~buried~~ installed for the purpose of transporting heat transfer fluid to and from a heat pump and installed in horizontal or vertical excavations below the frost or heat level at a depth where the ground temperature remains relatively constant, ~~or~~ placed in a body of water at a depth to avoid freezing or connected to a free-flowing water source such as a well or stream ~~for the purpose of transporting heat transfer liquid to and from a heat pump~~. ~~Included in this definition are closed loop systems in which the liquid is recirculated and open loop systems in which the liquid is drawn from a well or other source.~~ Closed loop systems recirculate heat transfer liquids containing antifreeze through pressurized pipes while open loop systems extract and return water to the source.

Reason: The potential for confusion in the placement of Loop Systems for Ground Source Heat Pumps exists because of various uses of the phrase “surface of the earth” or “earth” in definitions of Ground Source, Ground Source Heat Pump Technology and Loop Systems. The most common omission in the descriptions is the optimum installation depth at which the “loop” should be placed.

In the IMC definition being addressed in this proposal, the loop system is described as: “piping buried in horizontal or vertical excavations or placed in a body of water for the purpose of transporting heat transfer liquid to and from a heat pump”. No specifications exist for the minimum “burial” depth of the pipe in either the ground or the body of water. This omission could lead to pipes being installed at too shallow a depth in either the ground or body of water causing inefficient operation or failure of the mechanical equipment.

Recent actions in the International Green Construction Code hearings led to changes in the definition of “Ground Source” to the following: “Use of the ground (surface of the earth) as a heat source or sink for heating and/or cooling provided by heat pumps”. This definition change was introduced by Robert Dewey from the U.S. Department of Energy and was approved in final action hearings and does not specify the depth of the heat source or sink.

On U.S. Department of Energy’s Energy Efficiency & Renewable Energy, Geothermal Technologies Program Website: http://www1.eere.energy.gov/geothermal/heatpumps.html it is stated that: “The technology [GSHP] relies on the fact that the Earth (beneath the surface) remains at a relatively constant temperature throughout the year…..”

The two U.S. Department of Energy statements or definitions appear to contradict each other as one refers to “the surface of the earth” and the other refers to “beneath the surface” and neither defines the word “surface”.

To further confuse the matter most non-geologists or lay persons interpret “surface” to be the top most plane of something, the part that is easily touched or seen: for instance, in the sentence – the insect appeared to be walking on the surface of the water – it is clear that the insect is on the very top of the water.

The “surface” of the earth (sometimes referred to as the crust) is described by geologists as the top 5 – 31kilometers of the earth’s crust. Using that scientific description:
The IGCC definition appears to suggest that GSHP Loop systems can be installed anywhere from the top of the ground (where vegetation grows) to a depth of 31 kilometers.

The U.S. DOE description would mean that the loop pipes must be installed below the 5 - 31 kilometer thick surface
Changes to the IMC’s Ground Source Heat Pump Loop System in this proposal defines the optimum depth at which the loop system should be installed and allows for variations based on local conditions. It further clarifies the requirement for installing open loop systems.

Cost Impact: None

M6-12

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

202-GROUND SOURCE HEAT PUMP LOOP SYSTEM-M-SAGAN.DOC

M7–12
202

Proponent: James Paschal, Paschal Engineering, representing self
(Jim@PaschalEngineering.com)

Revise as follows:

MECHANICAL JOINT.

1. A connection between pipes, fittings, or pipes and fittings that is not welded, brazed, caulked, soldered, ~~or~~ solvent cemented, or heat-fused.
2. A general form of gas or liquid-tight connections obtained by the joining of parts through a positive holding mechanical construction such as, but not limited to, flanged, screwed, clamped or flared connections.

Reason: Heat fusion is now a defined type of joint for plastic piping, and is considered separate from welding because there is not any additional filler material used in forming the joint. However, heat-fusion joints are not mechanical joints and as such should be excluded from the definition of mechanical joints.

Cost Impact: This proposal will not increase the cost of construction.

M7-12

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

202-MECHANICAL JOINT-M-PASCHAL.DOC

M8–12
301.3

Proponent: James Ranfone, representing American Gas Association
(jranfon@aga.org)

Revise as follows:

301.3 Identification. Each length of pipe and tubing and each pipe fitting utilized in a mechanical system shall bear the identification of the manufacturer.

> **Exception:** Manufacturer identification for fittings and pipe nipples shall be on each piece or shall be printed on the fitting or nipple packaging or provided documentation.

Reason: The exception would allow identification of fittings to be provided on or with the packaging. Some piping fittings, short nipples for example, do not have the physical room for a manufacturers mark.

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

M8-12

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

301.3-M-RANFONE.DOC

M9–12
303.3

Proponent: Richard Grace, Fairfax County, representing Virginia Plumbing and Mechanical Inspectors Association, Virginia Building Code Officials Association

Revise as follows:

303.3 Prohibited locations. Fuel-fired appliances shall not be located in, or obtain combustion air from, any of the following rooms or spaces:

1. Sleeping rooms.
2. Bathrooms.
3. Toilet rooms.
4. Storage closets.
5. Surgical rooms.

Exception: This section shall not apply to the following appliances:

1. Direct-vent appliances that obtain all combustion air directly from the outdoors.
~~2. Solid fuel-fired appliances, provided that the room is not a confined space and the building is not of unusually tight construction.~~
~~3~~ 2 Appliances installed in a dedicated enclosure in which all combustion air is taken directly from the outdoors, in accordance with Chapter 7. Access to such enclosure shall be through a solid door, weather-stripped in accordance with the exterior door air leakage requirements of the *International Energy Conservation Code* and equipped with an approved self-closing device.

Reason: The terms “confined space” and “unusually tight construction” are no longer referenced in the IMC, and can no longer dictate the installation of these appliances.

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

M9-12

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

303.3-M-GRACE.DOC

M10–12
303.3

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

303.3 Prohibited locations. Fuel-fired appliances shall not be located in, or obtain combustion air from, any of the following rooms or spaces:

1. Sleeping Rooms
2. Bathrooms
3. Toilet Rooms
4. Storage Closets
5. Surgical Rooms

Exception: This section shall not apply to the following appliances:

1. Direct-vent appliances that obtain all combustion air from the outdoors.
2. Solid fuel-fired appliances, provided that ~~the room is not a confined space and the building is not of unusually tight construction~~ combustion air is provided in accordance with the manufacturers' instructions.
3. Appliances installed in a dedicated enclosure in which all combustion air is taken directly from the outdoors, in accordance with Chapter 7. Access to such enclosure shall be through a solid door, weather-stripped in accordance with the exterior door leakage requirements of the International Conservation Code and equipped with an approved self-closing device.

Reason: The concepts of confined space and unusually tight construction are no longer valid and were deleted from the IFGC along with the definitions of such.

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Cost Impact: None

M10-12

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

303.3-M-STRAUSBAUGH-PMGCAC.DOC

M11–12
303.5

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

303.5 Indoor locations. Furnaces and boilers installed in closets and alcoves shall be listed for such installation. ~~For purposes of this section, a closet or alcove shall be defined as a room or space having a volume less than 12 times the total volume of the fuel-fired appliances other than boilers and less than 16 times the total volume of boilers. Room volume shall be computed using the gross floor area and the actual ceiling height up to a maximum computation height of 8 feet.~~

Reason: This section needs to be coordinated with the IFGC. The volume rules for 12 times and 16 times the appliance volume, along with the concept of "rooms large in comparison with the appliance" were deleted from the IFGC and are a thing of the past. This IMC text is based on IFGC text that is antiquated and no longer existing in the IFGC.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M11-12

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

303.5-M-STRAUSBAUGH-PMGCAC.DOC

M12–12
304.10

Proponent: Jay F. Rowland, J.F.R. Enterprises, Inc., representing himself

Revise as follows:

304.10 Clearances from grade. Equipment and *appliances* installed at grade level shall be supported on a level concrete slab or other *approved* material extending not less than 3 inches (76 mm) above adjoining grade<u>. Prefabricated supports placed on grade without excavation shall maintain ground contact around the support perimeter. Soil shall be backfilled under the support in a manner that will resist erosion and settling. Alternatively, the equipment and appliances</u> ~~or~~ shall be suspended not less than 6 inches (152 mm) above adjoining grade. Such support shall be in accordance with the manufacturer's installation instructions.

Reason: "Other approved materials" (plastic and lightweight concrete pads) have seen continuous reduction of material/ribbing over the years as manufacturers lower costs and compete for market share. Plus, they want to make a lighter product that is friendly to installers. This suggested code change reminds manufacturers and installers that the equipment pads are expected to remain level over time, not just initial installation. Don't "set it and forget it" unless it's set correctly.

Take a look at homes in your neighborhood, and you will see that a large percentage of prefab equipment pads have been installed and maintained improperly. Too many pads have lost all soil under their downslope edges and are held in place largely by the weight of the unit and the line set. On the other hand, many pads have no clearance from grade.

Unfortunately, neither manufacturers nor techs have put enough focus on proper excavation of the soil, backfilling, placing rock around the pad, or other steps to resist erosion and settling (which will still occur to some degree even with a perfect install). We stop short of requiring strip footers tied into the pad from below. That's the best way to stop erosion, but it adds a higher cost, and the manufacturers can come up with similar options.

Installation instructions have been insufficient to address these common issues. In fact, prefab pads as currently made (3" height, and many of 2" height) cannot meet code if the site is properly excavated. Excavation requires going below grade, and a 3" pad cannot then extend 3" above grade. With 3" pads, the best option is to provide protection for the soil under and around the pad. Some calculations by a registered engineer are attached as substantiation of the significance of erosion.

In a nutshell, ground contact/support and erosion control (protecting soil under and around the pad) determine the actual clearance from grade.

Note: Rock, landscaping fabric, etc. should not be placed under a pad, so erosion channels aren't created.

Cost Impact: The code change proposal will not increase the cost of construction. If you expressly require strip footing or a similar solution, then the cost of construction will increase.

M12-12

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

304.10-M-ROWLAND.DOC

M13–12
304.10

Proponent: Tom Allen, representing himself

Revise as follows:

304.10 Clearances from grade. Equipment and *appliances* installed at grade level shall be supported on a level concrete slab or other *approved* material extending not less than 3 inches (76 mm) above adjoining grade or shall be suspended not less than 6 inches (152 mm) above adjoining grade. Such support shall be in accordance with the manufacturer's installation instructions.

> **Exception:** Existing support platforms shall not be required to comply with the heights above grade specified in this section where such platforms complied with the applicable code when originally installed.

Reason: Adds an exception for existing support platforms that met code when they were installed.

Cost Impact: There is no cost impact.

M13-12

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

304.10-M-ALLEN.DOC

M14–12
[B]304.11

Proponent: Gary Kreutziger, M.C.P., City of San Antonio, representing self (gkreutziger@sanantonio.gov)

THIS CODE CHANGE WILL BE HEARD BY THE IBC-MEANS OF EGRESS COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

Revise as follows:

[B] 304.11 Guards. Guards shall be provided where appliances, *equipment,* fans or other components that require service and roof hatch openings are located within 10 feet (3048mm) of a roof edge or open side of a walking surface and such edge or open side is located more than 30 inches (762mm) above the floor, roof, or grade below. The guard shall extend not less than 30 inches (762mm) beyond each end of such appliances, *equipment,* fans, <u>or</u> components ~~and roof hatch openings~~ and the top of the guard shall be located not less than 42 inches (1067mm) above the elevated surface adjacent to the guard. The guard shall be constructed so as to prevent the passage of a 21-inch-diameter (533mm) sphere and shall comply with the loading requirements for guards specified in the *International Building Code.*

Reason: The change will correlate the IMC with the IBC and IFC where there is currently a conflict. The IBC and IFC do not require the guards to extend 30 inches beyond a roof hatch opening as is currently required in the IMC. There are manufactured guards available now that mount directly to the roof hatch curb and encircle the roof hatch opening but do not extend 30 inches beyond the opening as required in the IMC, however, as the IMC is currently written these guards would not be allowed, but are allowed per the IBC and IFC. These guards meet the prescriptive requirements and intent of the IBC and IFC but not the IMC. The guards that encircle the roof hatch opening provide a safer access to the roof when oriented correctly, by serving as a handrail as well as a guard and also add value by limiting roof penetrations.

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

M14-12

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

[B]304.11-M-KREUTZIGER

M15–12
305.4, Chapter 15

Proponent: Robert O'Neill; David Thompson, Manufacturers Standardization Society, representing Manufacturers Standardization Society
(dthompson@mss-hq.org)

Revise as follows:

305.4 Interval of support. Piping shall be supported at distances not exceeding the spacing specified in Table 305.4, or in accordance with ~~MSS SP-69~~ ANSI/MSS SP-58-2009.

Add new standard to Chapter 15 as follows:

ANSI/MSS SP-58-2009
Pipe Hangers and Supports –Materials, Design, Manufacture, Selection, Application, and Installation

Reason: In 2009, SP-58 was revised (including the title) to comprehensively combine and incorporate all of the content of five Pipe Hanger and Support standards into a single document; specifically including all of the information from **ANSI/MSS SP-69-2003, *Selection and Application***; MSS SP-77-1995 (R 2000), *Guidelines for Pipe Support Contractual Relations*; MSS SP-89-2003, *Fabrication and Installation Practices*; and MSS SP-90-2000, *Guidelines on Terminology for Pipe Hangers and Supports*. On February 11, 2011, the revised SP-58 was approved by the American National Standards Institute (ANSI) as an American National Standard (ANS). The new title is **ANSI/MSS SP-58-2009, *Pipe Hangers and Supports –Materials, Design, Manufacture, Selection, Application, and Installation***. The aforementioned SP-69 will not be revised (will "sunset" by 2014) and SP-77, 89, and 90 were withdrawn in 2010. **This ANSI/MSS SP-58-2009 edition can officially be utilized and referenced in place of the aforementioned Standard Practices.**

Cost Impact: The code change proposal will not increase the cost of construction other than the minimal difference in cost to acquire the ANSI/MSS SP-58-2009 standard document.

Analysis: A review of the standard proposed for inclusion in the code, [ANSI/MSS SP-58-2009] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M15-12

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

305.4-M-ONEILL-THOMPSON.DOC

M16–12
TABLE 305.4

Proponent: Larry Gill, P. Eng., IPEX USA LLC
(larry.gill@ipexna.com)

Revise as follows:

TABLE 305.4
PIPING SUPPORT SPACING[a]

PIPING MATERIAL	MAXIMUM HORIZONTAL SPACING (feet)	MAXIMUM VERTICAL SPACING (feet)
PE-RT ≤ 1”	2 ⅔ (32 inches)	4
PE-RT ≥ 1¼	4	4

Reason: Add support dimensions for polyethylene of raised temperature (PE-RT). PE-RT is already in the International Codes and adding the support spacing will provide additional information for installation. All other dimensions in the table remain unchanged.

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

M16-12

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

T305.4-M-GILL.DOC

M17–12
305.5

Proponent: Jillian M. Frenkel – Georgia Licensed Residential Builder

Revise as follows:

305.5 Protection against physical damage. In concealed locations where piping, other than cast-iron or steel, is installed through holes or notches in studs, joists, rafters or similar members less than 11/2 inches (38 mm) from the nearest edge of the member, the pipe shall be protected by shield plates. Protective steel shield plates having a minimum thickness of 0.0575 inch (1.463 mm) (No. 16 gage) shall cover the area of the pipe where the member is notched or bored, and shall extend a minimum of 2 inches (51 mm) above sole plates and below top plates.

In concealed locations where piping other than cast iron or steel is installed within exterior wall cavities formed by framing members, and such piping is less than 1 ½ inches from the inside surface of the exterior wall sheathing, such piping shall be protected for its entire length within the cavity by shield plates have a minimum thickness of 0.0575 inch (1.463mm) (16 Gage).

Reason: Currently, the code requires protection by use of steel shield plate at the top and sole plates. This proposition is to add protection to mechanical lines that are located on exterior walls within the bays formed by framing members as seen in Figure 1. These unprotected lines can be punctured by installation of exterior coverings (i.e. siding, shake, etc) and left undetected during the building process or later by the homeowner. The reason/intent for the revision to the existing code is to prevent hazardous conditions and/or expensive repairs.

An example of a hazardous condition is a punctured refrigerant line. When a line is first punctured, the seal may be so tight that a leak is left undetected. In time, the metals will corrode and Freon will eventually leak out of the refrigerant lines. Over time, exposure to Freon can cause health issues ranging from minor to severe. It is documented that effects of Freon exposure via inhalation include mouth and nasal area irritation, dizziness and irregular heartbeat.

In yet another scenario, a punctured condensation line has the potential to become an unnecessary and expensive repair which can result in drywall repair, mechanical line repair, floor replacement, possibly insulation replacement and paint repair.

Cost Impact: The code change proposal will increase the cost of construction. The cost is roughly $40/10ft wall.

M17-12

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

305.5-M-FRENKEL.DOC

M18–12
306.1

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

306.1 Access. Appliances, <u>controls devices, heat exchangers and HVAC system components that utilize energy</u> shall be accessible for inspection, service, repair and replacement without disabling the function of a fire-resistance-rated assembly or removing permanent construction, other appliances, venting systems or any other piping or ducts not connected to the *appliance* being inspected, serviced, repaired or replaced. A level working space at least 30 inches deep and 30 inches wide (762 mm by 762 mm) shall be provided in front of the control side to service an *appliance*.

Reason: Section 306.1 applies to appliances and therefore does not address equipment such as fan/coil units, air handling units, damper motors, HVAC controls, etc. Units with heat exchangers need to be provided with access so that they can be cleaned. Air handlers and fan/coil units are not considered to be appliances because they do not fall under the definition because the code provides no specific requirements for them.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: This could increase the cost of construction.

M18-12

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

306.1-M-STRAUSBAUGH-PMGCAC.DOC

M19–12
306.3.2 (NEW)

Proponent: Tom Allen, representing himself

Add new text as follows:

306.6 Air Handling Units. Air handling units shall not be located in attics in dwelling units except where all of the following conditions are met:

1. A device is installed to alert the owner or shut off the unit when the condensation drainage system has failed.
2. The attic access opening is large enough to allow replacement of the air handler.
3. A notice is posted on the electric service panel indicating to the homeowner that an air handler is located in the attic. Such notice shall be in uppercase letters, in 16 point type, and with the title and first paragraph in bold and shall read as follows:

NOTICE TO HOMEOWNER

A PART OF YOUR AIR CONDITIONING SYSTEM, THE AIR HANDLER, IS LOCATED IN THE ATTIC. FOR PROPER, EFFICIENT, AND ECONOMIC OPERATION OF THE AIR CONDITIONING SYSTEM, YOU MUST ENSURE THAT REGULAR MAINTENANCE IS PERFORMED.

YOUR AIR CONDITIONING SYSTEM IS EQUIPPED WITH ONE OR BOTH OF THE FOLLOWING: 1) A DEVICE THAT WILL ALERT YOU WHEN THE CONDENSATION DRAIN IS NOT WORKING PROPERLY OR 2) A DEVICE THAT WILL SHUT OFF THE SYSTEM WHEN THE CONDENSATION DRAIN IS NOT WORKING. TO LIMIT POTENTIAL DAMAGE TO YOUR HOME, AND TO AVOID DISRUPTION OF SERVICE, IT IS RECOMMENDED THAT YOU VERIFY PROPER WORKING ORDER OF THESE DEVICES BEFORE EACH SEASON OF PEAK OPERATION.

Reason: Adds prescriptive requirements and notice requirements for air handler units in attics.

Cost Impact: There is a cost impact.

M19-12

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

306.3.2 (NEW)-ALLEN.DOC

M20–12
307.2

Proponent: Patrick A. McLaughlin, McLaughlin & Associates, representing Air-Conditioning, Heating & Refrigeration Institute
(pmclaugma@aol.com)

Revise as follows:

307.2 Evaporators and cooling coils. Condensate drain systems shall be provided for *equipment* and appliances containing evaporators or cooling coils. Condensate drain systems shall be designed, constructed and installed in accordance with Sections 307.2.1 through 307.2.4.

> **Exception:** Evaporators and cooling coils that are designed to operate in sensible cooling only and not support condensation shall not be required to meet the requirements of this section.

Reason: The introduction of chilled beam technology is relatively new in the North American market. The code does not take into consideration the fact that dry coils are utilized in most all chilled beam designs; it is an integral part of the design. The chilled beam products have been successfully operating in applications all over the world in this dry manner for over 25 years. Additionally, it is more hygienic and provides greater energy efficiency to design these systems with dry coils. Finally condensation prevention strategies are already employed as part of the design of chilled beam systems.

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

M20-12

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

307.2-M-MCLAUGHLIN.DOC

M21–12
307.2.2

Proponent: Tom Allen, representing self

Revise as follows:

307.2.2 Drain pipe materials and sizes. Components of the condensate disposal system shall be cast iron, galvanized steel, copper, cross-linked polyethylene, polybutylene, polyethylene, ABS, CPVC or PVC pipe or tubing. All components shall be selected for the pressure and temperature rating of the installation. Joints and connections shall be made in accordance with the applicable provisions of Chapter 7 of the *International Plumbing Code* relative to the material type. Condensate waste and drain line size shall be not less than 3/4-inch (19 mm) internal diameter and shall not decrease in size from the drain pan connection to the place of condensate disposal. Where the drain pipes from more than one unit are manifolded together for condensate drainage, the pipe or tubing shall be sized in accordance with Table 307.2.2.

> **Exception:** Where the drain pipe is less than 10 feet (3048 mm) in length for wall mounted ductless split units with a cooling capacity of less than 36,001 Btu/h, the size of the drain pipe need not be larger than the size of the factory drain outlet on the equipment.

Reason: Exception for small units that utilize a smaller drain than allowed by the table.

Cost Impact: There is no cost impact.

M21-12

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

307.2.2-M-ALLEN.DOC

M22–12
307.2.2

Proponent: James Paschal, Paschal Engineering, representing self (Jim@PaschalEngineering.com)

Revise as follows:

307.2.2 Drain pipe materials and sizes. Components of the condensate disposal system shall be cast iron, galvanized steel, copper, cross-linked polyethylene, ~~polybutylene~~, polyethylene, ABS, CPVC, ~~or~~ PVC, or polypropylene pipe or tubing. All components shall be selected for the pressure and temperature rating of the installation. Joints and connections shall be made in accordance with the applicable provisions of Chapter 7 of the *International Plumbing Code* relative to the material type. Condensate waste and drain line size shall not be less than ¾-inch (19 mm) internal diameter and shall not decrease in size from the drain pan connection to the place of condensate disposal. Where the drain pipes from more than one unit are manifolded together for condensate drainage, the pipe or tubing shall be sized in accordance with Table 307.2.2.

Reason: Delete PB material as it is no longer available or used in this application, and add polypropylene materials which are currently being used in this application.

Cost Impact: None

M22-12

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

307.2.2-M-PASCHAL.DOC

M23–12
307.2.3

Proponent: Richard Grace, Fairfax County, Virginia Plumbing and Mechanical Inspectors Association, Virginia Building Code Officials Association

Revise as follows:

307.2.3 Auxiliary and secondary drain systems. In addition to the requirements of Section 307.2.1, where damage to any building components could occur as a result of overflow from the *equipment* primary condensate removal system, one of the following auxiliary protection methods shall be provided for each cooling coil or fuel-fired *appliance* that produces condensate:

(1. thru 3. No change)

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 in 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: When these devices are installed in the primary drain line, they are not typically installed where the primary line connects to the equipment supplied drain pan. They are typically installed in the uppermost vertical level above the P-trap (approximately 6 or so inches horizontal of the unit itself). If a blockage occurs at the connection point of the primary line to the equipment supplied drain pan, or within the 6" piece of horizontal pipe between the unit and the detection device, the pan will fill and overflow without detection.

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

M23-12

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

307.2.3-M-GRACE.DOC

M24–12
307.2.3

Proponent: Jay F. Rowland, J.F.R. Enterprises, Inc., representing himself (code@jfrenterprises.com)

Revise as follows:

307.2.3 Auxiliary and secondary drain systems. In addition to the requirements of Section 307.2.1, where damage to any building components could occur as a result of overflow from the *equipment* primary condensate removal system, one of the following auxiliary protection methods shall be provided for each cooling coil or fuel-fired *appliance* that produces condensate:

1. An auxiliary drain pan with a separate drain shall be provided 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 $1^1/_2$ 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. Galvanized sheet steel pans shall have a minimum thickness of not less than 0.0236 inch (0.6010 mm) (No. 24 gage). Nonmetallic pans shall have a minimum thickness of not less than 0.0625 inch (1.6 mm).
   The auxiliary drain pan shall be provided with a water-level detection device conforming to UL 508 that will shut off the *equipment* served prior to overflow of the pan, or when condensate is sensed in the pan.
2. A separate overflow drain line shall be connected to the primary drain pan provided with the *equipment*. Such 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.
   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 in the equipment-supplied drain pan, located at a point higher than the primary drain line connection and below the overflow rim of such pan.
3. ~~An auxiliary drain pan without a separate drain line shall be provided under the coils on which condensate will occur. Such 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 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 in the equipment-supplied drain pan, located at a point higher than the primary drain line connection and below the overflow rim of such pan.~~

   Exception: Fuel-fired appliances that automatically shut down operation in the event of a stoppage in the condensate drainage system.

Reason: This code change is requested in order to bring the code in line with traditional best practices. The end result is building occupants saved from condensate catastrophes.

For decades, contractors have commonly installed three lines of protection against condensate overflow. Besides the drain line from the primary drain pan, they installed a secondary drain pan with a drain line *and* a float switch or similar device in the secondary drain pan. This practice is still common today, as evidenced by the strong tandem sales of shut-off devices along with secondary pans with holes pre-drilled.

Yet the code allows the installer to drop one line of protection as a way of saving a little money in the short run. The current requirement is for the drain from the primary pan to be backed up by only one other option. If the secondary drain line clogs, and there is no shut-off device, then the building is damaged. If the shut-off fails, and there is no secondary drain, then the building is damaged. The risk of a secondary device failing is significant, so a tertiary device isn't overkill. It is wise.

The code body should not assume that equipment is properly installed or maintained or, even if it is, that mechanical devices will always perform as desired. Especially over time, as all things perform less effectively as they age.

The IRC review committee tried to address this issue in its corresponding code section M1411.3.1 by adding the requirement of a secondary drain or pan. We have also submitted a code change request to clarify that section, as the language is a bit ambiguous. We hope, however, that the wording in both codes will be harmonized.

This code change uses existing language in a different arrangement (making methods 3 & 4 part of methods 1 & 2, respectively).

Note: We added the word "primary" to method 2 because some equipment is provided with both primary and secondary drain pans.

Cost Impact: The code change proposal will not increase the cost of construction. At least this is true for the contractors who protect their customers and follow the traditional best practices. Alternatively, we would point out that the cost of keeping the third line of defense against condensate damage is much lower than the cost of re-construction after damage is done. This type of water damage often is not covered by property insurance. Thank you for your consideration.

M24-12

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

307.2.3#1-M-ROWLAND.DOC

M25–12
307.2.3

Proponent: Jay F. Rowland, J.F.R. Enterprises, Inc., representing himself
(code@jfrenterprises.com)

Revise as follows:

307.2.3 Auxiliary and secondary drain systems. In addition to the requirements of Section 307.2.1, where damage to any building components could occur as a result of overflow from the *equipment* primary condensate removal system, one of the following auxiliary protection methods shall be provided for each cooling coil or fuel-fired *appliance* that produces condensate:

1. An auxiliary drain pan with a separate drain shall be provided 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 $1^{1}/_{2}$ 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. Galvanized sheet steel pans shall have a minimum thickness of not less than 0.0236 inch (0.6010 mm) (No. 24 gage), shall have seamless corners, and the interior shall be coated with a waterproof material. 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*. Such 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 provided under the coils on which condensate will occur. Such 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 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 in the equipment-supplied drain pan, located at a point higher than the primary drain line connection and below the overflow rim of such pan.

   Exception: Fuel-fired appliances that automatically shut down operation in the event of a stoppage in the condensate drainage system.

Reason: This code change is proposed to address the quality of drain pans, which play an obviously key role in preventing damage due to condensate.

First, we suggest that drain pan corners be "seamless," such as folded corners for metal pans. Notched corners that are later caulked, or perhaps welded, are prone to error.

More importantly, we suggest that drain pans essentially be rustproof. Resisting rust is not sufficient, because the drain pan is the one thing that should not rust through…and the technologies and products available today provide easy solutions. Polymer coatings, plastic pans, etc. have been used and proven for years. We've never seen a plastic pan rust through.

We stop short of saying that the entire pan must be rustproof, and focus only on the interior of the pan, because galvanized steel is so widely used. However, popularity does not justify its continued widespread use for this application. Whenever serious damage is caused to a building due to a rusted or leaky pan, it's a pretty safe bet that the pan was galvanized steel.

We believe this code change will increase the quality of construction and reflect well on the code.

Cost Impact: The code change proposal will increase the cost of construction. We hesitate to say there will be no increase in cost on commercial installations, but we believe any increase will be negligible…more psychological than real. Galvanized pans will have to be coated before installation, rather than after they start to rust. Alternatively, the installer may use a plastic pan.

If the auxiliary pan is viewed properly as insurance, then any cost difference is more than offset by not having to repair ceilings and other building components due to flooding (which is often not covered by property insurance). Thank you for your consideration.

M25-12
Public Hearing: Committee: AS AM D

M26– 12
202 (NEW), Section 307.2.3.1

Proponent: Timothy Burgos, InterCode Incorporated, representing Rectorseal Corporation and Ken Sagan, NRG Code Advocates, representing self
(ken@nrgcodeadvocates.com)

Add new definition as follows:

DUCTLESS MINI-SPLIT SYSTEM. A heating and cooling system that is comprised of one or multiple indoor evaporator/air handler units and an outdoor condensing unit that is connected by refrigerant piping and electrical wiring. A ductless mini-split system is capable of cooling or heating one or more rooms without the use of a traditional ductwork system.

Revise as follows:

307.2.3.1 Water-level monitoring devices and condensate pumps. On down-flow units and all other coils that do not have a secondary drain or provisions to install a secondary or auxiliary drain pan, a water-level monitoring device shall be installed inside the primary drain pan. This device shall shut off the *equipment* served in the event that the primary drain becomes restricted. Devices installed in the drain line shall not be permitted. For ductless mini-split equipment that is not able to drain condensate from the unit by gravity, a condensate pump shall be installed to remove water from the *equipment.* The condensate pump shall be powered by the same power supply that powers the *equipment* being served and shall be capable of shutting off the equipment served in the event of failure of the pump to remove condensate.

Reason: Ductless mini-split systems have existed for more than 50 years and have been available for more than 30 years in the United States HVAC residential and/or light commercial markets. Most American consumers, however, are unaware of these products. A ductless mini-split system is not a window unit; it is a permanently installed mechanical system used in new construction, additions, multi-family (condo/apartment) housing, and to improve comfort in poorly conditioned spaces.

Ductless Mini-split equipment must follow the same code requirements as other condensate producing equipment due to the potential damage and health risk associated with uncontrolled condensation. Ductless mini-split units also do not have provisions for a secondary drain, or auxiliary drain pans to prevent condensation from overflowing the primary drain pan. Currently it is unclear in the code if ductless mini-split units require water-level monitoring devices. In installations where gravity drains condensation removal is impossible, a condensate pump must be installed that communicates with the ductless mini-split to stop the equipment if there is a failure of the condensate removal system. Power for the condensate pump should be provided from the mini-split equipment and not from a separate power source. The danger of using a separate power supply is that if the circuit that supplies power to the condensate pump fails, but the circuit providing power to the mini split equipment remains active, the pump will not operate and the equipment will produce excessive condensation without shutting down. This code change addresses the condensate requirement and allows simplicity in code compliance.

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

M26-12

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

202-DUCTLESS MINI SPLIT SYSTEM (NEW) #2-M-BURGOS-SAGAN.DOC

M27–12
307.2.3.2

Proponent: Riley Archer, Rectorseal Corporation, representing Rectorseal Corporation (rileya@rectorseal.com)

Add new text as follows:

307.2.3.2 Ductless Mini split water-level monitoring devices and condensate pumps. A water-level monitoring device shall be installed inside the main drain pan of mini-split *equipment*. Such device shall shut off the *equipment* served in the event that the primary drain becomes restricted. For ductless mini split equipment that cannot drain condensation from the unit by gravity, a separate condensate pump shall be installed to remove water from the *equipment*, in addition to a water-level monitoring device. The condensate pump shall be capable of shutting off the equipment in the event that the condensate removal system has failed and shall be connected to the same electrical branch circuit as the *equipment* being served.

Reason: Ductless mini split equipment must follow the same regulations as other condensate producing equipment, due to the potential damage and health risk associated with uncontrolled condensation. Ductless mini split units also do not have provisions for secondary drain, secondary or auxiliary drain pans to prevent condensation from overflowing the primary drain pan. Currently it is unclear in the code language if mini split units require water-level monitoring devices. Applications where the ability to drain condensation with the use of gravity is not possible a condensate pump must be installed with the ductless mini split equipment. This pump should be able to stop the equipment for producing condensation if there is a failure in the condensate removal system. The condensate pump should be powered by the mini split equipment itself to ensure that a separate power supply is not used. The danger of using a separate power supply is that if the circuit that supplies power to the condensate pump fails, but the circuit providing power to the ductless mini split equipment remains active the pump will not operate and the equipment will produce condensation without shutting down. Both a condensate pump and water-level monitoring device are necessary due to restrictions occurring inside the drain pan and inside the condensate line will trip each devices cut off functions separately.

Cost Impact: There is little to no cost impact.

M27-12

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

307.2.3.(NEW)-M-ARCHER.DOC

M28–12
307.2.4

Proponent: Timothy Burgos, InterCode Incorporated, representing Rectorseal Corporation and Ken Sagan, NRG Code Advocates, representing self
(ken@nrgcodeadvocates.com)

Revise as follows:

307.2.4 Traps. Condensate drains shall be trapped as required by the *equipment* or *appliance* manufacturer. <u>Traps shall be transparent to allow for visual inspection and shall be designed to allow routine cleaning.</u>

Reason: Using premade clear taps will allow for visual confirmation that there is no clog in the trap and that water is flowing properly. Clear taps have been readily available for years and are as easily installed as a non-pre-manufactured trap.

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

M28-12

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

202-DUCTLESS MINI SPLIT SYSTEM (NEW) #1-M-BURGOS-SAGAN.DOC

M29–12
202, 307.2.4.1

Proponent: Timothy Burgos, InterCode Incorporated, representing Rectorseal Corporation and Ken Sagan, NRG Code Advocates, representing self

Add new definition as follows:

DUCTLESS MINI-SPLIT SYSTEM. A heating and cooling system that is comprised of one or multiple indoor evaporator/air handler units and an outdoor condensing unit that is connected by refrigerant piping and electrical wiring. A ductless mini-split system is capable of cooling or heating one or more rooms without the use of a traditional ductwork system.

Add new text as follows:

307.2.4.1 Ductless Mini-Split Traps. Ductless mini split equipment that produces condensation shall be provided with an inline check valve located in the drain line instead of a trap.

Reason: Ductless mini-split condensate lines are direct openings for unconditioned outside air, contaminants, insects and other undesirable materials to enter the conditioned space and should be trapped using an inline check valve as a preventative measure.

Ductless mini-split systems have existed for more than 50 years and have been available for more than 30 years in the United States HVAC residential and/or light commercial markets. Most American consumers, however, are unaware of these products. A ductless-mini split system is not a window unit; it is a permanently installed mechanical system used in new construction, additions, multi-family (condo/apartment) housing, and to improve comfort in poorly conditioned spaces. Since mini-splits require no ducts and indoor components are mounted directly on interior ceiling, walls, or on the floor, they avoid the energy losses associated with ductwork of central forced air systems. Duct losses can account for more than 30% of energy consumption for space conditioning, especially if the ducts are in an unconditioned space such as an attic.

Ductless mini-split heating and cooling systems are highly efficient products that deliver warm or cool air directly into different zones in a building instead of through ducts. They are also called mini-split, multi-split, or variable refrigerant flow (VRF) heat pump systems. They are an increasingly popular and cost-effective solution to replace inefficient baseboard electric heating and window air conditioners in existing homes.

Ductless mini-split systems have numerous potential applications in residential, commercial, and institutional buildings. The most common applications are in multifamily housing or as retrofit add-ons in houses with "non-ducted" heating systems, such as hydronic (hot water heat), radiant (electric resistance), and space heaters (wood, kerosene, propane). They can also be a good choice for room additions and small apartments where extending or installing distribution ductwork (for a central air-conditioner or heating systems) is not feasible or where existing equipment cannot handle the additional load.

A ductless mini-split system is comprised of an indoor unit called the evaporator and an outdoor unit called the condenser. The evaporator is connected to the condensing unit by copper tubing and electrical wiring which is passed through a 2 ½” – 4” hole. Basically, it is a small central air unit with the flexibility of cooling or heating one or more room.

The advantages of installing a ductless mini-split over a central air system.

The main advantages of a ductless mini-split are their small size and flexibility for zoning or heating and cooling individual rooms. Models can have as many as four indoor air handling units (for four zones or rooms) connected to one outdoor unit. The number of units is determined by how much heating or cooling is required for the building or each zone (which in turn is affected by the properties of the building envelope). Since each of the zones has its own thermostat, the space can be conditioned only when occupied saving energy and money.

1. With Central Air, an entire home must be cooled when only one room may be occupied. Ductless mini-splits cool only the areas that require conditioning.
2. 18,000 BTU is a typical minimum central air unit: ductless mini-splits are available beginning at 9,000 or 12,000 BTUs.
3. Typical homes requiring 3-ton HVAC units may not be zoned or require complex zoning systems that are very expensive for the homeowner. With ductless mini-splits, multiple evaporators make zoning as simple as setting a remote control.
4. Energy wasted in long lengths of uninsulated ductwork means higher energy bills. Less than 5% cooling loss occurs in insulated refrigerant lines compared with up to 25% through ducts.
5. Retrofitting existing homes with whole house air conditioning requires cutting holes in walls, floors, ceilings or decreasing closet space with ducts.
6. Ductless mini-splits require just a 2 ½ or 4” diameter hole in the outside wall meaningless mess and better home aesthetics.

Most systems now incorporate inverter-driven compressors, which allow for system ramp-up until the desired set temperature is met, then permit the system to modulate its operation so that a comfortable temperature is maintained. This operation avoids the abrupt and energy-consuming start and stop exhibited by traditional HVAC systems.

Ductless mini-split systems are also often easier to install than other types of space conditioning systems. For example, the hook-up between the outdoor and indoor units generally requires only a three inch (~8 centimeter [cm]) hole through a wall for the conduit. Also, most manufacturers of this type of system can provide a variety of lengths of connecting conduits. So, if necessary, you can locate the outdoor unit as far away as 50 feet (~15 meters [m]) from the indoor evaporator. This makes it possible to cool rooms on the front side of a building with the compressor in a more appropriate or inconspicuous place on the outside of the building.

Indoor air handlers can be suspended from a ceiling, flush-mounted in a drop ceiling, or hung on a wall. Floor-standing models are also available. Many offer a remote control to make control of high mounted units easier. Split systems can also contribute to the security of a building by eliminating the need for larger openings required for through-the-wall units or unsecured windows housing window-mounted units –openings that can provide easy access for intruders

Ductless mini-split equipment must follow the same code requirements as other condensate producing equipment due to the potential damage and health risk associated with uncontrolled condensation. Ductless mini-split units also do not have provisions for a secondary drain, or auxiliary drain pans to prevent condensation from overflowing the primary drain pan. Currently it is unclear in the code if ductless mini-split units require water-level monitoring devices. In installations where gravity drains condensation removal is impossible, a condensate pump must be installed that communicates with the ductless mini-split to stop the equipment if there is a failure of the condensate removal system. Power for the condensate pump should be provided from the mini-split equipment and not from a separate power source. The danger of using a separate power supply is that if the circuit that supplies power to the condensate pump fails, but the circuit providing power to the mini split equipment remains active, the pump will not operate and the equipment will produce excessive condensation without shutting down.

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

M29-12

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

202-DUCTLESS MINI SPLIT SYSTEM (NEW)-M-BURGOS.DOC

M30–12
307.2.5 (NEW)

Proponent: Tom Allen, representing self

Add new text as follows:

<u>**307.2.5 Pipe insulation.** Horizontal primary condensate drains located within unconditioned spaces shall be insulated and provided with a vapor barrier to prevent condensation from forming on the exterior of the drain pipe.</u>

Reason: adds requirement to prevent condensation on exterior of drain pipe

Cost Impact: There is a cost impact.

M30-12

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

307.2.5(NEW)-M-ALLEN.DOC

M31–12
202

Proponent: John Ingargiola and Gregory Wilson, representing Department of Homeland Security, Federal Emergency Management Agency (john.ingargiola@dhs.gov, gregory.p.wilson@dhs.gov) and Rebecca Quinn, RCQuinn Consulting, Inc., representing Federal Emergency Management Agency (rcquinn@earthlink.net).

THIS CODE CHANGE WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

Add new text as follows:

IMC [B] DESIGN FLOOD ELEVATION. The elevation of the “design flood,” including wave height, relative to the datum specified on the community’s legally designated flood hazard area map. In areas designated as Zone AO, the *design flood elevation* shall be the elevation of the highest existing grade of the *building’s* perimeter plus the depth number (in feet) specified on the flood hazard map. In areas designated as Zone AO where a depth number is not specified on the map, the depth number shall be taken as being equal to 2 feet (610 mm).

Reason: This definition is controlled by the IBC; this proposal brings the IPC, IMC, IFGC, and IPSDC definitions in line with the term as defined by the IBC.

Cost Impact: None

M31-12

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

M31-202-M-DESIGN FLOOD ELEVATION-M-INGARGIOLA-WILSON-QUINN.DOC

M32–12
307.2.5 (NEW)

Proponent: Andrew Scott Jones, President, A Better Deal Heating and Air Conditioning, Inc., a Texas Corporation, representing himself.
(tfkolter@gmail.com/tom.kolter@yahoo.com)

Add new text as follows:

<u>**307.2.5 Cleanouts.** Condensate drains shall be provided with a means to allow cleaning of the drain and clearing of blockages without having to cut or disassemble the piping.</u>

Reason: Drain line stoppages in evaporative coils drain pan drain lines are unavoidable and common occurrences requiring clearing the drain line. Clearing these lines almost always involves cutting the drain line itself, causing water to leak into the attic or closet where the drain is located, possible collected in a bucket or soaked up with rags or paper towels. Then the technician blows compressed air through the drain line in both directions from the cut. The cut must be repaired by resealing the drain line with a PVC coupling and solvent.

This process exposes the surrounding area to water leakage and spilling with the risk of damage, mold, spilling, as well as the extra time and effort of carrying extra equipment, parts and flammable solvent. The process takes extra time and costs the homeowner more money.

With a device that permits the introduction of compressed air or nitrogen directly into the drain system permitting clearing in both directions, there is no spillage of water, no cost for the couplings or solvent and no risk of water damage or mold. The entire process requires less than five minutes.

Typically the cost of clearing a drain equipped with such a device is at least 50% less to the homeowner than the cost of clearing a blockage through the common method of cutting the pipe, attempting to collect the condensate water and repairing the cut in the drain line.

Each time a drain line is cleared though the cutting/repair process, the repair could be accomplished by installing a $15.00 line clearing device rather than a simple coupling.

Also, if clearing the drain lines were part of regular maintenance, line blockages could largely be prevented in the first place.

Cost Impact: The code change will increase the cost of construction, totaling an estimated $15.00 per unit.

M32-12

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

307.2.3-M-JONES.DOC

M33–12
307.2.5

Proponent: Riley Archer, Rectorseal Corporation, representing Rectorseal Corporation (rileya@rectorseal.com)

Add new text as follows:

307.2.5 Back-flow prevention. Where the condensate drains from multiple appliances or equipment share common drain piping, a self-sealing check valve device shall be installed in the condensate line at the primary condensate pan. This device shall prevent condensate form flowing back into the *equipment* in the event of a blockage in the main drain line and shall be provided with a cleanout opening and a means to allow visual inspection of condensate flow.

Reason: On multi-story or single story buildings where multiple air conditioning units are tied into a common condensate line a clog in the disposal line will cause water to back up into the drain pans of all lower units tied into the condensate disposal line. This will occur even if all units are equipped with water-level detection devices due to the fact that the equipment on the lower level will shut down due to a backup, but the equipment on the higher level will continue to operate until water reaches the water-level detection device at that level. A manual cleanout is necessary to allow for removal of the clog within the line without cutting the condensate line to do so. The device must be capable of visual inspection to allow for view of check valve and flow of condensate.

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

M33-12

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

307.2.5 (NEW)-M-ARCHER.DOC

M34–12
202, 308

Proponent: Bob Eugene, representing Underwriters Laboratories (Robert.Eugene@ul.com)

Revise as follows:

PROTECTIVE ASSEMBLY (REDUCED CLEARANCE). Any noncombustible assembly that is *labeled* or constructed in accordance with Table 308.~~6~~4.2 and is placed between combustible materials or assemblies and mechanical appliances, devices or *equipment*, for the purpose of reducing required airspace clearances. Protective assemblies attached directly to a combustible assembly shall not be considered as part of that combustible assembly.

308.4 Allowable reduction. The reduction of required *clearances* to combustible assemblies or combustible materials shall be based on the utilization of a reduced *clearance* protective assembly in accordance with Section 308.~~5~~4.1 or 308.~~6~~4.2.

308.~~5~~4.1 Labeled assemblies. The allowable clearance reduction shall be based on an approved reduced clearance protective assembly that is listed and labeled in accordance with UL 1618.

308.~~6~~4.2 Reduction table. The allowable *clearance* reduction shall be based on one of the methods specified in Table 308.~~6~~4.2. Where required *clearances* are not listed in Table 308.~~6~~4.2, the reduced *clearances* shall be determined by linear interpolation between the distances listed in the table. Reduced *clearances* shall not be derived by extrapolation below the range of the table.

308.~~7~~5 Solid fuel-burning appliances. The *clearance* reduction methods specified in Table 308.~~6~~4.2 shall not be utilized to reduce the *clearance* required for solid fuel-burning appliances that are *labeled* for installation with clearances of 12 inches (305 mm) or less. Where appliances are *labeled* for installation with *clearances* of greater than 12 inches (305 mm), the *clearance* reduction methods of Table 308.~~6~~4.2 shall not reduce the *clearance* to less than 12 inches (305 mm).

308.~~8~~6 Masonry chimneys. The *clearance* reduction methods specified in 308.~~6~~4.2 shall not be utilized to reduce the *clearances* required for masonry *chimneys* as specified in Chapter 8 and the *International Building Code*.

308.~~9~~7 Chimney connector pass-throughs. The *clearance* reduction methods specified in 308.~~6~~4.2 shall not be utilized to reduce the *clearances* required for *chimney* connector pass-throughs as specified in Section 803.10.4.

308.~~10~~8 Masonry fireplaces. The *clearance* reduction methods specified in 308.~~6~~4.2 shall not be utilized to reduce the *clearances* required for masonry fireplaces as specified in Chapter 8 and the *International Building Code*.

308.~~11~~9 Kitchen exhaust ducts. The *clearance* reduction methods specified in 308.~~6~~4.2 shall not be utilized to reduce the minimum *clearances* required by Section 506.3.11 for kitchen exhaust ducts enclosed in a shaft.

TABLE ~~308.6~~ 308.4.2
CLEARANCE REDUCTION METHODS[b]

(Portions of table and footnotes not shown remain unchanged)

b. For limitations on clearance reduction for solid fuel-burning appliances, masonry chimneys, connector pass-throughs, masonry fire places and kitchen ducts, see Sections ~~308.7 through 308.11~~ 308.5 through 308.9.

Reason: Provide clarity that there are two different methods for reducing clearances.

Cost Impact: None

M34-12

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

308.4-M-EUGENE.DOC

M35–12
[B] 309.2 (NEW)

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

THIS CODE CHANGE PROPOSAL WILL BE HEARD BY THE IBC-GENERAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

Add new text as follows:

[**B] 309.2 Space-cooling systems.** Where the Dry bulb 2 ½ % Summer Design Temperature as determined in accordance with Appendix D of the *International Plumbing Code* is 92^{o} F or greater, occupancies in groups E, I1, I2, I4 and R shall be provided with active or passive space-cooling systems capable of maintaining an indoor temperature of 75^{o} F on the design day. Wall mounted and window mounted cooling units used to comply with this section shall not obstruct any required emergency escape and rescue openings.

Reason: Section 309 addresses the requirements for space heating in interior spaces and requires that the system be able to maintain a temperature of at least 68 degrees. This is considered to be necessary to make the space occupiable. However, the code does not have any cooling requirements for hospitals, operating rooms, health care facilities, nursing homes, etc. In warm humid climates, space cooling can become a life safety issue for some members of society. This is not about luxury; rather, it can be the difference between life and death.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: This proposal will increase the cost of construction.

M35-12

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

309.2(NEW)-M-STRAUSBAUGH-PMGCAC.DOC

M36-12

401.2, Table 403.3; 407 (New); Chapter 15, IBC 1203.1

Proponent: John Williams, CBO, Chair, ICC Ad Hoc Committee on Health Care and Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

THIS IS A 2 PART CODE CHANGE, BOTH PARTS WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THIS COMMITTEE.

PART I – IMC

Revise as follows:

Section 401.2 Ventilation required. Every occupied space shall be ventilated by natural means in accordance with Section 402 or by mechanical means in accordance with Section 403. Where the air infiltration rate in a dwelling unit is less than 5 air changes per hour when tested with a blower door at a pressure of 0.2-inch water column (50 Pa) in accordance with Section 402.4.1.2 of the *International Energy Conservation Code*, the dwelling unit shall be ventilated by mechanical means in accordance with Section 403. Ambulatory care facilities and Group I-2 occupancies shall be ventilated by mechanical means in accordance with Section 407.

TABLE 403.3
MINIMUM VENTILATION RATES

OCCUPANCY CLASSIFICATION	OCCUPANT DENSITY #/1,000 FT² [a]	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_p CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_a CFM/FT² [a]	EXHAUST AIRFLOW RATE CFM/ FT² [a]
Food and Beverage Service				
Bars, cocktail lounges	100	7.5	0.18	--
Cafeteria, fast food	100	7.5	0.18	--
Dining rooms	70	7.5	0.18	--
Kitchens (cooking) [b]	--	--	--	0.7
~~**Hospitals, Nursing and convalescent homes**~~				
~~Autopsy rooms [b]~~	~~--~~	~~--~~	~~--~~	~~0.5~~
~~Medical procedure rooms~~	~~20~~	~~15~~	~~--~~	~~--~~
~~Operating rooms~~	~~20~~	~~30~~	~~--~~	~~--~~
~~Patient rooms~~	~~10~~	~~25~~	~~--~~	~~--~~
~~Physical therapy~~	~~20~~	~~15~~	~~--~~	~~--~~
~~Recovery and ICU~~	~~20~~	~~15~~	~~--~~	~~--~~
Hotels, motels, resorts and dormitories				
Multipurpose assembly		5	0.06	--
Bathrooms/toilets-private[g]		--	--	25/50[f]

(Portions of table and footnotes not shown remain unchanged)

Add new text as follows:

SECTION 407
AMBULATORY CARE FACILITIES AND GROUP I-2 OCCUPANCIES

Section 407.1 General. Mechanical ventilation for ambulatory care facilities and Group I-2 occupancies shall be designed and installed in accordance with this code and ASHRAE 170.

Add new referenced standard to Chapter 15:

ASHRAE

Standard Reference Number	Title	Referenced in code section number
170-2008	Ventilation of Health Care Facilities (with addendums a through h – 2011)	407.1

PART II- IBC GENERAL

Revise as follows:

1203.1 General. Buildings shall be provided with natural ventilation in accordance with Section 1203.4, or mechanical ventilation in accordance with the *International Mechanical Code*. Where the air infiltration rate in a *dwelling unit* is less than 5 air changes per hour when tested with a blower door at a pressure 0.2 inch w.c. (50 Pa) in accordance with Section 402.4.1.2 of the *International Energy Conservation Code*, the *dwelling unit* shall be ventilated by mechanical means in accordance with Section 403 of the *International Mechanical Code*. Ambulatory care facilities and Group I-2 occupancies shall be ventilated by mechanical means in accordance with Section 407 of the *International Mechanical Code.*

Reason: This proposal is submitted by the ICC Ad Hoc Committee for Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 5 open meetings and over 80 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: http://www.iccsafe.org/cs/AHC/Pages/default.aspx. This proposal is being co-sponsored by the ICC Code Technology Committee. The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as “areas of study”. Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Currently Table 403.3 if the IMC has a limited number of spaces identified with ventilation rates, additionally if a room is not identified in the table then one is required to use the ventilation rate of an adjacent room that is on the list which is problematic if the space usage is vastly different. ASHRAE Standard 170, Table 7-1 has more comprehensive in the spaces that are identified as well as the design parameter requirements. Facility Guidelines Institute (FGI) has also incorporated ASHRAE 170 into the ventilation design requirements at health care facilities. ASHRAE 170 is similar in nature to the IMC referenced standard for the International Institute for Ammonia Refrigeration.

Cost Impact: The code change proposal should not increase the cost of construction because compliance with the standard is already required by facility licensure requirements.

Analysis: A review of the standard proposed for inclusion in the code, [ASHRAE170-2008] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M36-12
PART I – INTERNATIONAL MECHANICAL CODE

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

PART II – INTERNATIONAL BUILDING CODE

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

401.2-M-WILLIAMS-ADHOCHEALTHCARE.DOC

M37–12
401.2, Chapter 15, IBC 1203.1, IBC CHAPTER 35

Proponent: Steve Ferguson representing the American Society of Heating, Refrigerating, and Air-Conditioning Engineers

THIS IS A 2 PART CODE CHANGE, BOTH PARTS WILL BE HEARD BY THE INTERNATIONAL MECHANICAL CODE COMMITTEE AS 2 SEPARATE CODE CHANGES, SEE THE TENTATIVE HEARING ORDERS FOR THIS COMMITTEE.

PART I - IMC

Revise as follows:

401.2 Ventilation required. Every occupied space shall be ventilated by natural means in accordance with Section 402 or by mechanical means in accordance with Section 403. ~~Where the air infiltration rate in a dwelling unit is less than 5 air changes per hour when tested with a blower door at a pressure of 0.2-inch water column (50 Pa) in accordance with Section 402.4.1.2 of the International Energy Conservation Code, the dwelling unit shall be ventilated by mechanical means in accordance with Section 403~~. R-2, R-3, and R-4 buildings three stories or less in height above grade plane shall be ventilated by mechanical means in accordance with addendum j of ASHRAE Standard 62.2.

Add standard to Chapter 15 as follows:

ASHRAE Standard 62.2-10
Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings

PART II – IBC-GENERAL

1203.1 General. Buildings shall be provided with natural ventilation in accordance with Section 1203.4, or mechanical ventilation in accordance with the *International Mechanical Code.* ~~Where the air infiltration rate in a *dwelling unit* is less than 5 air changes per hour when tested with a blower door at a pressure 0.2 inch w.c. (50 Pa) in accordance with Section 402.4.1.2 of the *International Energy Conservation Code*, the *dwelling unit* shall be ventilated by mechanical means in accordance with Section 403 of the *International Mechanical Code*.~~ R-2, R-3, and R-4 buildings three stories or less in height above grade plane shall be ventilated by mechanical means in accordance with addendum j of ASHRAE Standard 62.2.

Add referenced standard to Chapter 35 as follows:

ASHRAE Standard 62.2-10
Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings

Reason: The previous requirements in the IMC were based on requirements in ASHRAE Standard 62.2.-2007. Since that time, the mechanical ventilation requirements in ASHRAE Standard 62.2 in R-2, R-3, and R-4 buildings have changed. This proposes to reference ASHRAE Standard 62.2 for ventilation requirements in these building types.
The changes in addendum j to 62.2-2010 account for unique features of multifamily buildings as compared to single-family buildings and include (1) adjusting the whole-building ventilation rate due to the fact that infiltration cannot be relied on for individual units in multifamily buildings; (2) provision of ventilation to common spaces and common parking garages, which do not exist in single-family buildings; and (3) prevention of contaminant transfer from other units through walls or ducts.

Cost Impact: There is no expected increase to the cost of construction, as this is simply a clarification of existing requirements.

Analysis: A review of the standard proposed for inclusion in the code, [ASHRAE 62.2-10] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M37-12
PART I-INTERNATIONAL MECHANICAL CODE

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

PART II-INTERNATIONAL BUILDING CODE

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

401.2-M-FERGUSON.DOC

M38–12
401.2, 401.3 (NEW), IBC 1203.1

Proponent: Craig Conner, representing self.

BOTH PARTS I AND II OF THIS CODE CHANGE WILL BE HEARD BY THE IMC COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

Part I – IMC

Revise as follows:

401.2 Ventilation required. Every occupied space shall be ventilated by natural means in accordance with Section 402 or by mechanical means in accordance with Section 403. ~~Where the air infiltration in a *dwelling unit* is less than 5 air changes per hour when tested with a blower door with a pressure of 0.2 inc W.C. (50 Pa) in accordance with Section 402.4.1.2~~ Where a dwelling unit complies with the air tightness requirements in Section C402.4.1 or R402.4.1.2 of the *International Energy Conservation Code*, the dwelling unit shall be ventilated by mechanical means in accordance with Section 403.

Add new text as follows:

401.3 Backdrafting elimination. Dwelling units that comply with the air tightness requirements in Section C402.4.1 or R402.4.1.2 of the *International Energy Conservation Code*, shall comply with at least one of the following options:

1) Space heating appliances, boilers, water heating appliances, wood stoves, and fireplaces in the conditioned space of the dwelling unit shall be of the direct-vent, induced-draft, or power-vented type.

2) Mechanical ventilation for the conditioned space, exhaust systems, clothes dryers and central vacuum systems shall not contribute to depressurization. Systems that provide *makeup air* at a rate approximately equal to or greater than the *exhaust air* rate, that are equipped with a means of closure, and that are automatically controlled to start and operate simultaneously with the exhaust system shall not be deemed to contribute to depressurization.

3) Testing demonstrates compliance with the CAN/CGSB 51.71-2005 depressurization test. Where required by the *code official,* testing shall be performed by an *approved* third party.

4) The *registered design professional* demonstrates in an approved manner that backdrafting will not occur.

Part II – IBC-GENERAL

Revise as follows:

1203.1 General. Buildings shall be provided with natural ventilation in accordance with Section 1203.4, or mechanical ventilation in accordance with the *International Mechanical Code*.

Dwelling units that comply with the air tightness requirements in Section C402.4.1 or R402.4.1.2 of the *International Energy Conservation Code*, ~~Where the air infiltration in a *dwelling unit* is less than 5 air changes per hour when tested with a blower door with a pressure of 0.2 inc W.C. (50 Pa) in accordance with Section 402.4.1.2 of the *International Energy Conservation Code*, the dwelling unit~~ shall be ventilated by mechanical means in accordance with Section 403 of the *International Mechanical Code.*

Add new standard to Chapter 15 as follows:

CAN/CGSB 51.71-2005 Depressurization Test

Reason: Backdrafting combustion appliances can lead to serious health consequences, occasionally including death. This change is designed to greatly reduce the likelihood of backdrafting. This change is also intended to remove the apparent requirement to apply a residential air tightness test to commercial spaces, and remove redundancy in the IBC and IMC.

The 2012 I-codes and common practices are increasing the potential for backdrafting in dwelling units. Back drafting is most likely if three things are true- construction is airtight, exhaust-only ventilation is used, and atmospherically vented (natural draft) combustion appliances are in conditioned spaces. New construction is required by the 2012 IECC to be much more airtight (C402.4.1 for commercial, R402.4.1.2 for residential). Mechanical ventilation is required by the 2012 I-codes in dwelling units, with the least expensive form of mechanical ventilation being the exhaust-only ventilation fans already in common use. The energy code no longer encourages more efficient condensing furnaces by recognizing their high energy efficiency; thereby, removing some of the motivation for condensing furnaces. The trend towards large exhaust fans, such as kitchen hoods, also contributes to the problem. This combination is a recipe for back drafting problems.

The proposed change gives several options. The first two options prevent back drafting by eliminating at least one of major contributor, either the natural draft (atmospherically vented) combustion appliances, or exhaust-only ventilation. The third option is a "Depressurization Test" (standard CAN/CGSB 51.71-2005), which tests for excessive depressurization levels in dwelling units. If a vented combustion appliance using combustion air from the conditioned space experiences strong enough depressurization, the flue gases will spill into the home. Anything more than a brief reverse flow can be serious. The fourth option could be used in situations where the registered design professional can show backdrafting is not a problem without doing a full depressurization test.

Confusion on when the 2012 IBC and IMC require mechanical ventilation in dwelling units is corrected by this change. The IBC and IMC partially, but not completely, repeat air tightness requirements from the IECC. The existing IBC and IMC can be read to require the residential criteria be applied to portions of commercial buildings, whereas the commercial portion of the IECC has its own air tightness criteria. Does a new dwelling unit in a commercial building that meets the 2012 IECC commercial air tightness requirements also require mechanical ventilation? In the 2012 IBC and IMC the answer is unclear unless the residential test is also performed, a test which may be difficult for some commercial buildings. Dwelling units which meet the relatively air tight 2012 IECC commercial criteria should require mechanical ventilation. This proposed change clarifies the IBC and IMC by simply referencing the IECC for air tightness requirements.

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

Analysis: A review of the standard proposed for inclusion in the code, [CAN/CGSB 51.71-2005] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M38-12
PART I – INTERNATIONAL MECHANICAL CODE

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

PART II – INTERNATIONAL BUILDING CODE

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

401.2-M-CONNER.DOC

M39–12
401.2, IBC 1203.1

Proponent: Mike Moore, Newport Ventures, representing Broan NuTone (mmoore@newportpartnersllc.com)

THIS IS A 2 PART CODE CHANGE, BOTH PARTS WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THIS COMMITTEE

PART I – IMC

Revise as follows:

401.2 Ventilation required. Every occupied space shall be ventilated by natural means in accordance with Section 402 or by mechanical means in accordance with Section 403. ~~Where the air infiltration rate in a dwelling unit is less than 5 air changes per hour when tested with a blower door at a pressure of 0.2 inch water column (50 Pa) in accordance with Section 402.4.1.2 of the International Energy Conservation Code, the dwelling unit shall be ventilated by mechanical means in accordance with Section 403~~. R-2, R-3, and R-4 buildings three stories or less in height above grade plane shall be ventilated by mechanical means in accordance with Section 403.

PART II – IBC GENERAL

Revise as follows:

1203.1 General. Buildings shall be provided with natural ventilation in accordance with Section 1203.4, or mechanical ventilation in accordance with the *International Mechanical Code*. ~~Where the air infiltration rate in a *dwelling unit* is less than 5 air changes per hour when tested with a blower door at a pressure 0.2 inch w.c. (50 Pa) in accordance with Section 402.4.1.2 of the *International Energy Conservation Code*, the *dwelling unit* shall be ventilated by mechanical means in accordance with Section 403 of the *International Mechanical Code*.~~ R-2, R-3, and R-4 buildings three stories or less in height above grade plane shall be ventilated by mechanical means in accordance with Section 403 of the *International Mechanical Code.*

Reason: To identify the mechanical ventilation requirements of dwelling units, designers are now required to cross reference the 2012 IECC, determine if the dwelling unit is within a building that is covered within the scope of Chapter 4 or Chapter 5 of the IECC, and then determine if the air tightness level of the unit is sufficiently tight to require mechanical ventilation per Section 401.2 of the IMC.

This proposal short cuts this burdensome circuit by clearly stating what the designer would find if he or she were to go through this exercise – that mechanical ventilation is required by the overlap of the 2012 IECC and 2012 IMC for R-2, R-3, and R-4 buildings. The reason for this is as follows:

1. The 2012 IMC 401.2 requires dwelling units with an air infiltration rate less than 5 ACH 50 (air changes per hour at 50 Pa, as confirmed by a blower door test in accordance with 2012 IECC Section 402.4.1.2) to be provided with mechanical ventilation.
2. The scope of Chapter 4 of the 2012 IECC overlaps with that of the IMC for R-2, R-3, and R-4 buildings three stories or less above grade plane (see the definition of Residential within Chapter 2 of the IECC).
3. 2012 IECC 402.4.1.2 requires that the air leakage rate for all buildings or dwelling units within its scope be less than or equal to 5 air changes per hour when tested with a blower door at a pressure of 0.2 inch water column (50 Pa).
4. The net result is that R-2, R-3, and R-4 buildings three stories or less in height above grade plane are required to be ventilated by mechanical means in accordance with Section 403 of the IMC.
5. Additionally, 2012 IECC 403.5 reads: "Mechanical Ventilation (Mandatory). The building shall be provided with ventilation that meets the requirements of the International Residential Code or International Mechanical Code, as applicable, or with other approved means of ventilation."

Combined, the overlap of the two codes requires that mechanical ventilation should be provided in accordance with Section 403. This proposal is needed to clarify this requirement and remove ambiguity in the code. Note that there is a companion code change proposed for Section 1203.1 of the IBC.

Cost Impact: There is no expected increase to the cost of construction, as this is simply a clarification of existing requirements.

M39-12
PART I – INTERNATIONAL MECHANICAL CODE

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

PART II – INTERNATIONAL BUILDING CODE

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

401.2-M-MOORE.DOC

M40–12
401.2.1 NEW

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Add new text as follows:

401.2 .1 Dwelling unit mechanical ventilation. The mechanical ventilation required for dwelling units by Section 401.2 shall be provided by means of one or more supply or exhaust fans or one or more local supply or exhaust fans. Outdoor air ducts connected to the return side of an air handler shall be considered as providing supply ventilation where utilized in conjunction with exhaust fans.

Reason: Section 401.2 requires mechanical ventilation in dwelling units under specified conditions, but unlike the IRC, it does not provide any guidance as to how this is to be accomplished. The proposed text is borrowed from the IRC.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M40-12

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

401.2.1-M-STRAUSBAUGH-PMGCAC.DOC

M41–12
401.3

Proponent: Randall R. Dahmen, P.E. Wisconsin licensed Commercial Building Inspector, representing self

Revise as follows:

401.3 When required. Ventilation shall be provided during the periods that the room or space is occupied. Continuous mechanical ventilation shall be provided for swimming pool areas.

Reason: As is typical, there is high humidity and an accumulation of chemicals in the air of enclosed spaces involving swimming pools. Without continuous air movement and air exchange, the humidity has been known to promote the growth of mold within the space. Additionally, due to chemicals commonly used to treat pool water, corrosion to exposed metals in such spaces have been known to occur where air movement and air exchange is not maintained.

Cost Impact: There would be an increase operational costs as associated with supply & exhaust fan operations and the need for additional tempered outside air as associated with IMC 403.2.1 Item 2. and IMC Table 403.3. Such costs are dependent on the size of the pool & deck.

M41-12

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

401.3-M-DAHMEN.DOC

M42–12

403, 403.3(NEW), 403.3.1 (NEW), 403.3.2(NEW), 403.3.2.1(NEW), 403.3.2.1.1(NEW), 403.3.2.2(NEW), 403.3.2.3(NEW), 403.3.2.4(NEW)

Proponent: Mike Moore, Newport Ventures, representing Broan NuTone (mmoore@newportpartnersllc.com)

Revise as follows:

403.1 Ventilation system. Except as required by Section 403.1.1, mechanical ventilation shall be provided by a method of supply air and return or exhaust air. The amount of supply air shall be approximately equal to the amount of return and exhaust air. The system shall not be prohibited from producing negative or positive pressure. The system to convey ventilation air shall be designed and installed in accordance with Chapter 6.

403.1.1 R-2, R-3 and R-4 occupancies. Mechanical ventilation air requirements for R-2, R-3, and R-4 buildings three stories or less in height above grade plane shall be provided by an exhaust system, supply system, or combination thereof.

403.2 Outdoor air required. The minimum outdoor airflow rate shall be determined in accordance with Section 403.3. ~~Ventilation supply systems shall be designed to deliver the required rate of outdoor airflow to the breathing zone within each occupiable space.~~

> **Exception:** Where the registered design professional demonstrates that an engineered ventilation system design will prevent the maximum concentration of contaminants from exceeding that obtainable by the rate of outdoor ventilation determined in accordance with Section 403.3, the minimum required rate of outdoor air shall be reduced in accordance with such engineered system design.

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

1. Ventilation air shall not be recirculated from one dwelling to another or to dissimilar occupancies.
2. Supply air to a swimming pool and associated deck areas shall not be recirculated unless such air is dehumidified to maintain the relative humidity of the area at 60 percent or less. Air from this area shall not be recirculated to other spaces where more than 10 percent of the resulting supply airstream consists of air recirculated from these spaces.
3. Where mechanical exhaust is required by Note b in Table 403.3.1.1, recirculation of air from such spaces shall be prohibited. All air supplied to such spaces shall be exhausted, including any air in excess of that required by Table 403.3.1.1.
4. Where mechanical exhaust is required by Note g in Table 403.3.1.1, mechanical exhaust is required and recirculation is prohibited where more than 10 percent of the resulting supply airstream consists of air recirculated from these spaces.

403.2.2 Transfer air. Except where recirculation from such spaces is prohibited by Table 403.3.1.1, air transferred from occupiable spaces is not prohibited from serving as makeup air for required exhaust systems in such spaces as kitchens, baths, toilet rooms, elevators and smoking lounges. The amount of transfer air and exhaust air shall be sufficient to provide the flow rates as specified in Section 403.3.1.1. The required outdoor airflow rates specified in Table 403.3.1.1 shall be introduced directly into such spaces or into the occupied spaces from which air is transferred or a combination of both.

In R-2, R-3, and R-4 occupancies three stories or less in height, measures shall be taken to minimize air movement across envelope components separating dwelling units including sealing penetrations in the common walls, ceilings, and floors of each unit, and by sealing vertical chases adjacent to the units. Doors between dwelling units and common hallways shall be gasketed or otherwise made airtight.

403.3 Outdoor air and local exhaust airflow rates. R-2, R-3, and R-4 buildings three stories or less in height above grade plane shall be provided with outdoor air and local exhaust in accordance with Section 403.3.2. All other buildings intended to be occupied shall be provided with outdoor air and local exhaust, in accordance with Section 403.3.1.

403.3.1 Other buildings intended to be occupied. The design of local exhaust systems and ventilation systems for outdoor air for occupancies other than R-2, R-3 and R-4 three stories are less above grade plane, shall comply with this section.

~~403.3~~403.3.1.1 Outdoor airflow rate. Ventilation systems shall be designed to have the capacity to supply the minimum outdoor airflow rate, determined in accordance with this section. Ventilation supply systems shall be designed to deliver the required rate of outdoor airflow to the breathing zone within each occupiable space. The occupant load utilized for design of the ventilation system shall not be less than the number determined from the estimated maximum occupant load rate indicated in Table 403.3.1.1. Ventilation rates for occupancies not represented in Table 403.3.1.1 shall be those for a listed occupancy classification that is most similar in terms of occupant density, activities and building construction; or shall be determined by an approved engineering analysis. The ventilation system shall be designed to supply the required rate of ventilation air continuously during the period the building is occupied, except as otherwise stated in other provisions of the code.

With the exception of smoking lounges, the ventilation rates in Table 403.3.1.1 are based on the absence of smoking in occupiable spaces. Where smoking is anticipated in a space other than a smoking lounge, the ventilation system serving the space shall be designed to provide ventilation over and above that required by Table 403.3.1.1 in accordance with accepted engineering practice.

> **Exception:** The occupant load is not required to be determined based on the estimated maximum occupant load rate indicated in Table 403.3.1.1 where approved statistical data document the accuracy of an alternate anticipated occupant density.

(Renumber current sections as indicated in table)

Old Section Numbering	New Section Numbering	Section Heading
403.3	403.3.1.1	Outdoor airflow rate
403.3.1	403.3.1.1.1	Zone outdoor airflow
403.3.1.1	403.3.1.1.1.1	Breathing zone outdoor airflow
403.3.1.2	403.3.1.1.1.2	Zone air distribution effectiveness
403.3.1.3	403.3.1.1.1.3	Zone outdoor airflow
403.3.2	403.3.1.1.2	System outdoor airflow
403.3.2.1	403.3.1.1.2.1	Single zone systems
403.3.2.2	403.3.1.1.2.2	100-percent outdoor air systems
403.3.2.3	403.3.1.1.2.3	Multiple zone recirculating systems
403.3.2.3.1	403.3.1.1.2.3.1	Primary outdoor air fraction
403.3.2.3.2	403.3.1.1.2.3.2	System ventilation efficiency
403.3.2.3.3	403.3.1.1.2.3.3	Uncorrected outdoor air intake
403.3.2.3.4	403.3.1.1.2.3.4	Outdoor air intake flow rate
403.4	403.3.1.2	Exhaust ventilation
403.5	403.3.1.3	System operation
403.6	403.3.1.4	Variable air volume system control
403.7	403.3.1.5	Balancing

403.3.2 R-2, R-3, and R-4 buildings three stories or less in height above grade plane. The design of local exhaust systems and ventilation systems for outdoor air in R-2, R-3, and R-4 occupancies three stories and less in height above grade plane shall comply with sections 403.3.2.1 through 403.3.2.4.

403.3.2.1 Outdoor air for dwelling units. An outdoor air ventilation system consisting of a mechanical exhaust system, supply system, or combination thereof shall be installed for each dwelling unit. Local exhaust or supply systems, including outdoor air ducts connected to the return side of an air handler, are permitted to serve as such a system. The outdoor air ventilation system shall be designed to provide the required rate of outdoor air continuously during the period that the building is occupied. The minimum continuous outdoor airflow rate is specified in Equation 4-1.

$Q_{OA} = 0.03A_{floor} + 7.5(N_{br} + 1)$ (**Equation 4-1**)

where

Q_{OA} = outdoor airflow rate, cfm

A_{floor} = floor area, ft^2

N_{br} = number of bedrooms; not to be less than one

> **Exception:** The outdoor air ventilation system shall be permitted to be designed to operate intermittently where the system has controls that enable operation for not less than 25-percent of each 4-hour segment and the outdoor airflow rate prescribed by Equation 4-1 is multiplied by the factor determined in accordance with Table 403.3.2.1. This factor shall be applied after the outdoor airflow rate is adjusted for occupant density in accordance with Section 403.3.2.1.1.

TABLE 403.3.2.1
INTERMITTENT OUTDOOR AIR RATE FACTORS[a,b]

RUN-TIME PERCENTAGE IN EACH 4-HOUR SEGMENT	25%	33%	50%	66%	75%	100%
Factor[a]	4	3	2	1.5	1.3	1.0

403.3.2.1.1 Occupant density. Equation 4-1 assumes that there are two occupants in a studio or one-bedroom dwelling unit and an additional occupant for each additional bedroom. Where higher occupant densities are known, the outdoor airflow rate shall be increased by 7.5 cfm for each additional occupant. Lower occupant densities shall not be used except where approved by the code official.

403.3.2.2 Outdoor air for other spaces. Corridors and other common areas within the conditioned space shall be provided with outdoor air at a rate of not less than 0.06 cfm per ft^2 of floor area.

403.3.2.3 Local exhaust. Local exhaust systems shall be provided in kitchens, bathrooms, and toilet rooms, and shall have the capacity to exhaust the minimum airflow rate determined in accordance with Table 403.3.2.3.

TABLE 403.3.2.3
MINIMUM REQUIRED LOCAL EXHAUST RATES FOR R-2, R-3, AND R-4 OCCUPANCIES

AREA TO BE EXHAUSTED	EXHAUST RATE CAPACITY
Kitchens	100 cfm intermittent or 25 cfm continuous
Bathrooms-Toilet Rooms	50 cfm intermittent or 20 cfm continuous

403.3.2.4. System controls. Local exhaust systems and ventilation systems for outdoor air shall be provided with controls that enable manual override.

Reason: Historically, the basis of the mechanical ventilation requirements for all buildings within the scope of the IMC has been ASHRAE Standard 62.1, Ventilation for Acceptable Indoor Air Quality. However, the scope of ASHRAE Standard 62.1 does not address R-2, R-3, and R-4 buildings with a height of three stories or less above grade plane. Instead, mechanical ventilation requirements for these buildings fall under the scope of ASHRAE Standard 62.2, *Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings*. This proposal seeks to align the mechanical ventilation requirements for R-2, R-3, and R-4 buildings of three stories or less above grade plane with the latest requirements of ASHRAE 62.2, while retaining common elements with the 2012 IRC mechanical ventilation requirements in Section M1507 wherever possible (e.g., Table 403.3.2.3 is the same as M1507.4; Table 403.3.2.1 is the same as M1507.3.3(2)).

This proposal makes no changes to the mechanical ventilation requirements of buildings other than R-2, R-3, and R-4 buildings of three stories or less above grade plane (note that the text removed from 403.2 has simply been reinserted in 403.3.1.1).

The effect of this proposal will be to simplify and clarify mechanical ventilation requirements for R-2, R-3, and R-4 buildings with a height of three stories or less above grade plane, ensuring that the IMC requirements are aligned with the latest ASHRAE standard that addresses these building types. Note that the latest ASHRAE 62.2 requirements addressing R-2, R-3, and R-4 buildings are found in addendum j to the 2010 edition. To receive a complimentary copy of addendum j, contact ASHRAE at (404) 636-8400.

Cost Impact: There is no expected increase to the cost of construction.

M42-12

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

403.1-M-MOORE.DOC

M43–12
403.2.1, Table 403.3

Proponent: Richard Grace, Fairfax County, Virginia Plumbing and Mechanical Inspectors Association, Virginia Building Code Officials Association

Revise as follows:

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

3. Where mechanical exhaust is required by Note b in Table 403.3, recirculation of air from such spaces shall be prohibited. Recirculation of air that is contained completely within such spaces shall not be prohibited. Where recirculation of air is prohibited, ~~A~~all air supplied to such spaces shall be exhausted, including any air in excess of that required by Table 403.3.

(Portions not shown remain unchanged)

Revise footnote as follows:

TABLE 403.3
MINIMUM VENTILATION RATES

b. Mechanical exhaust required and the recirculation of air from such spaces is prohibited. Recirculation of air that is contained completely within such spaces shall not be prohibited. (see Section 403.2.1, Item 3).

Reason: The language used in these sections is accurate, yet weak. The intent is commonly being misinterpreted, resulting in a requirement of 100% outdoor air systems to all spaces applicable to footnote b. This type of misinterpretation would not allow for the installation of a mini-split type room air conditioner or even a ceiling mounted paddle fan because both would recirculate air within the space. This is not the intent of this requirement. The intent of these sections is to prohibit air that is delivered to a space, such as a beauty salon or a repair garage, from being taken out of that space and delivered to another, unrelated space such as a dining room or a classroom or an operating room. Where a space is provided with an air distribution system dedicated to such space, the air delivered to that space cannot possibly be distributed to other, unrelated spaces, therefore recirculation "from" such spaces is not possible. The outdoor air and exhaust requirements for spaces subject to this footnote effectively remove the contaminants generated within such spaces, therefore air provided to such spaces that is in excess of that required by Table 403.3 may safely be recirculated *within* such spaces.

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

M43-12

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

403.2.1#1-M-GRACE.DOC

M44–12
403.2.1, Table 403.3

Proponent: Richard Grace, Fairfax County, Virginia Plumbing and Mechanical Inspectors Association, Virginia Building Code Officials Association

Revise as follows:

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

(No changes to items 1 through 3)

4. Where mechanical exhaust is required by Note g in Table 403.3, mechanical exhaust is required and recirculation <u>from such spaces</u> is prohibited where more than 10 percent of the resulting supply airstream consists of air recirculated from these spaces. <u>Recirculation of air that is contained completely within such spaces shall not be prohibited.</u>

TABLE 403.3
MINIMUM VENTILATION RATES

g. Mechanical exhaust is required and recirculation <u>from such spaces</u> is prohibited except that recirculation shall be permitted where the resulting supply airstream consists of not more than 10 percent air recirculated from these spaces<u>. Recirculation of air that is contained completely within such spaces shall not be prohibited.</u> (see Section 403.2.1, Items 2 and 4).

(Portions of table and footnotes not shown remain unchanged)

Reason: Unlike footnote b (Table 403.3), footnote g *does* allow for recirculation of air *from* such a space to another space. The purpose of footnote g was to encourage the use of heat recovery systems in air handling units and exhaust systems that served bathrooms, toilet rooms, locker rooms, and the like. For this reason, recirculation of air, from these spaces to other spaces, is limited. That limitation allowed for a small amount of leakage from the exhaust to the supply by the energy recovery units. Where energy recovery units are not used, meeting this requirement would be rare, where this requirement is applicable. The intent of this section is being misinterpreted, resulting in a requirement of 100% outdoor air systems where dedicated air handling units are being specified for such spaces. Where a space is provided with an air distribution system dedicated to such space, the air delivered to that space cannot possibly be distributed to other, unrelated spaces, therefore recirculation “from” such spaces is not possible. The outdoor air and exhaust requirements for spaces subject to this footnote effectively remove the contaminants generated within such spaces, therefore air provided to such spaces that is in excess of that required by Table 403.3 may safely be recirculated *within* such spaces, regardless of the percentage of the resulting supply airstream.

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

M44-12

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

403.2.1#2-M-GRACE.DOC

M45–12
Table 403.3

Proponent: Randall R. Dahmen, P.E. Wisconsin licensed Commercial Building Inspector, representing himself.

Revise as follows:

TABLE 403.3
MINIMUM VENTILATION RATES

OCCUPANCY CLASSIFICATION	OCCUPANT DENSITY #/1000 FT^{2a}	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_p CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_a CFM/FT^{2a}	EXHAUST AIRFLOW RATE CFM/FT^{2a}
Storage				
Repair garages, enclosed parking garages and aircraft hangars[b,d]	—	—	—	0.75

(Portions of table not shown remain unchanged.)

Reason: Enclosed parking garages have typically been viewed as a space in which automotive vehicles are to be located. The application of “enclosed parking garage” has been called into question when examining its application for use with aircraft hangars. The intent of the change is to provide clarity that the code entry involving a minimum exhaust rate is also applicable to aircraft hangars.

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

M45-12

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

T403.3#1-M-DAHMENDOC.DOC

M46–12
Table 403.3

Proponent: Richard Grace, Fairfax County, Virginia Plumbing and Mechanical Inspectors Association, Virginia Building Code Officials Association and Guy McMann, MCP, Jefferson County Colorado, Colorado Association of Plumbing and Mechanical Officials (CAPMO)
(gmcmann@jeffco.us)

Revise as follows:

TABLE 403.3
MINIMUM VENTILATION RATES

h. For nail salons, each nail station shall be provided with a *source capture system* capable of exhausting not less than 50 cfm per station. <u>Where one or more required source capture systems operate continuously during occupancy, the exhaust rate from such systems shall be permitted to be applied to the exhaust flow rate required by Table 403.3 for the nail salon.</u>

(Portions of table and footnotes not shown remain unchanged.)

Reasons:
Grace-The exhaust rate in the Table was established before the requirement for source capture systems was required. It's punitive to add more exhaust when the original amount was sufficient. It's not the intent for the source capture system flow rate to be in addition to the general exhaust requirement when it runs continuously as most of the vapors are being contained at the source. The balance of exhaust required will cover any fugitive vapors that may slip by the station exhaust system. If for instance there are individually controlled fans at each station, then that amount of exhaust would be in addition to the general amount because there is no guarantee that the fans will be used.

McMann-Currently the code is silent on how to apply both the general exhaust column and note h of Table 403.3 The exhaust rate in the Table was established before the requirement for source capture systems were required. It's punitive to add more exhaust when the original amount was sufficient. It's not the intent for the source capture system flow rate to be in addition to the general exhaust requirement when it runs continuously during occupancy as most of the chemical vapors are being contained at the source. The balance of exhaust required will cover any fugitive vapors that may slip by the station exhaust system. If for instance there are individually controlled fans at each station, then that amount of exhaust would be in addition to the general amount because there is no guarantee they will be operated. As an example, if the salon is required to have 800 cfm of general exhaust by Table 403.3 and 6 nail stations exhaust the required minimum of 300 cfm continuously, the general exhaust could be reduced to 500 cfm. The intent of the code is met because a total of 800 cfm is still being exhausted and the vapors are still being captured at their source.

Cost Impact: None

M46-12

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

T403#1-M-GRACE-MCMANN.DOC

M47-12/13
Table 403.3

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

TABLE 403.3
MINIMUM VENTILATION RATES

OCCUPANCY CLASSIFICATION	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, *Rp* CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHIN ZONE, *Ra* CFM/FT2	DEFAULT OCCUPANT DENSITY #/1000 FT2	EXHAUST AIRFLOW RATE CFM/FT2
Hospitals~~,~~ <u>and</u> nursing ~~and convalescent~~ homes [j] Autopsy rooms[b] Medical procedure rooms Operating rooms Patient rooms Physical therapy Recovery and ICU				

(Portions of table and notes not shown remain unchanged)

Reason: The term ‘convalescent home’ is currently being used incorrectly in IMC Table 403.3 as a Group I-2 facility. These facilities are currently listed as Group I-1 and R-4, therefore the requirements listed in the ventilation tables are not correct. In addition, there is a correlative change to delete this term from Group I-1 and R-4 as an outdated term.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as “areas of study”. Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: None

M47-12

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

403.3-M-BALDASSARRA-CTC.DOC

M48–12
Table 403.3

Proponent: Randall R. Dahmen, P.E. Wisconsin licensed Commercial Building Inspector, representing himself

Revise as follows:

TABLE 403.3
MINIMUM VENTILATION RATES

OCCUPANCY CLASSIFICATION	OCCUPANT DENSITY #/1000 FT^{2a}	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_p CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_a CFM/FT^{2a}	EXHAUST AIRFLOW RATE CFM/FT^{2a}
Specialty shops				
Vehicle wash area[b]	—	—	—	0.75

(Portions of table not shown remain unchanged.)

Reason: Vehicle wash areas which occur in enclosed spaces retain large amounts of humidity. Such areas also include exhausts from the motorized vehicles such as cars, trucks, etc. from when the vehicles were moved into the space. By exhausting the space during occupancy, both the humidity and the vehicle exhausts would be removed. Additionally, contaminants from the vehicle wash which may permeate the air will also be removed.

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

M48-12

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

T403.3#2-M-DAHMEN.DOC

M49–12
T403.3

Proponent: Guy McMann, MCP, Jefferson County Colorado, Colorado Association of Plumbing and Mechanical Officials (CAPMO) and Richard Grace, Fairfax County Government, representing The Virginia Plumbing and Mechanical Inspectors Association, The Virginia Building Code Officials Association (gmcmann@jeffco.us)

Revise as follows:

TABLE 403.3
MINIMUM VENTILATION RATES

OCCUPANCY CLASSIFICATION	OCCUPANT DENSITY #/1000 FT^{2} [a]	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE R_a CFM/FT^{2} [a]	EXHAUST AIRFLOW RATE CFM/FT^{2} [a]
Private dwellings, single and multiple				
Garages, common for multiple units[b]	—	—	—	0.75
~~Garages, separate for each dwelling[b]~~	—	—	—	~~100 cfm per car~~
Kitchens[b]	—	—	—	25/100[f]
Living areas[c]	— Based upon number of bedrooms. First bedroom, 2; each additional bedroom, 1	— 0.35 ACH but not less than 15 cfm/person	— —	—
Toilet rooms and bathrooms[g]	—	—		20/50[f]

(Portions of table not shown remain unchanged.)

Reason:

McMann-The requirement for an exhaust system which is a form of ventilation seems to conflict with Section 502.14 which exempts one and two family dwellings from being ventilated. The concern is installing a fan of this size will have no impact on the garage space as it would not provide much in the way of flow. There are very few if any jurisdictions enforcing a fan in a residential garage. There is no technical justification to require this provision because simply opening the door when a car leaves will provide more ventilation than any fan of this size would even if the garage has no windows and certainly makeup air could technically come into play which isn't practical either.

Grace-This is in direct conflict with Section 502.14 Exception # 2 which exempts one and two family dwellings. This makes no sense as there are no values to supply a garage with ventilation air and installing a fan of this size will have no impact on the garage space as it would not provide much in the way of flow. There are few if any jurisdictions enforcing a fan in a residential garage. There is no technical justification to require this provision because simply opening the door when a car leaves will provide more ventilation than any fan would and certainly makeup air would come into play which isn't practical either.

Cost Impact: This could *decrease* the cost of construction**.**

M49-12

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

T403.3#1-M-MCMANN.DOC

M50– 12
403

Proponent: Steve Ferguson representing the American Society of Heating, Refrigerating, and Air-Conditioning Engineers

Revise as follows:

403.3.1.1 Breathing zone outdoor airflow. The outdoor airflow rate required in the *breathing zone* (V_{bz}) of the occupiable space or spaces in a zone shall be not less than the value determined in accordance with Equation 4-1.

$V_{bz} = R_pP_z + R_aA_z$ (Equation 4-1)

Where:

A_z = *zone floor area*: the net occupiable floor area of the space or spaces in the zone.
P_z = *zone population*: the number of people in the space or spaces in the zone as determined by Section 403.3.1.4.
R_p = *people outdoor air rate:* the outdoor airflow rate required per person from Table 403.3
R_a = *area outdoor air rate:* the outdoor airflow rate required per unit area from Table 403.3

403.3.1.2 Zone air distribution effectiveness. The *zone air distribution effectiveness* (E_z) shall be not greater than the value determined using Table 403.3.1.2.

403.3.1.4 Design Zone Population. Design *zone population (P_z)* shall equal the largest (peak) number of people expected to occupy the *ventilation zone* during typical usage.

Exceptions:

1. Where the number of people expected to occupy the *ventilation zone* fluctuates, a *zone population* equal to the average number of people shall be permitted to be used,
2. Where the largest or average number of people expected to occupy the *ventilation zone* cannot be established for a specific design, an estimated value for *zone population* shall be permitted to be used, provided that such value is the product of the *net occupiable area* of the *ventilation zone* and the occupant density listed in Table 403.3.

403.3.2 System outdoor airflow. The outdoor air required to be supplied by each ventilation system shall be determined in accordance with Section 403.3.2.1 through 403.2.3 as a function of system type and zone outdoor airflow rates.

403.3.2.1 Single zone systems. ~~When~~ For *ventilation* systems wherein one or more air handler supplies a mixture of outdoor air and recirculated return air to only one zone, the system *outdoor air intake flow rate* (V_{ot}) shall be determined in accordance with Equation 4-3.

$V_{ot} = V_{oz}$ (Equation 4-3)

403.3.2.2 100% outdoor air systems. ~~When~~ For *ventilation* systems wherein one or more air handler supplies only outdoor air to one or more zones, the system *outdoor air intake flow* rate (V_{ot}) shall be determined using Equation 4-4.

$V_{ot} = \Sigma_{all\ zones}V_{oz}$ (Equation 4-4)

403.3.2.3 Multiple zone recirculating systems. Where one air handler supplies a mixture of outdoor air and recirculated return air to more than one zone, the system outdoor air intake flow rate (*Vot*) shall be determined
in accordance with Sections 403.3.2.3.1 through 403.3.2.3.4.

$Z_p = Voz/ Vpz$ (Equation 4-5)

Where

Vpz = Primary airflow: The airflow rate supplied to the zone from the air-handling unit at which the outdoor air intake is located. It includes outdoor intake air and recirculated air from that air-handling unit but does not include air transferred or air recirculated to the zone by other means. For design purposes, *Vpz* shall be the zone design primary
airflow rate, except for zones with variable air volume supply and *Vpz* shall be the lowest expected primary airflow rate to the zone when it is fully occupied.

TABLE 403.3
MINIMUM VENTILATION RATES

OCCUPANCY CLASSIFICATION	OCCUPANT DENSITY #/1000 FT^2 [a]	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_p CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_a CFM/FT^2 [a]	EXHAUST AIRFLOW RATE CFM/FT^2 [a]
Correctional facilities				
Cells without plumbing fixtures	25	~~5~~10	0.12	—
with plumbing fixtures[g]	25	~~5~~10	0.12	1.0
Dining halls (see food and beverage service)	—	—	—	—
Guard stations	15	5	0.06	—
Day room	30	5	0.06	—
Booking/waiting	50	7.5	0.06	—
Dry cleaners, laundries				
Coin-operated dry cleaner	20	15	—	—
Coin-operated laundries	20	7.5	~~0.06~~0.12	—
Commercial dry cleaner	30	30	—	—
Commercial laundry	10	25	—	—
Storage, pick up	30	7.5	0.12	—
Education				
Auditoriums	150	5	0.06	—
Corridors (see public spaces)	—	—	~~—~~0.06	—
Media center	25	10	0.12	—
Sports locker rooms[g]	—	—	—	0.5
Music/theater/dance	35	10	0.06	—
Smoking lounges[b]	70	60		—
Day care (through age 4)	25	10	0.18	—

Classrooms (ages 5-8)	25	10	0.12	—
Classrooms (age 9 plus)	35	10	0.12	—
Lecture classroom	65	7.5	0.06	—
Lecture hall (fixed seats)	150	7.5	0.06	—
Art classroom[g]	20	10	0.18	0.7
Science laboratories[g]	25	10	0.18	1.0
Wood/metal shops[g]	20	10	0.18	0.5
Computer lab	25	10	0.12	—
Multiuse assembly	100	7.5	0.06	—
Locker/dressing rooms[g]	—	—	—	0.25
Food and beverage service				
Bars, cocktail lounges	100	7.5	0.18	—
Cafeteria, fast food	100	7.5	0.18	—
Dining rooms	70	7.5	0.18	—
Kitchens (cooking)[b]	—20	—7.5	—0.12	0.7
Hospitals, nursing and convalescent homes				
Autopsy rooms[b]	—	—	—	0.5
Medical procedure rooms	20	15	—	—
Operating rooms	20	30	—	—
Patient rooms	10	25	—	—
Physical therapy	20	15	—	—
Recovery and ICU	20	15	—	—

(continued)

TABLE 403.3—continued
MINIMUM VENTILATION RATES

OCCUPANCY CLASSIFICATION	OCCUPANT DENSITY #/1000 FT[2 a]	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_p CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_a CFM/FT[2 a]	EXHAUST AIRFLOW RATE CFM/FT[2 a]
Hotels, motels, resorts and dormitories				
Multipurpose assembly	120	5	0.06	—
Bathrooms/toilet—private[g]		—	—	25/50[f]
Bedroom/living room	10	5	0.06	—
Conference/meeting	50	5	0.06	—
Dormitory sleeping areas		5	0.06	—
Gambling casinos	120	7.5	0.18	—
Lobbies/prefunction	120	7.5	0.06	—
Offices				
Conference rooms	50	5	0.06	—
Office spaces	5	5	0.06	—

Reception areas	30	5	0.06	—
Telephone/data entry	60	5	0.06	—
Main entry lobbies	10	5	0.06	—
Private dwellings, single and multiple				
Garages, common for multiple units[b]	—	—	—	0.75
Garages, separate for each dwelling[b]	—	—	—	100 cfm per car
Kitchens[b]	—	—	—	25/100[f]
Living areas[c]	Based upon number of bedrooms. First bedroom, 2; each additional bedroom, 1	0.35 ACH but not less than 15 cfm/person	—	—
Toilet rooms and bathrooms[g]	—	—	—	20/50[f]
Public spaces				
Corridors	—	—	0.06	—
Elevator car	—	—	—	1.0
Shower room (per shower head)[g]	—	—	—	50/20[f]
Smoking lounges[b]	70	60	—	—
Toilet rooms — public[g]	—	—	—	50/70[e]
Places of religious worship	120	5	0.06	—
Courtrooms	70	5	0.06	—
Legislative chambers	50	5	0.06	—
Libraries	10	5	0.12	—
Museums (children's)	40	7.5	0.12	—
Museums/galleries	40	7.5	0.06	—
Retail stores, sales floors and showroom floors				
Sales (except as below)	15	7.5	0.12	—
Dressing rooms	—	—	—	0.25
Mall common areas	40	7.5	0.06	—
Shipping and receiving	—2	—10	0.12	—
Smoking lounges[b]	70	60	—	—
Storage rooms	—	—	0.12	—
Warehouses (see storage)	—	—10	—0.06	—

TABLE 403.3—continued
MINIMUM VENTILATION RATES

OCCUPANCY CLASSIFICATION	OCCUPANT DENSITY #/1000 FT^{2} [a]	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_p CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_a CFM/FT^{2} [a]	EXHAUST AIRFLOW RATE CFM/FT^{2} [a]
Specialty shops				
Automotive motor-fuel dispensing stations[b]	—	—	—	1.5
Barber	25	7.5	0.06	0.5
Beauty salons[b]	25	20	0.12	0.6
Nail salons[b,h]	25	20	0.12	0.6
Embalming room[b]	—	—	—	2.0
Pet shops (animal areas)[b]	10	7.5	0.18	0.9
Supermarkets	8	7.5	0.06	—
Sports and amusement				
Disco/dance floors	100	20	0.06	—
Bowling alleys (seating areas)	40	10	0.12	—
Game arcades	20	7.5	0.18	—
Ice arenas without combustion engines	—	—	0.30	0.5
Gym, stadium, arena (play area)	—	—	0.30	—
Spectator areas	150	7.5	0.06	—
Swimming pools (pool and deck area)	—	—	0.48	—
Health club/aerobics room	40	20	0.06	—
Health club/weight room	10	20	0.06	—
Storage				
Repair garages, enclosed parking garages[b,d]	—	—	—	0.75
Warehouses	—	—10	0.06	—
Theaters				
Auditoriums (see education)	—	—	—	—
Lobbies	150	5	0.06	—
Stages, studios	70	10	0.06	—
Ticket booths	60	5	0.06	—
Transportation				
Platforms	100	7.5	0.06	—
Transportation waiting	100	7.5	0.06	—
Workrooms				
Bank vaults/safe deposit	5	5	0.06	—
Darkrooms	—	—	—	1.0

Copy, printing rooms	4	5	0.06	0.5
Meat processing[c]	10	15	—	—
Pharmacy (prep. area)	10	5	0.18	—
Photo studios	10	5	0.12	—
Computer (without printing)	4	5	0.06	—

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

a. Based upon *net occupiable floor area*.

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

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

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

e. Rates are per water closet or urinal. The higher rate shall be provided where the exhaust system is designed to operate intermittently. The lower rate shall be permitted only where the exhaust system is designed to operate continuously while occupied.

f. Rates are per room unless otherwise indicated. The higher rate shall be provided where the exhaust system is designed to operate intermittently. The lower rate shall be permitted only where the exhaust system is designed to operate continuously while occupied.

g. Mechanical exhaust is required and recirculation is prohibited except that recirculation shall be permitted where the resulting supply airstream consists of not more than 10 percent air recirculated from these spaces (see Section 403.2.1, Items 2 and 4).

h. For nail salons, each nail station shall be provided with a *source capture system* capable of exhausting not less than 50 cfm per station.

Reason: The current ventilation criteria in the IMC are essentially based on ASHRAE Standard 62-2007. Research has been conducted since then our knowledge of indoor air quality and ventilation has evolved. In response to these actions ASHRAE has enhanced Standard 62.1, upon which the IMC is based. This code change would make the IMC consistent with ventilation rate procedures defined in ANSI/ASHRAE Standard 62.1-2010.

Substantiation: ANSI/ASHRAE Standard 62.1-2010 is a consensus national standard. Standard 62.1 ventilation rate calculation procedure has been substantially updated in the 2010 version to reflect the latest research on building indoor air quality. The procedure now requires designers to account for pollutant sources other than occupants, such as building materials and furnishings, and to account for the efficiency of the ventilation system to deliver outdoor air to the breathing zone. Ventilation systems designed using the new procedures will result in slightly lower outdoor rates for most occupancies compared to the current code, reducing first costs and energy costs.

Cost Impact: The code change proposal will not increase the cost of construction, and in some instances will reduce the first cost of construction. Engineering design effort and jurisdictional plan review processes will not be materially affected due to the availability and greater specificity of compliance tools.

M50-12

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

403.3.1.1-M-FERGUSON.DOC

M51–12
403.2

Proponent: Maureen Traxler/City of Seattle Dept of Planning & Development/ City of Seattle Dept of Planning & Development
(maureen.traxler@seattle.gov)

Revise as follows:

403.2 Outdoor air required. The minimum outdoor airflow rate shall be determined in accordance with Section 403.3. ~~Ventilation~~ In occupiable spaces, the ventilation supply system~~s~~ shall be designed to deliver the required rate of outdoor airflow to the *breathing zone* ~~within each *occupiable space*~~.

> **Exception:** Where the *registered design professional* demonstrates that an engineered ventilation system design will prevent the maximum concentration of contaminants from exceeding that obtainable by the rate of outdoor air ventilation determined in accordance with Section 403.3, the minimum required rate of outdoor air shall be reduced in accordance with such engineered system design.

Reason: The purpose of this proposal is to make an editorial clarification. As currently worded, the provision has caused confusion that ventilation systems are only required for occupiable spaces. The purpose of the second sentence of Section 403.2 is to require that the outdoor airflow be directed to the breathing zone—a requirement that is only applicable in occupiable spaces because, according to the definition, "breathing zones" only occur in occupied spaces. The first sentence establishes the general requirement that minimum rates of outdoor air are required in all the locations specified in Table 403.3; as written, the second sentence causes some confusion that the outdoor air is only required for occupiable spaces. This proposal clarifies the meaning of the section without changing its impact.

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

M51-12

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

403.2-M-TRAXLER.DOC

M52–12
403.4

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

403.4 Exhaust ventilation. Exhaust airflow rate shall be provided in accordance with the requirements in Table 403.3. <u>Where Table 403.3 specifies a people outdoor airflow rate, an area outdoor airflow rate, or both for an occupancy that also has an exhaust airflow rate specified by Table 403.3, the space served by the required exhaust airflow shall be supplied with outdoor air at a rate not less than that determined in accordance with Section 403.3 and such outdoor air shall be either a component of the makeup air for the required exhaust airflow or it shall be otherwise relieved or exhausted.</u> Exhaust *makeup air* shall be permitted to be any combination of outdoor air, recirculated air and transfer air<u> provided that the outdoor air requirements of Table 403.3 are satisfied</u> ~~except as limited in accordance with Section 403.2~~.

Reason: Consistent with the intent of ASHRAE 62.1, the exhaust rate prescribed by the last (far right) column of Table 403.3 is NOT applied in addition to the rate determined from the other columns. Note that the exhaust column rate will almost always be greater than the rate determined from the other columns, therefore, the exhaust rate column rules. For example, see table entries for cells with plumbing, wood shops, science labs, barber shops, ice arenas and copy rooms. This raises the question of why are there numbers in the first 3 columns if they are overridden by the exhaust column. According to ASHRAE, the reason is to make sure that at least that much outdoor air is introduced into the space as makeup air for the exhaust system, with the rest of the makeup air being transfer air from other spaces. For example, assume a standalone barber shop of 1000 sq ft with a single zone and assume a zone effectiveness (E_z) of 1. So, 0.5 times 1000 = 500 CFM for the exhaust column. For the other columns, 7.5 times 25 occupants = 188CFM and 0.06 times 1000 = 60 CFM; 60 plus 188 = 248 CFM which is less than 500. The intent is that 500CFM is the required ventilation rate for the shop and the makeup air has to be composed of at least 248 CFM of outdoor air and the remainder of 252 CFM can be transfer air or outdoor air. Now that it can be seen how this is supposed to work, it is apparent that Section 403.4 fails to explain this. The code user would have no idea based on current text.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M52-12

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

403.4-M-STRAUSBAUGH.PMGCAC.DOC

M53–12
404.1

Proponent: Randall R. Dahmen, P.E. Wisconsin licensed Commercial Building Inspector, representing self

Revise as follows:

404.1 Enclosed parking garages. Where mechanical ventilation systems for enclosed parking garages ~~shall be permitted to~~ operate intermittently, such systems shall be in accordance with Item 1, 2 or both.

1. The system shall be arranged to operate automatically upon detection of vehicle operation or the presence of occupants by approved automatic detection devices.
2. The system shall be arranged to operate automatically by means of carbon monoxide detectors applied in conjunction with nitrogen dioxide detectors. Such detectors shall be installed in accordance with their manufacturers' recommendations. Additionally, the system shall operate at an exhaust rate of 0.75 cfm per square foot (0.0038 $m^3/s \cdot m^2$) of floor area for a total of 5 hours during any 24 consecutive hour period.

Reason: The operation of motion sensors in parking garages is very costly and energy inefficient. Initially the code just required carbon monoxide detectors and there was a concern about diesel emissions which would not be detected by the carbon monoxide detectors. Since that time, nitrogen dioxide detectors have been developed which will detect diesel emissions solving the concern about the increase of diesel powered vehicles in parking garages. Using both detectors has been the preferred option as an alternate method of addressing the problem.

The proposed additional language addressing the need for the system to operate 5 hrs per 24 hour period, is so that contaminants, other than those of carbon monoxide and nitrogen dioxide, that may be located within the garage enclosure, can be removed at regular intervals. The revision to the main section simply gets rid of permissive language.

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

M53-12

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

404.1-M-DAHMEN.DOC

M54–12
404.1

Proponent: Don Davies, Salt Lake City Corp/Salt Lake County representing Utah Chapter of ICC, Brent Ursenbach, Utah Chapter of ICC (don.davies@slcgov.com) and Donald R. Monahan, PE, Walker Parking Consultants/Engineers, Inc. representing the Parking Consultants Council of the National Parking Association, Washington, DC (don.monahan@walkerparking.com)

Revise as follows:

404.1 Enclosed parking garages. <u>Where</u> mechanical ventilation systems for enclosed parking garages ~~shall be~~ ~~permitted to~~ operate intermittently, <u>such operation shall be automatic</u> ~~in accordance with Item 1, Item 2 or both.~~

~~1. The system shall be arranged to operate automatically upon detection of vehicle operation or the presence of occupants by approved automatic detection devices.~~

~~2.~~ ~~The system shall be arranged to operate automatically~~ by means of carbon monoxide detectors applied in conjunction with nitrogen dioxide detectors. Such detectors shall be installed in accordance with their manufacturers' recommendations.

Reason: Enclosed parking garages require mechanical ventilation to safeguard the building occupants from emissions of high levels of carbon monoxide (CO) by cars and/or nitrogen dioxide (NO_2) from diesel engines. In most enclosed parking garages the operation of the ventilation system consumes the major portion of the total energy use of the facility. Reducing the energy use for ventilation while maintaining adequate indoor air quality can be achieved using demand ventilation control strategies. However permitting motion detectors to operate the ventilation system does not promote energy efficiency and will not provide optimum life safety protection for the following reasons:

- The mechanical ventilation system will run, unnecessarily, every time a vehicle or person moves even though the CO or NO_2 concentrations are within safe indoor air quality levels.
- Dangerous levels of CO and/or NO_2 from an idling vehicle will go undetected by motion detectors.

Whereas the mechanical ventilation system will only run when toxic gases present a threat to the safety of people, which is the most import purpose of a ventilation system. The revision to the main section simply gets rid of permissive language.

Cost Impact: There will be a significant savings in energy cost with approval of this proposal as follows:
Consider a 100,000 sf underground parking structure for about 350 parking spaces with a combined horsepower of all fans of approximately 75 HP. 75 HP X 746 Watts per HP = 55,950 watts or 55.95 kilowatts. Annual fan power consumption without gas detection = 12 hours per day X 365 days per year x 55.95 kW = 245,061 kWh. With gas detection demand control = 2 hours per day X 365 days X 55.95 kilowatts = 40,844 kWh. The annual savings is 204,217 kWh. At a U.S. average electric utility rate of $0.10 per kWh, the annual cost savings is $20,422.
(Source: "Demand Controlled Ventilation Cuts Energy Bills, Increases Patron Comfort", Parking Magazine by National Parking Association, March 2011.) In the 2000 ASHRAE Transactions, the paper "Evaluation of Design Ventilation Requirements for Enclosed Parking Facilities" by Ayari and Krarti indicated an energy savings of 17 to 46% with demand control ventilation strategies.

M54-12

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

404.1-M-DAVIES-MONAHAN-URSENBACH.DOC

M55–12
406.1

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Delete without substitution:

~~**406.1 General.** Uninhabited spaces, such as crawl spaces and attics, shall be provided with natural ventilation openings as required by the International Building Code or shall be provided with a mechanical exhaust and supply air system. The mechanical exhaust rate shall be not less than 0.02 cfm per square foot (0.00001 m3/s • m2) of horizontal area and shall be automatically controlled to operate when the relative humidity in the space served exceeds 60 percent.~~

Reason: The scoping statement for IMC Chapter 4, section 401.1, states that "This chapter shall govern the ventilation of spaces within a building intended to be occupied". Ventilation of unoccupied (uninhabited) spaces is a matter for the IBC to regulate and has no place in the IMC. Section 406 should be removed in its entirety.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M55-12

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

406.1-M-STRAUSBAUGH.PMGCAC.DOC

M56–12
202, 428 (NEW)

Proponent: Karen Hobbs, Natural Resources Defense Council, representing self (khobbs@nrdc.org); Harry Misuriello, American Council for an Energy-Efficient Economy, representing himself (misuriello@verizon.net)

Add new definition as follows:

EVAPORATIVE COOLING SYSTEM. A system for cooling the air in a building or space by removing heat from the outdoor air by means of the evaporation of water. The system forces air through wet porous pads, causing the latent heat of evaporation to cool the air. Water is continuously circulated over the pads to replenish the evaporated water. Where the cooled air is sent directly into the building, the system is referred to as "direct evaporative cooling". Where the cooled air is sent through heat exchangers re-circulating indoor air, the system is referred to as "indirect evaporative cooling".

Add new text as follows:

SECTION 428
EVAPORATIVE COOLING SYSTEMS

428.1 Evaporative Cooling. Evaporative cooling systems shall utilize use less than 4 gallons of water per ton-hour of cooling when system controls are set to maximum water use. Water use, expressed in maximum water use per ton-hour of cooling, shall be marked on the device and included in product user manuals, product information literature and installation instructions. Water use information shall be readily available at the time of code compliance inspection.

428.1.1 Overflow Alarm. The evaporative cooling system shall be equipped with an overflow alarm to alert building owners, tenants or maintenance personnel when the water refill valve continues to allow water to flow into the reservoir when the reservoir is full. The alarm shall have a minimum sound pressure level rating of 85 dB measured at a distance of ten feet.

428.1.2 Automatic Pump Shut-off. The evaporative cooling system shall automatically cease pumping water to the evaporation pads when there is no demand for sensible heat reduction.

428.1.3 Cooler Reservoir Discharge. A water quality management system is required utilizing a timer or water quality sensor. Where timers are used, the time interval between periods of discharging of water from the reservoir shall be set for six hours or greater of cooler operation. Continuous discharge and continuous bleed systems are prohibited.

428.1.3.1 Discharge Water Reuse. Where a nonpotable water source system exists on site, evaporative cooler discharge water shall be collected and discharged to such collection system.

> **Exception:** Where the reservoir water will adversely affect the quality of the nonpotable water supply making the nonpotable water unusable for its intended purposes.

428.1.3.2 Discharge Water to Drain. Where discharge water is not required to be recovered for reuse, the sump overflow drain line shall discharge to an approved location. Drain lines shall not be directly connected to any drainage system. Where the discharge water is discharged into a sanitary drain, an air gap of not less than 6 inches is required between the termination of the discharge line and the drain opening. The drain line shall terminate in a location that is readily visible to the building owner, tenants or maintenance personnel.

Reason:

1. This proposal was approved by the IGCC in May, 2011, as submitted by the Alliance for Water Efficiency (AWE) and Natural Resources Defense Council (NRDC).
2. Evaporative coolers can waste large quantities of water. There is great variance in water efficiencies of different makes and models. Limiting systems to use less than 4 gallons of water per hour is a relatively low standard and should be easily met by most systems.
3. NRDC estimates that nationwide adoption of the revised values in this proposal, effective 2016, can be expected to save:
   - 19 million gallons of water per day by 2030;
   - 9.3 million kilowatt hours per year by 2030; and
   - Consumers will realize more than $27 million dollars in reduced electricity and water costs.
4. Faulty float valves can cause reservoirs to overflow, sending thousands of gallons of water into the wastewater line without the problem detected. Alarms are needed to alert the operator of this waste.
5. The discharge water is nonpotable, but of sufficient quality to be reused for other applications.
6. There are no known water use standards for these systems by AHRI or any other known organization.

Cost Impact: None

M56-12

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

428(NEW)-P-HOBBS.DOC

M57–12
501.3 (NEW), 501.4 (NEW)

Proponent: Mike Moore, Newport Ventures, representing Broan NuTone (mmoore@newportpartnersllc.com)

Add new text as follows:

501.3 Common exhaust ducts for environmental air in dwelling units. A common exhaust duct shall not be used to convey environmental air from separate dwelling units unless a single fan designed and intended to run continuously is located downstream of the exhaust inlets. Common exhaust ducts for clothes dryers shall comply with Section 504.

501.4 Common supply ducts for ventilation air in dwelling units. A common supply duct shall not be used to provide ventilation air to separate dwelling units unless a single fan designed and intended to run continuously is located upstream of the supply outlets.

Reason: This change is intended to address cross-contamination of dwelling units with transfer air that could be communicated between units through common exhaust ducts that convey environmental air (e.g., exhaust from kitchens or baths) or common supply ducts that convey ventilation air. The language proposed is based on language that is sourced from ASHRAE 62.2-2010, addendum j. Without this requirement, the kitchen or bath exhaust from one dwelling unit could find its way into adjacent dwelling units, transporting moisture, odors, and other pollutants between units, instead of being conveyed outside the building. Similarly, cross contamination could also occur through the use of common supply ducts for ventilation air, unless properly addressed.

Common exhaust ducts for clothes dryers are already explicitly addressed in Section 504, and so are excluded from this requirement.

Cost Impact: Where contractors are not already installing separately ducted units or a common fan, the cost of construction is expected to increase.

M57-12

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

501.3(NEW)-M-MOORE.DOC

M58–12
501.3.1

Proponent: Umesh Kumar Bhargava, PE, Bhargava International Inc., representing self.

Revise as follows:

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:

3. For all *environmental air* exhaust: ~~3~~ 1 feet) from property lines; ~~3~~ 1 feet from operable openings into buildings for all occupancies other than Group U and ~~10~~ 5 feet from mechanical air intakes. Such exhaust shall not be considered to be hazardous or noxious.

(Portions not shown remain unchanged)

Reason: Local exhaust is more effective than central exhaust. Therefore, in dwelling unit's side wall exhaust is gaining more popularity amongst engineers. However due to limited exterior wall space availability and clearances requirements from openings, the proposed change is suggested based on following reasons:

a. Environmental air is discharged to outside the dwelling and therefore is diluted instantly and does not have impact on indoor air quality.
b. Products of combustion from Direct Vent appliances are permitted to terminate with 1 foot.
c. IMC permits to recirculate kitchen exhaust air. It indicates that environmental air is acceptable to be recirculating with carbon filter. Dilution of environmental air by mixing with atmospheric air should more effective than carbon filter, which depend on user behavior.
d. Velocity at exterior termination is approximately 5 miles per hour (600 feet per minute, 50 CFM thru 4 inch diameter duct)
e. High discharge velocity also results in mixing outside atmospheric air instantaneous dilution.

Cost Impact: None

M58-12

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

501.2.1-M-BHARGAVA.DOC

M59–12
501.3

Proponent: Umesh Kumar Bhargava, PE, Bhargava International Inc., representing self

Revise as follows:

501.3 Exhaust discharge. The air removed by every mechanical exhaust system shall be discharged outdoors at a point where it will not cause a nuisance and not less than the distances specified in Section 501.3.1. The air shall be discharged to a location from which it cannot again be readily drawn in by a ventilating system. Air shall not be exhausted into an attic or crawl space.

Exceptions:

1. Whole-house ventilation-type attic fans shall be permitted to discharge into the attic space of *dwelling units* having private attics.
2. Commercial cooking recirculating systems.
3. <u>Where installed in accordance with the manufacturer's installation instructions and where mechanical or *natural ventilation* is otherwise provided in accordance with Chapter 4, *listed* and *labeled* ductless range hoods shall not be required to discharge to the outdoors.</u>

Reason: Residential kitchen exhaust recirculating hoods are not stated in the Code explicitly.

Cost Impact: None

M59-12

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

501.2-M-BHARGAVA.DOC

M60–12
501.3, 501.3.1.1

Proponent: Robert Atkins, Prince William, VA, representing VA Plumbing and Mechanical Inspectors Association (VPMIA) and VA Building Code Officials Association (VBCOA) (radkins@pwcgov.org) and Guy McMann, MCP, Jefferson County Colorado, represented Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

Revise as follows:

501.3 Exhaust discharge. The air removed by every mechanical exhaust system shall be discharged outdoors at a point~~ where it will not cause a nuisance and~~ not less than the distances specified in Section 501.3.1. The air shall be discharged to a location from which it cannot again be readily drawn in by a ventilating system. Air shall not be exhausted into an attic, ~~or~~ crawl space, or be directed onto walkways.

~~**501.3.1.1 Exhaust discharge**. Exhaust air shall not be directed onto walkways.~~

Reason:
Atkins-.The term "nuisance" is too subjective and un-enforceable. Combining 501.3.1.1 into 501.3 (both titled "Exhaust discharge") is appropriate as it is applicable to all locations of exhaust discharge.

McMann-It's not necessary to have an entire Section on this topic when it can be incorporated into 501.2. The term "nuisance" in this instance is un-enforceable as it is too subjective in nature.

Cost Impact: None

M60-12

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

501.3-M-ATKINS-MCMANN.DOC

M61–12
501.4

Proponent: Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C., representing Self (JBEngineer@aol.com)

Revise as follows:

501.4 Pressure equalization. Mechanical exhaust systems shall be sized to remove the quantity of air required by this chapter to be exhausted. The system shall operate when air is required to be exhausted. Where mechanical exhaust is required in a room or space in other than occupancies in R-3 and *dwelling units* in R-2, such space shall be maintained with a neutral or negative pressure. If a greater quantity of air is supplied by a mechanical ventilating supply system than is removed by a mechanical exhaust for a room, adequate means shall be provided for the natural or mechanical exhaust of the excess air supplied. If only a mechanical exhaust system is installed for a room or if a greater quantity of air is removed by a mechanical exhaust system than is supplied by a mechanical ventilating supply system for a room, adequate *makeup air* consisting of supply air, transfer air or outdoor air shall be provided to satisfy the deficiency. ~~The calculated building infiltration rate shall not be used to satisfy the requirements of this section.~~

Reason: Calculating the building infiltration rate is a valid method of providing make up for an exhaust system. I have personally designed in excess of 1000 buildings using the calculated infiltration rate to provide make up air for the exhaust system. All of these buildings are working without incident. Mechanical engineers are trained in methods for calculating the infiltration rate. There should not be an arbitrary requirement in the code that prohibits common engineering design practices.

Cost Impact: This change does not increase the cost of construction.

M61-12

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

501.4-M-BALLANCO.DOC

M62–12
501.3.2

Proponent: Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C., representing self (JBEngineer@aol.com)

Revise as follows:

501.3.2 Exhaust opening protection. Exhaust openings that terminate outdoors shall be protected with corrosion resistant screens, louvers or grilles. ~~Openings in screens, louvers and grilles shall be sized not less than 1/4 inch (6 mm) and not larger than 1/2 inch (13 mm).~~ Openings shall be protected against local weather conditions. Louvers that protect exhaust openings in structures located in hurricane-prone regions, as defined in the *International Building Code*, shall comply with AMCA Standard 550. Outdoor openings located in exterior walls shall meet the provisions for exterior wall opening protectives in accordance with the *International Building Code*.

Reason: There is no justification for requiring a small opening size for exhaust terminations. Furthermore, this can result in a fire hazard for exhaust ducts, such as dryer exhaust duct terminations. Many commercial buildings are performing without incident with louvers that have openings that exceed ½ inch. By implication, every termination would require a screen since a louver is either horizontal or vertical with the opening much greater than ½ inch. The opening size of a exhaust termination should be left for the engineer to design based on the system being installed.

Cost Impact: This change does not increase the cost of construction.

M62-12

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

501.3.2-M-BALLANCO.DOC

M63–12
502.14

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

502.14 Motor Vehicle Operation. In areas where motor vehicles operate, mechanical ventilation shall be provided in accordance with Section 403. Additionally, areas in which stationary motor vehicles are operated shall be provided with a source capture system that connects directly to the motor vehicle exhaust systems. <u>Such system shall be engineered by a registered design professional or shall be factory-built equipment designed and sized for the purpose.</u>

Exceptions:

1. This section shall not apply where the motor vehicles being operated or repaired are electrically powered.
2. This section shall not apply to one- and two- family dwellings.
3. This section shall not apply to motor vehicle service areas where engines are operated inside the building only for the duration necessary to move the motor vehicles in and out of the building.

Reason: Section 502.14 requires a *source capture system,* but no criteria or specs are given for such systems. At minimum, such systems need to be engineered systems as opposed to randomly chosen fans, pipe and hoses thrown together by an installer. The term is defined as a mechanical exhaust system that discharges to the outdoors with no further criteria given. Without this revision, the code could not be cited to prevent home-made concoctions and "handyman" specials from being installed.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: This proposal could increase the cost of construction.

M63-12

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

502.14-M-STRAUSBAUGH-PMGCAC.DOC

M64–12

502.20 (NEW), Table 404.3

Proponent: Guy McMann MCP, Jefferson County Colorado representing Colorado Association of Plumbing and Mechanical Officials (CAPMO)
(gmcmann@jeffco.us)

Add new text as follows:

502.20 Manicure and pedicure stations. Manicure and pedicure stations shall be provided with an exhaust system in accordance with Table 403.3, note h. Manicure tables and pedicure stations not provided with factory-installed exhaust inlets shall be provided with exhaust inlets located not more than 12 inches horizontally and vertically from the point of chemical application.

Revise as follows:

TABLE 404.3
MINIMUM VENTILATION RATES

h. For nail salons, each ~~nail~~ manicure and pedicure station shall be provided with a source capture system capable of exhausting not less than 50 cfm per station. Exhaust inlets shall be located in accordance with Section 502.20

(Portions of table and footnotes not shown remain unchanged)

Reason: There needs to be more guidance in the code for code officials, designers and installers to reinforce the requirements for the source capture system at pedicure and manicure stations. Chemicals are being applied at pedicure stations and therefore needs to be included. There is much confusion as to where these outlets should be located in order to obtain maximum efficiency with as few fugitive vapors as possible. These dimensions have proven to work very well in observing many installations since these requirements were first a code requirement, and still provides the designer with flexibility. This will provide guidance where there currently is none as the definition of “source capture system” does not provide any.

Cost Impact: None

M64-12

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

502.20 (NEW)-M-MCMANN.DOC

M65–12
504.2 (NEW)

Proponent: Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C., representing In-O-Vate Technologies (JBEngineer@aol.com)

Add new text as follows:

504.2 Exhaust duct connections. Dryer exhaust ducts located in framed walls shall commence at a noncombustible dryer exhaust duct wall receptacle. The wall receptacle shall accommodate the connection between the dryer and the dryer exhaust duct.

(Renumber subsequent sections.)

Reason: A receptacle behind the dryer that facilitates the connection and the collection of the flex hose to occur in the cell of the wall is a device that will save lives and prevent property damage from dryer fires and increase the efficiency of the dryer appliance. It is well established that there are an average of 15,000 dryer fires a year in the United States.

Without a receptacle, an elbow connection endures stress that could damage the fitting to the point of needing replacement. Undetected leaks in the elbow can result in dryer exhaust air leaking into the cavity wall, creating a fire hazard.

Cost Impact: This will not increase the cost of construction.

M65-12

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

504.2(NEW)-M-BALLANCO.DOC

M66–12
504.4, 504.6.2

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

504.4 Exhaust installation. Dryer exhaust ducts for clothes dryers shall terminate on the outside of the building and shall be equipped with a backdraft damper. Screens shall not be installed at the duct termination~~. Ducts shall not be connected or installed with sheet metal screws or other fasteners that will obstruct the exhaust flow.~~ Clothes dryer exhaust ducts shall not be connected to a vent connector, vent or *chimney*. Clothes dryer exhaust ducts shall not extend into or through ducts or plenums.

504.6.2 Duct installation. Exhaust ducts shall be supported at 4-foot (1219 mm) intervals and secured in place. The insert end of the duct shall extend into the adjoining duct or fitting in the direction of airflow. Ducts shall ~~not~~ be joined with <u>nominal ¼ inch long by 1/8 inch diameter rivets</u> ~~screws~~ or <u>other</u> fasteners that <u>do not</u> protrude into the inside of the duct <u>more than such rivets.</u>

Reason: Sections 504.4 and 504.6.2 both discuss duct fasteners, but, state different requirements and the IRC says something different yet. The IRC allows duct fasteners that protrude into the duct a limited distance. It is not logical for the IRC and IMC to differ on this subject. If duct fasteners are not allowed, there would be no method of securing duct joints other than duct tape. Tapes are sealing methods, not duct joining methods, and will eventually allow the duct joints to separate in concealed locations.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M66-12

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

504.4-M-STRAUSBAUGH.PMGCAC.DOC

M67–12
504.5

Proponent: Umesh Kumar Bhargava, Bhargava International, Inc.

Revise as follows:

504.5 Makeup air. Installations exhausting more than 200 cfm (0.09m3/s) shall be provided with *makeup air*. Where a closet is designed for the installation of a clothes dryer, an opening having an area of not less than 100 square inches (0.0645 m2) shall be provided in the closet enclosure or *makeup air* shall be provided by other *approved* means. <u>Make up air shall be provided at a rate of not less than 80 cfm for each domestic clothes dryer.</u>

Reason:

1. Clothes dryers manufacturers do not publish dryer exhaust air CFM requirements. These manufacturers publish only exhaust duct diameter requirements and equivalent duct length.
2. IMC should provide guidance of exhaust CFM for residential type clothes dryers. I have contacted several manufacturers and only one manufacturer indicated 220 CFM outlet with no duct attached.
3. Most manufacturers require 4 inch diameter round duct with 65 feet of equivalent length.
4. Duct diameter: 4 inch Pressure drop 1 inch wg per 100 feet Pressure Drop 65 feet = 0.65 CFM 100 Velocity: 1200
5. To keep laundry in negative pressure 80 CFM per dryer is suggested.

Cost Impact: None

M67-12

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

504.5(NEW)-M-BHARGAVA.DOC

M68–12
504.5 (NEW), 504.6.4, 504.6.4.3(NEW), Chapter 15

Proponent: Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C., self

Add new text as follows:

<u>**504.5 Dryer Exhaust Duct Power Ventilators.** Domestic dryer exhaust duct power ventilators shall conform to UL 705 for use in dryer exhaust duct systems. The dryer exhaust duct power ventilator shall be installed in accordance with the manufacturer's instructions.</u>

(Renumber subsequent sections)

Revise text as follows:

504.6.4 Duct length. The maximum allowable exhaust duct length shall be determined by one of the methods specified in Section<u>s</u> 504.6.4.1 ~~or 504.6.4.2~~ <u>through 504.6.4.3</u>.

Add new text as follows:

<u>**504.6.4.3 Dryer exhaust duct power ventilator length.** The maximum length of the exhaust duct shall be determined by the dryer exhaust duct power ventilator manufacturer's installation instructions.</u>

Add new standard to Chapter 15 as follows:

UL Underwriters Laboratories, Inc.
333 Pfingsten Road
Northbrook, IL 60062-2096

Standard Referenced number	Title	Reference in code section number
<u>705-2004 Revision 5</u>	<u>Standard for Power Ventilators</u>	<u>504.5</u>

Reason: This is a companion change to the change adding reference to UL 705 for dryer exhaust power ventilators. UL 705 has testing requirements that will establish the maximum length permitted for a dryer duct connecting to a dryer exhaust duct power ventilator. The maximum dryer duct length must be included in the manufacturer's installation instructions.

This will add the requirements for dryer exhaust power ventilators for domestic dryer use. Dryer exhaust duct power ventilators are now regulated by Supplemental requirements to UL 705. These supplemental requirements specify testing for ventilators used in this application. The requirements include many safety provisions for the ventilators. The ventilator manufacturer specifies the maximum length of the dryer exhaust duct. This length is used for testing and listing the ventilator, thus verifying the instructions.

Cost Impact: This will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [UL 705-2004, Revision 5] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M68-12

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

504.5-504.6.4-M-BALLANCO.DOC

M69–12
504.6.4.1

Proponent: Tom Allen, representing self

Revise as follows:

504.6.4.1 Specified length. The maximum length of the exhaust duct shall be 35 feet (10 668 mm) from the connection to the transition duct from the dryer to the outlet terminal. Where fittings are used, the maximum length of the exhaust duct shall be reduced in accordance with Table 504.6.4.1.

> **Exception.** Where a clothes dryer booster fan is installed and listed and labeled for the application, the maximum length of the exhaust duct, including any transition duct, shall be permitted to be in accordance with the booster fan manufacturer's installation instructions. Where a clothes dryer booster fan is installed and not readily accessible from the room in which the dryer is located, a permanent identifying label shall be placed adjacent to where the exhaust duct enters the wall. The label shall bear the words: "This dryer exhaust system is equipped with a remotely located booster fan."

Reason: Adds prescriptive and labeling requirements for drier boosted fan.

Cost Impact: There is a cost impact.

M69-12

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

504.6.4.1-M-ALLEN.DOC

M70–12
504.6.5

Proponent: Richard Grace, Fairfax County Government, representing The Virginia Plumbing and Mechanical Inspectors Association, The Virginia Building Code Officials Association and Guy McMann MCP, Jefferson County Colorado, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO)
(gmcmann@jeffco.us)

Revise as follows:

504.6.5 Length identification. Where the exhaust duct equivalent length exceeds 35 feet ~~is concealed within the building construction~~, the equivalent length of the exhaust duct shall be identified on a permanent label or tag. The label or tag shall be located within 6 feet (1829 mm) of the exhaust duct connection.

Reason: If the equivalent length is code compliant, there is no need for extra signage. This puts the code official in a position of recording each installation in order to verify at time of final that the stated length is accurate. This is over the top for code officials and installers to keep track of in a world of increasing duties and fewer resources. It should not matter if the duct is concealed or not as this is a benefit for the building owner or user.

Cost Impact: None

M70-12

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

504.6.5-M-GRACE-MCMANN.DOC

M71–12

504.6.7, 504.6, IFGC 614.6.3, IFGC 614.6

Proponent: C. Ray Allshouse, AIA, CBO, City of Shoreline, WA, representing the Washington Association of Building Officials Technical Code Development Committee (rallshouse@shorelinewa.gov)

Revise as follows:

504.6~~.7~~ (IFGC 614.6~~.3~~) Protection required. Protective shield plates shall be placed where nails or screws from finish or other work are likely to penetrate the clothes dryer exhaust duct. Shield plates shall be placed on the finished face of all framing members where there is less than $1^{1}/_{4}$ inches (32 mm) between the duct and the finished face of the framing member. Protective shield plates shall be constructed of steel, have a thickness of 0.062 inch (1.6 mm) and extend a minimum of 2 inches (51 mm) above sole plates and below top plates.

504.~~6~~<u>7</u> (IFGC 614.~~6~~<u>7</u>) Domestic clothes dryer ducts. Exhaust ducts for domestic clothes dryers shall conform to the requirements of Sections 504.6.1 through 504.6.~~7~~<u>6</u>.

Reason: Existing dryer duct protection requirements for concealed dryer exhaust ducts should apply not only to domestic installations but to commercial installations as well. By making this a general dryer duct requirement, protection will be extended to include commercial clothes dryer exhaust ducts.

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

M71-12

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

504.6.7-614.6.3-M-ALLSHOUSE-.DOC

M72–12
504.8, Chapter 15

Proponent: John D. Nicholas of Perceptive Solutions LLC representing Unifrax I LLC (john@perceptivesolutionsllc.com)

Revise as follows:

504.8 Common exhaust systems for clothes dryers located in multistory structures. Where a common multistory duct system is designed and installed to convey exhaust from multiple clothes dryers, the construction of the system shall be in accordance with all of the following:

1. The shaft in which the duct is installed shall be constructed and fire-resistance rated as required by the *International Building Code.* <u>Where a fire resistive metallic duct system is installed instead of a duct system within a shaft, the fire-resistive metallic duct system shall be listed and labeled in accordance with ASTM E2816 and the fire resistance rating shall be as required by the *International Building Code.*</u>

(Portions not shown remain unchanged.)

Add new standard to Chapter 15 as follows:

<u>ASTM</u>
<u>E2816-11, *Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems*</u>

Reason: This proposed code change allows for the use of either a pre-fabricated duct system or field applied enclosure system in lieu of a shaft when these duct systems are tested and listed in accordance with *ASTM E2816-11, Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems* a full consensus test method that was specifically designed to assess both specific end use of the duct and its protection materials.

The history of many provisions in our building codes are traced back to ASTM E119 as it is the oldest fire-resistance standard cited in the U.S. building codes. However, when fire test standards were developed for specific material applications those test standards replaced ASTM E119. There are many examples of advancements in fire testing being used to provide a fire test based on ASTM E119 but specifically developed for a particular application: doors, windows, firestop systems, joint systems, etc. For example, doors were tested to ASTM E119, then ASTM E152, and now to UL10b and 10c, which were developed to assess the door's fire performance in a specific application. As products are in service for prolonged periods of time some performance limitations are noted and addressed by industry and the codes. This proposed code change is a cost effective method of providing a test specifically designed to test the duct system as the shaft is not tested as constructed in the field but rather as a wall panel. ASTM E119 does not have a protocol for testing shafts that can be engulfed in a fire. The fire-resistance engulfment test of ASTM E2816 is a much more serve test scenario for a shaft or duct system as the volume of air within the shaft or duct is limited and will heat faster than the ambient laboratory air in contact with the wall panel. Also, the stability of the shaft as constructed in the field will react differently than a wall panel. The corners of the shaft will be tested as the sides of the shaft create stresses on the corners that are not evaluated by the ASTM E119 wall panel, which is secured into a test frame. Using tests designed to address the actual construction and application of materials is more conservative and usually increases life safety. Further, sometimes newer fire tests allow more cost effective materials and construction than materials assessed by traditional tests not specifically designed to address their actual construction and application.

The clothes dryer exhaust duct system should comply with ASTM E2816 horizontal duct and vertical duct under the following situation. According to the text in Section 504.8 and referenced use, the clothes dryer exhaust duct system is designed to expel "…moisture and any products of *combustion* to the outside of the building," which indicates that the pressure of the contaminated air is negative relative to the building. There is a possibility that a fire may originate in the clothes dryer exhaust duct system because there may be products of combustion within the clothes dryer exhaust. Another possibility is that a fire surrounds (engulfs) the clothes dryer exhaust duct system. An unprotected clothes dryer exhaust duct system will allow the products of *combustion* to be heated and potentially ignite, which may facilitate the spread of fire within the building. Therefore, clothes dryer exhaust duct system should be isolated from the building to prevent the spread of fire as intended by the use of a fire resistive metallic duct systems, which are fire tested for these specific events: fire inside the duct and fire outside the duct. Fire resistive metallic duct systems tested and listed to ASTM E2816 may provide a higher degree of fire protection. Shaft enclosures tested to ASTM E119 are tested as panels and are not subjected to an engulfment scenario as are fire resistive metallic duct systems tested and listed to ASTM E2816.

This method of tests uses the ASTM E119 time-temperature curve and replicates use of exhaust by using a fan technique to create a negative pressure within the duct similar to that occurring while a clothes dryer exhaust system is in use. This method of tests also assesses both an internal and external fire threat to the duct as well as the transition or connection of horizontal ducts to vertical ducts. In ASTM E2816, the systems supports are also tested as part of the fire resistance test. ASTM E2816 offers the following tests to assess performance: ASTM E84 for the system's flame spread and smoke developed indices, ASTM E136 for insulation's non-combustibility, ASTM C518 for the insulation's durability and ASTM E814 for the system's ability as a firestop to prevent the spread of fire from compartment to compartment, ASTM E2226 for the resistance to the application of a hose stream, and ASTM C411 for the insulation covering's and lining's ability to resist flaming, glowing, smoldering or smoking while in service, which was just approved in December 2011 and this test method will also become part of the standard upon its latest publication. ICC-ES AC179, *Acceptance Criteria for Metallic HVAC Duct Enclosure Assemblies,* originally cited ISO 6944 as the test to determine the duct system's fire resistance but now cites ASTM E2816-11 for that purpose as well as to determine the characteristics of the system and enclosure material currently cited in the codes. ICC-ES AC179, *Acceptance Criteria for Metallic HVAC Duct Enclosure Assemblies,* cites ASTM E2816-11 to establish requirements for fire protection enclosure systems, applied to metallic HVAC ducts which provide an alternate to required fire-resistance-rated shafts or an alternate to required fire dampers in specific locations, as well as to determine the characteristics of the system and enclosure material currently cited in the codes.

Table 1. Loss Measures for Clothes Dryer Fires in Buildings[1]

[All fires, 3-year average (2002-2004)]

Measure	All Buildings	Non-residential Buildings	Residential Buildings
Loss per fire	$8,891	$7,462	$9,176
Injuries per 1000 fires	37.2	58.9	33.0
Deaths per 1000 fires	1.0	0.0	1.2

Source: NFIRS 5.0 data only; Loss per fire is computed for only those fires where loss information was provided

These comments are respectfully submitted as the ASTM Task Group Chair of ASTM E2816 who drafted its first version, as the ANSI Designated Expert to ISO TC92 SC2 WG4 that created and maintains ISO 6944 *Fire Containment — Elements of Building Construction — Part 1: Ventilation Ducts* and one who has designed, supervised, and overseen HVAC fire tests as part of an international laboratory as well as one who had jurisdiction over the product certification process for products and materials.

Bibliography:
1. www.usfa.fema.gov/downloads/pdf/tfrs/v7i1.pdf

Cost Impact: This change will potentially reduce the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [ASTM E2816-11] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M72-12

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

504.8-M-NICHOLAS.DOC

M73–12
504.8, 505.3 (NEW)

Proponent: Al Godwin, CBO, CPM representing Aon Fire Protection Engineering (al.godwin@aon.com)

Revise as follows:

504.8 Common exhaust systems for clothes dryers located in multistory structures. Where a common multistory duct system is designed and installed to convey exhaust from multiple clothes dryers, the construction of the system shall be in accordance with all of the following:

(Items 1 through 12 remain unchanged)

13. Dryer ducts shall have a cleanout located near the shaft penetration to permit cleaning of the 22" subduct required by Section 607.5.5, exception 2. The subduct length shall be considered in the calculation of allowable duct length.

505.3 Common exhaust systems for domestic kitchens located in multistory structures. Where a common multistory duct system is designed and installed to convey exhaust from multiple domestic kitchen exhaust systems, the construction of the system shall be in accordance with all of the following:

1. The shaft in which the duct is installed shall be constructed and fire-resistance rated as required by the *International Building Code*.
2. Dampers shall be prohibited in the exhaust duct, except as specified in Section 505.1. Penetrations of the shaft and ductwork shall be protected in accordance with Section 607.5.5, exception 2.
3. Rigid metal ductwork shall be installed within the shaft to convey the exhaust. The ductwork shall be constructed of sheet steel having a minimum thickness of 0.0187 inch (0.4712 mm) (No. 26 gage) and in accordance with SMACNA *Duct Construction Standards*.
4. The ductwork within the shaft shall be designed and installed without offsets.
5. The exhaust fan motor design shall be in accordance with Section 503.2.
6. The exhaust fan motor shall be located outside of the airstream.
7. The exhaust fan shall run continuously, and shall be connected to a standby power source.
8. Exhaust fan operation shall be monitored in an *approved* location and shall initiate an audible or visual signal when the fan is not in operation.
9. Makeup air shall be provided for the exhaust system.
10. A cleanup opening shall be located at the base of the shaft to provide access to the duct to allow for cleanout and inspection. The finished openings shall be not less than 12 inches by 12 inches (305 mm by 305 mm).
11. Screens shall not be installed at the termination.
12. The common multistory duct system shall serve only kitchen exhaust and shall be independent of other exhaust systems.

Reason: Since exception 2 has been installed in the IBC, it has been incomplete. The IMC has done a good job of updating the provisions for common ducts with clothes dryers but nothing has been done for domestic kitchens. Designers would not go to the expense of installing a shaft for domestic kitchen exhaust if there was not a smoke issue. When expensive condo's install super domestic kitchens, there is going to be smoke.

Also, IMC Section 505.1 specifically requires systems with downdraft exhaust to discharge to the exterior. How is that going to be done in a multi-story building? And, where there is smoke, there is grease. Thus, provisions are needed for kitchen exhaust and such exhaust needs to be separate from bathroom/toilet exhaust. The designer should take some responsibility for controlling grease discharge, but specifics are left to his/her discretion. Long dryer ducts have to install a 90 degree riser at the very end of their discharge, the weakest point. A cleanout is appropriate. Perhaps someone has a better idea, but this should be a start.

Cost Impact: This code proposal will not increase the cost of construction since this is the method it should be designed to and it is less expensive than installation of a Type I hood.

M73-12

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

504.8-M-GODWIN.DOC

M74–12
504.8, Chapter 15

Proponent: Tony Crimi, A.C. Consulting Solutions Inc, representing International Firestop Council

Revise as follows:

504.8 Common exhaust systems for clothes dryers located in multistory structures. Where a common multistory duct system is designed and installed to convey exhaust from multiple clothes dryers, the construction of the system shall be in accordance with all of the following:

1. The shaft in which the duct is installed shall be constructed and fire-resistance rated as required by the *International Building Code*. <u>As an alternative to a fire-resistance-rated shaft, the duct shall be enclosed in a duct enclosure system tested and *listed* to have not less than a 2-hour fire-resistance rating in accordance with ASTM E2816-11.</u>

(Portions not shown remain unchanged)

Add new Referenced Standard to Chapter 15 as follows:

<u>ASTM E2816-11, Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems.</u>

Reason: This proposal would allow an additional tested method of protection for duct enclosures systems to be used. The enclosures or ductwork would be permitted to be used if it were protected by a tested and listed assembly conforming to the new *ASTM E2816-11, Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems* evaluated for the specific purpose. This test is now also referenced as part of ICC-ES AC179, Acceptance Criteria for Metallic HVAC Duct Enclosure Assemblies. The purpose of these acceptance criteria is to establish requirements for fire protection enclosure systems applied to metallic HVAC ducts, which provides an alternate to required fire-resistance-rated shafts or an alternate to required fire dampers in specific locations. This criterion provides an alternate to shaft enclosures for vertical ducts.

The new ASTM Standard evaluates the HVAC duct systems for surface burning characteristics, non-combustibility, fire resistance, durability, and fire engulfment with horizontal and vertical through-penetration firestops. The Standard evaluates the fire performance of HVAC ducts for both supply (pressurization) and return air, in the vertical and horizontal orientation, with or without openings. These test methods evaluate the ability of a HVAC duct system to resist the spread of fire from one compartment to another compartment when subjected to the standard time-temperature curve of ASTM E119.

Cost Impact: This change will potentially reduce the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [ASTM E2816-11] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M74-12

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

504.8-M-CRIMI.DOC

M75–12
505.1

Proponent: Joshua Smith, New York State Office of Fire Prevention and Control (Joshua.Smith@dhses.ny.gov)

Revise as follows:

SECTION 505
DOMESTIC KITCHEN EXHAUST EQUIPMENT

505.1 Domestic systems. Where domestic range hoods and domestic appliances equipped with downdraft <u>or</u> <u>updraft</u> exhaust are located within dwelling units, such hoods and appliances shall discharge to the outdoors through sheet metal ducts constructed of galvanized steel, stainless steel, aluminum or copper. Such ducts shall have smooth inner walls and shall be air tight and equipped with a backdraft damper.

Exceptions:

1. Where installed in accordance with the manufacturer's installation instructions, where mechanical or natural ventilation is otherwise provided in accordance with Chapter 4 and, <u>where a smoke alarm or detector is not present within 20 ft horizontally of the cooking appliances,</u> listed and labeled ductless range hoods shall not be required to discharge to the outdoors
2. Ducts for domestic kitchen cooking appliances equipped with downdraft exhaust systems shall be permitted to be constructed of Schedule 40 PVC pipe provided that the installation complies with all of the following:
   - 2.1. The duct shall be installed under a concrete slab poured on grade.
   - 2.2. The underfloor trench in which the duct is installed shall be completely backfilled with sand or gravel.
   - 2.3. The PVC duct shall extend not greater than 1 inch (25 mm) above the indoor concrete floor surface.
   - 2.4. The PVC duct shall extend not greater than 1 inch (25 mm) above grade outside of the building.
   - 2.5. The PVC ducts shall be solvent cemented.

Reason: The purpose of this code change is to reduce the number of nuisance fire alarms due to normal cooking conditions. Hoods that do not vent to the outside have added to the number of nuisance fire alarms by recirculating the dirty air further throughout the cooking area. In many cases the hoods that do not vent to the outside end up pointing the products of combustion directly at a smoke detector. R-2 Occupancies specifically can present a special hazard because many are required to have smoke detection in the kitchen area because it is located directly outside of a sleeping room. The design and layout of the dwelling unit within the occupancy in itself can be a cause for a rise in nuisance fire alarms. Because it is impractical and dangerous to remove life safety devices other provisions should be made to reduce the number of nuisance alarms. In R-2 occupancies that have retrofitted in ventilation direct to the outside of the building the number of cooking related nuisance fire alarms due to normal cooking vapor have been reduced.

Cost Impact: This proposal will increase the cost of construction.

M75-12

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

505.1-M-SMITH.DOC

M76-12
505.1, 505.3(NEW), 507.2.3

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

SECTION 505
DOMESTIC KITCHEN EXHAUST EQUIPMENT

505.1 Domestic systems. Where domestic range hoods and domestic appliances equipped with downdraft exhaust are ~~located within dwelling units~~ provided, such hoods and appliances shall discharge to the outdoors through sheet metal ducts constructed of galvanized steel, stainless steel, aluminum or copper. Such ducts shall have smooth inner walls, shall be air tight, shall be equipped with a backdraft damper, and shall be independent of all other exhaust systems.

Exceptions:

1. In other than Group I-1 and I-2, where installed in accordance with the manufacturer's installation instructions and where mechanical or *natural ventilation* is otherwise provided in accordance with Chapter 4, *listed* and *labeled* ductless range hoods shall not be required to discharge to the outdoors.
2. Ducts for domestic kitchen cooking appliances equipped with downdraft exhaust systems shall be permitted to be constructed of Schedule 40 PVC pipe and fittings provided that the installation complies with all of the following:
   - 2.1. The duct shall be installed under a concrete slab poured on grade.
   - 2.2. The under floor trench in which the duct is installed shall be completely backfilled with sand or gravel.
   - 2.3. The PVC duct shall extend not more than 1 inch (25 mm) above the indoor concrete floor surface.
   - 2.4. The PVC duct shall extend not more than 1 inch (25 mm) above grade outside of the building.
   - 2.5. The PVC ducts shall be solvent cemented.

505.2 Makeup air required. Exhaust hood systems capable of exhausting in excess of 400 cfm (0.19 m^3/s) shall be provided with *makeup air* at a rate approximately equal to the *exhaust air* rate. Such *makeup air* systems shall be equipped with a means of closure and shall be automatically controlled to start and operate simultaneously with the exhaust system.

505.3 Other than Group R. In other than Group R occupancies, where domestic cooking appliances are utilized for domestic purposes, such appliances shall be provided with domestic range hoods. Hoods and exhaust systems shall be in accordance with Sections 505.1 and 505.2.

SECTION 507
COMMERCIAL KITCHEN HOODS

507.2.3 Domestic cooking appliances used for commercial purposes. Domestic cooking appliances utilized for commercial purposes shall be provided with Type I or Type II hoods as required for the type of appliances and processes in accordance with Sections 507.2, 507.2.1 and 507.2.2. Domestic cooking appliances utilized for domestic purposes shall comply with Section 505.

Reason: The intent of this proposal is to clarify requirements and address new situations as Assisted Living and Nursing Home designs change.

Current requirements for domestic appliances used for domestic purposes are geared towards Group R facilities. When a stove is located in another use group, often a requirement for commercial hoods is misapplied. In a residential dwelling unit, often a range hood is not required if there is enough ventilation. Given the different types of facilities, this proposal would always require a hood when a range was provided in another use group.

As the style of assisted living facilities and nursing homes attempts to produce a more residential atmosphere, domestic ranges are provided either within the unit (some assisted living) or in common use areas (assisted living or nursing home residential 'suites'). Residents use this equipment for light cooking duties (few people and only occasional meals) or special cooking (i.e., cookies, cakes). If this equipment is used for cooking for a large number of residents on a regular basis, it is being used for commercial purposes, and it would fall under 507.2.3.

Hospitals or outpatient rehab facilities sometimes have domestic ranges in occupational therapy and dietician areas. The goal being to provide residents with training on good eating habits when they are at home.

Changes to 505.1 would allow residential and areas such as business break rooms to allow for recirculation if the mechanical system is designed for it.

The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April, 2005, the CTC has held twenty-two meetings – all open to the public.

Cost Impact: Reduction

M76-12

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

505-M-BALDASSARRA-CTC.DOC

M77–12
505.1

Proponent: Gary Kreutziger, M.C.P., City of San Antonio, representing Gary Kreutziger (gkreutziger@sanantonio.gov)

Revise as follows:

505.1 Domestic systems. Where domestic range hoods and domestic appliances equipped with downdraft exhaust are ~~located within dwelling units~~ installed, such hoods and appliances shall discharge to the outdoors through sheet metal ducts constructed of galvanized steel, stainless steel, aluminum or copper. Such ducts shall have smooth inner walls, shall be air tight, shall be equipped with a backdraft damper, and shall be independent of all other exhaust systems.

Reason: The change will provide prescriptive requirements for all installations of domestic range hoods and domestic appliances with downdraft exhaust. As the section is currently written it only applies to dwelling units. Domestic appliances are often installed in church kitchens, assisted living classrooms, break rooms, child care facilities, fire stations, etc. all of which use the domestic appliances in the same manner and with approximately the same frequency as a dwelling unit. IMC section 507.2.3 requires a type I or II hood over domestic appliances utilized for commercial purposes. Most jurisdictions would not consider the domestic appliances installed in the aforementioned occupancies as utilized for commercial purposes. This code change will provide direction where the code is currently silent.

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

M77-12

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

505.1-M-KREUTZIGER

M78–12
505.1, 505.1.1(NEW)

Proponent: William Freer, New York State Office of Fire Prevention and Control (WFreer@dhses.ny.gov)

Revise as follows:

SECTION 505
DOMESTIC KITCHEN EXHAUST EQUIPMENT

505.1 Domestic systems. Where domestic range hoods and domestic appliances equipped with downdraft exhaust are located within dwelling units, such hoods and appliances shall discharge to the outdoors through sheet metal ducts constructed of galvanized steel, stainless steel, aluminum or copper. Such ducts shall have smooth inner walls, shall be air tight, shall be equipped with a backdraft damper, and shall be independent of all other exhaust systems.

Exceptions:

1. Where installed in accordance with the manufacturer's installation instructions and where mechanical or natural ventilation is otherwise provided in accordance with Chapter 4, listed and labeled ductless range hoods shall not be required to discharge to the outdoors.

2. Ducts for domestic kitchen cooking appliances equipped with downdraft exhaust systems shall be permitted to be constructed of Schedule 40 PVC pipe provided that the installation complies with all of the following:
   2.1. The duct shall be installed under a concrete slab poured on grade.
   2.2. The underfloor trench in which the duct is installed shall be completely backfilled with sand or gravel.
   2.3. The PVC duct shall extend not greater than 1 inch (25 mm) above the indoor concrete floor surface.
   2.4. The PVC duct shall extend not greater than 1 inch (25 mm) above grade outside of the building.
   2.5. The PVC ducts shall be solvent cemented.

<u>**505.1.1 Exhaust equipment activation.** Where required by the code official, domestic range hood and downdraft exhaust systems shall be interconnected with the domestic cooking appliance served so that such range hoods and downdraft exhaust systems automatically activate when the domestic appliance is in use.</u>

Reason: The purpose of this code change is to reduce the number of nuisance fire alarms. A major contributor to the number of nuisance alarms in R-2 occupancies has been the resident failing to turn the hood on while cooking. This is most prevalent in student housing but can also been seen in senior and apartment housing. The current code requires the hood / ventilation be in place but has no means of requiring or making the user turn them on. By adding a low cost interlock the vent would be in operation anytime cooking was in progress. This would strengthen the current code while keeping with its original intent.

At Bard College in Northern Dutchess County they have a major nuisance fire alarm problem that they have been diligently working on. They first tried changing their hoods to vent to the outside. That change cut the nuisance alarm in about half. Still not happy with the number of nuisance alarms they added the interlocking devices to the new dorm. To date, there have been no nuisance alarms in the new building.

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

M78-12

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

505.1.1(NEW)-M-FREER.DOC

M79–12
505.2

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

505.2 Makeup air required. Exhaust hood systems capable of exhausting in excess of 400 cfm shall be <u>mechanically</u> provided with *makeup air* at a rate approximately equal to the *exhaust air* rate. Such *makeup air* systems shall be equipped with a means of closure and shall be automatically controlled to start and operate simultaneously with the exhaust system.

Reason: Section 505.2 does not state whether the makeup air system is required to be mechanical or gravity. Current text certainly suggests that mechanical is required. Should a simple louvered opening with a damper be permitted to provide makeup air by gravity? If so, how much pressure loss is allowed across the louvered opening? This loss must be known in order to calculate the opening and louver size. The code is silent on this. The intent is to prevent negative pressures from being developed by the kitchen exhaust that would affect other exhaust systems, chimneys, fireplaces, appliances and appliance vents. A small gravity opening to the outdoors would allow makeup air to enter the kitchen, but how negative must the space go to cause the necessary airflow rate to pass through such opening? Mechanical makeup air can be matched to the exhaust rate with no pressurization of the space.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: This could increase the cost of construction depending on how current text is interpreted.

M79-12

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

505.2-M-STRAUSBAUGH.PMGCAC.DOC

M80–12
505.2

Proponent: Dan Buuck, National Association of Home Builders (NAHB) (dbuuck@nahb.org)

Revise as follows:

505.2 Makeup air required. Exhaust hood systems capable of exhausting in excess of 400 cubic feet per minute (0.19 m3/s) shall be provided with makeup air at a rate approximately equal to the difference between the exhaust air rate and 400 cubic feet per minute (0.19 m3/s). Such makeup air systems shall be equipped with a backdraft damper~~means of closure and shall be automatically controlled to start and operate simultaneously with the exhaust system~~.

> **Exception:** In dwelling units, where all appliances are of direct-vent, power-vented, unvented, or electric type, makeup air is not required for hood systems that exhaust 600 CFM or less. Exhaust hood systems located in such dwelling units and capable of exhausting in excess of 600 cubic feet per minute (0.28 m3/s) shall be provided with makeup air at a rate approximately equal to the difference between the exhaust air rate and 600 cubic feet per minute.

Reason: This section, new in the 2009 International Residential Code (IRC) and 2009 International Mechanical Code (IMC), attempts to solve an unproven backdrafting problem with range hoods. The exhaust rate of 400 cubic feet per minute (cfm) was chosen arbitrarily and without substantiation other than it being greater than the minimum exhaust rate of range hoods on the market. However, several manufacturers do not produce any range hoods below the 400 cfm threshold, effectively reducing a homeowner's choice of kitchen exhaust options without the added difficulty and expense of installing makeup air.

The reasoning that kitchen exhaust systems are available with an exhaust rate under 400 cfm does not take down-draft systems, popular with homeowners, into consideration. Most of them operate at 500 to 600 cfm and therefore require makeup air under this section.

As written, this section allows range hoods up to 400 cfm to be installed without makeup air. It would be consistent to require makeup air equaling the amount above and beyond 400 cfm for larger fans. Essentially, there would be no difference between the effect a 400 cfm fan has on a house and a 600 cfm fan with 200 cfm of makeup air. This would also improve the feasibility and acceptance of this code section as well as cut down on the amount of wasted energy in heating or cooling the makeup air.

This section requires an automatic means of closure for the makeup air opening beyond what the code has historically required for residential construction. For example, Section G2407.6 requires no dampers whatsoever for combustion air openings to the outdoors, such as found in many homes in the northern US. The amended section would allow barometric dampers as required for clothes dryer exhaust ducts.

Finally, the current code section does not take into account the fact that in many homes there is no danger of backdrafting (the original reason for this code section) due to the lack of natural draft appliances. The 400 cfm threshold could be raised to 600 cfm in those cases with no added danger. This would allow for down-draft fans without dedicated makeup air when the exception is met.

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

M80-12

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

505.2-M-BUUCK.DOC

M81–12
505.3

Proponent: Tom Allen, representing self

Add new text as follows:

505.3 APPLIANCES ABOVE COOKING APPLIANCES. The installation of a listed and labeled cooking appliance or microwave oven over a listed and labeled cooking appliance shall conform to the terms of the upper appliance's listing and label and the manufacturer's installation instructions.

Reason: Adds requirements for installation of Microwave ovens over cooking appliances.

Cost Impact: There is no cost impact.

M81-12

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

505.3 (NEW)-M-ALLEN.DOC

M82–12
505.3 (NEW)

Proponent: Tom Allen, representing himself

Add new text as follows:

505.3 OVERHEAD EXHAUST HOODS. Domestic open-top broiler units shall be provided with an exhaust hood, installed accordance with Section 623.7 of the *International Fuel Gas Code*. The hood shall be at least as wide as the broiler unit and shall extend over the entire unit. Such exhaust hood shall discharge to the outdoors and shall be equipped with a back draft damper or other means to control infiltration/exfiltration when not in operation.

> **Exception:** Broiler units incorporating an integral exhaust system, and listed and labeled for use without an exhaust hood, need not be provided with an exhaust hood.

Reason: Adds requirements for installation of exhaust hoods over domestic open top broilers.

Cost Impact: There is a cost impact.

M82-12

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

505.4(NEW)-M-ALLEN.DOC

M83–12
506.3.2.5, 506.3.2.5.1, 506.3.2.5.2, 506.3.2.5.3

Proponent: Steve Ferguson, representing ASHRAE

Delete and substitute as follows:

~~**506.3.2.5 Grease duct test.** Prior to the use or concealment of any portion of a grease duct system, a leakage test shall be performed. Ducts shall be considered to be concealed where installed in shafts or covered by coatings or wraps that prevent the ductwork from being visually inspected on all sides. The permit holder shall be responsible to provide the necessary *equipment* and perform the grease duct leakage test. A light test shall be performed to determine that all welded and brazed joints are liquid tight.~~

~~A light test shall be performed by passing a lamp having a power rating of not less than 100 watts through the entire section of ductwork to be tested. The lamp shall be open so as to emit light equally in all directions perpendicular to the duct walls. A test shall be performed for the entire duct system, including the hood-to-duct connection. The duct work shall be permitted to be tested in sections, provided that every joint is tested. For *listed* factory-built grease ducts, this test shall be limited to duct joints assembled in the field and shall exclude factory welds.~~

<u>**506.3.2.5 Duct Leakage Performance Testing.** Prior to the use or concealment of any portion of a grease duct system, a leakage test shall be performed to determine that all welded joints and seams are liquid tight. Ducts shall be considered to be concealed where they are installed in shafts or covered by coatings or wraps that prevent the duct from being visually inspected on all sides. It is permissible to test the duct in sections, provided that, after the duct system is completely assembled, all field-assembled joints, including the duct-to-hood connection, are tested. For testing performed in accordance with this section, only the field-assembled joints of listed factory-built grease ducts are required to be tested.</u>

<u>The leakage test shall consist of a light test, an air or a water pressure test, or an approved equivalent test. The permit holder shall be responsible for providing the necessary equipment for performing the test.</u>

<u>**506.3.2.5.1 Light Test.** The light test shall be performed by passing a lamp having a power rating of not less than 100 watts through the entire section of ductwork to be tested. The lamp shall be open so as to emit light equally in all directions perpendicular to the duct walls. Light from the duct interior shall not be visible through any exterior surface.</u>

<u>**506.3.2.5.2 Air Test.** The air test shall be performed by sealing the entire duct system from the hood exhaust opening(s) to the duct termination. The sealed duct system shall then be pressurized to a pressure of not less than 1.0 inch water column and the duct system shall be required to hold this pressure for not less than 20 minutes.</u>

<u>**506.3.2.5.3 Water Test.** The water test shall be performed by use of a pressure washer operating at a pressure of not less than 1,500 psi and simulating cleaning operations. The water shall be applied directly to all areas to be tested. Water applied to the duct interior shall not be visible on any exterior surface in any volume during the test.</u>

Reason: The proposed language is the current Section 5.2 Duct Leakage Performance Testing of ASHRAE's Standard 154-2011 "Ventilation for Commercial Cooking Operations". The 154 Standards Committee received input from the general public, committee members, members of ASHRAE TC 5.10 "Kitchen Ventilation", IMC members, specifiers, end-users and manufacturers while considering the proposed language for inclusion in Standard 154. During the considerations some of the comments and reasons for the final language include:

1. In field installations where duct systems may be high above finished floors or in tight enclosures it may be very difficult or even unsafe for an inspector to access all seams and joints that need to be inspected using the IMC light test method.
2. Pressure test may be more practical for longer or elevated runs. The pressure test is already in use in some areas including Minnesota where it is a grease duct test method required by State Building/Mechanical Code.

3. Water leaks are more easily located than light or pressure leaks. Additionally pressure washing is one of the primary methods used to clean kitchen grease duct systems. Exposing these duct systems to the water test method during commissioning can detect and prevent future water leaks caused by high pressure washing.
4. These tests may be used in combination if the facility and duct routing make one test in one area of the duct system more practical than another.

Cost Impact: Zero. The light test is already a code requirement. The additional test methods only offer alternatives that may be better suited to a particular installation.

M83-12

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

506.3.2.5-M-FERGUSON.DOC

M84–12
506.3.2.5

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

506.3.2.5 Grease duct test. Prior to the use or concealment of any portion of a grease duct system, a leakage test shall be performed. Ducts shall be considered to be concealed where installed in shafts or covered by coatings or wraps that prevent the ductwork from being visually inspected on all sides. The permit holder shall be responsible to provide the necessary *equipment* and perform the grease duct leakage test. A light test<u> or an air test</u> shall be performed to determine that all welded and brazed joints are liquid tight. <u>A test shall be performed for the entire duct system, including the hood-to-duct connection.</u> <u>For listed factory-built ducts,</u> <u>tests shall be limited to duct joints assembled in the field and shall exclude factory welds.</u> <u>The duct work shall be permitted to be tested in sections, provided that every joint is tested.</u>

A light test shall be performed by passing a lamp having a power rating of not less than 100 watts through the entire section of ductwork to be tested. The lamp shall be open so as to emit light equally in all directions perpendicular to the duct walls. ~~A test shall be performed for the entire duct system, including the hood-to-duct connection. The duct work shall be permitted to be tested in sections, provided that every joint is tested.~~ ~~For *listed* factory-built grease ducts, this test shall be limited to duct joints assembled in the field and shall exclude factory welds.~~

<u>An air test shall be performed by capping the ductwork system at the outlet and at the point of connection to the hood and then pressurizing the system with air at a pressure of not less than 1 inch wc. A manometer shall be used to measure pressure within the ductwork. Before taking pressure readings, the temperature of the air in the ductwork and the ductwork itself shall be allowed to stabilize and the source of air pressure shall be disconnected from the ductwork system. The ductwork system shall maintain the pressure without loss for a period of not less than 15 minutes.</u>

Reason: The code allows only one method of testing grease ducts and that method is far from precise. An air test is much more likely to expose a leak and provides the installer with an option. This air test is also allowed by ASHRAE 154. Much of Sections 506 and 507 is parallel with 154.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M84-12

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

506.3.2.5-M-STRAUSBAUGH.PMGCAC.DOC

M85–12
506.3.7.1

Proponent: Curt Campbell, Chesterfield County, VA, representing Va. Plumbing and Mechanical Inspectors Association (VPMIA) and Va. Building Code Officials Association (VBCOA) (CampbellCu@chesterfield.gov)

Revise as follows:

506.3.7.1 Grease <u>duct</u> reservoirs. Grease <u>duct</u> reservoirs shall:

1. Be constructed as required for the grease duct they serve.
2. Be located on the bottom of the horizontal duct or the bottommost section of the duct riser.
3. Have a length and width of not less than 12 inches (305 mm). Where the grease duct is less than 12 inches (305 mm) in a dimension, the reservoir shall be not more than 2 inches (51 mm) smaller than the duct in that dimension.
4. Have a depth of not less than 1 inch (25.4 mm).
5. Have a bottom that is sloped to a point for drainage.
6. Be provided with a cleanout opening constructed in accordance with Section 506.3.8 and installed to provide direct access to the reservoir. The cleanout opening shall be located on a side or on top of the duct so as to permit cleaning of the reservoir.
7. Be installed in accordance with the manufacturer's instructions where manufactured devices are utilized.

Reason: IMC 506.5.2 references an approved grease reservoir for manufactured vertical grease exhaust fans. The current language would require this reservoir to comply with 506.3.7.1, which of course is not applicable. This language should clearly show that these two grease reservoirs are two entirely different devices.

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

M85-12

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

506.3.7.1-M-CAMPBELL.DOC

M86–12
506.3.8

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

Revise as follows:

506.3.8 Grease duct cleanouts and openings. Grease duct cleanouts and openings shall comply with all of the following:

1. Grease ducts shall not have openings except where required for the operation and maintenance of the system.
2. Sections of vertical grease ducts that are inaccessible from the hood or discharge openings shall be provided with cleanout openings spaced not more than 20 feet apart and not more than 10 feet from changes in direction greater than 45 degrees.
3. Cleanouts and openings shall be equipped with tight-fitting doors constructed of steel having a thickness not less than that required for the duct.
4. Cleanout doors shall be installed liquid tight.
5. Door assemblies including any frames and gaskets shall be approved for the application and shall not have fasteners that penetrate the duct.
6. Gasket and sealing materials shall be rated for not less than 1500ºF (816ºC).
7. Listed door assemblies shall be installed in accordance with the manufacturer's instructions.

Reason: Sometimes there are vertical sections of grease duct that are in the middle of a run and inaccessible from the hood, fan or horizontal cleanouts and it can extend long distances. This may apply in high rise buildings as the grease will congeal over this vertical distance as it cools making it difficult to clean because there is no access. This is a helpful clarification as how to access these sections of duct that could not be otherwise accessed.

Cost Impact: This may increase the cost of construction.

M86-12

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

506.3.5-M-MCMANN.DOC

M87–12
506.3.7.1

Proponent: Guy McMann, MCP, Jefferson County Colorado, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO)
(gmcmann@jeffco.us)

Revise as follows:

506.3.7.1 Grease reservoirs. Grease reservoirs shall:

1. Be constructed as required for the grease duct they serve.
2. Be located on the bottom of the horizontal duct or the bottommost section of the duct riser.
3. ~~Have a length and width of not less than 12 inches (305 mm). Where the grease duct is less than 12 inches (305 mm) in a dimension, the reservoir shall be not more than 2 inches (51 mm) smaller than the duct in that dimension.~~
3. Extend across the full width of the duct and have a length of not less than 12 inches.
4. Have a depth of not less than 1 inch (25.4 mm).
5. Have a bottom that ~~is sloped to a point for drainage.~~ slopes to a drain.
6. Be provided with a cleanout opening constructed in accordance with Section 506.3.8 and installed to provide direct access to the reservoir. The cleanout opening shall be located on a side or on top of the duct so as to permit cleaning of the reservoir.
7. Be installed in accordance with the manufacturer's instructions where manufactured devices are utilized.

Reason: The current text permits grease to pass by the trap as a result of being anything smaller than the full width of the duct. There is no need to require a minimum arbitrary length as long as the fitting captures the grease as intended by the designer. Item 5 requires a sloped bottom but fails to actually require a drain. Sometimes simpler is better.

Cost Impact: None

M87-12

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

506.3.7.1-M-MCMANN.DOC

M88–12
506.3.11

Proponent: Richard Grace, Fairfax County Government, representing The Virginia Plumbing and Mechanical Inspectors Association, The Virginia Building Code Officials Association; Guy McMann, MCP, Jefferson County Colorado, Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

THIS CODE CHANGE WILL BE HEARD BY THE IBC FIRE SAFETY. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

Revise as follows:

506.3.11 Grease duct enclosures. A grease duct serving a Type I hood that penetrates a ceiling, wall or floor shall be enclosed from the point of penetration to the outlet terminal. 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 either field-applied or factory-built. Duct enclosures shall have a fire-resistance rating not less than that of the floor assembly penetrated, and not less than 1 hour. <u>Fire dampers shall not be installed in grease ducts.</u> Duct enclosures shall be as prescribed by Section 506.3.11.1, 506.3.11.2 or 506.3.11.3.

Reason: Although this states the obvious, the code just needs to come out and directly say that this is not an option.

Cost Impact: None

M88-12

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

506.3.11-M-GRACE-MCMANN.DOC

M89–12
506.3.11, 506.3.11.1

Proponent: Tony Crimi, A.C. Consulting Solutions Inc., representing International Firestop Council (tcrimi@sympatico.ca) and John D. Nicholas of Perceptive Solutions LLC representing Unifrax I LLC (john@perceptivesolutionsllc.com)

Revise as follows:

506.3.11 Grease duct enclosures. A grease duct serving a Type I hood that penetrates a ceiling, wall, floor or any concealed spaces shall be enclosed from the point of penetration to the outlet terminal. 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 either field-applied or factory-built. Duct enclosures shall have a fire-resistance rating of not less than that of the assembly penetrated and not less than 1 hour. Duct enclosures shall be as prescribed by Section 506.3.11.1 or 506.3.11.2 ~~or 506.3.11.3~~.

~~**506.3.11.1 Shaft enclosure.** Commercial kitchen grease ducts constructed in accordance with Section 506.3.1 shall be permitted to be enclosed in accordance with the *International Building Code* requirements for shaft construction. Such grease duct systems and exhaust *equipment* 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 6 inches (76 mm). Duct enclosures shall be sealed around the duct at the point of penetration and vented to the outside of the building through the use of weather-protected openings.~~

506.3.11.1 ~~2~~ Field-applied grease duct enclosure.
Commercial kitchen grease ducts constructed in accordance with Section 506.3.1 shall be enclosed by field applied grease duct enclosure that is a listed and labeled material, system, product, or method of construction specifically evaluated for such purpose in accordance with ASTM E 2336. The surface of the duct shall be continuously covered on all sides from the point at which the duct originates to the outlet terminal. Duct penetrations shall be protected with a through-penetration fire-stop system classified in accordance with ASTM E 814 or UL 1497 and having a “F” and “T” rating equal to the fire-resistance rating of the assembly being penetrated. Such systems shall be installed in accordance with the listing and the manufacturer’s installation instructions. Partial application of a field-applied grease duct enclosure system shall not be installed for the sole purpose of reducing clearances to combustibles at isolated sections of grease duct. Exposed duct-wrap systems shall be protected where subject to physical damage.

506.3.11.2 ~~3~~ Factory-built grease duct assemblies. Factory- built grease duct assemblies incorporating integral enclosure materials shall be *listed* and *labeled* for use as commercial kitchen grease duct assemblies in accordance with UL 2221. Duct penetrations shall be protected with a through-penetration firestop system classified in accordance with ASTM E 814 or UL 1479 and having an “F” and “T” rating equal to the fire-resistance rating of the assembly being penetrated. Such assemblies shall be installed in accordance with the listing and the manufacturer’s installation instructions.

506.3.11.3 ~~4~~ Duct enclosure not required. A duct enclosure shall not be required for a grease duct that penetrates only a nonfire-resistance-rated roof/ceiling assembly.

Reasons:

CRIMI- The use of a grease duct enclosure installed in conformance with the IBC requirements for shaft construction is really just another "field-applied" grease duct enclosure system, and should be subject to the same conditions as any other field-applied grease duct enclosure system. In that case, Section 506.3.1 becomes redundant, since testing in conformance with ASTM E2336 addresses the issues related to clearances to combustible and noncombustible construction.

The historical practice of allowing certain materials to be used to enclose grease ducts serving Type 1 hoods without specifically fire testing then for the application needs to be revisited. The IBC requirements for shaft construction cover many items, but the fire-resistance requirements to conform to ASTM E119 do not address normal service conditions for grease ducts at all. Evaluating enclosure materials used to protect a grease duct from fire is an aid for predicting their fire performance and promotes uniformity in requirements of various authorities. To do this it is necessary that the fire-endurance properties of enclosure materials be measured and specified according to a common standard expressed in terms that are applicable alike to a wide variety of materials, situations, and conditions of exposure. The ASTM E2336 and UL 2221 test methods evaluate the enclosure materials and the grease duct enclosure systems using the following test methods: noncombustibility, fire resistance, durability, internal fire, and fire-engulfment with a through-penetration fire stop.

In contrast to the requirements of IBC Section 713 for Shaft Enclosures, these test methods prescribe a standardized fire exposure for comparing the test results of grease duct enclosure materials and grease duct enclosure systems. Using these test results to predict the performance of actual grease duct enclosure systems requires the evaluation of these specific test conditions.

Over the last decade, the technology surrounding the installation and protection of grease ducts has evolved in response to growing concern over grease duct fires, and concerns over space. The protection of grease ducts under fire exposure conditions is an item of importance in securing constructions that are safe, and that are not a menace to adjacent construction or building occupants. Protection of grease ducts has long been addressed in the codes of many authorities, municipal and other agencies. Many types of enclosure materials are used to protect grease ducts. Normally, these enclosure materials are either applied to grease ducts in the field or are fabricated as part of the grease duct when shipped from the factory.

NICHOLAS-This proposed code change allows for the use of either a pre-fabricated duct system or field applied enclosure system when these systems are tested and listed in accordance with *ASTM E2336, Standard Test Methods for Fire Resistive Grease Duct Enclosure Systems* a full consensus test method that was specifically designed to assess both specific end use of the duct and its protection materials.

The history of many provisions in our building codes are traced back to ASTM E119 as it is the oldest fire-resistance standard cited in the U.S. building codes. However, when fire test standards are developed for specific material applications those test standards replaced ASTM E119. There are many examples of advancements in fire testing being used to provide a fire test based on ASTM E119 but specifically developed for a particular application: doors, windows, firestop systems, joint systems, etc. For example, doors were tested to ASTM E119, then ASTM E152, and now to UL10b and 10c, which were developed to assess the door's fire performance in a specific application. This proposed code change is a cost effective method of providing a test specifically designed to test the duct system as the shaft is not tested as constructed in the field but rather as a wall panel. ASTM E119 does not have a protocol for testing shafts that can be engulfed in a fire. The fire-resistance engulfment test of ASTM E2336 is a much more serve test scenario for a shaft or duct system as the volume of air within the shaft or duct is limited and will heat faster than the ambient laboratory air in contact with the wall panel. Also, the stability of the shaft as constructed in the field will react differently than a wall panel. The corners of the shaft will be tested as the sides of the shaft create stresses on the corners that are not evaluated by the ASTM E119 wall panel, which is secured into a test frame. Using tests designed to address the actual construction and application of materials is more conservative and usually increases life safety. Further, sometimes newer fire tests of materials allow more cost effective materials and construction than materials assessed by traditional tests not specifically designed to address their actual construction and application.

As products are in service for prolonged periods of time some performance limitations are noted and addressed by industry and the codes. GA-216-2007, *Specifications for the Application and Finishing of Gypsum Panel Products* states "1.4 Gypsum panel products shall not be used where they will be exposed to sustained temperatures of more than 125ºF (52ºC) for extended periods of time.[1]"

Also, several changes related to the use of conventional shaft materials have taken place within the building and mechanical codes over the years. For example, the IMC under Section 602.2 **Construction** states, "The use of gypsum boards to form plenums shall be limited to systems where the air temperatures do not exceed 125ºF (52ºC) and the building and mechanical system design conditions are such that the gypsum board surface temperature will be maintained above the airstream dew-point temperature." A similar limitation is noted in the IMC under Section 603.5.1 **Gypsum Ducts** states, "The use of gypsum boards to form air shafts (ducts) shall be limited to return air systems where the air temperatures do not exceed 125ºF (52ºC) and the gypsum board surface temperature is maintained above the airstream dew-point temperature. Air ducts formed by gypsum boards shall not be incorporated in air-handling systems utilizing evaporative coolers." For these reasons, a shaft wall construction tested to ASTM E119 as a panel may not provide the performance when that construction is tested as a shaft engulfed in a fire. Nor may a shaft wall construction tested to ASTM E119 as a panel maintain its stability and insulation when tested as a shaft subjected to a prolonged service test temperature established by UL1978 and adopted by ASTM E2336 and UL 2221.

Both ASTM E2336 and UL2221 have an engulfment fire tests and a portion of their standard dedicated to a prolonged internal service temperature test, approximately 500°F, which must be maintained for a minimum of 4-hour exposure. Then with 15 minutes the fire test temperature is increase to approximately 2000°F and sustained for 30 minutes. These test protocols are designed to subject the fire protection materials to an exposure that may be experienced in service. As these tests where not developed for a particular material, having conventional shaft materials tested to the same tests will ensure conformity of fire protection and dispel concerns about the service temperature limitations, which may decrease the performance of conventional shaft materials, cited in the codes and by the industry.

This method of tests uses the ASTM E119 time-temperature for the engulfment test to assess the duct system. This method of tests also assesses both internal and external fire threats as well as both horizontal ducts and vertical ducts. In ASTM E2336, the systems supports are also tested as part of the fire resistance test. ASTM E2336 offers the following tests to assess performance: ASTM E136 for insulation's non-combustibility, ASTM C518 for the insulation's durability and ASTM E814 for the system's ability as a firestop to prevent the spread of fire from compartment to compartment, and ASTM E2226 for the resistance to the application of a hose stream.

ICC-ES AC101, *Acceptance Criteria For Grease Duct Enclosure Assemblies*, establishes requirements for fire protection enclosure systems, applied to grease ducts which provide an alternate to required fire-resistance-rated shafts, as well as to determine the characteristics of the system and enclosure material currently cited in the codes.

These comments are respectfully submitted as the ASTM Task Group Chair of ASTM E2336 who drafted its first version, as the ANSI Designated Expert to ISO TC92 SC2 WG4 that created and maintains ISO 6944 *Fire Containment — Elements of Building Construction — Part 2: Kitchen Extract Ducts* and one who has designed, supervised, and overseen grease duct fire tests as part of an international laboratory as well as one who had jurisdiction over the product certification process for products and materials.

Bibliography:
1. GA-216-2007, Copyright 2007, Gypsum Association

Cost Impact: This change will potentially reduce the cost of construction.

M89-12

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

506.3.11-M-CRIMI-NICHOLAS.DOC

M90–12
506.3.11

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

506.3.11 Grease duct enclosures. A grease duct serving a Type I hood that penetrates a ceiling, wall, floor or any concealed spaces 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*.

Reason: Section 506.3.11 does not state that in-line fans located inside the building would have to be enclosed no differently than a grease duct. Such fans are installed in, and as part of, the duct system and if the duct must be enclosed, so too must the fan.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: This proposal could increase the cost of construction depending upon how current text is interpreted.

M90-12

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

506.3.11#2-M-STRAUSBAUGH.PMGCAC.DOC

M91–12
506.3.11

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

THIS CODE CHANGE WILL BE HEARD BY THE IBC FIRE SAFETY COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

Revise as follows:

506.3.11 Grease duct enclosures. A grease duct serving a Type I hood that penetrates a ceiling, wall, floor or any concealed spaces shall be enclosed from the point of penetration
to the outlet terminal. 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 either field-applied or factory-built. Duct enclosures shall have a fire-resistance rating of not less than that of the assembly penetrated and not less than 1 hour. Duct enclosures shall be as prescribed by Section 506.3.10.1, 506.3.10.2 or 506.3.10.3. <u>Penetrations of the grease duct enclosure made by the grease duct are not required to be protected by fire dampers or smoke dampers.</u>

Reason: Section 712.1.5 of the IBC refers to the IMC for protection of grease duct penetrations. It is the intent that the enclosure requirements of Section 506.3.11 negate the need for fire dampers in grease ducts, however, the code has never clearly stated this intent. This proposal does not prohibit the installation of fire dampers that are part of a listed Type I hood.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M91-12

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

506.3.11#1-M-STRAUSBAUGH.PMGCAC.DOC

M92–12
506.3.11, 506.3.11.1, 506.3.11.2, 506.3.11.3, Chapter 15

Proponent: Bob Eugene/Underwriters Laboratories/Underwriters Laboratories (Robert.Eugene@ul.com)

Revise as follows:

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 spaces shall be enclosed from the point of penetration to the outlet terminal. 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 ~~either~~ a shaft enclosure in accordance with Section 506.3.11.1, a field-applied enclosure assembly in accordance with 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. ~~Duct enclosures shall be as prescribed by Section 506.3.11.1, 506.3.11.2 or 506.3.11.3.~~

> **Exception:** ~~**506.3.11.4 Duct enclosure not required.**~~ A duct enclosure shall not be required for a grease duct that penetrates only a nonfire-resistance-rated roof/ceiling assembly.

506.3.11.1 Shaft enclosure. ~~Commercial kitchen grease~~ Grease ducts constructed in accordance with Section 506.3.1 shall be permitted to be enclosed in accordance with the *International Building Code* requirements for shaft construction. Such grease duct systems and exhaust *equipment* 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 6 inches (76 mm). Duct enclosures shall be sealed around the duct at the point of penetration and vented to the outside of the building through the use of weather-protected openings.

506.3.11.2 Field-applied grease duct enclosure. ~~Commercial kitchen grease~~ Grease ducts constructed in accordance with Section 506.3.1 shall be enclosed by a *listed* and *labeled* field-applied grease duct enclosure ~~that is a listed and labeled~~ material, systems, product, or method of construction specifically evaluated for such purpose in accordance with ASTM E 2336. The surface of the duct shall be continuously covered on all sides from the point at which the duct originates to the outlet terminal. Duct penetrations shall be protected with a through-penetration ~~fire-stop~~ firestop system ~~classified~~ tested and *listed* in accordance with ASTM E 814 or UL ~~1497~~ 1479 and having a “F” and “T” rating equal to the fire-resistance rating of the assembly being penetrated. The grease duct enclosure and firestop system shall be installed in accordance with the listing and the manufacturer’s instructions. ~~Such fire-stop systems shall be installed in accordance with the listing and the manufacturer’s installation instructions.~~ Partial application of a field-applied grease duct enclosure shall not be installed for the sole purpose of reducing clearances to combustibles at isolated sections of grease duct. Exposed duct-wrap systems shall be protected where subject to physical damage.

506.3.11.3 Factory-built grease duct enclosure assemblies. Factory-built grease ducts ~~assemblies~~ incorporating integral enclosure materials shall be *listed* and *labeled* for use as ~~commercial kitchen~~ grease duct enclosure assemblies specifically evaluated for such purpose in accordance with UL 2221. Duct penetrations shall be protected with a through-penetration firestop system ~~classified~~ tested and *listed* in accordance with ASTM E 814 or UL 1479 and having an “F” and “T” rating equal to the fire-resistance rating of the assembly being penetrated. ~~Such assemblies~~ The grease duct enclosure assembly and firestop system shall be installed in accordance with the listing and the manufacturer’s instructions.

Add referenced standard to Chapter 15 as follows:

UL 1479-03 Standard for Fire Tests of Through-Penetration Firestops

Reason: There is a lot of confusion regarding the options for enclosing a commercial kitchen grease duct in the code community due to the current wording of section 506.3.11. The general requirements are mixed in with the specific requirements for the three construction options and the wording does not accurately define how these products are tested and listed. The focus of this effort is to combine common requirements in the first paragraph, clearly delineate which requirements apply to each of the three construction options and to clarify the wording to accurately reflect how these products are tested, listed and labeled.

Cost Impact: None

Analysis: A review of the standard proposed for inclusion in the code, [UL 1479-03] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M92-12

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

506.3.11-M-EUGENE.DOC

M93–12
506.3.11.1

Proponent: Vickie J. Lovell, Intercode Incorporated, representing 3M Company (vickie@intercodeinc.com)

Revise as follows:

506.3.11.1 Shaft enclosure. Commercial kitchen grease ducts constructed in accordance with Section 506.3.1 shall be permitted to be enclosed by a listed and labelled material, system, product, or method of construction specifically evaluated for such purpose in accordance with ASTM E2336. ~~in accordance with the *International Building Code* requirements for shaft construction.~~ Such grease duct systems and exhaust *equipment* 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 6 inches (76 mm). Duct enclosures shall be sealed around the duct at the point of penetration in accordance with the *International Building Code* Section 714 and vented to the outside of the building through the use of weather-protected openings.

Reason: The IBC requirements for shaft construction cover many items, but the construction of a fire-resistance shaft that conform to ASTM E119 do not address fire conditions for grease duct enclosures at all.

The use of a grease duct enclosure installed in conformance with the IBC requirements for shaft construction should meet the same performance as any other "field-applied" grease duct enclosure system, and should be subjected to the same test conditions as any other field-applied grease duct enclosure system.

The ASTM E2336 test methods evaluate the enclosure materials and the grease duct enclosure systems using the following test methods: noncombustibility, fire resistance, durability, internal fire, and fire-engulfment with a through-penetration fire stop.

The proposed revisions to 506.3.11.1 do not preclude the use of gypsum boards or any other material to form a grease duct enclosure, but ensures that it will be assembled in a configuration that has been demonstrated to provide adequate protection necessary to contain a grease duct fire.

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

M93-12

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

506.3.11-M-LOVELL.DOC

M94–12
506.3.11.1

Proponent: Vickie Lovell, InterCode Incorporated representing the 3M Company (vickie@intercodeinc.com)

Revise as follows:

506.3.11.1 Shaft enclosure. Commercial kitchen grease ducts constructed in accordance with Section 506.3.1 shall be permitted to be enclosed in accordance with the *International Building Code* requirements for shaft construction. Such grease duct systems and exhaust *equipment* 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 6 inches (76 mm). <u>The materials used to form such enclosures shall be limited to an assemblage of materials that can withstand temperatures that exceed 125ºF (52ºC) for the time period of the fire-resistance rating of the floor or roof assembly penetrated.</u> Duct enclosures shall be sealed around the duct at the point of penetration and vented to the outside of the building through the use of weather-protected openings.

Reason: The historical practice of allowing certain materials, such as gypsum wallboard, to be used to enclose grease ducts serving Type 1 hoods is in consistent with the requirements for field applied, and factory built grease duct enclosures. The IBC requirements for shaft construction cover many items, but the fire-resistance requirements to conform to ASTM E119 do not address normal service conditions for grease ducts at all.

As written, any assembly of gypsum board would be permitted as a grease duct enclosure. Section 602.2 of the IMC has, for many years, recognized the practical limitations of using gypsum wallboard in elevated temperature applications.

In the IMC 602.2. the use of gypsum boards to form plenums is limited to conditions where the air temperatures do not exceed 125ºF (52ºC) and the building and mechanical system design conditions are such that the gypsum board surface temperature will be maintained.

Grease duct fires are typically very hot, exceeding the capability of a single layer of 5/8 inch gypsum board without some specific instruction on how it should be configured to provide adequate fire protection, including internal and external fire exposure for the duration and at the expected temperatures of a grease fire.

Cost Impact: This code change will not increase the cost of construction and may in fact reduce the cost of construction.

M94-12

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

506.3.11.1-M-LOVELL.DOC

M95–12
506.3.11.2

Proponent: Richard Grace, Fairfax County Government, representing The Virginia Plumbing and Mechanical Inspectors Association, The Virginia Building Code Officials Association; Guy McMann, MCP, Jefferson County Colorado, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

Revise as follows:

506.3.11.2 Field-applied grease duct enclosure Commercial kitchen grease ducts constructed in accordance with Section 506.3.1 shall be enclosed by a field-applied grease duct enclosure that is a listed and labeled material, system, product or method of construction specifically evaluated for such purpose in accordance with ASTM E 2336.

The surface of the duct shall be continuously covered on all sides <u>with two layers of field applied grease duct enclosure material, </u>from the point at which the duct originates to the outlet terminal. Duct penetrations shall be protected with a through-penetration fire stop system classified in accordance with ASTM E 814 or UL 1479 and having an "F" and "T" rating equal to the fire-resistance rating of the assembly being penetrated. Such systems shall be installed in accordance with the listing and the manufacturer's installation instructions. Partial application of a field applied grease duct enclosure system shall not be installed for the sole purpose of reducing clearances to combustibles at isolated sections of grease duct. Exposed duct wrap systems shall be protected where subject to physical damage

Reason: As with many Standards, some of the pertinent language is not included in code text forcing the user to locate the Standard which may not be available or possibly even having to purchase it. In order to satisfy ASTM E 2336, two layers of wrapping material must be installed. This is extremely important information that the user needs to be aware of ahead of time, not only for bidding purposes but in order to pass an inspection the fist time around. Inspectors also need this information so they know what to look for. Although the manufacturer's instructions require the two layers, this is simply a benefit for the user as this will aid on the front side of a possible installation.

Cost Impact: None

M95-12

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

506.3.11-2-M-GRACE-MCMANN.DOC

M96–12
506.4.1.1 (New), 505.1.1 (New)

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

THIS CODE CHANGE WILL BE HEARD BY THE IBC-FIRE SAFETY COMMITTEE, SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

Add new text as follows:

506.4.1.1 Duct Penetrations. Fire dampers, combination fire/smoke dampers and ceiling radiation dampers are not required in exhaust ducts serving Type II hoods. Ducts that penetrate fire-resistance-rated assemblies and that are not required by this section to have dampers shall comply with the requirements of Sections 714.2 through 714.3.3 of the *International Building Code.* Ducts that penetrate horizontal assemblies and that are not required to be contained within a shaft and not required by this section to have dampers shall comply with the requirements of Sections 714.4 through 714.4.2.2 of the *International Building Code.*

505.1.1 Duct Penetrations. Fire dampers, combination fire/smoke dampers and ceiling radiation dampers are not required in domestic kitchen hood exhaust ducts. Ducts that penetrate fire-resistance-rated assemblies and that are not required by this section to have dampers shall comply with the requirements of Sections 714.2 through 714.3.3 of the *International Building Code.* Ducts that penetrate horizontal assemblies and that are not required to be contained within a shaft and not required by this section to have dampers shall comply with the requirements of Sections 714.4 through 714.2.2 of the *International Building Code.*

Reason: Exception # 5 to Section 717.5.3 (IMC [B]607.5.5) addresses kitchen exhaust ducts but does not identify whether this means Type I, Type II, domestic or all of these. Rather than trying to revise the IBC text, the committee decided to let the exception apply broadly to all kitchen exhaust ducts without limitation and address the penetration protection requirements in the relative location in the IMC. For Type I kitchen exhaust ducts, dampers are not required, as was the probable intent of exception # 5. Such ducts are required to be enclosed in rated enclosures by Section 506.3.11. Because Type II and domestic exhaust ducts are not required to enclosed, some form of penetration protection would be required, therefore the proposed new text requires protection in accordance with the IBC, such as through-penetration firestop systems.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M96-12

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

506.4.1.1-M-STRAUSBAUGH.PMGCAC.DOC

M97–12
506.5.1.1 (NEW)

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

Add new text as follows:

506.5.1.1 In line fan Location. Where enclosed duct systems are connected to in line fans, the fan shall be located in a room or space having the same fire resistance rating as the duct enclosure. Access shall be provided for servicing and cleaning of fan components. Such rooms or spaces shall be ventilated in accordance with the fan manufacturers' installation instructions.

Reason: Currently there is no guidance in the IMC as to how and where an in-line fan is to be located as these types of fans are usually in unique locations. Fans cannot be treated the same way as ducts as far as ratings are concerned. Fans cannot be wrapped with duct wrap material. This proposal would require the fan be installed in a rated room or a rated enclosure when the ducts attached to the fan are required to be protected. The rated rooms or enclosures may need to be ventilated according to the fan manufacturers' instructions. This language is consistent with NFPA-96.

Cost Impact: This may or may not increase cost.

M97-12

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

506.5.1.1(NEW)-MCMANN.DOC

M98–12
506.5.1.1(NEW)

Proponent: Richard Grace, Fairfax County Government, representing The Virginia Plumbing and Mechanical Inspectors Association, The Virginia Building Code Officials Association

Add new text as follows:

506.5.1.1 In line fan Location. Where enclosed duct systems are connected to in-line fans, such fans shall be located in a room, space or enclosure having the same fire-resistance rating as the duct enclosure.

Reason: Currently there is no guidance in the IMC as to how and where an in-line fan is to be located as these types of fans are usually in unique locations. There is a misconception that the fan itself has to be in some kind of an enclosure itself which it does not, just be located in a rated room. This language is consistent with NFPA-96.

Cost Impact: None

M98-12

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

506.5.1.1-M-GRACE.DOC

M99–12
506.5.1.2(NEW), 507.2

Proponent: Guy McMann, MCP, Jefferson County Colorado, Colorado Association of Plumbing and Mechanical Officials (CAPMO)
(gmcmann@jeffco.us)

Revise as follows:

507.2 Where required. A Type I or Type II hood shall be installed at or above all commercial cooking appliances in accordance with Sections 507.2.1 and 507.2.2. Where any cooking appliance under a single hood requires a Type I hood, a Type I hood shall be installed. Where a Type II hood is required, a Type I or Type II hood shall be installed.

> **Exception:** Where cooking appliances are equipped with integral down draft exhaust systems and such appliances and exhaust systems are listed and labeled for the application, ~~in accordance with NFPA 96~~, a hood shall not be required at or above them.

506.5.1.2 Down draft cooking appliances and ventilation systems. Down draft cooking appliances and ventilation systems shall be installed in accordance with the manufacturer's instructions and shall comply with all of the following requirements:

1. Exhaust ducts shall comply with Section 506.
2. Clearances to combustibles shall be in accordance with the manufacturer's listing.
3. Appliances shall be provided with filters complying with UL 1046.
4. Spaces containing such appliances shall be provided with makeup air complying with Section 508.
5. Appliances shall be interlocked with the exhaust system such that they cannot operate unless the exhaust system and makeup air system are operating.
6. The exhaust system shall be provided with controls that will prevent appliance operation when airflow falls below 25% of the normal operating flow rate or 10% below the exhaust air flow specified in the equipment listing, whichever is lower.
7. The ventilation system shall be capable of capturing and containing the effluent at the source

Reason: It's not a good practice to send the user to another Standard only to be confused by the different language and requirements that are not in the IMC. The IMC has all the pertinent information required for safe installations.

Currently the code is silent and provides no guidance on what to expect when code officials come across these types of appliances (Hibachi Tables). The National Standard contains requirements that are not present in the code and needs to be addressed. These appliances usually involve bottom discharge exhaust systems that may need monitoring to maintain capture and containment as they are not required to have type I hoods over them.

Cost Impact: None

M99-12

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

506.5.1.2(NEW)-M-MCCANN.DOC

M100–12
506.5.3

Proponent: Guy McMann, MCP, Jefferson County Colorado, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) and Richard Grace, Fairfax County Government, The Virginia Plumbing and Mechanical Inspectors Association, The Virginia Building Code Officials Association

Revise as follows:

506.5.3 Exhaust fan mounting ~~An~~ Up-blast fan<u>s serving Type I hoods and installed in a vertical or horizontal position</u> shall be hinged<u>,</u> ~~and~~ supplied with a flexible weatherproof electrical cable to permit inspection and cleaning <u>and shall be equipped with a means of restraint to limit the swing of the fan on its hinge</u>. The ductwork shall extend a minimum of 18 inches (457 mm) above the roof surface.

Reason: Some clarification is needed in distinguishing between Type I fans and all others. Type II fans and other types of up-blast fans do not require hinges. There needs to be some method of restraint on hinged fans as they can become quite large and heavy. If one was to get loose from a grip the potential for damage from the fan falling in an opposite direction becomes high. This could result in damage to the electrical cable on the roof, wall or elsewhere. Also, the fan could tear itself off the curb altogether. In any case, property damage or personal injury could result. A restraining cable will aid in stabilizing the fan so cleaning and maintenance operations can be accomplished safely.

Cost Impact: Adding a cable may increase the cost of the fan.

M100-12

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

506.5.3-M-GRACE-MCMANN.DOC

M101–12
507

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

SECTION 507
COMMERCIAL KITCHEN HOODS

507.1 General. Commercial kitchen exhaust hoods shall comply with the requirements of this section. Hoods shall be Type I or II and shall be designed to capture and confine cooking vapors and residues. A Type I or Type II hood shall be installed at or above all *commercial cooking appliances* in accordance with Sections 507.2 and 507.3. Where any cooking *appliance* under a single hood requires a Type I hood, a Type I hood shall be installed. Where a Type II hood is required, a Type I or Type II hood shall be installed. ~~Commercial kitchen exhaust hood systems shall operate during the cooking operation.~~

Exceptions:

1. Factory-built commercial exhaust hoods that are listed and labeled in accordance with UL 710, and installed in accordance with Section 304.1 shall not be required to comply with Sections 507.1.5, 507.2.3, 507.2.5, 507.2.8, 507.3.1, 507.3.3, 507.4 and 507.5. ~~507.4, 507.5, 507.7, 507.11, 507.12, 507.13, 507.14, and 507.15.~~
2. Factory-built commercial cooking recirculating systems that are listed and labeled in accordance with UL 710B, and installed in accordance with Section 304.1 shall not be required to comply with Sections 507.1.5, 507.2.3, 507.2.5, 507.2.8, 507.3.1, 507.3.3, 507.4 and 507.5. ~~507.4, 507.5, 507.7, 507.11, 507.12, 507.13, 507.14, and 507.15~~. Spaces in which such systems are located shall be considered to be kitchens and shall be ventilated in accordance with Table 403.3. For the purpose of determining the floor area required to be ventilated, each individual *appliance* shall be considered as occupying not less than 100 square feet (9.3 m2).
3. ~~Net exhaust volumes for hoods shall be permitted to be reduced during part-load cooking conditions, where engineered or *listed* multispeed or variable speed controls automatically operate the exhaust system to maintain capture and removal of cooking effluents as required by this section. Reduced volumes shall not be below that required to maintain capture and removal of effluents from the idle cooking appliances that are operating in a standby mode.~~
3. Where cooking appliances are equipped with integral down-draft exhaust systems and such appliances and exhaust systems are listed and labeled for the application in accordance with NFPA 96, a hood shall not be required at or above them.

507.1.1 Operation. Commercial kitchen exhaust hood systems shall operate during the cooking operation. The hood exhaust rate shall comply with the listing of the hood or shall comply with Section 507.5. ~~Type I~~ Hood systems shall be designed and installed to automatically activate the exhaust fan whenever cooking operations occur. The activation of the exhaust fan shall occur through an interlock with the cooking appliances, by means of heat sensors or by means of other approved methods. A method of interlock between an exhaust hood system and appliances equipped with standing pilot burners shall not cause the pilot burners to be extinguished. A method of interlock between an exhaust hood system and cooking appliances shall not involve or depend upon any component of a fire extinguishing system.

The net exhaust volumes for hoods shall be permitted to be reduced during part-load cooking conditions, where engineered or *listed* multispeed or variable speed controls automatically operate the exhaust system to maintain capture and removal of cooking effluents as required by this section. Reduced volumes shall not be below that required to maintain capture and removal of effluents from the idle cooking appliances that are operating in a standby mode.

~~**507.2 Where required.** A Type I or Type II hood shall be installed at or above all *commercial cooking appliances* in accordance with Sections 507.2.1 and 507.2.2. Where any cooking *appliance* under a single hood requires a Type I hood, a Type I hood shall be installed. Where a Type II hood is required, a Type I or Type II hood shall be installed.~~

> ~~**Exception:** Where cooking appliances are equipped with integral down-draft exhaust systems and such appliances and exhaust systems are listed and labeled for the application in accordance with NFPA 96, a hood shall not be required at or above them.~~

507.1.23 Domestic cooking appliances used for commercial purposes. Domestic cooking appliances utilized for commercial purposes shall be provided with Type I or Type II hoods as required for the type of appliances and processes in accordance with Sections 507.2 and 507.3.

507.1.3 Fuel-burning appliances. Where vented fuel-burning appliances are located in the same room or space as the hood, provisions shall be made to prevent the hood system from interfering with normal operation of the *appliance* vents.

507.1.4 Cleaning. A hood shall be designed to provide for thorough cleaning of the entire hood.

507.1.5 Exhaust outlets. Exhaust outlets located within the hood shall be located so as to optimize the capture of particulate matter. Each outlet shall serve not more than a 12-foot (3658 mm) section of hood.

507.2~~.1~~ Type I hoods. Type I hoods shall be installed where cooking *appliances* produce grease or smoke as a result of the cooking process. Type I hoods shall be installed over *medium-duty*, *heavy-duty* and *extra-heavy duty cooking appliances*. Type I hoods shall be installed over *light-duty cooking appliances* that produce grease or smoke.

> **Exception:** A Type I hood shall not be required for an electric cooking appliance where an approved testing agency provides documentation that the appliance effluent contains 5 mg/m3 or less of grease when tested at an exhaust flow rate of 500 cfm (0.236 m3/s) in accordance with Section 17 of UL 710B.

~~**507.2.1.1 Operation.** Type I hood systems shall be designed and installed to automatically activate the exhaust fan whenever cooking operations occur. The activation of the exhaust fan shall occur through an interlock with the cooking appliances, by means of heat sensors or by means of other *approved* methods. A method of interlock between an exhaust hood system and appliances equipped with standing pilot burners shall not cause the pilot burners to be extinguished. A method of interlock between an exhaust hood system and cooking appliances shall not involve or depend upon any component of a fire extinguishing system.~~

507.2.1~~.2~~ Type I exhaust flow rate label. Type I hoods shall bear a label indicating the minimum exhaust flow rate in cfm per linear foot (1.55 L/s per linear meter) of hood that provides for capture and containment of the exhaust effluent for the cooking appliances served by the hood, based on the cooking appliance duty classifications defined in this code.

507.2.2 Type I extra-heavy-duty. Type I hoods used over *extra-heavy-duty cooking appliances* shall not cover *heavy-*, *medium-* or *light-duty appliances*. Such hoods shall discharge to an exhaust system that is independent of other exhaust systems.

507.2.3 Type I materials. Type I hoods shall be constructed of steel having a minimum thickness of 0.0466 inch (1.181 mm) (No. 18 gage) or stainless steel not less than 0.0335 inch [0.8525 mm (No. 20 MSG)] in thickness.

507.2.4 Type I supports. Type I hoods shall be secured in place by non-combustible supports. All Type I hood supports shall be adequate for the applied load of the hood, the unsupported ductwork, the effluent loading and the possible weight of personnel working in or on the hood.

507.2.5 Type I joints, seams and penetrations. External hood joints, seams and penetrations for Type I hoods shall be made with a continuous external liquid-tight weld or braze to the lowest outermost perimeter of the hood. Internal hood joints, seams, penetrations, filter support frames and other appendages attached inside the hood shall not be required to be welded or brazed but shall be otherwise sealed to be grease tight.

Exceptions:

1. Penetrations shall not be required to be welded or brazed where sealed by devices that are *listed* for the application.
2. Internal welding or brazing of seams, joints and penetrations of the hood shall not be prohibited provided that the joint is formed smooth or ground so as to not trap grease, and is readily cleanable.

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: *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.

507.2.7 Type I hoods penetrating a ceiling. Type I hoods or portions thereof penetrating a ceiling, wall or furred space shall comply with Section 506.3.11. Field-applied grease duct enclosure systems, as addressed in Section 506.3.11.2, shall not be utilized to satisfy the requirements of this section.

507.2.8 Type I grease filters. Type I hoods shall be equipped with grease filters listed and labeled in accordance with UL 1046 and designed for the specific purpose. Grease-collecting *equipment* shall be provided with access for cleaning. The lowest edge of a grease filter located above the cooking surface shall be not less than the height specified in Table 507.2.8.

TABLE 507.2.8
MINIMUM DISTANCE BETWEEN THE LOWEST EDGE OF A GREASE FILTER AND THE COOKING SURFACE OR THE HEATING SURFACE

Type of Cooking Appliances	Height Above Cooking Surface (feet)
Without exposed flame	0.5
Exposed flame and burners	2
Exposed charcoal and charbroil type	3.5

For SI: 1 foot = 304.8 mm.

507.2.8.1 Criteria. Filters shall be of such size, type and arrangement as will permit the required quantity of air to pass through such units at rates not exceeding those for which the filter or unit was designed or *approved*. Filter units shall be installed in frames or holders so as to be readily removable without the use of separate tools, unless designed and installed to be cleaned in place and the system is equipped for such cleaning in place. Removable filter units shall be of a size that will allow them to be cleaned in a dishwashing machine or pot sink. Filter units shall be arranged in place or provided with drip-intercepting devices to prevent grease or other condensate from dripping into food or on food preparation surfaces.

507.2.8.2. Mounting position of grease filters. Filters shall be installed at an angle of not less than 45 degrees (0.79 rad) from the horizontal and shall be equipped with a drip tray beneath the lower edge of the filters.

507.2.9 Grease gutters for Type I hood. Grease gutters shall drain to an *approved* collection receptacle that is fabricated, designed and installed to allow access for cleaning.

507.3~~2.2~~ 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 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)].

> ~~**507.2.3 Domestic cooking appliances used for commercial purposes.** Domestic cooking appliances utilized for commercial purposes shall be provided with Type I or Type II hoods as required for the type of appliances and processes in accordance with Sections 507.2, 507.2.1 and 507.2.2.~~

> ~~**507.2.4 Extra-heavy-duty.** Type I hoods for use over *extra-heavy-duty cooking appliances* shall not cover *heavy-*, *medium-* or *light-duty appliances*. Such hoods shall discharge to an exhaust system that is independent of other exhaust systems.~~

~~**507.3 Fuel-burning appliances.** Where vented fuel-burning appliances are located in the same room or space as the hood, provisions shall be made to prevent the hood system from interfering with normal operation of the *appliance* vents.~~

~~**507.4 Type I materials.** Type I hoods shall be constructed of steel having a minimum thickness of 0.0466 inch (1.181 mm) (No. 18 gage) or stainless steel not less than 0.0335 inch [0.8525 mm (No. 20 MSG)] in thickness.~~

507.3.1~~5~~ Type II hood materials. Type II hoods shall be constructed of steel having a minimum thickness of 0.0296 inch (0.7534 mm) (No. 22 gage) or stainless steel not less than 0.0220 inch (0.5550 mm) (No. 24 gage) in thickness, copper sheets weighing not less than 24 ounces per square foot (7.3 kg/m2) or of other *approved* material and gage.

507.3.2~~6~~ Type II Supports. ~~Type I hoods shall be secured in place by non-combustible supports.~~ All ~~Type I and~~ Type II hood supports shall be adequate for the applied load of the hood, the unsupported ductwork, the effluent loading and the possible weight of personnel working in or on the hood.

~~**507.7 Hood joints, seams and penetrations.** Hood joints, seams and penetrations shall comply with Sections 507.7.1 and 507.7.2.~~

~~**507.7.1 Type I hoods.** External hood joints, seams and penetrations for Type I hoods shall be made with a continuous external liquid-tight weld or braze to the lowest outermost perimeter of the hood. Internal hood joints, seams, penetrations, filter support frames and other appendages attached inside the hood shall not be required to be welded or brazed but shall be otherwise sealed to be grease tight.~~

~~**Exceptions:**~~

1. ~~Penetrations shall not be required to be welded or brazed where sealed by devices that are *listed* for the application.~~
2. ~~Internal welding or brazing of seams, joints and penetrations of the hood shall not be prohibited provided that the joint is formed smooth or ground so as to not trap grease, and is readily cleanable.~~

507.<u>3.3</u>~~7.2~~ Type II hoods <u>joint, seams and penetrations</u>. Joints, seams and penetrations for Type II hoods shall be constructed as set forth in Chapter 6, shall be sealed on the interior of the hood and shall provide a smooth surface that is readily cleanable and watertight.

~~**507.8 Cleaning and grease gutters.** A hood shall be designed to provide for thorough cleaning of the entire hood. Grease gutters shall drain to an *approved* collection receptacle that is fabricated, designed and installed to allow access for cleaning~~.

~~**507.9 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:** *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.~~

~~**507.10 Hoods penetrating a ceiling.** Type I hoods or portionsthereof penetrating a ceiling, wall or furred space shall comply with Section 506.3.11. Field-applied grease duct enclosure systems, as addressed in Section 506.3.11.2, shall not be utilized to satisfy the requirements of this section.~~

~~**507.11 Grease filters.** Type I hoods shall be equipped with grease filters listed and labeled in accordance with UL 1046 and designed for the specific purpose. Grease-collecting *equipment* shall be provided with access for cleaning. The lowest edge of a grease filter located above the cooking surface shall be not less than the height specified in Table 507.11.~~

~~**TABLE 507.11**~~
~~**MINIMUM DISTANCE BETWEEN THE LOWEST EDGE OF A GREASE FILTER AND THE COOKING SURFACE OR THE HEATING SURFACE**~~

~~**Type of Cooking Appliances**~~	~~**Height Above Cooking Surface (feet)**~~
~~Without exposed flame~~	~~0.5~~
~~Exposed flame and burners~~	~~2~~
~~Exposed charcoal and charbroil type~~	~~3.5~~

~~For SI: 1 foot = 304.8 mm.~~

~~**507.11.1 Criteria.** Filters shall be of such size, type and arrangement as will permit the required quantity of air to pass through such units at rates not exceeding those for which the filter or unit was designed or *approved*. Filter units shall be installed in frames or holders so as to be readily removable without the use of separate tools, unless designed and installed to be cleaned in place and the system is equipped for such cleaning in place. Removable filter units shall be of a size that will allow them to be cleaned in a dishwashing machine or pot sink. Filter units shall be arranged in place or provided with drip-intercepting devices to prevent grease or other condensate from dripping into food or on food preparation surfaces.~~

~~**507.11.2 Mounting position.** Filters shall be installed at an angle of not less than 45 degrees (0.79 rad) from the horizontal and shall be equipped with a drip tray beneath the lower edge of the filters.~~

<u>**507.4 Hood size and location**. Hoods shall comply with the overhang, set back and height requires in accordance with Sections 507.4.1 and 507.4.2 based on the type hood</u>.

507.<u>4.1</u> ~~12~~ Canopy hoods. The inside lower edge of canopy-type Type I and II commercial hoods shall overhang or extend a horizontal distance of not less than 6 inches (152 mm) beyond the edge of the top horizontal surface of the *appliance* on all open sides. The vertical distance between the front lower lip of the hood and such surface shall not exceed 4 feet (1219 mm).

Exception: The hood shall be permitted to be flush with the outer edge of the cooking surface where the hood is closed to the *appliance* side by a noncombustible wall or panel.

507.4.2 ~~14~~ Noncanopy hoods. Noncanopy-type hoods shall be located a maximum of 3 feet (914 mm) above the cooking surface. The edge of the hood shall be set back a maximum of 1 foot (305 mm) from the edge of the cooking surface.

507.5 ~~13~~ Capacity of hoods. Commercial food service hoods shall exhaust a minimum net quantity of air determined in accordance with this section and Sections 507.5~~13~~.1 through 507.5~~13~~.5. The net quantity of *exhaust air* shall be calculated by subtracting any airflow supplied directly to a hood cavity from the total exhaust flow rate of a hood. Where any combination of *heavy-duty*, *medium-duty* and *light-duty cooking appliances* are utilized under a single hood, the exhaust rate required by this section for the heaviest duty *appliance* covered by the hood shall be used for the entire hood.

507.5~~13~~.1 Extra-heavy-duty cooking appliances. The minimum net airflow for hoods, as determined by Section 507.1~~2~~, used for *extra-heavy-duty cooking appliances* shall be determined as follows:

Type of Hood	CFM per linear foot of hood
Backshelf/pass-over	Not allowed
Double island canopy (per side)	550
Eyebrow	Not allowed
Single island canopy	700
Wall-mounted canopy	550

For SI: 1 cfm per linear foot = 1.55 L/s per linear meter.

507.5~~13~~.2 Heavy-duty cooking appliances. The minimum net airflow for hoods, as determined by Section 507.1~~2~~, used for *heavy-duty cooking appliances* shall be determined as follows:

Type of Hood	CFM per linear foot of hood
Backshelf/pass-over	400
Double island canopy (per side)	400
Eyebrow	Not allowed
Single island canopy	600
Wall-mounted canopy	400

For SI: 1 cfm per linear foot = 1.55 L/s per linear meter.

507.5~~13~~.3 Medium-duty cooking appliances. The minimum net airflow for hoods, as determined by Section 507.1~~2~~, used for *medium-duty cooking appliances* shall be determined as follows:

Type of Hood	CFM per linear foot of hood
Backshelf/pass-over	300
Double island canopy (per side)	300
Eyebrow	250
Single island canopy	500
Wall-mounted canopy	300

For SI: 1 cfm per linear foot = 1.55 L/s per linear meter.

507.5~~13~~.4 Light-duty cooking appliances. The minimum net airflow for hoods, as determined by Section 507.1~~2~~, used for *light-duty cooking appliances* and food service preparation shall be determined as follows:

Type of Hood	CFM per linear foot of hood
Backshelf/pass-over	250
Double island canopy (per side)	250
Eyebrow	250

Single island canopy	400
Wall-mounted canopy	200

For SI: 1 cfm per linear foot = 1.55 L/s per linear meter.

507.<u>5</u>~~13~~.5 Dishwashing appliances. The minimum net airflow for Type II hoods used for dishwashing appliances shall be 100 CFM per linear foot of hood length.

Exception: Dishwashing appliances and *equipment* installed in accordance with Section 507.<u>3</u>~~2.2~~.

~~**507.14 Noncanopy size and location.** Noncanopy-type hoods shall be located a maximum of 3 feet (914 mm) above the cooking surface. The edge of the hood shall be set back a maximum of 1 foot (305 mm) from the edge of the cooking surface.~~

~~**507.15 Exhaust outlets.** Exhaust outlets located within the hood shall be located so as to optimize the capture of particulate matter. Each outlet shall serve not more than a 12-foot (3658 mm) section of hood.~~

507.<u>6</u>~~16~~ Performance test. A performance test shall be conducted upon completion and before final approval of the installation of a ventilation system serving *commercial cooking appliances*. The test shall verify the rate of exhaust airflow required by Section 507.<u>5</u>~~13~~, makeup airflow required by Section 508 and proper operation as specified in this chapter. The permit holder shall furnish the necessary test *equipment* and devices required to perform the tests.

507.<u>6</u>~~16~~.1 Capture and containment test. The permit holder shall verify capture and containment performance of the exhaust system. This field test shall be conducted with all appliances under the hood at operating temperatures, with all sources of outdoor air providing *makeup air* for the hood operating and with all sources of recirculated air providing conditioning for the space in which the hood is located operating. Capture and containment shall be verified visually by observing smoke or steam produced by actual or simulated cooking, such as with smoke candles, smoke puffers, etc.

Reason: This section needs to be reorganized. The scope of this section has become much too large and non-cohesive due to multiple “tweaks” in the past. Requirements are “jumbled” and bounce around between the different types of hoods. There has been no change to intent in this proposed reorganization, only the presentation of the text has changed.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M101-12

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

507.M-STRAUSBAUGH.PMGCAC.DOC

M102–12
507

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

Revise as follows:

507.1 General. Commercial kitchen exhaust hoods shall comply with the requirements of this section, shall be listed and labeled in accordance with UL 710 or 710 B as applicable and shall be installed in accordance with Section 304.1. Hoods shall be Type I or II and shall be designed to capture and confine cooking vapors and residues. Commercial kitchen exhaust hood systems shall operate during the cooking operation.

Exception~~s~~:

~~1. Factory-built commercial exhaust hoods that are listed and labeled in accordance with UL 710, and installed in accordance with Section 304.1 shall not be required to comply with Sections 507.4, 507.5, 507.7, 507.11, 507.12, 507.13, 507.14, and 507.15.~~

~~2. Factory-built commercial cooking recirculating systems that are listed and labeled in accordance with UL 710B, and installed in accordance with Section 304.1 shall not be required to comply with Sections 507.4, 507.5, 507.7, 507.11, 507.12, 507.13, 507.14, and 507.15. Spaces in which such systems are located shall be considered to be kitchens and shall be ventilated in accordance with Table 403.3. For the purpose of determining the floor area required to be ventilated, each individual *appliance* shall be considered as occupying not less than 100 square feet (9.3 m^2).~~

~~3~~1 Net exhaust volumes for hoods shall be permitted to be reduced during part-load cooking conditions, where engineered or *listed* multispeed or variable-speed controls automatically operate the exhaust system to maintain capture and removal of cooking effluents as required by this section. Reduced volumes shall not be below that required to maintain capture and removal of effluents from the idle cooking appliances that are operating in a standby mode.

507.1.1 Kitchen ventilation. Spaces in which factory-built commercial cooking recirculating systems are located shall be considered to be kitchens and shall be ventilated in accordance with Table 403.3. For the purpose of determining the floor area required to be ventilated, each individual *appliance* shall be considered as occupying not less than 100 square feet (9.3 m^2).

Delete sections without substitution as follows:

~~**507.4**~~
~~**507.5**~~
~~**507.7**~~
~~**507.11**~~
~~**507.12**~~
~~**507.13**~~
~~**507.14**~~
~~**507.15**~~

Reason: ASHRAE standard 154 no longer recognizes unlisted hoods. This proposal makes the IMC parallel with 154 and simplifies it by eliminating the code coverage for unlisted hoods and eliminates the confusion created by the 2 exceptions to Section 507.1 that exempt listed hoods from much of the current code requirements.

Cost Impact: There is some cost impact of requiring listed Type I hoods but this is offset by additional energy savings since listed hoods operate at a lower airflow rate and are more energy efficient than unlisted hoods.

M102-12

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

507.1-M-FERGUSON.DOC

M103–12
507.2.1.1.1(NEW)

Proponent: Guy McMann, MCP, Jefferson County Colorado, Colorado Association of Plumbing and Mechanical Officials (CAPMO) and Roger Harper, Louisa County, VA, representing VA. Plumbing and Mechanical Inspectors Association (VPMIA)

Revise as follows:

507.2.1.1.1 Multiple hoods utilizing a single exhaust system. Where heat or radiant energy sensors are utilized in hood systems consisting of multiple hoods served by a single exhaust system, such sensors shall be provided in each hood. Sensors shall be capable of being accessed from the hood outlet or from a cleanout location.

(Renumber subsequent section)

Reason:
Harper-Utilizing heat sensors to activate the exhaust hood is only effective if the sensors are placed in an appropriate location. Having sensors installed in a duct system, downstream of the cooking appliances, affects the time in which the hood will activate and will not be consistent with the intent of 507.2.1.1. Locating a sensor in the exhaust outlet of each hood will assure timely fan activation.

McMann-Having sensors installed elsewhere in a duct system affects the time in which the hood will activate and will not be consistent with the intent of 507.2.1.1. For example, 5 hoods on a single fan system where the sensor is located in a trunk duct downstream of 5 branches. The heat from the hood farthest away will take some time to reach the sensor under passive conditions if it makes it there at all under a light load. Its possible that reverse flow may occur under negative building pressure. Locating a sensor in the exhaust outlet of each hood will assure timely fan activation.

Sensors require periodic cleaning and access is required to the inside to the duct to mount them or replace then. Provisions need to be made for these operations. Installing a sensor on a non-factory made cleanout is a excellent solution or simply providing nearby works as well.

Cost Impact: This may increase cost.

M103-12

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

M103-507.2.1.1.1(NEW)-M-MCMANN-HARPER.DOC

M104–12
507.2

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

507.2 Where required. A Type I or Type II hood shall be installed at or above all commercial cooking appliances in accordance with Sections 507.2.1 and 507.2.2 Where any cooking appliance under a single hood requires a Type I hood, a Type I hood shall be installed. Where a Type II hood is required, a Type I or Type II hood shall be installed. <u>Where a Type I hood is installed, the installation of the entire system, including the hood, ducts, exhaust equipment and makeup air system shall comply with the requirements of Sections 506, 507, 508 and 509.</u>

Reason: The code allows a Type I hood to be installed where the installation is required to have a Type II hood. The problem with replacing a Type II hood with a Type I is that the building can change hands and cooking operations can commence legally without triggering a permit. A Type I hood substituted for a Type II can be fitted with lesser gage duct with no thought to clearances and when a new tenant comes in, they see a Type I hood and start cooking items that produce grease and smoke, not understanding what's really above the ceiling. This situation provides a false sense of security for owners, tenants and code officials and this can lead to significant hazards down the road. If Type I hoods are installed, they should be installed with all of the materials and requirements that are associated such an installation. Installing a Type I hood without Type I ducts, clearances, etc is analogous to installing fire sprinkler heads without a water supply.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: This proposal will increase the cost of construction.

M104-12

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

507.2-M-STRAUSBAUGH.PMGCAC.DOC

M105–12

507.2.1, 507.2.1.3 (NEW), 507.2.2, 507.2.2.1, TABLE 507.2.1, TABLE 507.2.2.1, 507.2.2.2, TABLE 507.2.2.2

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

Revise as follows:

507.2.1 Type I hoods. Type I hoods shall be installed where cooking *appliances* produce grease or smoke as a result of the cooking process. Type I hoods shall be installed over *medium-duty*, *heavy-duty* and *extra-heavy-duty cooking appliances*. Type I hoods shall be installed over *light-duty cooking appliances* that produce grease or smoke. The duty classifications of cooking appliances served by Type I hoods shall be in accordance with Table 507.2.1

> **Exception:** A Type I hood shall not be required for an electric cooking appliance where an approved testing agency provides documentation that the appliance effluent contains 5 mg/m^3 or less of grease when tested at an exhaust flow rate of 500 cfm (0.236 m^3/s) in accordance with Section 17 of UL 710B.

507.2.1.3. Type I hoods shall overhang the appliances and equipment in accordance with their listing.

TABLE 507.2.1
APPLIANCE DUTY CLASSIFICATIONS BY APPLIANCE TYPE

Appliance Description	Size	Type I Hoods			
		Light Duty	Medium Duty	Heavy Duty	Extra-Heavy Duty
Braising pan/tilting skillet, electric	All	●	-	-	-
Oven, rotisserie, electric and gas	All	●	-	-	-
Oven, Combi, electric and gas	All	●	-	-	-
Oven, convection, full-size, electric and gas	All	●	-	-	-
Oven, convection, half-size, electric and gas [protein cooking]	All	●	-	-	-
Oven, deck, electric and gas	All	●	-	-	-
Oven, mini-revolving rack, electric and gas	All	●	-	-	-
Oven, rapid cook, electric	All	●	-	-	-
Oven, rotisserie, electric and gas	All	●	-	-	-
Range, discrete element, electric (with or without oven)	All	●	-	-	-
Salamander, electric and gas	All	●	-	-	-
Braising pan/tilting skillet, gas	All	-	●	-	-
Broiler, chain conveyor, electric	All	-	●	-	-
Broiler, electric, under-fired	All	-	●	-	-
Conveyor oven, electric	6 kW or larger	-	●	-	-
Conveyor oven, gas	All	-	●	-	-
Fryer, doughnut, electric and gas	All	-	●	-	-
Fryer, kettle, electric and gas	All	-	●	-	-
Fryer, open deep-fat, electric and gas	All	-	●	-	-
Fryer, pressure, electric and gas	All	-	●	-	-
Griddle, double-sided, electric and gas	All	-	●	-	-

Appliance Description	Size	Type I Hoods			
		Light Duty	Medium Duty	Heavy Duty	Extra-Heavy Duty
Griddle, flat, electric and gas	All	-	•	-	-
Range, cook-top, induction	All	-	•	-	-
Range, open-burner, gas (with or without oven)	All	-	•	-	-
Range, hot top, electric and gas	All	-	•	-	-
Broiler, chain conveyor, gas	All	-	-	•	-
Broiler, electric and gas, over-fired (upright)	All	-	-	•	-
Broiler, gas, under-fired	All	-	-	•	-
Range, wok, gas and electric	All	-	-	•	-
Appliances using solid fuel (wood, charcoal, briquettes, and mesquite) to provide all or part of the heat source for cooking	All	-	-	-	•

507.2.2 Type II hoods. Type II hoods shall be installed above dishwashers and appliances as required by Table 507.2.2. The duty classifications of cooking appliances served by Type II hoods shall be in accordance with Table 507.2.2 ~~that produce heat or moisture and do not produce grease or smoke as a result of the cooking process, except 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 m^3/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 m^2). Such additional square footage shall be provided with exhaust at a rate of 0.70 cfm per square foot [.00356 m^3/(s □ m^2)].~~ Where hoods are not required, the additional heat and moisture loads generated by such appliances shall be accounted for in the sensible and latent loads for the HVAC system.

TABLE 507.2.2
TYPE II HOOD REQUIREMENTS BY APPLIANCE DESCRIPTION

Appliance Description	Size	Hood Not Required[a,b]	Type II Hoods[a]	
			Light Duty	Medium Duty
Cabinet, holding, electric	All	•	-	-
Cabinet, proofing, electric	All	•	-	-
Cheese-melter, electric	All	•	-	-
Coffee maker, electric	All	•	-	-
Cooktop, induction, electric	All	•	-	-
Dishwasher, under-counter, electric	All	•	-	-
Dishwasher, powered sink, electric	All	•		
Drawer Warmer, 2 drawer, electric	All	•	-	-
Egg cooker, electric	All	•	-	-
Espresso machine, electric	All	•	-	-
Grill, panini, electric	All	•	-	-
Hot dog cooker, electric	All	•	-	-
Hot plate, countertop, electric	All	•	-	-

Appliance Description	Size	Hood Not Required[a,b]	Type II Hoods[a]	
			Light Duty	Medium Duty
Ovens, conveyor, electric	< 6 kW	●		
Ovens, microwave, electric	All	●		
Ovens, warming, electric (add temp.)	All	●	-	-
Popcorn machine, electric	All	●	-	-
Rethermalizer, electric	All	●	-	-
Rice cooker, electric	All	●	-	-
Steam table, electric	All	●	-	-
Steamers, bun, electric	All	●	-	-
Steamer, compartment atmospheric, countertop, electric	All	●		
Steamer, compartment pressurized, countertop, electric	All	●		
Table, hot food, electric	All	●		
Toaster, electric	All	●	-	-
Waffle Iron, electric	All	●	-	-
Cheese-melter, gas	All	-	●	-
Dishwasher, conveyor rack, chemical sanitizing	All	-	●	-
Dishwasher, conveyor rack, hot water sanitizing	All	-	●	-
Dishwasher, door-type rack, chemical sanitizing	All	-	●	-
Dishwasher, door-type rack, hot water sanitizing	All	-	●	-
Kettle, steam jacketed, tabletop, electric, gas and direct steam	< 20 gallons	-	●	-
Oven, convection, half-size, electric and gas [non-protein cooking]	All		●	
Pasta cooker, electric	All	-	●	-
Rethermalizer, gas	All	-	●	-
Rice cooker, gas	All	-	●	-
Steamer, atmospheric, gas	All		●	
Steamer, pressurized, gas	All		●	
Steamer, atmospheric, floor-mounted, electric	All		●	
Steamer, pressurized, floor-mounted, electric	All		●	
Kettle, steam-jacketed floor mounted, electric, gas and direct steam	< 20 gallons	-	●	
Pasta cooker, gas	All	-	-	●
Smoker, electric and gas, pressurized	All	-	-	●
Steam-jacketed kettle, floor mounted, electric and gas	20 gallons or larger	-	-	●
[a]A hood shall be provided for an electric appliance if it produces 3.1×10^{-7} lb/ft^3 (5 mg/m^3) of grease or more when measured at 500 cfm (236 L/s). See Section 4.2.1.				
[b]Where hoods are not required, the additional heat and moisture loads generated by such appliances shall be accounted for in the sensible and latent loads for the HVAC system.				

507.2.2.1 Type II hood exhaust flow rates. The net exhaust flow rate for Type II hoods shall comply with Table 507.2.2.1. The duty level for the hood shall be the duty level of the appliance that has the highest (heaviest) duty level of all of the appliances that are installed underneath the hood according to Table 507.2.2. The net exhaust flow rate is the exhaust flow rate for a hood, minus any internal discharge makeup air flow rate.

TABLE 507.2.2.1:
TYPE II HOOD MINIMUM NET EXHAUST AIRFLOW RATES

Type of Hood	**Minimum Net Exhaust Flow Rate per Linear Hood Length in cfm/ft (L/s/m)**	
	Light Duty Equipment	**Medium Duty Equipment**
Wall-mounted Canopy	200 (310)	300 (465)
Single island	400 (620)	500 (775)
Double island (per side)	250 (388)	300 (465)
Eyebrow	250 (388)	250 (388)
Backshelf/ Pass-over	200 (310)	300 (465)

507.2.2.2 Type II hood overhang. Type II hoods shall overhang the appliances and equipment served in accordance with Table 507.2.2.2.

TABLE 507.2.2.2
MINIMUM OVERHANG REQUIREMENTS FOR TYPE II HOODS

Type of Hood	**End Overhang**	**Front Overhang**	**Rear Overhang**
Wall-mounted canopy	6 in. (154 mm)	12 in. (154 mm)	N/A
Single-island canopy	12 in. (154 mm)	12 in. (154 mm)	12 in. (154 mm)
Double-island canopy	12 in. (154 mm)	12 in. (154 mm)	N/A
Eyebrow	N/A	12 in. (154 mm)	N/A
Backshelf/ Proximity/Pass-over	6 in. (154 mm)	10 in. (254 mm) (setback)	N/A
N/A = not applicable			

Delete definitions as follows:

~~LIGHT-DUTY COOKING APPLIANCE~~
~~MEDIUM DUTY COOKING APPLIANCE~~
~~HEAVY-DUTY COOKING APPLIANCE~~
~~EXTRA-HEAVY-DUTY COOKING APPLIANCE~~

Reason: The changes presented here reflect ASHRAE Standard 154-2011. Unlisted Type I hoods have been eliminated – the reasons for this change are that Type 1 hoods have been tested for the ability to structurally not warp or fail when subjected to grease fires as well as listed hoods tend to be more energy efficient than unlisted Type I hoods. Additionally Standard 154 has classified the duty-level required for both Type 1 and Type II hoods based on ASHRAE research projects. Additionally, Standard 154 has determined whether appliances need to be classified as unhooded, requiring Type 1 hoods or requiring Type II hoods.

Cost Impact: Requiring Type I hoods and showing which appliances can be unhooded does not have a cost for the operator. Both of these actually save significant amounts of energy (and costs) by reducing the amount of exhaust air required in kitchen spaced. Additionally there are cost savings in terms of reduced fan and duct sizes.

M105-12

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

507.2.1-M-FERGUSON.DOC

M106–12
507.2.1

Proponent: Roger Harper, Louisa County, VA, representing Va. Plumbing and Mechanical Inspectors Association (VPMIA), Va. Building Code Officials Association (VBCOA), and ICC Region VII (sharper@louisa.org) and Guy McMann MCP, Jefferson County Colorado, Colorado Association of Plumbing and Mechanical Officials (CAPMO)
(gmcmann@jeffco.us)

Revise as follows:

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

Reason: This does nothing but create confusion for designers and code officials. By definition, light duty appliances cannot produce grease or smoke and there are no examples of what this is referring to. Does this apply to burnt toast? It's anybody's guess. If it can't be explained it should not be in the code.

Cost Impact: None

M106-12

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

507.2.1-M-HARPER-MCMANN.DOC

M107–12
507.2.1.1

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

Revise as follows:

507.2.1.1 Operation. ~~Type I hood systems shall be designed and installed to automatically activate the exhaust fan whenever cooking operations occur. The activation of the exhaust fan shall occur through an interlock with the cooking appliances, by means of heat sensors or by means of other *approved* methods~~. The exhaust fan serving a Type I hood shall have automatic controls that will activate the fan when any appliance that requires such Type I Hood is turned on, or a means of interlock shall be provided that will prevent operation of such appliances when the exhaust fan is not turned on. Where one or more temperature or radiant energy sensors are used to activate a Type I hood exhaust fan, the fan shall activate not more than 15-minutes after the first appliance, served by that hood, has been turned on. A method of interlock between an exhaust hood system and appliances equipped with standing pilot burners shall not cause the pilot burners to be extinguished. A method of interlock between an exhaust hood system and cooking appliances shall not involve or depend upon any component of a fire extinguishing system.

Reason: Clarification that the exhaust fan interlock is to prevent appliance operation when the exhaust fan is not on instead of preventing operation of the exhaust fan when appliance is not on. Also to recognize exhaust systems that include multiple hoods and or hood sections with multiple exhaust fans. The intent is to provide exhaust for operating appliances only. If this can be achieved with only one of multiple fans in a system then there is no need to pay the energy penalty of turning the complete system on. Also recognition that many low energy input cooking appliances require a warm-up period before any cooking may take place.

Cost Impact: None. This is already a code requirement to ensure fan operation when the appliances are in operation.

M107-12

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

507.2.1.1-M-FERGUSON.DOC

M108–12
507.3

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

Revise as follows:

507.3 Fuel-burning appliances. ~~Where vented fuel-burning appliances are located in the same room or space as the hood, provisions shall be made to prevent the hood system from interfering with normal operation of the appliance vents.~~ <u>Fuel burning appliances located in the same room or space as a Type-I or Type-II hood and not located beneath the hood shall be direct-vent appliances</u>.

Reason: 507.3 only states that "provisions" need to be made when dealing with non-direct vent appliances but provides no guidance as to what's really required or intended. This creates confusion for the user. Non-direct vent appliances and those with draft hoods are subject to many factors, one of which is a loss in building pressure which will result in improper venting and spilling flue gases back into the space. These appliances are also in competition for air with other appliances and are no match for powered exhaust equipment such as hoods. The kitchen environment lends itself to negative pressure either by design or by accident. A perfectly balanced system usually doesn't last long as every minute detail affects the system. Limiting fuel burning appliances to direct-vent removes the risk of spillage, providing a safe environment for line staff, regardless of the kitchen pressure.

Cost Impact: This may increase cost.

M108-12

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

507.3-M-MCMANN.DOC

M109–12
507.3 (NEW)

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Add new text as follows:

<u>**507.3 Fuel-burning appliances.** Vented fuel-burning appliances of other than the direct-vent type shall not be located in the same room as a kitchen exhaust hood and shall not be located in a room that opens directly into a room containing a kitchen exhaust hood.</u>

Reason: Current Section 507.3 is very vague and provides no course of action to prevent the problem. Traditionally, this negative pressure problem has been corrected by either using direct-vent appliances or by simply not installing appliances in the same room as the hood system.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: This proposal will increase the cost of construction.

M109-12

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

507.3-M-STRAUSBAUGH.PMGCAC.DOC

M110–12
507.11

Proponent: Jay Parikh, P.E., Compliance Solutions International Inc., representing himself

Revise as follows:

507.11 Grease filters. Type I hoods shall be equipped with grease filters listed and labeled in accordance with UL 1046 ~~and designed for the specific purpose~~. Grease~~-collecting~~ ~~*equipment*~~ filters shall be provided with access for cleaning or replacement. The lowest edge of a grease filter located above the cooking surface shall be not less than the height specified in Table 507.11.

Reason: (1) The grease filter listed and labeled in accordance with UL 1046 is designed for the specific purpose of using it in Type I hoods in commercial cooking operations. Hence, the phrase "and designed for the specific purpose" is not needed. This phrase is a carry-over from the earlier editions of this code, when the filter listing in accordance with UL 1046 was not required. (2) "Grease filter" is a better and more appropriate term instead of the term "Grease collecting equipment" to refer to these filters, as used in the heading of this section and also in other two sentences in this section, and hence "Grease filter" should be used in the second sentence as well. (3) Some grease filters available today are not to be cleaned, but are to be disposed of when loaded with grease, and replaced with new filters. The proposed change in the second sentence addresses such filters.

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

M110-12

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

507.11-M-PARIKH.DOC

M111–12
507.11.1

Proponent: Jay S. Parikh, Compliance Solutions International Inc., representing self.

Revise as follows:

507.11.1 Criteria. Filters shall be of such size, type and arrangement as will permit the required quantity of air to pass through such units at rates not exceeding those for which the filter or unit was designed or *approved*. Filter units shall be installed in frames or holders so as to be readily removable without the use of separate tools, unless designed and installed to be cleaned in place and the system is equipped for such cleaning in place. Where filters are designed to be and required to be cleaned, removable filter units shall be of a size that will allow them to be cleaned in a dishwashing machine or pot sink. Filter units shall be arranged in place or provided with drip-intercepting devices to prevent grease or other condensate from dripping into food or on food preparation surfaces.

Reason: Some grease filters available today are not to be cleaned, but are to be disposed of when loaded with grease, and replaced with new filters. The proposed change addresses such filters.

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

M111-12

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

507.11.1-M-PARIKH.DOC

M112–12
508.1.2 (NEW)

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

Add new text as follows:

<u>**508.1.2 Air balance**. Design plans for a facility with a commercial kitchen ventilation system shall include a schedule or diagram indicating the design outdoor air balance. The design outdoor air balance shall indicate all exhaust and replacement air for the facility, plus the net exfiltration if applicable. The total replacement air airflow rate shall equal the total exhaust airflow rate plus the net exfiltration.</u>

Reason: The proposed text is consistent with ASHRAE 154 and the IMC is currently silent on this issue.

Cost Impact: This will not increase the cost of construction.

M112-12

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

508.1.2(NEW)-M-FERGUSON.DOC

M113–12
510.4, 510.5

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

510.4 Independent system. Hazardous exhaust systems shall be independent of other types of exhaust systems. ~~Incompatible materials, as defined in the *International Fire Code*, shall not be exhausted through the same hazardous exhaust system. Hazardous exhaust systems shall not share common shafts with other duct systems, except where such systems are hazardous exhaust systems originating in the same fire area.~~

> ~~**Exception:** The provision of this section shall not apply to laboratory exhaust systems where all of the following conditions apply:~~
>
> 1. ~~All of the hazardous exhaust ductwork and otherlaboratory exhaust within both the occupied space and the shafts are under negative pressure while in operation.~~
> 2. ~~The hazardous exhaust ductwork manifolded together within the occupied space must originate within the same fire area.~~
> 3. ~~Each control branch has a flow regulating device.~~
> 4. ~~Perchloric acid hoods and connected exhaust shall be prohibited from manifolding.~~
> 5. ~~Radioisotope hoods are equipped with filtration and/ or carbon beds where required by the *registered design professional*.~~
> 6. ~~Biological safety cabinets are filtered.~~
> 7. ~~Provision is made for continuous maintenance of negative static pressure in the ductwork. Contaminated air shall not be recirculated to occupiable areas. Air containing explosive or lammable vapors, fumes or dusts; flammable, highly toxic or toxic gases; or radioactive material shall be considered to be contaminated.~~

510.5 Incompatible materials and common shafts. Incompatible materials, as defined in the *International Fire Code*, shall not be exhausted through the same hazardous exhaust system. Hazardous exhaust systems shall not share common shafts with other duct systems, except where such systems are hazardous exhaust systems originating in the same fire area.

> **Exception:** The provisions of this section shall not apply tolaboratory exhaust systems where all of the following conditions apply:
>
> 1. All of the hazardous exhaust ductwork and other laboratory exhaust within both the occupied space and the shafts are under negative pressure while in operation.
> 2. The hazardous exhaust ductwork manifolded together within the occupied space must originate within the same fire area.
> 3. Each control branch has a flow regulating device.
> 4. Perchloric acid hoods and connected exhaust shall be prohibited from manifolding.
> 5. Radioisotope hoods are equipped with filtration and/or carbon beds where required by the *registered design professional*.
> 6. Biological safety cabinets are filtered.
> 7. Provision is made for continuous maintenance of negative static pressure in the ductwork.

Contaminated air shall not be recirculated to occupiable areas. Air containing explosive or flammable vapors, fumes or dusts; flammable, highly toxic or toxic gases; or radioactive material shall be considered to be contaminated.

Reason: The exception to Section 510.4 states that the provision (singular) of this section does not apply if the 7 items are met. Which provision of the three provisions in the main section is being exempted? While it appears that this was meant to apply only to the 2nd and 3rd sentences, it actually applies to the entire section. It makes no sense for the exception to negate the 1st sentence of the main section. Hazardous exhaust must always be independent of other types of exhaust.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M113-12

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

510.4.#2-M-STRAUSBAUGH.PMGCAC.DOC

M114–12
510.4

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

510.4 Independent system. Hazardous exhaust systems shall be independent of other types of exhaust systems. Incompatible materials, as defined in the *International Fire Code*, shall not be exhausted through the same hazardous exhaust system. Hazardous exhaust systems shall not share common shafts with other duct systems, except where such systems are hazardous exhaust systems originating in the same fire area.

> **Exception:** The provision of this section shall not apply to laboratory exhaust systems where all of the following conditions apply:
>
> 1. All of the hazardous exhaust ductwork and other laboratory exhaust within both the occupied space and the shafts are under negative pressure while in operation.
> 2. The hazardous exhaust ductwork manifolded together within the occupied space must originate within the same fire area.
> 3. Each control branch has a flow regulating device.
> 4. Perchloric acid hoods and connected exhaust shall be prohibited from manifolding.
> 5. Radioisotope hoods are equipped with filtration and/or carbon beds where required by the *registered design professional*.
> 6. Biological safety cabinets are filtered.
> 7. Provision is made for continuous maintenance of negative static pressure in the ductwork.

~~Contaminated air shall not be recirculated to occupiable areas. Air containing explosive or flammable vapors, fumes or dusts; flammable, highly toxic or toxic gases; or radioactive material shall be considered to be contaminated.~~

Reason: Section 510.4, the last paragraph, conflicts with section 501.3 by implying that hazardous exhaust can be recirculated if cleaned somehow. It was never the intent to allow hazardous exhaust under Section 510 to be recirculated because the complexity of the exhaust is such that effective filtering cannot be prescribed in most cases and because it poses unacceptable risk to the occupants. Filter maintenance is also a major concern. Hazardous exhaust should always discharge to the outdoors, as was intended by this section.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None.

M114-12

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

510.4#4-M-STRAUSBAUGH.PMGCAC.DOC

M115–12
510.4

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

510.4 Independent system. Hazardous exhaust systems shall be independent of other types of exhaust systems. Incompatible materials, as defined in the *International Fire Code*, shall not be exhausted through the same hazardous exhaust system. Hazardous exhaust systems shall not share common shafts with other duct systems, except where such systems are hazardous exhaust systems originating in the same fire area.

Exception: The provision of this section shall not apply to laboratory exhaust systems where all of the following conditions apply:

1. All of the hazardous exhaust ductwork and other laboratory exhaust within both the occupied space and the shafts are under negative pressure while in operation.
2. The hazardous exhaust ductwork manifolded together ~~within the occupied space~~ must originate within the same fire area.
3. Each control branch has a flow regulating device.
4. Perchloric acid hoods and connected exhaust shall be prohibited from manifolding.
5. Radioisotope hoods are equipped with filtration and/or carbon beds where required by the *registered design professional*.
6. Biological safety cabinets are filtered.
7. Provision is made for continuous maintenance of negative static pressure in the ductwork.

Contaminated air shall not be recirculated to occupiable areas. Air containing explosive or flammable vapors, fumes or dusts; flammable, highly toxic or toxic gases; or radioactive material shall be considered to be contaminated.

Reason: The words "**in the occupied space**" have led to interpretation issues. Such words beg the question of what the code intends if the ducts are manifolded in an **unoccupied** space. The code is conspicuously silent on this question. If the intent is to prevent the spread of fire, smoke and hazardous contaminants from one fire area to another, the location of the manifold is irrelevant. Any manifold, regardless of location, would link the ducts and, in turn, link the fire areas in which they originate.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M115-12

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

510.4#3-M-STRAUSBAUGH.PMGCAC.DOC

M116–12
510.4, 510.5

Proponent: Jeremy Lebowitz, P.E., Rolf Jensen & Associates, Inc., representing himself (jlebowitz@rjagroup.com)

Revise as follows:

510.4 Independent system. Hazardous exhaust systems shall be independent of other types of exhaust systems. Incompatible materials, as defined in the *International Fire Code*, shall not be exhausted through the same hazardous exhaust system. Hazardous exhaust systems shall not share common shafts with other duct systems, except where such systems are hazardous exhaust systems originating in the same fire area.

Exception: The provision of this section shall not apply to laboratory exhaust systems where all of the following conditions apply:

1. All of the hazardous exhaust ductwork and other laboratory exhaust within both the occupied space and the shafts are under negative pressure while in operation.
2. The hazardous exhaust ductwork manifolded together within the occupied space must originate within the same fire area.
3. <u>Hazardous exhaust ductwork originating in different fire areas and manifolded together in an unoccupied common shaft shall meet the provisions of Section 717.5.3, Exception 1.1 of the *International Building Code*.</u>
4. Each control branch has a flow regulating device.
5. Perchloric acid hoods and connected exhaust shall be prohibited from manifolding.
6. Radioisotope hoods are equipped with filtration and/or carbon beds where required by the *registered design professional*.
7. Biological safety cabinets are filtered.
8. Provision is made for continuous maintenance of negative static pressure in the ductwork.

<u>**510.5 Contaminated air.**</u> Contaminated air shall not be recirculated to occupiable areas. Air containing explosive or flammable vapors, fumes or dusts; flammable, highly toxic or toxic gases; or radioactive material shall be considered to be contaminated.

(Renumber subsequent sections)

Reason: Non-laboratory hazardous exhaust is already permitted to be manifolded together in a common exhaust duct when originating from the same fire area. IMC 510.4 Exception addresses ducts acting as a direct link between different fire areas through the requirement for continuous negative pressure within the duct. The manifold location is relevant as the amount of dilution inside the shaft is far greater than outside of it. IMC 510.4 Exception should allow manifolding of hazardous exhaust ducts from different fire areas within shafts. Fire dampers are prohibited at the shaft penetration, but alternative protection can and should be provided via subducts. 2012 IBC 717.5.3 Exception 1.1 allows 22-inch subducts with continuous upward airflow in lieu of fire dampers at shaft penetrations. This code approach suggests that a subduct with continuous airflow prevents contaminants from spreading between fire areas and justifies the manifolding of hazardous laboratory exhaust from separate fire areas within shafts.

Additionally, the requirements after the exception (new section 510.5) should be broken out into a separate code section to clearly show that they apply to all hazardous exhaust systems, including laboratory exhaust systems meeting the requirements of the exception.

Cost Impact: The code change will not increase the cost of construction, as it would generally permit the use of fewer shafts throughout a given building.

M116-12

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

510.4-M-LEBOWITZ

M117–12
510.4

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

Independent system. Hazardous exhaust systems shall be independent of other types of exhaust systems. Incompatible materials, as defined in the *International Fire Code*, shall not be exhausted through the same hazardous exhaust system. Hazardous exhaust systems shall not share common shafts with other duct systems, except where such systems are hazardous exhaust systems originating in the same fire area.

> **Exceptions:** The provision of this section shall not apply to laboratory exhaust systems where all of the following conditions apply:
>
> 1. All of the hazardous exhaust ductwork and other laboratory exhaust within both the occupied space and the shafts are under negative pressure while in operation.
> 2. The hazardous exhaust ductwork manifolded together within the occupied space must originate within the same fire area.
> 3. Each control branch has a flow regulating device.
> 4. Perchloric acid hoods and connected exhaust shall be prohibited from manifolding.
> 5. Radioisotope hoods are equipped with filtration and/ or carbon beds where required by the *registered design professional*.
> 6. Biological safety cabinets are filtered.
> 7. ~~Provision is made for continuous maintenance of negative static pressure in the ductwork.~~ <u>Each hazardous exhaust duct system shall be served by redundant exhaust fans that comply with either of the following:</u>
>   <u>7.1 The fans shall operate simultaneously in parallel and each fan shall be individually capable of providing the required exhaust rate.</u>
>   <u>7.2 Each of the redundant fans is controlled so as to operate when the other fan has ailed or is shut down for servicing.</u>

(Portions of text not shown remain unchanged.)

Reason: Section 510.4, exception item #7 says nothing about how the intent is to be accomplished. Does this imply standby power, redundant fans, both? Code change M55-03/04 that put this text in the code suggests that the intent was to require redundant exhaust fans in case one fan fails or needs to be serviced.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: This proposal will increase the cost of construction.

M117-12

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

510.4 #1-M-STRAUSBAUGH.PMGCAC.DOC

M118–12
510.5.5

Proponent: Dustin McLehaney, Chesterfield County, VA, Va. Plumbing and Mechanical Inspectors Association (VPMIA) And Va. Building Code Officials Association (VBCOA) and Guy McMann, MCP, Jefferson County Colorado, Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Revise as follows:

510.5.5 Makeup air. Makeup air shall be provided at a rate approximately equal to the rate that air is exhausted by the hazardous exhaust system. Makeup-air intakes shall be located ~~so as to avoid recirculation of contaminated air.~~ in accordance with Section 401.4.

Reason:
McLehaney-This is editorial in nature. It removes ineffective language ("avoid") and references the appropriate code section for intakes opening locations.
McMann- This is editorial in nature and referencing the Section for intakes provides all the requirements for intake openings instead of merely addressing recirculation generically.

Cost Impact: None

M118-12

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

510.5.5-M-MCLEHANEY.DOC

M119–12
510.6.1.1(NEW)

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Add new text as follows:

510.6.1.1 Hazardous exhaust ducts that penetrate fire-resistance-rated shafts shall comply with Section 714.3.1 or 714.3.1.2 of the International Building Code.

Reason: Section 510.6 prohibits Fire/Smoke dampers in hazardous exhaust ducts but section 607.5.5 says the opposite. Section 510.6.2 addresses floor/ceiling assemblies. Section 510.3 addresses fire-resistance-rated wall assemblies. Section 510.6.4 addresses fire walls. The code is silent on penetration of fire rated shaft walls.

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Cost Impact: This proposal will increase the cost of construction.

M119-12

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

510.6.1.1-M-STRAUSBAUGH.PMGCAC.DOC

M120–12
510.8

Proponent: Marcelo M. Hirschler, GBH International
(gbhint@aol.com)

Delete and substitute as follows:

~~**510.8 Duct construction.** Ducts used to convey hazardous exhaust shall be constructed of *approved* G90 galvanized sheet steel, with a minimum nominal thickness as specified in Table 510.8. Nonmetallic ducts used in systems exhausting nonflammable corrosive fumes or vapors shall be *listed* and *labeled*. Nonmetallic ducts shall have a flame spread index of 25 or less and a smoke-developed index of 50 or less, when tested in accordance with ASTM E 84 or UL 723. Ducts shall be *approved* for installation in such an exhaust system. Where the products being exhausted are detrimental to the duct material, the ducts shall be constructed of alternative materials that are compatible with the exhaust.~~

510.8 Duct construction. Ducts used to convey hazardous exhaust shall be constructed of materials *approved* for installation in such an exhaust system and shall comply with one of the following:

1. Ducts shall be constructed of *approved* G90 galvanized sheet steel, with a minimum nominal thickness as specified in Table 510.8.
2. Ducts used in systems exhausting nonflammable corrosive fumes or vapors shall be constructed of nonmetallic materials that exhibit a flame spread index of 25 or less and a smoke-developed index of 50 or less when tested in accordance with ASTM E84 or UL 723 or that are *listed* and *labeled* for the application.
3. Where the products being exhausted are detrimental to the duct material, the ducts shall be constructed of alternative materials that are compatible with the exhaust.

Reason: This is simply editorial cleanup. The present section seems to suggest, in the first sentence, that the ducts must be constructed of galvanized sheet steel, something which the second sentence contradicts. Any material used for construction of hazardous exhaust ducts needs to be approved for the system.

Cost Impact: None

M120-12

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

510.8-M-HIRSCHLER.DOC

M121–12
511.3.1(NEW), 511.3.2(NEW), 511.3.3(NEW)

Proponent: Tom Allen, representing himself

Add new text as follows:

511.3.1 Ambient Temperature Noncombustible Materials. Ducts conveying noncombustible materials at ambient temperatures shall have a clearance of not less than 1/2 inch from combustible construction and a clearance not less than of 6 inches to stored combustible materials.

511.3.2 Ambient Temperature Combustible Materials. Ducts conveying combustible materials at ambient temperature shall have a clearance of not less than 18 inches from combustible construction and combustible materials.

Exceptions:

1. The required clearance shall be 6 inches from combustible materials and 1/2 inch from combustible construction where the duct system is provided for the specific hazard.
2. Where the combustible material is protected in accordance with Table M308.6. the clearances between ducts and combustible materials shall be in accordance with that table.

511.3.3 Systems Operating at Temperatures Above 100ºF. Ducts conveying materials whose temperature exceeds 100ºF (37.7ºC) shall have clearances in accordance with Table M511.3.3. All ducts shall be lined with refractory materials if the temperature of the conveyed material exceeds 900º.

TABLE 511.3.3
CLEARANCES FOR DUCTS CONVEYING MATERIALS
TEMPERATURES EXCEEDING 100ºF

Product Temperature (In Duct)	Maximum Dimension of Duct (inches)	Minimum Clearance (inches)
101º-600	Up to and including 8 Over 8	8 12
601º-900º	Up to and including 8 Over 8	18 24
901º	All ducts shall be lined with refractory material	24

Reason: Adds requirements for clearances from ducts to combustible construction.

Cost Impact: There is a cost impact.

M121-12

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

511.3(NEW)-M-ALLEN.DOC

M122–12
514.2

Proponent: Randall R. Dahmen, P.E. Wisconsin licensed Commercial Building Inspector, representing himself

Revise as follows:

514.2 Prohibited applications. Energy recovery ventilation systems shall not be used in the following systems:

1. Hazardous exhaust systems covered in Section 510.
2. Dust, stock and refuse systems that convey explosive or flammable vapors, fumes or dust.
3. Smoke control systems covered in Section 513.
4. Commercial kitchen exhaust systems serving Type I and Type II hoods.
5. Clothes dryer exhaust systems covered in Section 504.

   Exception: The use of an energy recovery ventilation system design is not prohibited for the applications listed herein provided that corrosion, heat, cross-contamination and fouling are addressed through an approved engineering analysis.

Reason: There are various types of energy recovery designs on the market that can adequately address various concerns involving corrosion, heat, cross-contamination and fouling. As currently written, the language in the IMC provides no exceptions. Clearly, any energy recovery system designated for use with any of the listed systems would need to be fully thought-out and specifically engineered for the proposed system. To completely eliminate the opportunity for an engineered design, also completely eliminates the opportunity for energy recovery. The proposed language provides the authority having jurisdiction the final say on the acceptability of the proposed system based on the engineering analysis provided at the specific site in question.

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

M122-12

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

514.2-M-DAHMEN.DOC

M123–12
514.2

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

514.2 Prohibited applications. Energy recovery ventilation systems shall not be used in the following systems:

> **Exception:** The application of ERV equipment that recovers sensible heat only utilizing coil-type and fixed- plate heat exchangers shall not be limited by this section.

Portions not shown remain unchanged.

Reason: Section 514 limits the applications for ERV's and was focused on wheel- type heat exchanger units. Exemptions should apply for "run-around-coils", fixed plate heat exchangers and other non- latent energy types of ERV's. The ERV types in the exception cannot leak contaminants from one air stream to another, which was the concern of the original text. ERV's are in demand for some of these applications to meet the goals of energy and sustainability "green" codes, standards and rating systems.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M123-12

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

514.2-M-STRAUSBAUGH.PMGCAC.DOC

M124–12
601.5 (New)

Proponent: Tom Allen, representing self

Add new text as follows:

<u>**601.5 Balanced Return Air.** Provisions shall be made to avoid unbalanced air flows and pressure differentials caused by restricted return air where return air intakes are centrally located, pressure differentials across closed doors shall be limited to 0.01 inch WC (2.5 pascals) or less. Pressure differentials across fire walls in ceiling space plenums shall be limited to 0.01 inch WC (2.5 pascals) by providing air duct pathways or air transfer pathways from the high pressure zone to the low zone.</u>

1. <u>Transfer ducts that are 1½ times the cross sectional area of the supply ducts entering the room or space served combined with the door undercut of at least 1 inch shall be considered as to achieve return air balance.</u>
2. <u>Through-the-wall transfer grilles that have a grill area of 50 square inches per 100 cfm of supply air combined with a door undercut of at least 1 inch shall be considered as achieving return air balance.</u>

<u>Only habitable rooms shall be required to meet these requirements for balanced return air except that all supply air into the master suite shall be included.</u>

Reason: Adds design and prescriptive requirements for balanced return air.

Cost Impact: There is a cost impact.

M124-12

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

601.5(NEW)-M-ALLEN.DOC

M125–12
602

Proponent: Steven J. Clark, P.E., Aquatherm, representing self
(steve.clark@aquathermpipe.com)

Revise as follows:

SECTION 602
PLENUMS

602.1 General. Supply, return, exhaust, relief and ventilation air <u>distribution systems shall be constructed in accordance with Section 603.</u> ~~plenums shall be limited to uninhabited crawl spaces, areas above a ceiling or below the floor, attic spaces and mechanical *equipment* rooms. Plenums shall be limited to one fire area. Fuel-fired appliances shall not be installed within a *plenum*.~~

~~**602.2 Construction.** *Plenum* enclosures shall be constructed of materials permitted for the type of construction classification of the building. The use of gypsum boards to form plenums shall be limited to systems where the air temperatures do not exceed 125ºF (52ºC) and the building and mechanical system design conditions are such that the gypsum board surface temperature will be maintained above the airstream dew-point temperature. Air plenums formed by gypsum boards shall not be incorporated in air-handling systems utilizing evaporative coolers.~~

~~**602.2.1 Materials within plenums.** Except as required by Sections 602.2.1.1 through 602.2.1.5, materials within plenums shall be noncombustible or shall be listed and labeled as having a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E 84 or UL 723.~~

~~**Exceptions:**~~

1. ~~Rigid and flexible ducts and connectors shall conform to Section 603. 2. Duct coverings, linings, tape and connectors shall conform to Sections 603 and 604.~~
3. ~~This section shall not apply to materials exposed within plenums in one- and two-family dwellings.~~
4. ~~This section shall not apply to smoke detectors.~~
5. ~~Combustible materials fully enclosed within one of the following:~~
   - ~~5.1. Continuous noncombustible raceways orenclosures.~~
   - ~~5.2. Approved gypsum board assemblies.~~
   - ~~5.3. Materials listed and labeled for installation within a plenum.~~
6. ~~Materials in Group H, Division 5 fabrication areas and the areas above and below the fabrication area that share a common air recirculation path with the fabrication area.~~

~~**602.2.1.1 Wiring.** Combustible electrical wires and cables and optical fiber cables exposed within a plenum shall be listed as having a maximum peak optical density of 0.50 or less, an average optical density of 0.15 or less, and a maximum flame spread distance of 5 feet (1524 mm) or less when tested in accordance with NFPA 262 or shall be installed in metal raceways or metal sheathed cable. Combustible optical fiber and communication raceways exposed within a plenum shall be listed as having a maximum peak optical density of 0.5 or less, an average optical density of 0.15 or less, and a maximum flame spread distance of 5 feet (1524 mm) or less when tested in accordance with ANSI/UL 2024. Only plenum-rated wires and cables shall be installed in plenum-rated raceways. Electrical wires and cables, optical fiber cables and raceways addressed in this section shall be listed and labeled and shall be installed in accordance with NFPA 70.~~

~~**602.2.1.2 Fire sprinkler piping.** Plastic fire sprinkler piping exposed within a *plenum* shall be used only in wet pipe systems and shall have a peak optical density not greater than 0.50, an average optical density not greater than 0.15, and a flame spread of not greater than 5 feet (1524 mm) when tested in accordance with UL 1887. Piping shall be *listed* and *labeled*.~~

~~**602.2.1.3 Pneumatic tubing.** Combustible pneumatic tubing exposed within a *plenum* shall have a peak optical density not greater than 0.50, an average optical density not greater than 0.15, and a flame spread of not greater than 5 feet (1524 mm) when tested in accordance with UL 1820. Combustible pneumatic tubing shall be *listed* and *labeled*.~~

~~**602.2.1.4 Electrical equipment in plenums.** Electrical *equipment* exposed within a *plenum* shall comply with~~
~~Sections 602.2.1.4.1 and 602.2.1.4.2.~~

~~**602.2.1.4.1 Equipment in metallic enclosures.** Electrical *equipment* with metallic enclosures exposed within a *plenum* shall be permitted.~~

~~**602.2.1.4.2 Equipment in combustible enclosures.** Electrical *equipment* with combustible enclosures exposed within a *plenum* shall be *listed* and *labeled* for such use in accordance with UL 2043.~~

~~**602.2.1.5 Foam plastic insulation.** Foam plastic insulation used as interior wall or ceiling finish, or as interior trim, in plenums shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E 84 or UL 723 and shall also comply with one or more of Sections 602.2.1.5.1, 602.2.1.5.2 and 602.2.1.5.3.~~

~~**602.2.1.5.1 Separation required.** The foam plastic insulation shall be separated from the plenum by a thermal barrier complying with Section 2603.4 of the *International Building Code* and shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E 84 or UL 723 at the thickness and density intended for use.~~

~~**602.2.1.5.2 Approval.** The foam plastic insulation shall exhibit a flame spread index of 25 or less and a smoke-developed index of 50 or less when tested in accordance with ASTM E 84 or UL 723 at the thickness and density intended for use and shall meet the acceptance criteria of Section 803.1.2 of the *International*~~
~~*Building Code* when tested in accordance with NFPA 286.~~

~~The foam plastic insulation shall be approved based on tests conducted in accordance with Section 2603.10 of the *International Building Code*.~~

~~**602.2.1.5.3 Covering.** The foam plastic insulation shall be covered by corrosion-resistant steel having a base metal thickness of not less than 0.0160 inch (0.4 mm) and shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E 84 or UL 723 at the thickness and density intended for use.~~

~~**602.3 Stud cavity and joist space plenums.** Stud wall cavities and the spaces between solid floor joists to be utilized asair plenums shall comply with the following conditions:~~

1. ~~Such cavities or spaces shall not be utilized as a *plenum* for supply air.~~
2. ~~Such cavities or spaces shall not be part of a required fire-resistance-rated assembly.~~
3. ~~Stud wall cavities shall not convey air from more than one floor level.~~
4. ~~Stud wall cavities and joist space plenums shall complywith the floor penetration protection requirements of the *International Building Code*.~~
5. ~~Stud wall cavities and joist space plenums shall be isolated from adjacent concealed spaces by *approved* fireblocking as required in the *International Building Code*.~~
6. ~~Studwall cavities in the outside walls of building envelope assemblies shall not be utilized as air plenums.~~

~~**[B] 602.4 Flood hazard.** For structures located in flood hazard areas, plenum spaces shall be located above the elevation required by Section 1612 of the *International Building Code* for utilities and attendant equipment or shall be designed and constructed to prevent water from entering or accumulating within the plenum spaces during floods up to such elevation. If the plenum spaces are located below the elevation required by Section 1612 of the *International Building Code* for utilities and attendant equipment, they shall be capable of resisting hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding up to such elevation.~~

Reason: Purpose of Code Change – To improve the health and life safety of buildings by eliminating a major loophole that favors some HVAC systems over others.

Air plenums are often formed out of cavities within the building structure, under the assumption that eliminating ductwork saves some construction costs as well as engineering design time. This is a false economy and a poor and unsafe practice for a number of reasons:

1. Due to fires that have started or spread through plenums, numerous codes regulate the construction and materials allowed in plenums. These requirements to have everything from pipes and insulation to control wiring be "plenum rated" has driven up the costs of construction for many of the other trades on the project. These "plenum rated" materials often contain hazardous materials.
2. Plenum air systems are impossible to clean due to the type of construction and the wires, cables and pipes that are in the way. Since this is the air the occupants are breathing, this can lead to numerous health issues.
3. Plenum air systems can grow mold.

1. Plenum return air systems are not compatible with the use or return air grill filters, which keep the return air system cleaner.
2. Plenum air systems typically contain materials that can produce VOX gases that then end up in the air stream.
3. Plenum return air systems present a fire hazard, where fires can start or are drawn into, can quickly spread and are very difficult to fight.
4. The chemicals found in a plenum can produce deadly combustion gases during a fire and these deadly fumes can now be spread by the air system.
5. Plenums add considerable work load to the code enforcement community while offering no health or safety benefit.

Cost Impact: Any savings that could be gained by avoiding following the requirements for ducting air in Section 603, and instead following the loophole provided in section 602 only applies when the designer chooses to use Forced Air HVAC systems and chooses not to spend the time designing a return air system. Thermal transfer mediums other than air are for more compact and efficient at moving thermal energy around a building. (Water uses one tenth the transfer energy of air.) By hiding the cost of the forced air systems in the bids of other trades, the existing loophole acts as a misleading subsidy to forced air systems, making them appear less costly than they really are. This distorts the relative HVAC system economics, driving the market towards inefficient systems.

Most likely, the cost of buildings is far higher due to the use a plenums. Many non-HVAC building trades are impacted and forced to use more expensive materials and construction technics to meet the "plenum rated" requirements. While nearly impossible to calculate, it is doubtful that there is any net savings to the total project cost by having plenums.

There should be a substantial savings for the code enforcement community by eliminating the confusion and safety issues presented by the current loophole.

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M125-12

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

602.1-M-CLARK.DOC

M126–12
602.1

Proponent: Guy McMann, MCP, Jefferson County Colorado, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO)
(gmcmann@jeffco.us)

Revise as follows:

SECTION 602
PLENUMS

602.1 General. Supply, return, exhaust, relief and ventilation air plenums shall be limited to uninhabited crawl spaces, areas above a ceiling or below the floor, attic spaces and mechanical equipment rooms. Plenums shall be limited to one fire area. <u>Return and transfer air shall be ducted from the boundary of the fire area directly to the air handling equipment.</u> Fuel-fired appliances shall not be installed within a plenum**.**

Reason: It needs to be clarified that protected openings connecting one fire area to another are still linking the fire areas together regardless of whether a fire damper is installed in a fire barrier. There will still be a physical path for smoke to travel through even when the equipment has stopped in fire mode. Making it clear that this situation would require a direct ducted connection to the air handling equipment will be helpful to the user.

Cost Impact: None

M126-12

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

602.1.#2-M-MCMANN.DOC

M127–12
602.1, 602.2.1, 602.3, 1104.4.3

Proponent: Guy McMann, MCP, Jefferson County Colorado, Colorado Association of Plumbing and Mechanical Officials (CAPMO)
(gmcmann@jeffco.us)

Revise as follows:

SECTION 602
PLENUMS

602.1 General Supply, return, exhaust, relief and ventilation air plenums shall be limited to under floor spaces in computer rooms, shafts ~~uninhabited crawl spaces, areas above a ceiling or below the floor, attic spaces~~ and mechanical equipment rooms. HVAC systems in other spaces shall be ducted. Plenums shall be limited to one fire area. Fuel-fired appliances shall not be installed within a plenum

602.2.1 Materials within plenums. Except as required by sections 602.2.1.1 through 602.2.1.5, materials within plenums shall be noncombustible or shall be listed and labeled as having a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E 84 or UL 723.

Exceptions:

1. Rigid and flexible ducts and connectors shall conform to Section 603.
2. Duct coverings, linings, tape and connectors shall conform to Sections 603 and 604.
3. This section shall not apply to materials exposed within plenums in one- and two-family dwellings.
4. This section shall not apply to smoke detectors.
5. Combustible materials fully enclosed within one of the following:
   5.1. Continuous noncombustible raceways or enclosures.
   5.2. Approved gypsum board assemblies.
   5.3. Materials listed and labeled for installation within a plenum.
6. ~~Materials in Group H, Division 5 fabrication areas and the areas above and below the fabrication area that share a common air recirculation path with the fabrication area.~~

~~**602.3 Stud cavity and joist space plenums** Stud wall cavities and the spaces between solid floor joists to be utilized as air plenums shall comply with the following conditions:~~

1. ~~Such cavities or spaces shall not be utilized as a plenum for supply air.~~
2. ~~Such cavities or spaces shall not be part of a required fire-resistance-rated assembly.~~
3. ~~Stud wall cavities shall not convey air from more than one floor level.~~
4. ~~Stud wall cavities and joist space plenums shall comply with the floor penetration protection requirements of the International Building Code.~~
5. ~~Stud wall cavities and joist space plenums shall be isolated from adjacent concealed spaces by approved fireblocking as required in the International Building Code.~~
6. ~~Studwall cavities in the outside walls of building envelope assemblies shall not be utilized as air plenums.~~

~~**1104.4.3 Plenums**. Where the space above a suspended ceiling is continuous and part of the supply or return air plenum system, this space shall be included in calculating the volume of the enclosed space.~~

Reason: As a result of the direction the Energy code is taking us, its time for building cavities to stop being utilized as return air plenums. Ducting the returns eliminates many problems as plenum ceiling over time become contaminated with dirt and other impurities contributing to sick building syndrome.

- Insulation cannot be effectively cleaned.

- A ducted system can be cleaned and is efficient where a ceiling really cannot be effectively cleaned.
- There are friable material issues that may lead to health problems.
- Air admittance valves could be installed in all ceilings.
- Ducts can be sealed, cleaned and tested.
- Return air temperatures can be kept down without the light and roof heat load.
- The plenum construction might not need to be as tight.
- Balancing issues exist due to low return air pressure path that doesn't effectively pull the air from rooms and make its way back to the fan.
- Mold spores can be transported from above ceiling wet area such as condensate pans, ceiling tiles, leaky pipe or utility chases, general water damage, etc. that could create a microbial habitat. This proposal limits plenums to shafts, equipment rooms and computer rooms as equipment in computer rooms are specifically designed to be used in conjunction with built up floors. This will still permit shafts in office buildings to still be employed as return air plenums and sub duct systems would not be affected either. Many systems are designed to eliminate plenums and those designs would not be affected but there could be cost increase for the balance. Eliminating 99% of plenums greatly simplifies the inspection and plan review process. Stricken language will not be required if ceiling plenums are prohibited. The elimination of the majority of plenums will need to be approved in the Mechanical Code before the other codes can be modified.

Cost Impact: This proposal may increase cost.

M127-12

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

602.1#1-M-MCMANN.DOC

M128–12
602.1

Proponent: Gary Kreutziger,M.C.P., City of San Antonio, representing Gary Kreutziger (gkreutziger@sanantonio.gov)

Revise as follows:

602.1 General. Supply, return, exhaust, relief and *ventilation air* plenums shall be limited to uninhabited crawl spaces, areas above a ceiling or below the floor, attic spaces and mechanical *equipment* rooms. Plenums shall be limited to one fire area <u>and one smoke compartment</u>. Fuel-fired appliances shall not be installed within a *plenum*.

Reason: With the principal cause of death in fire victims being carbon monoxide poisoning followed by carbon dioxide poisoning and/or oxygen deficiency, it should be a code priority to limit the ability for smoke to migrate from one smoke compartment to another smoke compartment. But the code does not prioritize smoke migration in the same way it does fire migration. In the same manner that fire is restricted from migrating from one fire area to another fire area by limiting plenums to one fire area, so should smoke be restricted from migrating from one smoke compartment to another smoke compartment. Transfer openings in fire barriers are required to have fire dampers and transfer openings in smoke barriers are required to have smoke dampers, however, this is where the similarity stops. If plenums are limited to one fire area, then why not also to one smoke compartment, since smoke is the principal cause of death in fire victims?

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

M128-12

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

602.1#2-M-KREUTZIGER.DOC

M129–12
202, Section 602

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Add new definition as follows:

NON-DISCRETE PRODUCT. Products such as conduit, cable and plastic piping systems that are tested in accordance with ASTM E84 or UL 723.

Delete and substitute as follows:

~~**SECTION 602**~~
~~**PLENUMS**~~

~~**602.1 General.** Supply, return, exhaust, relief and *ventilation air* plenums shall be limited to uninhabited crawl spaces, areas above a ceiling or below the floor, attic spaces and mechanical *equipment* rooms. Plenums shall be limited to one fire area. Fuel-fired appliances shall not be installed within a *plenum*.~~

~~**602.2 Construction.** *Plenum* enclosures shall be constructed of materials permitted for the type of construction classification of the building.~~

~~The use of gypsum boards to form plenums shall be limited to systems where the air temperatures do not exceed 125ºF (52ºC) and the building and mechanical system design conditions are such that the gypsum board surface temperature will be maintained above the airstream dew-point temperature. Air plenums formed by gypsum boards shall not be incorporated in air-handling systems utilizing evaporative coolers.~~

~~**602.2.1 Materials within plenums.** Except as required by Sections 602.2.1.1 through 602.2.1.5, materials within plenums shall be noncombustible or shall be listed and labeled as having a flame spread index of not more than 25~~
~~and a smoke-developed index of not more than 50 when tested in accordance with ASTM E 84 or UL 723.~~

~~**Exceptions:**~~

1. ~~Rigid and flexible ducts and connectors shall conform to Section 603.~~
2. ~~Duct coverings, linings, tape and connectors shall conform to Sections 603 and 604.~~
3. ~~This section shall not apply to materials exposed within plenums in one- and two-family dwellings.~~
4. ~~This section shall not apply to smoke detectors.~~
5. ~~Combustible materials fully enclosed within one of the following:~~
   - 5.1. ~~Continuous noncombustible raceways or enclosures.~~
   - 5.2. ~~Approved gypsum board assemblies.~~
   - 5.3. ~~Materials listed and labeled for installation within a plenum.~~
6. ~~Materials in Group H, Division 5 fabrication areas and the areas above and below the fabrication area that share a common air recirculation path with the fabrication area.~~

~~**602.2.1.1 Wiring.** Combustible electrical wires and cables and optical fiber cables exposed within a plenum shall be listed as having a maximum peak optical density of 0.50 or less, an average optical density of 0.15 or less, and a maximum flame spread distance of 5 feet (1524 mm) or less when tested in accordance with NFPA 262 or shall be installed in metal raceways or metal sheathed cable. Combustible optical fiber and communication raceways exposed within a plenum shall be listed as having a maximum peak optical density of 0.5 or less, an average optical density of 0.15 or less, and a maximum flame spread distance of 5 feet (1524 mm) or less when tested in accordance with ANSI/UL 2024. Only plenum-rated wires and cables shall be installed in plenum-rated raceways. Electrical wires and cables, optical fiber cables and raceways addressed in this section shall be listed and labeled and shall be installed in accordance with NFPA 70.~~

~~**602.2.1.2 Fire sprinkler piping.** Plastic fire sprinkler piping exposed within a *plenum* shall be used only in wet pipe systems and shall have a peak optical density not greater than 0.50, an average optical density not greater than 0.15, and a flame spread of not greater than 5 feet (1524 mm) when tested in accordance with UL 1887. Piping shall be *listed* and *labeled*.~~

~~**602.2.1.3 Pneumatic tubing.** Combustible pneumatic tubing exposed within a *plenum* shall have a peak optical density not greater than 0.50, an average optical density not greater than 0.15, and a flame spread of not greater than 5 feet (1524 mm) when tested in accordance with UL 1820. Combustible pneumatic tubing shall be *listed* and *labeled*.~~

~~**602.2.1.4 Electrical equipment in plenums.** Electrical *equipment* exposed within a *plenum* shall comply with Sections 602.2.1.4.1 and 602.2.1.4.2.~~

~~**602.2.1.4.1 Equipment in metallic enclosures.**Electrical *equipment* with metallic enclosures exposed within a *plenum* shall be permitted.~~

~~**602.2.1.4.2 Equipment in combustible enclosures.**Electrical *equipment* with combustible enclosures exposed within a *plenum* shall be *listed* and *labeled* for such use in accordance with UL 2043.~~

~~**602.2.1.5 Foam plastic insulation.** Foam plastic insulation used as interior wall or ceiling finish, or as interior~~
~~trim, in plenums shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E 84 or UL 723 and shall also comply with one or more of Sections 602.2.1.5.1, 602.2.1.5.2 and 602.2.1.5.3.~~

~~**602.2.1.5.1 Separation required.** The foam plastic insulation shall be separated from the plenum by a thermal barrier complying with Section 2603.4 of the *International Building Code* and shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E 84 or UL 723 at the thickness and density intended for use.~~

~~**602.2.1.5.2 Approval.** The foam plastic insulation shall exhibit a flame spread index of 25 or less and a smoke-developed index of 50 or less when tested in accordance with ASTM E 84 or UL 723 at the thickness and density intended for use and shall meet the acceptance criteria of Section 803.1.2 of the *International Building Code* when tested in accordance with NFPA 286.~~

~~The foam plastic insulation shall be approved based on tests conducted in accordance with Section 2603.10 of the *International Building Code*.~~

~~**602.2.1.5.3 Covering.** The foam plastic insulation shall be covered by corrosion-resistant steel having a base metal thickness of not less than 0.0160 inch (0.4 mm) and shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E 84 or UL 723 at the thickness and density intended for use.~~

~~**602.3 Stud cavity and joist space plenums.** Stud wall cavities and the spaces between solid floor joists to be utilized as air plenums shall comply with the following conditions:~~

1. ~~Such cavities or spaces shall not be utilized as a *plenum* for supply air.~~
2. ~~Such cavities or spaces shall not be part of a required fire-resistance-rated assembly.~~
3. ~~Stud wall cavities shall not convey air from more than one floor level.~~
4. ~~Stud wall cavities and joist space plenums shall comply with the floor penetration protection requirements of the *International Building Code*.~~
5. ~~Stud wall cavities and joist space plenums shall be isolated from adjacent concealed spaces by *approved* fireblocking as required in the *International Building Code*.~~
6. ~~Studwall cavities in the outside walls of building envelope assemblies shall not be utilized as air plenums.~~

~~**[B] 602.4 Flood hazard.** For structures located in flood hazard areas, plenum spaces shall be located above the elevation required by Section 1612 of the *International Building Code* for utilities and attendant~~

~~equipment or shall be designed and constructed to prevent water from entering or accumulating within the plenum spaces during floods up to such elevation.~~

~~If the plenum spaces are located below the elevation required by Section 1612 of the *International Building Code* for utilities and attendant equipment, they shall be capable of resisting hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding up to such elevation.~~

602.1 General. Supply, return, exhaust, relief and ventilation air plenums shall be limited to uninhabited crawl spaces, areas above a ceiling or below the floor, attic spaces and mechanical equipment rooms. Plenums shall be limited to one fire area. Fuel-fired appliances shall not be installed within a plenum.

602.2 Construction. Plenum enclosures shall be constructed of materials permitted for the type of construction classification of the building.

The use of gypsum boards to form plenums shall be limited to systems where the air temperatures do not exceed 125ºF (52ºC) and the building and mechanical system design conditions are such that the gypsum board surface temperature will be maintained above the airstream dew-point temperature. Air plenums formed by gypsum boards shall not be incorporated in air-handling systems utilizing evaporative coolers.

602.3 Materials installed within plenums. Sections 602. 3.1 through 602.3.8 shall apply to materials exposed within plenums. Such sections shall not apply to the following:

1. Dwelling units.
2. Smoke detectors.
3. Combustible materials fully enclosed within continuous noncombustible raceways or enclosures, gypsum board or other assembly meeting the fire resistive requirements of the building type of construction.
4. Materials in Group H, Division 5 fabrication areas and the areas above and below the fabrication area that share a common air recirculation path with the fabrication area.

602.3.1 Rigid and flexible ducts and connectors. Rigid and flexible ducts and connectors shall conform to Section 603.

602.3.2 Duct coverings, linings, tape and connectors. Duct coverings, linings, tape and connectors shall conform to Sections 603 and 604.

602.3.3 Combustible Wiring. Combustible electrical wires and cables and optical fiber cables exposed within a plenum shall be listed as having a maximum peak optical density of 0.50 or less, an average optical density of 0.15 or less, and a maximum flame spread distance of 5 feet (1524 mm) or less when tested in accordance with NFPA 262 or shall be installed in metal raceways or metal sheathed cable. Combustible optical fiber and communication raceways exposed within a plenum shall be listed as having a maximum peak optical density of 0.5 or less, an average optical density of 0.15 or less, and a maximum flame spread distance of 5 feet (1524 mm) or less when tested in accordance with ANSI/UL 2024. Only plenum-rated wires and cables shall be installed in plenum-rated raceways. Electrical wires and cables, optical fiber cables and raceways addressed in this section shall be listed and labeled and shall be installed in accordance with NFPA 70.

602.3.4 Combustible fire sprinkler piping. Combustible fire sprinkler piping exposed within a plenum shall be used only in wet pipe systems and shall have a peak optical density not greater than 0.50, an average optical density not greater than 0.15, and a flame spread of not greater than 5 feet (1524 mm) when tested in accordance with UL 1887.

602.3.5 Combustible pneumatic tubing. Combustible pneumatic tubing exposed within a plenum shall have a peak optical density not greater than 0.50, an average optical density not greater than 0.15, and a flame spread of not greater than 5 feet (1524 mm) when tested in accordance with UL 1820.

602.3.6 Electrical equipment in plenums. Electrical equipment exposed within a plenum shall be enclosed within metallic enclosures or shall meet the requirements of UL 2043.

602.3.7 Foam plastic insulation. Foam plastic insulation used as interior wall or ceiling finish, or as interior trim, in plenums shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E 84 or UL 723 and shall also comply with one or more of the following:

1. The foam plastic insulation shall be separated from the plenum by a thermal barrier complying with Section 2603.4 of the International Building Code and shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E 84 or UL 723 at the thickness and density intended for use.
2. The foam plastic insulation shall exhibit a flame spread index of 25 or less and a smoke-developed index of 50 or less when tested in accordance with ASTM E 84 or UL 723 at the thickness and density intended for use and shall meet the acceptance criteria of Section 803.1.2 of the International Building Code when tested in accordance with NFPA 286. The foam plastic insulation shall be approved based on tests conducted in accordance with Section 2603.10 of the International Building Code .
3. The foam plastic insulation shall be covered by corrosion-resistant steel having a base metal thickness of not less than 0.0160 inch (0.4 mm) and shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E 84 or UL 723 at the thickness and density intended for use.

602.3.8 Non-discrete products. *Non-discrete products* not addressed in Sections 602.3.1 through 602.3.7 installed within plenums shall be noncombustible or shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E 84 or UL 723.

Reason: This section was reorganized to eliminate a format having several exceptions. New text was added to cover what was addressed in the current Section 602.2.1, which was, in essence, what the industry refers to as non–discrete products that can be tested to ASTM E 84 or UL 723.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M129-12

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

202-NON-DISCRETE PRODUCT-M-STRAUSBAUGH.PMGCAC.DOC

M130–12
602.2

Proponent: Marcelo M. Hirschler, GBH International and Robert J Davidson, Davidson Code Concepts (gbhint@aol.com)

Revise as follows:

602.2 Construction. *Plenum* enclosures shall be constructed of materials <u>that comply with the requirements of section 703.5 of the *International Building Code* or of materials that have a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E 84 or UL 723</u> ~~permitted for the type of construction classification of the building~~. The use of gypsum boards to form plenums shall be limited to systems where the air temperatures do not exceed 125ºF (52ºC) and the building and mechanical system design conditions are such that the gypsum board surface temperature will be maintained above the airstream dew-point temperature. Air plenums formed by gypsum boards shall not be incorporated in air-handling systems utilizing evaporative coolers.

Reason: All the materials contained <u>within a plenum</u> must be noncombustible or have a flame spread index of not more than 25 and a smoke developed index of not more than 50, except for a series of materials that meet their own special tests. The materials of construction of the plenum itself need to meet similar requirements. The IMC section is shown below.

> **602.2.1 Materials within plenums**. Except as required by Sections 602.2.1.1 through 602.2.1.6, materials within plenums shall be noncombustible or shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E 84 or UL 723.

Plenums should not be allowed to be constructed simply of combustible materials (for example plain wood) because if the plenum enclosures can be made of wood, any fire would be able to spread along the walls of the plenum (wood typically has a flame spread index of up to 200) even with the best materials contained within the plenum.

During the last cycle proposal M88 introduced this issue but the technical committee was concerned that the proposal was placed in the wrong location because the requirements were placed in section 602.2.1 and they conflicted with the requirements of section 602.2 which would appear to allow plenum enclosures to be constructed of wood or other combustible building materials.

Requiring that a material be noncombustible in accordance with Section 703.5 of the IBC is much less onerous than simply requiring it to be noncombustible because composite materials are actually permitted to be “somewhat combustible” in accordance with 703.5.2 and only “elementary materials” are required to be strictly noncombustible. In particular section 703.5.2 of the IBC is intended to allow gypsum board to be classified as noncombustible, and, therefore, this avoids a conflict with the remainder of section 602.2 that allows gypsum board into certain plenums.

Section 703.5 of the IBC reads as follows:

703.5 Noncombustibility tests. *The tests indicated in Sections 703.5.1 and 703.5.2 shall serve as criteria for acceptance of building materials as set forth in Sections 602.2 602.3 and 602.4 in Type I, II, III and IV construction. The term “noncombustible” does not apply to the flame spread characteristics of interior finish or trim materials. A material shall not be classified as a noncombustible building construction material if it is subject to an increase in combustibility or flame spread beyond the limitations herein established through the effects of age, moisture or other atmospheric conditions.*
703.5.1 Elementary materials. *Materials required to be noncombustible shall be tested in accordance with ASTM E 136.*
703.5.2 Composite materials. *Materials having a structural base of noncombustible material as determined in accordance with Section 703.5.1 with a surfacing not more than 0.125 inch (3.18 mm) thick that has a flame spread index not greater than 50 when tested in accordance with ASTM E 84 or UL 723 shall be acceptable as noncombustible materials.*

The revised language proposed for the IMC takes care of the problem of using highly combustible materials to construct plenums by requiring that plenum enclosures be constructed of noncombustible materials (in accordance with section 703.5 of the IBC, which includes gypsum board) or of materials that meet the same fire test requirements as the materials contained within the plenum for all types of buildings.

Cost Impact: Plenums will not be permitted to be constructed of wood.

M130-12

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

602.2-M-HIRSCHLER.DOC

M131–12
202, 602.2.1, 602.2.1.6 (NEW), Chapter 15

Proponent: Michael Cudahy, Plastic Pipe and Fittings Association (PPFA)
(mikec@cmservnet.com)

Add definition as follows:

WATER DISTRIBUTION PIPE. A piping or tubing within the structure or on the premises that conveys water from the water service pipe, or from the meter when the meter is at the structure, to the points of utilization.

Add text as follows:

602.2.1 Materials within plenums. Except as required by Sections 602.2.1.1 through 602.2.1.~~5~~6, materials within plenums shall be noncombustible or shall be listed and labeled as having a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E 84 or UL 723.

Exceptions:

1. Rigid and flexible ducts and connectors shall conform to Section 603.
2. Duct coverings, linings, tape and connectors shall conform to Sections 603 and 604.
3. This section shall not apply to materials exposed within plenums in one- and two-family dwellings.
4. This section shall not apply to smoke detectors.
5. Combustible materials fully enclosed within one of the following:
   - 5.1. Continuous noncombustible raceways or enclosures.
   - 5.2. Approved gypsum board assemblies.
   - 5.3. Materials listed and labeled for installation within a plenum.
6. Materials in Group H, Division 5 fabrication areas and the areas above and below the fabrication area that share a common air recirculation path with the fabrication area.

602.2.1.6 Plastic water distribution pipe. Plastic water distribution piping and tubing used in a pressurized wet system exposed within a plenum shall have a peak optical density not greater than 0.50, an average optical density not greater than 0.15, and a flame spread of not greater than 5 feet (1524 mm) when tested in accordance with UL 1887 or shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E 84, UL 723 or CAN/ULC S102.2

Add referenced standard to Chapter 15:

CAN/ULC S102.2-10
Standard Method of Test for Burning Characteristics of Flooring, Floor Coverings and Miscellaneous Materials and Assemblies.

Reason: The intent of this proposal is to provide known and accepted test methods, such as CAN/ULC S102.2 and UL-1887, to evaluate the acceptability of combustible supply piping to be used in plenum spaces. Such piping is used for hot and cold water supply but not as drain, waste and vent piping.

This action will complement the current standard, the ASTM E-84 test method, which is available to assess flame spread properties of combustible supply piping, and provide regulators and suppliers with the improved option of the UL test method to assess production of smoke by combustible piping. We do not wish to remove ASTM E84 as a suitable test for there are existing listings.

While UL 1887 is specifically scoped for use with combustible sprinkler piping at the present time, it is my understanding from discussions with UL representatives that allowing for/requiring its utilization for combustible pressure piping, will not require modification of that standard. The membership should note that such piping is functionally equivalent to sprinkler piping in the application covered by the proposed code change.

In all cases testing according to UL 1887 is carried out on empty piping, i.e. piping NOT including water or any other liquid. This was a concern stated by the Committee in its earlier deliberations. This test condition insures that under the proposal combustible piping will be tested according to the most pessimistic scenario possible when comparing full or empty piping. This is because empty combustible piping is far more easily ignited and presents a greater smoke hazard than combustible piping that is full of water when they are compared directly.

S102.2 is referenced in the building code, and UL 1887 is already in the IMC.
The term “water distribution pipe” is already defined in the IPC.

Cost Impact: None

Analysis: A review of the standard proposed for inclusion in the code, [CAN/ULC S102.2-10] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M131-12

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

602.2.1-M-CUDAHY.DOC

M132–12

602.2.1, Chapter 15

Proponent: Joseph Dorney, Quality Assurance Engineer, Chamberlin Rubber Company Inc., representing self (JDorney@crubber.com)

Revise as follows:

602.2.1 Materials within plenums. Except as required by Sections 602.2.1.1 through 602.2.1.5, materials within plenums shall be noncombustible or shall be listed and labeled as having a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E 84, ~~or~~ UL 723, or UL 94.

Add new standard to Chapter 15 as follows:

UL 94-06 Tests for Flammability of Plastic Materials for Parts in Devices and Appliances

Reason: The UL94 fire rating test is a more rigorous and applicable standard for hydronic system hoses to be tested and rated to. This proposal would simply add this code to the list of acceptable standards for materials within plenums.

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

Analysis: A review of the standard proposed for inclusion in the code, [UL 94-06] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M132-12

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

602.2.1-M-DORNEY

M133–12
602.2.1

Proponent: Tony Crimi, A.C. Consulting Solutions Inc, representing International Firestop Council (tcrimi@sympatico.ca)

Revise as follows:

602.2.1 Materials within plenums. Except as required by Sections 602.2.1.1 through 602.2.1.5, materials within plenums shall be noncombustible or shall be listed and labeled as having a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E 84 or UL 723.

Exceptions:

1. Rigid and flexible ducts and connectors shall conform to Section 603.
2. Duct coverings, linings, tape and connectors shall conform to Sections 603 and 604.
3. This section shall not apply to materials exposed within plenums in one- and two-family dwellings.
4. This section shall not apply to smoke detectors.
5. Combustible materials fully enclosed within one of the following:
   5.1. Continuous noncombustible raceways or enclosures.
   5.2. Approved gypsum board assemblies.
   5.3. Materials listed and labeled as plenum protection systems for use within a plenum.

Reason: This proposal aims to clarify Exception 5 to 602.2.1 which permits combustible materials to be installed in plenums provided they are fully enclosed in, amongst other things, "Materials listed and labelled for installation within a plenum." However, the current language lacks any kind of specific test standard, or detail as to the intent. Some have interpreted the exception to mean that the combustible item can be covered with *any* 25/50 rated material to bring it into code compliance. Testing has demonstrated that this is not the case. An individual material may pass the flame/smoke criteria, but may not provide enough protection for the combustible item beneath it to also pass the test. Reasons for this may include material shrinkage, high thermal conductivity, inadequate thickness, etc.

Testing and Certification Laboratories do provide Listings for “Plenum Protection Systems”, which serve to protect a combustible item, keeping it from the degrading under fire conditions. These materials are qualified through fire testing of the combustible item together with the 'plenum protection material' as a system, to one of the plenum fire test methods dictated by the item type (such as NFPA 262, UL 1887, UL 1820 or UL 2024). These fire tests are a modified version of ASTM E 84 and utilise the Steiner Tunnel furnace. Testing is conducted at nationally recognised testing laboratories (NRTL) such as Intertek, ETL or UL. Listed system are then identified under the plenum protection (PP) category in the lab’s Certifications Directory.

Cost Impact: This proposal will not affect the cost of construction.

M133-12

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

602.2.2.1-M-CRIMI.DOC

M134–12
202, 602.2.1.4

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Add new definition as follows:

DISCRETE PRODUCT. Products such as duct straps, duct fittings, duct registers, and pipe hangers that are tested to UL 2043.

Revise as follows:

~~**602.2.1.4 Electrical equipment in plenums**. Electrical equipment exposed within a plenum shall comply with Sections 602.2.1.4.1 and 602.2.1.4.2~~

~~**602.2.1.4.1 Equipment in metallic enclosures.** Electrical equipment with metallic enclosures exposed within a plenum shall be permitted.~~

~~**602.2.1.4.2 Equipment in combustible enclosures**. Electrical equipment with combustible enclosures exposed within a plenum shall be listed and labeled for such use in accordance with UL 2043.~~

602.2.1.4 Discrete electrical, plumbing and mechanical products in plenums. Where discrete electrical, plumbing and mechanical products and appurtenances are located in a plenum and have exposed combustible material, they shall be listed and labeled for such use in accordance with UL 2043.

Reason: The first part of this proposal is just a text cleanup to delete unnecessary wording. Section 602.2.1.4.1 does not state a requirement and is simply the inverse of section 602.2.1.4.2. With Section 602.2.1.4.1 gone, Section 602.2.1.4 has no purpose. The only actual requirement is stated in Section 602.2.1.4.2. The second part of this proposal revises the remaining section to broaden its coverage to more than electrical products. There are combustible plumbing and mechanical products such as plumbing appurtenances, pipe and duct supports, condensate pumps, duct fittings, etc that are used in plenums and that cannot be effectively tested in accordance with standards ASTM E84 or UL 723. The UL 2043 standard was developed to test products and materials not able to be tested in accordance with ASTM E84 or UL 723, and is currently adopted by reference in Section 602.2.1.4.2. These products are individual distinct pieces and non-continuous (i.e. "discrete"). This proposal was presented last cycle and the Committee had questions about the term "discrete'. Per the dictionary, 'discrete' refers to products that are non-continuous, individual distinct pieces, as compared to non-discrete products such as cable or plastic pipe. If adopted, this proposal will provide consistency in how the ICC codes treat discrete components in plenums. The new definition is necessary because of the new term. The definition basically states that a discrete product is something that is necessarily tested to UL 2043. A discrete product is defined by how it is tested.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M134-12

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

202-DISCRETE PRODUCT (NEW)-M-STRAUSBAUGH-PMGCAC.DOC

M135–12
602.2.1.4

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

~~**602.2.1.4 Electrical equipment in plenums.** Electrical equipment exposed within a plenum shall comply with sections 602.2.1.4.1 and 602.2.1.4.2.~~

~~**602.2.1.4.1 Equipment in metallic enclosures.** Electrical equipment with metallic enclosures exposed within a plenum shall be permitted.~~

602.2.1.4~~.2~~ Equipment in combustible enclosures. Electrical equipment with combustible enclosures exposed within a plenum shall be listed and labeled for such use in accordance with UL 2043.

Reason: Sections 602.2.1.4 and 602.2.1.4.1 are non-requirements and serve no purpose. Section 602.2.1.4.2 is the only real requirement.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M135-12

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

602.2.1.4-M-STRAUSBAUGH.PMGCAC.DOC

M136–12
602.2.1.6 (NEW)

Proponent: Marcelo M. Hirschler/GBH International
(gbhint@aol.com)

Add new text as follows:

<u>**602.2.1.6** Plastic piping and tubing used in plumbing systems shall exhibit a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E84 or UL 723. The fire test report shall indicate that the materials were tested at full width of the tunnel and without water or any other liquid in the piping or tubing during the test.</u>

Reason: The IMC requires, in 602.2.1, that all materials within plenums must meet a flame spread index of 25 and a smoke developed index of 50 when tested to ASTM E84. However, in actual practice, many plastic piping and tubing materials are tested by filling the product with water during the test. This is neither a test in accordance with ASTM E84 nor is it adequate for the following reasons:

1. The plastic piping and tubing is listed for use in plenums and can be used with liquids other than water. For example it could be used for combustible liquids.
2. The plastic piping and tubing is not required to be held horizontally in the plenum. If the pipe is not horizontal then the water will not be retained in the pipe during use.
3. During construction and remodeling pipes are often empty.
4. Fire testing for all other products using ASTM E84 is conducted on the material to be used and not on the material with some fillings.
5. ASTM E84 requires all materials and products to be tested at full tunnel width, with only very few exceptions. Plastic piping and tubing is not one of the exceptions. The exceptions in ATM E84 are: (1) when there is a standard practice for the material (as shown in section 6.8), (2) when adhesives and trim have been listed with tests at less than full width and (3) when a specific test or application standard has been issued (as shown in Appendix X5). The relevant sections are shown below (section 6.3 and its associated subsections, section 6.8 and appendix X5).
6. Other plastic piping and tubing materials are tested without water and the comparison is inadequate if some materials are tested full of water.
7. Some materials are tested with water simply because they cannot meet the requirements otherwise.
8. If the IMC committee believes that ASTM E84 is not an appropriate test for such materials (which is a reasonable approach) a code change is needed and an alternate test must be specified because the present wording of section 602.2.1 of the IMC requires plastic piping and tubing to be tested to the ASTM E84/UL 723 test by default, without offering additional guidance on how to do the testing.

ASTM E84 section 6.3, 6.8 and Appendix X5:
6.3 The size of the test specimen shall be:
Width: between 20 and 24 in. (508 and 610 mm)
Length: 24 ft + 12 in. — 6 in.
Thickness: maximum 4 in. (101 mm).
NOTE 1 - The test apparatus is not designed for testing at thicknesses greater than 4 in. (101 mm), but has the ability to be modified if required. This is accomplished through (a) modifications to the test apparatus lid to maintain an airtight seal, and (b) the introduction, usually of additional sample/lid supports above the test apparatus ledges. Due to the composition of some materials, test results obtained at a thickness greater than 4 in. (101 mm) will potentially vary from results of a test on the same material tested at a thickness of 4 in. (101 mm) or less.
6.3.1 The test specimen shall not be required to conform to the test specimen length and width described in 6.3 when the material complies with 6.3.1.1-6.3.1.3.
NOTE 2—When tests are conducted with materials installed at less than full width, representing the end-use width, any resulting flame spread and smoke developed indices will not relate to indices obtained with the calibration material, which is tested using the specimen width described in 6.3.
6.3.1.1 Materials for which there is a standard practice to address specimen preparation and mounting with this test method shall be tested as described in the appropriate standard practice (see 6.8).
6.3.1.2 Adhesives and trim shall be permitted to be tested in the width or length, or both, specified in their listings, or as part of their conditions for being labeled, by a nationally recognized testing laboratory.
6.3.1.3 Materials and products for which there is a specific test method or application standard requiring the use of the apparatus described in Section 5 shall be permitted to be tested in accordance with that specific test method or application standard (see Appendix X5).
6.8 In addition to the above provisions, the standard practices listed below shall be used for specimen preparation and mounting of the relevant test materials. For all other products, guidance on mounting methods is provided in Appendix X1.
E2231 for pipe and duct insulation materials.
E2404 for paper, vinyl and textile wall and ceiling covering materials.
E2573 for site-fabricated stretch systems.

E2579 for the following wood products: solid board, lumber and timber products (including solid boards, lumber, timber, fingerjoined lumber, glulam, laminate wood, laminated veneer lumber and parallel strand lumber products), panel products (including fibreboard, hardboard, oriented strandboard, waferboard, and plywood panel products), decorative wood products (including fine woodwork, millwork and moulding) and shingles and shakes used as interior wall and ceiling finish and interior trim.
E2599 for reflective insulation, radiant barrier and vinyl stretch ceiling materials for building applications.
E2688 for tapes up to and including 8 in. (203.2 mm) in width.
E2690 for caulks and sealants intended to be applied up to and including 8 in. (203.2 mm) in width.

X5. SPECIFIC TEST METHODS AND APPLICATION STANDARDS
X5.1 The following standards address testing of materials in accordance with test methods that are applications or variations of this test method or apparatus.
X5.1.1 Wires and cables for use in air-handling spaces are covered by NFPA 262.
X5.1.2 Pneumatic tubing for control systems are covered by UL 1820.
X5.1.3 Combustible sprinkler piping is covered by UL 1887.
X5.1.4 Optical fiber and communications raceways are covered by UL 2024.

IMC 602.2.1 Materials within plenums. Except as required by Sections 602.2.1.1 through 602.2.1.5, materials within plenums shall be noncombustible or shall be listed and labeled as having a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E84 or UL 723.

For information also:
NFPA 90A (section on ceiling cavity plenums)
4.3.11.2.6.6 Plastic piping and tubing used in plumbing systems shall be permitted to be used within a ceiling cavity plenum if it exhibits a flame spread index of 25 or less and a smoke developed index of 50 or less when tested in accordance with ASTM E 84, *Standard Test Method for Surface Burning Characteristics of Building Materials*, or ANSI/UL 723, *Standard for Test for Surface Burning Characteristics of Building Materials*, at full width of the tunnel and with no water or any other liquid in the pipe during the test.

NFPA 90A (section on raised floor plenums)
4.3.11.5.5.7 Plastic piping and tubing used in plumbing systems shall be permitted to be used within a raised floor plenum if it exhibits a flame spread index of 25 or less and a smoke developed index of 50 or less when tested in accordance with ASTM E 84, *Standard Test Method for Surface Burning Characteristics of Building Materials*, or ANSI/UL 723, *Standard for Test for Surface Burning Characteristics of Building Materials*, at full width of the tunnel and with no water or any other liquid in the pipe during the test.

Cost Impact: None

M136-12

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

602.2.1.6(NEW)-M-HIRSCHLER.DOC

M137–12
602.2.1.6(NEW), Chapter 15

Proponent: David W. Ash, Lubrizol Advanced Materials Inc.

Add next text as follows:

602.2.1.6 Plastic plumbing piping. Plastic plumbing piping exposed within a plenum shall have a peak optical density not greater than 0.50. an average optical density not greater than 0.15, and a flame spread index of not greater than 5 feet (1524 mm) when tested in accordance with UL 1887 or shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with CAN/ULC S102.2. Piping shall be listed and labeled.

Add referenced standard to Chapter 15:

CAN/ULC S102.2-10
Standard Method of Test for Surface Burning Characteristics of Flooring. Floor Coverings and Miscellaneous Materials and Assemblies

Reason: Currently ASTM E-84 is the required test to determine the flame and smoke properties of materials. These values then determine whether or not a material may be used within plenums. There are exceptions to this standard for those products with special criteria and those are shown in sections 602.2.1.1 through 602.2.1.5.

Since that test is specified by the IMC, all other products, including plastic plumbing pipe, must be evaluated by this test. The scope of ASTM E-84 test states that it is applicable to surfaces such as walls and ceilings. Many products that are not used in a flat form are impacted by this requirement. Obviously, a pipe's tubular shape does not correspond to a flat shape. Although an ASTM committee has been attempting to decide on a test method for pipe, to date they have not been successful. Consequently, ASTM E-84 does not provide any direction in testing a pipe.

Other test standards have been developed that do include provisions for testing pipe. These standards have been successfully used for a number of years. The UL 1887 and CAN/ULC S1 02.2 standards recognize that the appropriate way to evaluate the flame and smoke characteristics of a pipe is to test a sample in that shape. These standards provide specific direction in the testing of the pipe and do not leave the decision of what sample to test up to the manufacturer or the testing agency. The addition of these two standards to the IMC as method to evaluate plastic plumbing pipe provides a clearer direction than what the IMC currently offers.

The CAN/ULC S102.2 standard is currently referenced in the International Building Code. The UL 1887 standard is currently referenced in the International Mechanical Code.

Cost Impact: This proposal would not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [CAN/ULC S102.2-10] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M137-12

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

602.2.1.6(NEW)-M-ASH.DOC

M138–12
602.3.1 (NEW)

Proponent: Guy McMann, MCP, Jefferson County Colorado, Colorado Association of Plumbing and Mechanical Officials (CAPMO)
(gmcmann@jeffco.us)

Add new text as follows:

602.3.1 Dwelling stud cavity and joist space plenums prohibited. Building framing cavities in dwelling units shall not be utilized as ducts or plenums

Reason:
- This proposal brings consistency between the IMC and the residential portion of the IECC. A distinction needs to be made here that this prohibition only applies to dwellings. There is nothing in the commercial portion of the IECC to support this prohibition in commercial applications.
- These requirements still have value in non-residential applications and should not be deleted in their entirety. The new sub-section isolates the residential prohibition.

Cost Impact: None

M138-12

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

602.3.1(NEW)-M-MCMANN.DOC

M139–12
602.3

Proponent: Dustin McLehaney, Chesterfield County, VA, Va. Plumbing and Mechanical Inspectors Association (VPMIA) And Va. Building Code Officials Association (VBCOA) (MclehaneyD@chesterfield.gov)

Delete and substitute as follows:

~~**602.3 Stud cavity and joist space plenums.** Stud wall cavities and the spaces between solid floor joists to be utilized as air plenums shall comply with the following conditions:~~

1. ~~Such cavities or spaces shall not be utilized as a plenum for supply air.~~
2. ~~Such cavities or spaces shall not be part of a required fire-resistance-rated assembly.~~
3. ~~Stud wall cavities shall not convey air from more than one floor level.~~
4. ~~Stud wall cavities and joist space plenums shall comply with the floor penetration protection requirements of the *International Building Code*.~~
5. ~~Stud wall cavities and joist space plenums shall be isolated from adjacent concealed spaces by approved fire-blocking as required in the *International Building Code*.~~
6. ~~Stud wall cavities in the outside wall of building envelope assemblies shall not be utilized as air plenums.~~

602.3 Building cavities. Building framing cavities shall not be used as ducts or plenums.

Reason: 2012 IECC section R403.2.3 and IRC N1103.2.3 both read as follows;

Building cavities. *Building framing cavities shall not be used as ducts or plenums.*

This practice is not permitted in residential applications. There is no logical reasoning that it should be permitted in a commercial application.

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

M139-12

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

602.3-M-MCLEHANEY.DOC

M140–12
603

Proponent: Bob Eugene, Underwriters Laboratories, representing Underwriters Laboratories (Robert.Eugene@ul.com)

Revise as follows:

603.4 Metallic ducts. All metallic ducts shall be constructed as specified in the SMACNA *HVAC Duct Construction Standards- Metal and Flexible* *or shall comply with UL181.* Flexible metallic ducts complying with UL 181 shall be listed and labeled as Class 0 or Class 1 flexible air ducts and shall be installed in accordance with Section 304.1.

> **Exception:** Ducts constructed and installed in accordance with SMACNA *HVAC Duct Construction Standards- Metal and Flexible* within single *dwelling units* shall have a minimum thickness as specified in Table 603.4

603.4.1 Minimum fasteners. Rigid ~~R~~Round metallic ducts constructed in accordance with SMACNA *HVAC Duct Construction Standards- Metal and Flexible* shall be mechanically fastened by means of at least three sheet metal screws or rivets spaced equally around the joint.

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

603.5 Nonmetallic ducts. Nonmetallic ducts shall comply with UL 181, shall be ~~constructed~~ listed and labeled as ~~with~~ Class 0 or Class 1 flexible air ducts ~~material~~, and shall be ~~comply with UL 181~~ installed in accordance with Section 304.1. Fibrous duct construction shall conform to the SMACNA *Fibrous Glass Duct Construction Standards* or NAIMA *Fibrous Glass Duct Construction Standards.* The air temperature within nonmetallic ducts shall not exceed 250ºF (121ºC).

603.6 Installation of listed and labeled air ducts. Listed and labeled air ducts shall be installed in accordance with Sections 603.6.1 and 603.6.2.

603.6.1 Air temperature. The design temperature of air to be conveyed in flexible air ducts and flexible air connectors shall be less than 250ºF (121ºC).

603.6.2 Flexible air duct and air connector clearance. Flexible air ducts and air connectors shall be installed with a minimum *clearance* to an *appliance* as specified in the *appliance* manufacturer's installation instructions.

~~**603.6 Flexible air ducts and flexible air connectors.** Flexible air ducts, both metallic and nonmetallic, shall not be limited in length. shall comply with Sections 603.6.1, 603.6.1.1, 603.6.3 and 603.6.4. Flexible air connectors, both metallic and nonmetallic, shall comply with Sections 603.6.2 through 603.6.4.~~

~~**603.6.1 Flexible air ducts.** Flexible air ducts, both metallic and nonmetallic, shall be tested in accordance with UL 181. Such ducts shall be *listed* and *labeled* as Class 0 or Class 1 flexible air ducts and shall be installed in accordance with Section 304.1.~~

~~**603.6.2.**~~ **603.7 Flexible air connectors.** Flexible air connectors, both metallic and nonmetallic, shall comply with UL 181, shall be *listed* and *labeled* as Class 0 or Class 1 flexible air connectors, and shall be installed in accordance with Section 304.1.

~~**603.6.2.1**~~ **603.7.1 Connector length.** Flexible air connectors shall be limited in length to 14 feet (4267 mm).

~~**603.6.2.2**~~ <u>**603.7.2**</u> **Connector penetration limitations.** Flexible air connectors shall not pass through any wall, floor or ceiling.

~~**603.6.3 Air temperature.** The design temperature of air to be conveyed in flexible air ducts and flexible air connectors shall be less than 250ºF (121ºC).~~

~~**603.6.4 Flexible air duct and air connector clearance.** Flexible air ducts and air connectors shall be installed with a minimum *clearance* to an *appliance* as specified in the *appliance* manufacturer's installation instructions.~~

603.9 Joints, seams and connections. All longitudinal and transverse joints, seams and connections in metallic and nonmetallic ducts shall be constructed as specified in *SMACNA HVAC Duct Construction Standards—Metal and Flexible or NAIMA Fibrous Glass Duct Construction Standards* <u>in accordance with 603.9.1</u> *<u>or</u>* <u>shall comply with</u> *<u>UL181</u>* <u>in accordance with Section 603.9.2</u>*.* <u>Duct connections to flanges of air distribution system equipment shall be sealed and mechanically fastened.</u> <u>Closure systems used to seal ductwork shall be installed in accordance with the duct and closure system manufacturer's instructions. Unlisted duct tape is not permitted as a sealant on any duct.</u>

<u>**603.9.1 Ducts in accordance with SMACNA and NAIMA**. Joints, seams and connections in metallic and nonmetallic ducts constructed as specified in *SMACNA HVAC Duct Construction Standards—Metal and Flexible and NAIMA Fibrous Glass Duct Construction Standards*</u> ~~All joints, longitudinal and transverse seams and connections in ductwork~~ shall be securely fastened and sealed with welds, gaskets, mastics (adhesives), mastic-plus-embedded-fabric systems, liquid sealants ~~or~~ tapes<u>, or closure systems in accordance with Section 603.9.2</u>.

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

<u>**603.9.2 Ducts in accordance with UL 181.**</u> Closure systems used to seal ductwork <u>in accordance with UL181 shall be</u> listed and labeled in accordance with <u>either</u> UL 181A <u>or 181B in accordance with Table 603.9.2</u>. <u>Closure systems used to seal rigid metallic and rigid fiberglass ducts shall comply with 181A and</u> shall be marked "181A-P" for pressure-sensitive tape, "181 A-M" for mastic or "181 A-H" for heat-sensitive tape. Closure systems used to seal 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* shall be sealed and mechanically fastened.~~ Mechanical fasteners for use with flexible nonmetallic air ducts shall comply with UL 181B and shall be marked "181B-C." ~~Closure systems used to seal metal ductwork shall be installed in accordance with the manufacturer's installation instructions. Unlisted duct tape is not permitted as a sealant on any duct.~~

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

TABLE 603.9.2
CLOSURE SYSTEMS

Type of Ductwork	Standard	Type of Closure System	Marking
Rigid Metallic or Rigid Fiberglass	UL 181A	Pressure Sensitive Tape	181A-P
Rigid Metallic or Rigid Fiberglass	UL 181A	Mastic Tape	181A-M
Rigid Metallic or Rigid Fiberglass	UL 181A	Heat Sensitive Tape	181A–H
Flexible Air Ducts and Air Connectors	UL 181B	Pressure Sensitive Tape	181B-FX
Flexible Air Ducts and Air Connectors	UL 181B	Mastic Tape	181B-M
Flexible Non-Metallic Air Ducts	UL181B	Mechanical Fastener[a]	181B-C[a]

[a]Mechanical fasteners shall be used in conjunction with a listed pressure sensitive tape or mastic in accordance with UL181.

(Portions not shown remain unchanged.)

Reason: To provide additional clarity and consistency in the requirements air ducts constructed to SMACNA requirements and those that comply with UL181. This also provides additional clarity and consistency for the sealing of all ductwork.

Cost Impact: None

M140-12

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

603.4-M-EUGENE.DOC

M141–12
603.1.1(NEW), 603.1.2 (NEW), 603.1.3 (NEW)

Proponent: Tom Allen, representing himself

Add new text as follows:

603.1.1 Mechanical fastening. Joints between sections of air ducts and plenums, between intermediate and terminal fittings and other components of air distribution systems, and between subsections of these components shall be mechanically fastened to secure the sections independently of the closure system(s).

603.1.2 Sealing. Air distribution system components shall be sealed with approved closure systems.

603.1.3 Space provided. Space shall be provided adjacent to all mechanical components located in or forming a part of the air distribution system to provide access for construction and sealing in accordance with the requirements of Section 603.1, inspection, cleaning and maintenance. Not less than 4 inches (102 mm) of space hall be provided around air handling units.

> **Exception**: Retrofit and replacement units not part of a renovation are exempt from the minimum clearance requirement.

Reason: Adds requirements for fastening, sealing and providing space to install, inspect, and maintain ducts and plenums.

Cost Impact: There is a cost impact.

M141-12

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

603.1.1(NEW)-M-ALLEN.DOC

M142–12
603.2, 918.2

Proponent: Guy McMann, MCP, Jefferson County Colorado, Colorado Association of Plumbing and Mechanical Officials (CAPMO)
(gmcmann@jeffco.us)

Revise as follows:

603.2 Duct sizing. Ducts installed within a single dwelling unit shall be sized in accordance with ACCA Manual D, the appliance manufacturer's installation instructions or other approved methods. Ducts installed within all other buildings shall be sized in accordance with the ASHRAE Handbook of Fundamentals or other equivalent computation procedure.

Revise as follows:

~~**918.2 Minimum duct sizes.** The minimum unobstructed total area of the outdoor and return air ducts or openings to a forced-air warm-air furnace shall be not less than 2 square inches per 1,000 Btu/h (4402 mm2/kW) output rating capacity of the furnace and not less than that specified in the furnace manufacturer's installation instructions. The minimum unobstructed total area of supply ducts from a forced-air warm-air furnace shall not be less than 2 square inches for each 1,000 Btu/h (4402 mm2/kW) output rating capacity of the furnace and not less than that specified in the furnace manufacturer's installation instructions.~~

> ~~**Exception:** The total area of the supply air ducts and outdoor and return air ducts shall not be required to be larger than the minimum size required by the furnace manufacturer's installation instructions.~~

918.~~3~~ 2 Heat pumps~~. The minimum unobstructed total area of the outdoor and return air ducts or openings to a heat pump 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 listing of the heat pump~~ Electric heat pumps shall be tested in accordance with UL 1995.

Reason: This is outdated legacy code language and is not consistent with current practice. It is up to the design professional, or the requirements from Manual D or the manufacturer of the appliances to determine minimum sizes of ducts and transfer openings, not the code. If these numbers where to be applied, then the code could be condoning an undersized system. This subject matter is already covered in 603.2. There are too many variables and different situations for just one minimum to work for everything.

Cost Impact: None

M142-12

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

603.2-M-MCMANN.DOC

M143–12
TABLE 603.4

Proponent: Luis Escobar, Air Conditioning Contractors of America, representing ACCA (luis.escobar@acca.org)

Revise as follows:

TABLE 603.4
DUCT CONSTRUCTION MINIMUM SHEET METAL THICKNESSES FOR SINGLE DWELLING UNITS

DUCT SIZE	GALVANIZED		<u>Appropriate Aluminum B&S Gauge</u> ~~ALUMINUM MINIMUM THICKNESS (in.)~~
	Minimum thickness (in.)	Equivalent galvanized gauge ~~gage~~ no.	
Round ducts and enclosed rectangular ducts			
14 inches or less	<u>0.013</u> ~~0.0157~~	<u>30</u> ~~28~~	<u>26</u> ~~0.0175~~
<u>Over 14”</u> ~~16 and 18 inches~~	<u>0.016</u> ~~0.0187~~	<u>28</u> ~~26~~	<u>24</u> ~~0.018~~
~~20 inches and over~~	~~0.0236~~	~~24~~	~~0.023~~
Exposed rectangular ducts			
14 inches or less	<u>0.016</u> ~~0.0157~~	28	<u>24</u> ~~0.0175~~
Over 14 inches[a]	<u>0.019</u> ~~0.0187~~	26	<u>22</u> ~~0.018~~

For SI: 1 inch = 25.4 mm, 1 inch water gage = 249 Pa.
~~a. For duct gages and reinforcement requirements at static pressures of ½-inch, 1-inch and 2-inch w.g., SMACNA *HVAC Duct Construction Standards*, Tables 2-1, 2-2, and 2-3, shall apply.~~

Reason: The change that was previously made in the 2009 IMC (and carried forward to the 2012 IMC) unnecessarily increased the material thickness required for round sheet metal ducts.

This proposed change seeks to return to the requirements of 2006 and previous IMC editions which have historically recognized 30 gauge sheet metal as being appropriate for round ducts 14 inches or less diameter in “Single Dwelling Units”.

The changes to table 603.4 in the 2009 IMC (and carried forward to the 2012 IMC):

1. Significantly increased cost for round sheet metal ducts
2. Did not improve safety
3. Did not improve energy performance
4. Encourages increased use of less expensive and less efficient non-metallic ducts.

Cost Impact: This code change proposal will **<u>not</u>** increase the cost of construction.

M143-12

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

T603.4-M-ESCOBAR.DOC

M144–12
603.4, T603.4

Proponent: Guy McMann, MCP, Jefferson County Colorado, Colorado Association of Plumbing and Mechanical Officials (CAPMO)
(gmcmann@jeffco.us)

Revise text as follows:

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

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

~~TABLE 603.4~~
~~DUCT CONSTRUCTION MINIMUM SHEET METAL THICKNESSES FOR SINGLE DWELLING UNITS~~

~~DUCT SIZE~~	~~Galvanized~~		~~Aluminum~~
	~~Minimum thickness (in)~~	~~Equivalent galvanized gauge no.~~	~~Minimum thickness~~
~~Round ducts and enclosed rectangular ducts~~			
~~14" or less~~	~~0.0157~~	~~28~~	~~0.0175~~
~~16 and 18 inch~~	~~0.0187~~	~~26~~	~~0.018~~
~~20 inch and over~~	~~0.0236~~	~~24~~	~~0.023~~
~~Exposed rectangular ducts~~			
~~14" or less~~	~~0.0157~~	~~28~~	~~0.0175~~
~~Over 14"inches[a]~~	~~0.0187~~	~~26~~	~~0..018~~

~~For SI: 1 inch = 25.4 mm, 1 inch water gage = 249 Pa.~~

~~a. For duct gages and reinforcement requirements at static pressures of ½", 1" and 2" w.g., see SMACNA Duct Construction Standard, Tables 2-1; 2-2 and 2-3; 2005, 3rd edition.~~

Reason: The exception is of no value because the Table is not different from the Standard. The Table has no value added because it is flawed. It says that an enclosed duct of 20 inches and larger needs to be a heavier gage than exposed duct of the same size which is backwards. This Table would need to be larger and more complete in scope to be of any value and therefore should be deleted. It's easier to just check the Standard than to re-write it in Table format.

Cost Impact: None

M144-12

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

T603.4-M-MCMANN.DOC

M145–12
603.4.2 (NEW)

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Add new text as follows:

603.4.2 Duct lap. Crimp joints for round and oval metal ducts shall be lapped not less than one inch and the male end of the duct shall extend into the adjoining duct in the direction of airflow.

Reason: Section 603.4.1 states the number of fasteners to be used for the fastening of metal ducts but is silent on how many inches the ducts must be lapped and if the ducts must be lapped in a certain direction. The code should specifically state how much lap there should be within the ducts prior to securing them as stated in Section 603.4.1.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M145-12

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

603.4.2-M-STRAUSBAUGH.PMGCAC.DOC

M146–12
603.6.1.1

Proponent: Eli P. Howard III, Sheet Metal and Air-Conditioning Contractors' National Association, Inc. (ehoward@smacna.org)

Revise as follows:

603.6.1.1 Duct length. Flexible air ducts shall ~~not~~ be limited in length to 5 feet within a single branch run.

Reason: Current practice is that flexible duct is run in such long lengths as to restrict airflow because of the higher air resistance inherent in flexible duct. Further compounding the problem, installers will use a full box (25 ft) to make a 20 ft or shorter run and this "compression" results in even higher resistance to airflow. Consider that ASHRAE's Advanced Energy Guides require the 5 foot limit in an effort to reduce fan horsepower requirements in commercial construction.

Cost Impact: Initial cost will increase modestly but energy savings will quickly offset that cost.

M146-12

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

603.6.1.1-M-HOWARD.DOC

M147–12
603.8.3

Proponent: Jim Wischhusen, Monoxivent, representing self
(jimw@monoxivent.com)

Revise as follows:

603.8.3 Plastic ducts and fittings. Plastic ducts shall be constructed ~~of PVC~~ with Class 0 or Class 1 material in accordance with UL 181 and having a minimum pipe stiffness of 8 psi (55 kPa) at 5-percent deflection when tested in accordance with ASTM D2412~~. Plastic duct fittings shall constructed of either PVC or high density polyethylene. Plastic duct and fittings shall be utilized in underground installations only.~~ The maximum design temperature for systems utilizing plastic duct and fittings shall be 150°F (66°C).

Reason: Fire, heat and smoke can readily pass through the interior of HVAC ducts constructed of any material, even if it is buried. Therefore, regardless of whether the duct is buried or not, plastic ducts should be constructed with Class 0 or Class 1 duct material in accordance with UL 181 (ref. 2009 IMC Section 603.5). Neither PVC or high-density polyethylene are Class 0 or Class 1 materials, so reference to these in this section as construction materials should be deleted. Also, if the plastic duct is constructed of a Class 0 or Class 1 material, it should not be limited to underground installations only. This proposal provides for the use of newer fire retardant materials that offer additional safety in the event of a building fire.

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

M147-12

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

603.8.3#2-M-WISCHHUSEN.DOC

M148–12
603.9

Proponent: Timothy Burgos, InterCode Incorporated, representing Ductmate Industries

Revise as follows:

603.9 Joints, seams and connections. All longitudinal and transverse joints, seams and connections in metallic and nonmetallic ducts shall be constructed as specified in SMACNA *HVAC Duct Construction Standards—Metal and Flexible* and NAIMA *Fibrous Glass Duct Construction Standards*. All joints, longitudinal and transverse seams and connections in ductwork shall be securely fastened and sealed with welds, gaskets, mastics (adhesives), mastic-plus-embedded-fabric systems, liquid sealants or tapes. Closure systems used to seal ductwork *listed* and *labeled* in accordance with UL 181A shall be marked “181A-P” for pressure-sensitive tape, “181 A-M” for mastic or “181 A-H” for heat-sensitive tape. Closure systems used to seal 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* shall be sealed and mechanically fastened. Mechanical fasteners for use with flexible nonmetallic air ducts shall comply with UL 181B and shall be marked “181B-C.” Closure systems used to seal metal ductwork shall be installed in accordance with the manufacturer’s installation instructions. Unlisted duct tape is not permitted as a sealant on any duct.

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

Reason: There is a conflict between Section 603.9 and its exception. This code change proposal removes the conflict by not allowing locking type longitudinal joints to be exempt from the sealing requirements of Section 603.9.

Section 603.9 states that all joints need to be sealed. Locking type longitudinal joints are not air tight and must be sealed, and should not be exempt from the sealing requirements found in Section 603.9. Continuously welded seams, as demonstrated in welded pipe, are considered to be air tight and therefore should be exempt from any additional sealing requirements.

Requiring locking-type longitudinal joints to be sealed in accordance with Section 603.9 will reduce the amount of air leakage from the duct, thus, increasing the energy efficiency of the duct system.

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

M148-12

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

603.9-M-BURGOS.DOC

M149–12
603.9

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

603.9 Joints, seams and connections All longitudinal and transverse joints, seams and connections in metallic and nonmetallic ducts shall be constructed as specified in SMACNA *HVAC Duct Construction Standards-Metal and Flexible* and NAIMA *Fibrous Glass Duct Construction Standards.* All joints, longitudinal and transverse seams and connections in ductwork shall be securely fastened and sealed with welds, gaskets, mastics (adhesives), mastic-plus-embedded-fabric systems, liquid sealants or tapes. ~~Closure systems~~ Tapes and mastics used to seal metallic and fibrous glass ductwork shall be *listed* and *labeled* in accordance with UL 181A and shall be marked "181A-P" for pressure-sensitive tape, "181 A-M" for mastic or "181 A-H" for heat-sensitive tape. Closure systems used to seal 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* shall be sealed and mechanically fastened. Mechanical fasteners for use with flexible nonmetallic air ducts shall comply with UL 181B and shall be marked "181B-C." Closure systems used to seal ~~metal~~ all ductwork shall be installed in accordance with the manufacturer's ~~installation~~ instructions. ~~Unlisted duct tape is not permitted as a sealant on any duct~~.

Reason: This proposal simplifies this section by stating what is meant by "closure systems." Tapes and mastics are addressed in UL181A. There is no closure system listed specifically for metal ducts, but it is appropriate to require sealing products used for metal ducts to be listed to UL181A because if the sealing product is good enough for fibrous glass ducts it is good enough for metal ducts. This is the case in the field, as fibrous glass duct tapes are commonly used with metal ducts. The manufacturer's instructions should apply for all closure systems, not just those for metal ducts. The last sentence is unnecessary because this proposal requires all tapes to be listed, including those used with metal ducts.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M149-12

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

603.9#1-M-STRAUSBAUGH.PMGCAC.DOC

M150–12
603.9.1 (NEW), Chapter 15

Proponent: Timothy Burgos, InterCode Incorporated, Representing Ductmate Industries

Add new text as follows:

603.9.1 Duct system leak-testing. Ducts shall be installed and sealed in accordance with Section 603.9. Ducts and plenums shall be leak-tested in accordance with the SMACNA *HVAC Air Duct Leakage Test Manual* with an air leakage class (*CL*) less than or equal to 6.0 as determined in accordance with Equation 6-1.

$CL = F/P^{0.65}$ **(Equation 6-1)**

where:

F = The measured leakage rate in cfm per 100 square feet of duct surface.
P = The static pressure of the test.

Documentation shall be furnished by the designer demonstrating that representative sections totaling at least 25 percent of the duct area have been tested and that all tested sections meet the requirements of this section.

Add new referenced standard to Chapter 15 as follows:

SMACNA HVAC Air Duct Leakage Test Manual - 1985

Reason: Currently, there are no requirements for leak-testing in the International Mechanical Code. This code change proposal introduces a requirement for leak-testing all ductwork. The language for this proposal was adapted from Section C403.2.7.1.3 of the 2012 International Energy Conservation Code.

By requiring all pressure classes of ductwork to be tested, it will eliminate the confusion for a building official in determining which duct needs to be tested. Section 603.9 states the requirements of how ducts are supposed to be constructed and sealed. However, the section lacks a specific requirement in establishing a maximum air leakage rate for a duct. This proposal, if accepted, will establish these requirements by requiring all ductwork to be leak-tested in accordance with *SMACNA HVAC Air Duct Leakage Test Manual* using Equation 4-5, as noted in the section. By providing this equation, a more consistent test procedure can be established.

As new technologies are developed that increase HVAC efficiencies, it would only make sense to include requirements to improve the efficiencies of the ductwork. This proposal provides a means for the code officials to verify compliance with the code.

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, [SMACNA HVAC Air Duct Leakage Test Manual - 1985] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M150-12

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

603.9.1(NEW)-M-BURGOS.DOC

M151–12
603.9

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

603.9 Joints, seams and connections. All longitudinal and transverse joints, seams and connections in metallic and nonmetallic ducts shall be constructed as specified in SMACNA *HVAC Duct Construction Standards—Metal and Flexible* and NAIMA *Fibrous Glass Duct Construction Standards*. All joints, longitudinal and transverse seams and connections in ductwork shall be securely fastened and sealed with welds, gaskets, mastics (adhesives), mastic-plus-embedded-fabric systems, liquid sealants or tapes. Closure systems used to seal ductwork *listed* and *labeled* in accordance with UL 181A shall be marked "181A-P" for pressure-sensitive tape, "181 A-M" for mastic or "181 A-H" for heat-sensitive tape. Closure systems used to seal 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* shall be sealed and mechanically fastened. Mechanical fasteners for use with flexible nonmetallic air ducts shall comply with UL 181B and shall be marked "181B-C." Closure systems used to seal metal ductwork shall be installed in accordance with the manufacturer's installation instructions. Unlisted duct tape is not permitted as a sealant on any duct.

> **Exception:** ~~Continuously welded and locking-type longitudinal joints and seams in ducts operating at static pressures less than 2 inches of water column (500 Pa) pressure classification shall not require additional closure systems~~ For ducts having a static pressure classification of less than 2 inches of water column (500Pa), additional closure systems shall not be required for continuously welded joints and seams and locking-type joints and seams of other than the snap-lock and button-lock types.

Reason: Unless sealant or a gasket is used, snap-lock and button-lock type seams will leak significantly. The current exception attempted to prevent unnecessary sealing for joints and seams that leak very little or not at all, but it went too far by including all locking type joints and seams. Some locking joints are leakproof such as mechanically folded seams used for spiral seam duct, but this cannot be said for all locking joints.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M151-12

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

603.9-#2-M-STRAUSBAUGH.PMGCAC.DOC

M152–12
603.10

Proponent: Anthony Frank Caminita, Duct Saddle LLC., representing self
(fcaminita@ductsaddle.com)

Revise as follows:

603.10 Supports. Ducts shall be supported at intervals not to exceed 12 feet (3658mm) and shall be in accordance with SMACNA-HVAC Duct Construction Standards- Metal and Flexible. Flexible and other factory-made ducts shall be supported by a saddle not less than 5.5 inches in width and shall be supported in accordance with the manufacturer's instructions.

Reason: When ducts are laying on a flat surface in an attic or crawl space in a high humidity area, the bottom of the duct will condensate and drip water on to the sheet rock which will develop into stains, mold and possibly attracting tennites. The heat in the attic will dry the top part of the duct's outer jacket but cannot reach the lower part that is touching the flat surface. Also by requiring ducts to be supported with a minimum 5 %" wide support, this would prevent kinking and sagging in the duct which can lead to restriction of air flow when the duct is installed in a twisted pattern on the attic floor.

Cost Impact: The code change will add minimal cost.

M152-12

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

603.10-M-CAMINITA.DOC

M153–12
603.10

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

603.10 Supports. Ducts shall be supported ~~at intervals not to exceed 12 feet (3658 mm) and shall be~~ in accordance with SMACNA *HVAC Duct Construction Standards—Metal and Flexible*. ~~Flexible and other factory-made ducts shall be supported in accordance with the manufacturer's instructions.~~

Reason: This section should just reference the SMACNA standards as opposed to specifying a support interval. The 12 foot interval requirement is too broad and is inappropriate for many sizes and types of ducts . Many ducts require closer supports. This text could be easily interpreted as allowing 12 feet maximum support intervals for all ducts.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: This proposal could increase the cost of construction.

M153-12

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

603.10-M-STRAUSBAUGH.PMGCAC.DOC

M154–12
603.12

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

603.12 Condensation. Provisions shall be made to prevent the formation of condensation on the exterior and interior surfaces of any duct.

Reason: Ducts such as toilet and kitchen exhaust and clothes dryer exhaust that are run in unconditioned spaces will be subject to the formation of condensation on the inside of the duct. It is common for exhaust ducts in ventilated attics to fill with water in low points and become blocked and/or leak into the exhaust fan or dryer. Condensation can also form in HVAC ducts where humid indoor air passes through such ducts that are chilled in unconditioned spaces. External insulation combined with a vapor barrier can prevent condensation on the outside of ducts and that same insulation with or without a vapor barrier can also prevent condensation on the inside of a duct, except for when the airflow initially starts. When the duct temperature comes up to the temperature of the air within it, the condensation will stop and the initial condensation will evaporate.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: This proposal will increase the cost of construction.

M154-12

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

603.12-M-STRAUSBAUGH.PMGCAC.DOC

M155–12
202, 604.7

Proponent: Ken Sagan, NRG Code Advocates, representing Reflective Insulation Manufacturers Association International
(ken@nrgcodeadvocates.com)

Add new text as follows:

REFLECTIVE INSULATION. Reflective insulation materials consist of one or more low-emittance surfaces, such as metallic foil or metallic deposits, unmounted or mounted on substrates. Reflective insulations derive their thermal performance from surfaces with an emittance of 0.1 or less, facing enclosed air spaces, yielding a reduction in radiant heat transfer.

Revise text as follows:

604.7 Identification. External duct insulation, except spray polyurethane foam, and factory-insulated flexible duct shall be legibly printed or identified at intervals not greater than 36 inches (914 mm) with the name of the manufacturer, the thermal resistance R-value at the specified installed thickness and the flame spread and smoke-developed indexes of the composite materials. All duct insulation product R-values shall be based on insulation only, excluding air films, vapor retarders or other duct components, and shall be based on tested C-values at 75°F (24°C) mean temperature at the installed thickness, in accordance with recognized industry procedures. The installed thickness of duct insulation used to determine its R-value shall be determined as follows:

1. For duct board, duct liner and factory-made rigid ducts not normally subjected to compression, the normal insulation thickness shall be used.
2. For duct wrap, the installed thickness shall be assumed to be 75 percent (25 percent compression) of normal thickness.
3. For factory-made flexible air ducts, the installed thickness shall be determined by dividing the difference between the actual outside diameter and nominal inside diameter by two.
4. For spray foam polyurethane foam, the aged R-value per inch, measured in accordance with recognized industry standards, shall be provided to the customer in writing at the time of foam application.
5. For reflective insulation, R-values shall be based on tested U-values using recognized industry procedures as a reflective insulation system on rigid duct in heating, ventilation and air conditioning systems. Packages of reflective insulation shall be labeled with the number of reflective sheets, the number and thickness of the air spaces in the assembly and the R-value of the assembly.

Reason: A type of reflective insulation (reflective plastic core insulation) is currently included in the IBC Code Definitions. This proposal attempts to provide additional information relating to that product category as a whole and for the products specified in this proposal.

The proposal proposes to clarify the process within the codes for accurately labeling and evaluating the performance of reflective insulation when installed on ducts. ASTM C1668-10 addresses this issue and provides specification on how to determine product performance.

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

M155-12

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

202-REFLECTIVE INSULATION-M-SAGAN.DOC

M156–12
605.1

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

605.1 General. Heating and air-conditioning systems ~~of the central type~~ shall be provided with *approved* air filters. Filters shall be installed such that all return air, outdoor air and makeup air is filtered ~~in the return air system,~~ upstream from any heat exchanger or coil. Filters shall be installed in an *approved* convenient location. Liquid adhesive coatings used on filters shall have a flash point not lower than 325ºF (163ºC).

Reason: It is just as important to filter outdoor air and makeup air as it is to filter return air. This provision should not be limited to central type systems because all heat exchangers need to be protected from fouling by air-borne debris.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M156-12

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

605.1-M-STRAUSBAUGH.PMGCAC.DOC

M157–12
[B] 607.5.4.1

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

THIS CODE CHANGE WILL BE HEARD BY THE INTERNATIONAL MECHANICAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

Revise as follows:

[B] 607.5.4.1 Smoke damper. Smoke dampers shall close as required by Section 607.3.3.2.

~~The smoke damper shall close upon actuation of a listed smoke detector or detectors installed in accordance with the International Building Code and one of the following methods, as applicable:~~

1. ~~Where a smoke damper is installed within a duct, a smoke detector shall be installed in the duct within 5 feet (1524 mm) of the damper with no air outlets or inlets between the detector and the damper . The detector shall be listed for the air velocity, temperature and humidity anticipated at the point where it is installed. Other than in mechanical smoke control systems, dampers shall be closed upon fan shutdown where local smoke detectors require a minimum velocity to operate.~~
2. ~~Where a smoke damper is installed above smoke barrier doors in a smoke barrier , a spot-type detector listed for releasing service shall be installed on either side of the smoke barrier door opening.~~
3. ~~Where a smoke damper is installed within an air transfer opening in a wall, a spot-type detector listed for releasing service shall be installed within 5 feet (1524 mm) horizontally of the damper .~~
4. ~~Where a smoke damper is installed in a corridor wall or ceiling, the damper shall be permitted to be controlled by a smoke detection system installed in the corridor .~~
5. ~~Where a total-coverage smoke detector system is provided within areas served by a heating, ventilation and air-conditioning (HVAC) system, smoke dampers shall be permitted to be controlled by the smoke detection system.~~

Reason: This text is redundant language and is not needed as Section 607.3.3.2 says exactly the same thing.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M157-12

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

607.5.4.1-M-STRAUSBAUGH.PMGCAC.DOC

M158–12
202 (New), 608 (New), 608.1 (New)

Proponent: Timothy Burgos, InterCode Incorporated, representing 3M Company

Add new text as follows:

REFLECTIVE DUCT. A duct or conduit with a reflective interior surface utilized for conveying daylight or artificial light.

SECTION 608
REFLECTIVE DUCTS

608.1 Reflective Ducts. Reflective ducts that are designed and installed to provide light to the interior space of a building shall be constructed, braced, reinforced and installed to provide structural strength and durability in accordance with the requirements of Section 603. The installation of reflective ducts shall not affect the fire protection requirements specified in the *International Building Code*. Reflective ducts shall not be used for conveying air and are not required to be pressurized.

Reason: The purpose of this code change proposal is to add a new definition and section to the International Mechanical Code in order to differentiate between duct used to convey air and duct used to convey light. There are many new technologies that exist worldwide today that bring light from the exterior of a building to the interior space of a building. These technologies utilize a reflective duct to convey the light into the building. The reflective duct is similar in construction to duct used to convey air in the way it is braced, reinforced, and installed. Reflective duct differs because it is not used to condition a space. Additionally, reflective duct does not need to meet all the requirements of an air conveying duct, i.e. the insulation and pressurization requirements.

The language used to create the new Section 608.1 was adapted from Section 603 of the 2012 International Mechanical Code. The definition for reflective duct was adapted from the definition of duct found in the 2012 International Mechanical Code.

Reflective duct (the two ducts on the outside) in an open ceiling alongside a traditional HVAC duct.

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

M158-12

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

202-REFLECTIVE DUCTS-M-BURGOS.DOC

M159–12
701.2 (NEW)

Proponent: Guy McMann, MCP, Jefferson County Colorado, Colorado Association of Plumbing and Mechanical Officials (CAPMO)
(gmcmann@jeffco.us)

Add new text as follows:

701.2 Dampered openings Where combustion air openings are provided with volume, smoke or fire dampers, the dampers shall be interlocked with the firing cycle of the appliances served, so as to prevent operation of any appliance that draws combustion air from the room or space when any of the dampers are closed. Manual dampers shall not be installed in combustion air ducts. Ducts not provided with dampers and that pass through rated construction shall be enclosed in a shaft in accordance with the *International Building Code*.

Reason: This is basic pertinent information that the user shouldn't have to go to the standard to figure out.

Cost Impact: None

M159-12

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

702(NEW)-M-MCMANN.DOC

M160–12
802.9

Proponent: Guy McMann, MCP, Jefferson County Colorado, Colorado Association of Plumbing and Mechanical Officials (CAPMO)
(gmcmann@jeffco.us)

Add new text as follows:

802.9 Protection against physical damage. In concealed locations, where a vent is installed through holes or notches in studs, joists, rafters or similar members less than 11/2 inches (38 mm) from the nearest edge of the member, the vent shall be protected by shield plates. Protective steel shield plates having a minimum thickness of 0.0575 inch (1.463 mm) (No. 16 gage), shall cover the area of the vent where the member is notched or bored and shall extend a minimum of 4 inches (102 mm) above sole plates, below top plates and to each side of a stud, joist or rafter.

Reason: All vent piping needs to be protected from punctures and other forms of damage. This text is absent from this section and is consistent with the same subject matter in the family of PMG codes.

Cost Impact: None

M160-12

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

802.9-M-MCMANN.DOC

M161–12
802.10

Proponent: Guy McMann, MCP, Jefferson County Colorado, Colorado Association of Plumbing and Mechanical Officials (CAPMO)
(gmcmann@jeffco.us)

Add new text as follows:

802.10 Door swing. Appliance and equipment vent terminals shall be located such that doors cannot swing within 12 inches (305 mm) horizontally of the vent terminals. Door stops or closures shall not be installed to obtain this clearance.

Reason: As indicated in the photo, any appliance vent can be subject to damage as a result of a door swing even when the vent has been installed in accordance with the manufacturer's instructions. Most manufacturers do not address proximity to doors on a different plane. Even if the door doesn't come in contact with the vent terminal, the door could be left too close to the vent when the appliance is operating and possibly overheating the door causing problems.

Cost Impact: None

M161-12

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

802.10(NEW)-M-MCMANN.DOC

M162–12
901.4

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

~~901.4~~ 902.2 Fireplace accessories. Listed and labeled fireplace accessories shall be installed in accordance with the conditions of the listing and the manufacturer's instructions. Fireplace accessories shall comply with UL 907.

Reason: This section is applicable only to masonry fireplaces, therefore it belongs in Section 902 where its application will be limited to masonry fireplaces.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M162-12

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

901.4-M-STRAUSBAUGH.PMGCAC.DOC

M163–12
903.4(NEW)

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee and Thomas Stroud, Senior Manager of Codes & Standards for the Hearth, Patio & Barbecue Association, representing the Hearth, Patio & Barbecue Association.

Add new text as follows:

<u>**903.4 Gasketed fireplace doors.** A gasketed fireplace door shall not be installed on a factory-built fireplace except where the fireplace system has been specifically tested, *listed* and *labeled* for such use in accordance with UL 127.</u>

Reason:
Strausbaugh, PMG-CAC-Because of requirements in the IECC that require all fireplaces to be provided with gasketed doors, a great deal of controversy has resulted. Most factory-built fireplaces are not tested for use with sealed glass doors and installing such doors on fireplaces that are not tested for these doors could cause overheating of the fireplace resulting in a fire hazard. Without testing, the effect of the doors will be an unknown.

Stroud-Combustible clearances of the factory built fireplace and chimney system are determined by rigorous testing under UL 127. The addition of gasketed fireplace doors not specifically tested and listed for use with the fireplace can cause a change in the performance of the fireplace resulting in a hazardous condition.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M163-12

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

903.4(NEW)-M-STRAUSBAUGH.PMGCAC- STROUD.DOC

M164–12
908.5

Proponent: Guy Tomberlin, Fairfax County Virginia, representing Fairfax County Virginia (guy.tomberlin@fairfaxcounty.gov)

Revise as follows:

908.5 Water supply. Cooling towers, evaporative coolers and fluid coolers shall be provided with an approved water supply, sized for peak demand. The quality of water shall be provided in accordance with the equipment manufacturer's recommendations. ~~Water supplies~~ The piping system and protection of the potable water supply system shall be installed as required by the *International Plumbing Code.*

Reason: Various water resources are being utilized across the nation in many different ways. This is being done for many various reasons. Some are because of water shortages, others are in effort to simply conserve our precious resources and others are being done to constructively utilize rain water and properly treated re-use water. Technology provides us with the options for many different water reuses such as reclaimed and rainwater. This proposal clarifies that if the quality of water can be achieved then alternate sources shall be permitted. In addition if an interconnection or back up is provided with the potable system then proper cross connection contamination prevention shall be provided in accordance with the International Plumbing Code. Lastly, the piping system shall be installed according to the International Plumbing Code.

Cost Impact: reduces the cost below current requirements for the initial installation and throughout the life of the structure.

M164-12

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

908.5-M-TOMBERLIN.DOC

M165–12
908.8(NEW), Chapter 15

Proponent: Tracy Quinn, Natural Resources Defense Council, on behalf of self (tquinn@nrdc.org)

Add new text as follows:

908.8 Cooling Towers. Cooling towers greater than 150 tons in capacity shall comply with Sections 908.8.1 through 908.8.4.

908.8.1 Conductivity or Flow-based Control. Cooling towers shall include of controls that maximize the cycles of concentration based on local water quality conditions. Such controls shall automate system bleed and chemical feed based on conductivityor in proportion to metered makeup volume, metered bleed volume, or bleed time.

908.8.2 Flow Meter. A water meter or sub-meter shall be installed to measure the volume of makeup water entering the cooling tower. Where both potable and non-potable water are supplied to the tower, a meter or sub-meter shall be installed to measure each source separately.

908.8.3 Overflow Alarm. Cooling towers shall include of an overflow alarm to prevent overflow of the sump in case of makeup water valve failure. Such overflow alarm shall send an audible signal or provide an alert by means of the Building Management System to the tower operator in case of sump overflow.

908.8.4 Drift Eliminators. Cooling towers shall be equipped with drift eliminators that achieve drift reduction to 0.002 percent of the circulated water volume. Drift eliminators shall be tested using the Isokinetic Drift Measurement Test Cost for Water Cooling Tower – ATC – 140" testing code from the Cooling Technology Institute.

Add new standard to Chapter 15 as follows:

ATC-140-2011 Isokinetic Drift Measurement Test Cost for Water Cooling Tower – ATC-140" testing code.

Reason: This section includes water efficiency provisions for cooling towers and evaporative cooling systems that tend to waste large quantities of water.

The complexity of managing cooling systems combined with the high operational and financial cost of early failure of a cooling tower, can result in an overly conservative approach to tower bleed frequency. The codes as proposed here aim to ensure that all cooling towers covered by the IMC have the controls necessary to maximize cycles of concentration and minimize unintentional waters losses such as leaks and overflow. Below we have provided information specific to the revisions we have proposed. The information comes from a 2011 Codes and Standards Enhancement Initiative (CASE) for Cooling Tower Water Savings prepared by the California Statewide Utility Code and Standards Program on Cooling Tower Water Savings (attached), hereafter referred to as the CASE study.

Flow meter – "This measure provides a number of water-efficiency benefits. A flow meter on the makeup water line effectively submeters the cooling tower, allowing the operator to know how much water the tower is using and facilitating the identification of excessive water use due to leaks, for example."

Alarm – "Unintended water losses can occur if the standard float valve that controls the flow of makeup water in the sump fails, resulting in overflow into the sewer line. The failure of the makeup water line control also results in uncontrolled dilution and no activation of chemical feed, putting the system at risk for scale. An overflow alarm prevents these losses from going undetected for days, weeks or longer. An overflow alarm system includes a float switch and an audible electronic signaling device or notification through a building management system. Industry contacts, including cooling tower manufacturers and water treatment companies, generally indicated that the prevalence of installed overflow alarms is very low."

Drift Eliminators – "Efficient drift eliminators minimize losses due to drift, which is liquid water that is blown or splashed out of the tower during normal operations. Drift eliminators include secondary benefits, such as minimizing the spread of disease and preventing damage to adjacent property, such as parked cars, that would otherwise be splashed. According to representatives of cooling tower manufacturers, water treatment companies and drift eliminator distributors, most cooling towers have drift eliminators installed and the drift eliminators are likely to control drift losses to 0.005% or less. Current practice for new tower installations is to include drift eliminators and at least one manufacturer, Evapco, specifies equipment that limits losses to a maximum of 0.0001%." The Cooling Technology Institute (CTI) has a test code for measuring drift that should be used to meet this requirement; "Isokinetic Drift Measurement Test Cost for Water Cooling Tower – ATC – 140". The purpose of this code is to describe instrumentation and procedures for the testing and evaluation of drift from water-cooling towers. The code was revised in July 2011.

According to the CASE study, application of these code changes should result in a first year statewide water savings 32.3 million gallons in California (based on statewide annual sales of water-cooled chillers). Using the statewide average embedded energy value of 9.977 kWh/million gallons of water, the first year statewide energy savings is 323 MWh. Extracting this to an estimated national savings (based on population ratios), this code change could save 268 million gallons of water in the first year, and 2678 MWh.

Cost Impact: A cost-effectiveness analysis was performed as part of a Codes and Standards Enhancement Initiative (CASE) for Cooling Tower Water Savings, prepared by the California Statewide Utility Codes and Standards Program (attached).

From CASE: "Below are the present value costs and savings associated with the proposed measures installed on a 350 ton cooling tower over the 15 year analysis period."

Table 11. Life Cycle Cost of Proposed Measures

Measure Name	Additional Costs- Current Measure Costs (Relative to Basecase) ($)		PV of Additional Maintenance Costs (Savings) (Relative to Basecase) (PV$)		PV of Water and Chemical Cost Savings - Per Proto Building (PV$)	LCC Per Prototype Building ($)	
	Per unit	Per Proto Building	Per unit	Per Proto Building		Based on Current Costs	Based on Post-Adoption Costs
Cooling Tower Measures	$3,624	$3,624	$0	$0	$11,165	-$7,540	-$7,540

Analysis: A review of the standard proposed for inclusion in the code, [ATC-140-2011] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M165-12

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

908.5.1-M-QUINN.DOC

M166–12
917.2

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Delete text as follows:

~~**917.2 Prohibited location.** Cooking appliances designed, tested, *listed* and *labeled* for use in commercial occupancies shall not be installed within *dwelling units* or within any area where domestic cooking operations occur.~~

Reason: Section 917.2 is redundant with Section 917.3 and there may be appliances that are listed for both domestic and commercial use and such appliances would be prohibited by current text. Current Section 917.3 captures the entire intent and is all that is needed.

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Cost Impact: None

M166-12

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

917.2-M-STRAUSBAUGH.PMGCAC.DOC

M167–12
918.6(NEW), 918.8, 601.5 (NEW)

Proponent: Guy McMann, MCP, Jefferson County Colorado, Colorado Association of Plumbing and Mechanical Officials (CAPMO)
(gmcmann@jeffco.us)

Delete and substitute text as follows:

~~**918.6 Prohibited sources.** Outdoor or return air for forced air heating and cooling systems shall not be taken from the following locations:~~

1. ~~Less than 10 feet (3048 mm) from an *appliance* vent outlet, a vent opening from a plumbing drainage system or the discharge outlet of an exhaust fan, unless the outlet is 3 feet (914 mm) above the outdoor air inlet.~~
2. ~~Where there is the presence of objectionable odors, fumes or flammable vapors; or where located less than 10 feet (3048 mm) above the surface of any abutting public way or driveway; or where located at grade level by a sidewalk, street, alley or driveway.~~
3. ~~A hazardous or insanitary location or a refrigeration *machinery room* as defined in this code.~~
4. ~~A room or space, the volume of which is less than 25 percent of the entire volume served by such system. Where connected by a permanent opening having an area sized in accordance with Sections 918.2 and 918.3, adjoining rooms or spaces shall be considered as a single room or space for the purpose of determining the volume of such rooms or spaces.~~

   ~~**Exception:** The minimum volume requirement shall not apply where the amount of return air taken from~~
   ~~a room or space is less than or equal to the amount of supply air delivered to such room or space.~~

5. ~~A closet, bathroom, toilet room, kitchen, garage, boiler room, furnace room or unconditioned attic.~~

   ~~**Exceptions:**~~

   ~~5.1 Where return air intakes are located not less than 10 feet (3048 mm) from cooking appliances, and serve the kitchen area only, taking return air from a kitchen shall not be prohibited.~~
   ~~5.2 Dedicated forced-air systems serving only a garage shall not be prohibited from obtaining return air from the garage.~~
6. ~~An unconditioned crawl space by means of direct connection to the return side of a forced air system. Transfer openings in the crawl space enclosure shall not be prohibited.~~
   ~~7. A room or space containing a fuel-burning *appliance* where such room or space serves as the sole source of return air.~~

   ~~**Exceptions:**~~

   ~~7.1. This shall not apply where the fuel-burning *appliance* is a direct-vent *appliance*.~~
   ~~7.2. This shall not apply where the room or space complies with the following requirements:~~
   ~~7.2.1. The return air shall be taken from a room or space having a volume exceeding 1 cubic foot for each 10 Btu/h (9.6 L/W) of combined input rating of all fuelburning appliances therein.~~
   ~~7.2.2. The volume of supply air discharged back into the same space shall be approximately equal to the volume of return air taken from the space.~~
   ~~7.2.3. Return-air inlets shall not be located within 10 feet (3048 mm) of any *appliance* firebox or draft hood in the same room or space.~~

7.3. ~~This shall not apply to rooms or spaces containing solid-fuel-burning appliances, provided that return-air inlets are located not less than 10 feet (3048 mm) from the firebox of the appliances.~~

~~**918.8 Return-air limitation.** Return air from one *dwelling unit* shall not be discharged into another *dwelling unit*.~~

918.6 Outdoor and Return air openings. Outdoor intake openings shall be located in accordance with Section 401.4. Return air openings shall be located in accordance with Section 601.5.

601.5. Return air openings. Return air openings for heating, ventilation and air conditioning systems shall comply with all of the following:

1. Openings shall not be located less than 10 feet measured in any direction from an open combustion chamber or draft hood of another appliance located in the same room or space.
2. Return air shall not be taken from a hazardous or insanitary location or a refrigeration room as defined in this code.
3. The amount of return air taken from any room or space shall be not greater than the flow rate of supply air delivered to such room or space.
4. Return and transfer openings shall be sized in accordance with the appliance or equipment manufacturers' installation instructions, ACCA Manual D or the design of the *registered design professional*.
5. Return air from one dwelling unit shall not be discharged into or taken from another dwelling unit.
6. Taking return air from a crawl space shall not be accomplished through a direct connection to the return side of a forced air furnace. Transfer openings in the crawl space enclosure shall not be prohibited.
7. Return air shall not be taken from a closet, bathroom, toilet room, kitchen, garage, boiler room, furnace room or unconditioned attic.

   Exceptions:

   1. Taking return air from a kitchen is not prohibited where such return air openings serve the kitchen only, and are located not less than 10 feet from the cooking appliances.
   2. Dedicated forced air systems serving only the garage shall not be prohibited from obtaining return air from the garage

Reason: This is an attempt to reorganize and delete language in this section that contains outdated legacy code language. This Section is much more complicated than it needs to be as the foremost concern regarding return air is to keep contaminants out of the openings and air stream. This section is long over-due for an overhaul the intent in which is to simplify the matter.

- This section is being relocated to more central location as the subject matter applies to more than just furnaces; it applies to air conditioning and ventilation systems as well. A simple reference to this new Section is all that will be required in the new 918.6. Outdoor air intake openings are already covered in 401.4 and do not need to be duplicated here.

- Existing item 1 and 2 dealt primarily with outdoor opening which can be referenced in 401.4.

  - Existing item 3 remains in its new location.

  - Existing item 4 will literally prevent a return air opening in most bedrooms as they are usually less than 25% of the area served. There is no technical justification for this benchmark. What significance would there be between 25% and 26% that will impact the return air system? There is no need for such an arbitrary benchmark. What's really important is not to take too much air out of a room as noted in the new #3.

  - The size of any transfer should be according to design, not arbitrary, outdated numbers as in the existing #4

  - Existing 5 and 6 remain in the new location.

  - Item 7 has many problems and has been deleted in its entirety. It's a tortured approach as it attempts to describe a furnace in an enclosure with no return air duct along side a water heater all the while using the enclosure as a plenum utilizing louvered doors or openings to bring air back to the unit. This is not current practice and is prohibited. It calls for volume which is twice as much as current combustion requirements and is very difficult to explain the picture it attempts to deliver.

- Section 918.8 has been incorporated into the new location as #7.

All the usual requirements that can affect the quality and installation of return air openings are contained in this new location and in turn, simplifies the subject matter for the user. There are no new requirements.

Cost Impact: None

M167-12

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

918.6-M-MCMANN.DOC

M168–12
928.1

Proponent: Guy Tomberlin, Fairfax County VA, representing Fairfax County Virginia (guy.tomberlin@fairfaxcounty.gov)

Revise as follows:

928.1 General. Evaporative coolers equipment shall:

1. Be installed in accordance with the manufactures instructions.
2. Be installed on a level platform in accordance with section 304.10.
3. Have openings in exterior walls or roofs flashed in accordance with the *International Building Code.*
4. ~~Be provided with potable water backflow protection in accordance with section 608 of the *International Plumbing Code*.~~Be provided with an approved water supply, sized for peak demand. The quality of water shall be provided in accordance with the equipment manufacturer's recommendations. The piping system and protection of the potable water supply system shall be installed as required by the *International Plumbing Code*.
5. Have air intake opening locations in accordance with Section 401.4.

Reason: This is consistent action in accordance with the proposal submitted to Section 908 for cooling towers. Various water resources are being utilized across the nation in many different ways. This is being done for many various reasons. Some are because of water shortages, others are in effort to simply conserve our precious resources and others are being done to constructively utilize rain water and properly treated re-use water. Technology provides us with the options for many different water reuses such as reclaimed and rainwater. This proposal clarifies that if the quality of water can be achieved then alternate sources shall be permitted. In addition if an interconnection or back up is provided with the potable system then proper cross connection contamination prevention shall be provided in accordance with the International Plumbing Code. Lastly, the piping system shall be installed according to the International Plumbing Code.

Cost Impact: reduces the cost below current requirements for the initial installation and throughout the life of the structure.

M168-12

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

928.1-M-TOMBERLIN.DOC

M169–12
923.1

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

THIS IS A 2 PART CODE CHANGE, BOTH PARTS WILL BE HEARD BY THE IMC COMMITTEE AS 2 SEPARATE CODE CHANGES, SEE THE TENTATIVE HEARING ORDERS FOR THIS COMMITTEE.

PART I-IMC

Revise as follows:

SECTION 923
~~SMALL~~ CERAMIC KILNS

923.1 General. ~~The provisions of this section shall apply to kilns that are used for ceramics, have a maximum interior volume of 20 cubic feet (0.566 m^3) and are used for hobby and noncommercial purposes~~. Kilns shall be listed and labeled unless otherwise approved in accordance with Section 105.2. Electric kilns shall comply with UL 499. The approval of unlisted appliances in accordance with Section 105.2 shall be based upon approved engineering evaluation.

Reason: The code is silent on kilns over 20 cubic feet in volume. For example, if someone wanted to construct a very large gas-fired kiln, the code would provide no guidance and such appliance would likely be unlisted. A similar change is proposed for the IFGC.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

PART II-IFGC

SECTION 629
~~SMALL~~ CERAMIC KILNS

629.1 General. ~~Ceramic~~ Kilns ~~with a maximum interior volume of 20 cubic feet and used for hobby and noncommercial purposes~~ shall be installed in accordance with the manufacturer's ~~installation~~ instructions and the provisions of this code. Kilns shall comply with Section 301.3

Reason: The code is silent on kilns over 20 cubic feet in volume. For example, if someone wanted to construct a very large gas-fired kiln, the code would provide no guidance and such appliance would likely be unlisted. A similar change is proposed for the IMC.

Cost Impact: None

M169-12
PART I-IMC

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

PART II-IFGC

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

923.1-M-STRAUSBAUGH.PMGCAC.DOC

M170–12
1001.1

Proponent: Guy McMann, MCP, Jefferson County Colorado, Colorado Association of Plumbing and Mechanical Officials (CAPMO)
(gmcmann@jeffco.us)

Revise as follows:

SECTION 1001
GENERAL

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

Exceptions:

1. Pressure vessels used for unheated water supply.
2. Portable unfired pressure vessels and Interstate Commerce Commission containers.
3. Containers for bulk oxygen and medical gas.
4. Unfired pressure vessels having a volume of 5 cubic feet (0.14 m3) or less operating at pressures not exceeding 250 pounds per square inch (psi) (1724 kPa) and located within occupancies of Groups B, F, H, M, R, S and U.
5. Pressure vessels used in refrigeration systems that are regulated by Chapter 11 of this code.
6. Pressure tanks used in conjunction with coaxial cables, telephone cables, power cables and other similar humidity control systems.
7. ~~Any boiler or pressure vessel subject to inspection by federal or state inspectors.~~

Reason: This is not a code requirement. It's a given that Federal and State requirements can trump local codes and this would occur for more than just boilers. If this is absent from the code nothing changes. Why is this language only in Chapter 10? It should be in Chapter 1 if anywhere as this is administrative in nature. This would need to be in each chapter to be effective which doesn't make much sense.

Cost Impact: None

M170-12

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

1001.1-M-MCMANN.DOC

M171–12
1003.1

Proponent: Gary L. Scribner, Deputy Chief, Missouri Division of Fire Safety, representing the National Board of Boiler & Pressure Vessel Inspectors
(gary.scribner@dfs.dps.mo.gov)

Revise as follows:

1003.1 General. All pressure vessels, unless otherwise *approved* shall be constructed and certified in accordance with the ASME *Boiler and Pressure Vessel Codes,* ~~*shall bear the label of an approved agency*~~ and shall be installed in accordance with the manufacturer's instructions and nationally recognized standards. Directly fired pressure vessels shall meet the requirements of Section 1004.

Reason: This proposal provides language as contained in the ASME Boiler and Pressure Vessel Codes and gives the authority having jurisdiction the ability to approve other constructions while still adopting the IMC.

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

M171-12

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

1003.1-M-SCRIBNER.DOC

M172– 12
1003.3, Chapter 15

Proponent: Gary L. Scribner, Deputy Chief, Missouri Division of Fire Safety, representing the National Board of Boiler & Pressure Vessel Inspectors
(gary.scribner@dfs.dps.mo.gov)

Revise as follows:

1003.3 Welding. Welding on pressure vessels shall be performed by ~~*approved* welders in compliance with nationally recognized standards.~~ <u>an R-Stamp holder in accordance with the *National Board Inspection Code, Part 3* or in accordance with an *approved* standard.</u>

Add new standard to Chapter 15 as follows:

<u>National Board Inspection Code 2011, Part 3</u>

Reason: The National Board R- Stamp program is the only nationally recognized standard for weld repairs and/or alterations to boilers and pressure vessels. The standard is also required by the U.S. Department of Transportation. Some state and local jurisdictions do have modified versions of the R stamp program that they utilize; the proposed wording covers both possibilities while clearly stating the nationally recognized 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, [National Board Inspection Code 2011, Part 3] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M172-12

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

1003.3-M-SCRIBNER.DOC

M173–12
1004.1

Proponent: Gary L. Scribner, Deputy Chief, Missouri Division of Fire Safety, representing the National Board of Boiler & Pressure Vessel Inspectors
(gary.scribner@dfs.dps.mo.gov)

Revise as follows:

1004.1 Standards. ~~Oil-fired boilers and their control systems shall be listed and labeled in accordance with UL 726. Electric boilers and their control systems shall be listed and labeled in accordance with UL 834. Solid-fuel-fired boilers shall be listed and labeled in accordance with UL 2523. Boilers shall be designed and constructed in accordance with the requirements of ASME CSD-1 and as applicable, the ASME *Boiler and Pressure Vessel Code*, Section I or IV; NFPA 8501; NFPA 8502 or NFPA 8504.~~ Boilers shall be designed, constructed and certified in accordance with the ASME *Boiler and Pressure Vessel Code,* Section I or IV. Controls and safety devices for boilers with fuel input ratings of 12,500,000 Btu/hr or less shall meet the requirements of ASME *CSD-1.* Controls and Safety devices for boilers with inputs greater than 12,500,000 shall meet the requirements of *NFPA 85.* Package oil fired boilers shall be listed and labeled in accordance with *UL 726* or other *approved* standard. Packaged electric boilers shall be listed and labeled in accordance with *UL 834* or other *approved* standard.

Reason: Current wording is not correct since ASME CSD-1 is not a construction standard. The proposed wording starts with the vessel construction requirements and continues with the acceptable standards for complete appliances. The proposed wording is no change from the intent of the previous wording. NFPA 8501, 8502 & 8504 have been combined into NFPA 85.

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

M173-12

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

1004.1-M-SCRIBNER.doc

M174–12
1006.8

Proponent: Gary L. Scribner, Deputy Chief, Missouri Division of Fire Safety, representing the National Board of Boiler & Pressure Vessel Inspectors
(gary.scribner@dfs.dps.mo.gov)

Revise as follows:

1006.8 Electrical requirements. The power supply to the electrical control system shall be from a two-wire branch circuit that has a grounded conductor, or from an isolation transformer with a two-wire secondary. Where an isolation transformer is provided, one conductor of the secondary winding shall be grounded. Control voltage shall not exceed 150 volts nominal, line to line. Control and limit devices shall interrupt the ungrounded side of the circuit. A means to manually disconnecting the control circuit shall be provided, and controls shall be arranged so that when deenergized, the burner shall be inoperative. Such means shall be capable of being locked in the off position and shall be provided with ready access. <u>A manually operated remote shutdown switch or circuit breaker shall be installed at an *approved* location.</u>

Reason: The proposed wording clarifies an important electrical requirement that is already in codes that are referenced by the IMC. (ASME CSD-1).

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

M174-12

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

1006.8-M-SCRIBNER.DOC

M175–12
1007.1, 1007.2, 1007.3

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

1007.1 General. ~~All~~ Steam and hot water boilers shall be protected with a low-water cutoff control <u>except as required by Section 1007.2</u>.

<u>**1007.2 Flow sensing control.** Coil-type and water-tube-type boilers that require forced circulation of water through the boiler shall be protected with a flow sensing control.</u>

1007.~~2~~ <u>3</u> Operation. ~~The~~ Low-water cutoff <u>controls and flow sensing controls required by Sections 1007.1 and 1007.2</u> shall automatically stop the combustion operation of the appliance when the water level drops below the lowest safe water level as established by the manufacturer <u>or when water circulation stops, respectively</u>.

Reason: There is no exception to Section 1007.1 for coil-type hot water supply boilers that require forced circulation and use flow switches to stop combustion when water flow is lost. Flow switches that monitor forced circulation through a water tube- or coil-type boiler provide the same function as a low-water cutoff and should be recognized as an alternative to a low-water cutoff.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

M175-12

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

1007.1-M-STRAUSBAUGH.PMGCAC.DOC

M176–12
1008, 1008.1

Proponent: Gary L. Scribner, Deputy Chief, Missouri Division of Fire Safety, representing the National Board of Boiler & Pressure Vessel Inspectors
(gary.scribner@dfs.dps.mo.gov)

Revise as follows:

SECTION 1008
~~STEAM~~ BOTTOM BLOWOFF VALVE

Revise as follows:

1008.1 General. Every steam boiler shall be equipped with ~~a quick-opening blowoff valve.~~ bottom blowoff valve(s). The valve(s) shall be installed in the opening provided on the boiler. The minimum size of the valve(s) and associated piping shall be the size specified by the boiler manufacturer or the size of the boiler blowoff-valve opening. Where the maximum allowable working pressure of the boiler exceeds 100 psig, two bottom blowoff valves shall be provided consisting of either two slow opening valves in series or one quick opening valve and one slow opening in series with the quick opening valve installed closest to the boiler.

Reason: The proposed wording clarifies the type of valve. The term steam blowoff valve is confused with a safety or safety relieve valve. The proposed wording is consistent with *ASME Boiler & Pressure Vessel Codes* and the *National Board Inspection Code*. The proposed wording is consistent with *ASME Boiler & Pressure Vessel Codes* and *ASME Code for Pressure Piping.* (B31.1).

Cost Impact: This proposed change could have a cost impact of $200 to $2000 depending on the size of the boiler. The cost would include the cost of the valve and labor to install it. Boiler systems that are designed in accordance with the ASME Boiler & Pressure Vessel codes would not be impacted since they already meet this requirement.

M176-12

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

1008-1008.1-M-SCRIBNER.DOC

M177–12
1009.2

Proponent: Gary L. Scribner, State of Missouri/Missouri Division of Fire Safety, the National Board of Boiler & Pressure Vessel Inspectors
(gary.scribner@dfs.dps.mo.gov)

Revise as follows:

1009.2 Closed-type expansion tanks. Closed-type expansion tanks shall be installed in accordance with the manufacturer's instructions. Expansion tanks for systems designed to have an operating pressure in excess of 30 psi shall be constructed and certified in accordance with the ASME *Boiler and Pressure Vessel Codes.* The size of the tank shall be based on the capacity of the hot-water-heating system. The minimum size of the tank shall be determined in accordance with the following equation where all necessary information is known:

(Portions of text not shown remain unchanged.)

The minimum size of the tank shall be determined from Table 1009.2 where all necessary information is not known:

TABLE 1009.2
CLOSED-TYPE EXPANSION TANK SIZING

System Volume In gallons	Tank Capacities in gallons	
	Pressurized Diaphragm Type	Non-Pressurized Type
100	9	15
200	17	30
300	25	45
400	33	60
500	42	75
1,000	83	150
2,000	165	300

Reason: The proposed wording is consistent with *ASME Boiler & Pressure Vessel Codes* Section IV, Paragraph HG-709.2 & Table 709.2.

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

M177-12

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

1009.2-M-SCRIBNER.DOC

M178–12
1011.1

Proponent: Gary L. Scribner, Deputy Chief, Missouri Division of Fire Safety, representing the National Board of Boiler & Pressure Vessel Inspectors
(gary.scribner@dfs.dps.mo.gov)

Revise as follows:

1011.1 Tests. Upon completion of the assembly and installation of boilers and pressure vessels, acceptance tests shall be conducted in accordance with the requirements of the ASME *Boiler and Pressure Vessel Code* <u>or the manufacturer's requirements and such tests shall be *approved*</u>. ~~Where field assembly of pressure vessels or boilers is required, a copy of the completed U-1 Manufacturer's Data Report required by the *ASME Boiler & Pressure Vessel Code* shall be submitted to the code official.~~ <u>A copy of all test documents along with all manufacturer's data reports required by the ASME *Boiler and Pressure Vessel Codes* shall be submitted to the code official.</u>

Reason: Current wording requires a form U1-a which is an ASME manufacturer's data report for a pressure vessel only. There are several manufacturer's data reports depending on the type of vessel and the section of the code the vessel was built to. The proposed meets the current intent of the code without detailing each form required for each type of vessel.

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

M178-12

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

1011.1-M-SCRIBNER.DOC

M179–12
1101.10

Proponent: David R. Scott, AIA, representing Target Corporation.
(David.Scott@Target.com)

Revise as follows:

1101.10 Locking access port caps. Refrigerant circuit access ports located outdoors shall be fitted with locking-type tamper-resistant caps or shall be otherwise secured to prevent unauthorized access.

> **Exception:** This section shall not apply to refrigerant circuit access ports on equipment installed in controlled areas such as on roof tops with locked and alarmed access hatches or doors.

Reason: Building roofs that secure equipment by means of locked and alarmed devices prevent unauthorized access to such areas.

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

M179-12

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

1101.10-M-SCOTT.DOC

M180-12
1101.10

Proponent: Claude Kennedy, Oregon Mechanical Officials Association
(ckennedy@cityofsalem.net)

Revise as follows:

1101.10 Locking access port caps. Refrigerant circuit access ports located outdoors shall be fitted with locking-type tamper-resistant caps or shall be otherwise secured to prevent unauthorized access.

> **Exception:** Refrigerant circuit access ports on roof top units not accessible to the public.

Reason: The purpose of this section is to prevent the inappropriate usage of refrigerant by the public by making access to the refrigerant access ports difficult if not impossible. We feel that placing units in these locations makes access to the ports difficult if not impossible.

Cost Impact: Savings due to not requiring installation of locking caps in unnecessary locations.

M180-12

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

1107.1-M-KENNEDY.DOC

M181–12
1102.3 (NEW)

Proponent: Mona Casey, Founder, United Parents to Restrict Open Access to Refrigerant

Add new text as follows:

1102.3 Access port protection. Refrigerant access ports shall be protected in accordance with Section 1101.10 whenever refrigerant is added to or recovered from refrigeration or air conditioning systems.

Reason: The purpose of the code change proposal is to add requirements to the code for securing refrigerant access ports whenever intrusive access to the refrigeration or air conditioning units are necessary for adding or recovering refrigerant. This change compliments the current requirements in the code.

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

M181-12

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

1102.3(NEW)-M-CASEY.DOC

M182–12
202, Table 1103.1, 1104.1

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

Revise as follows:

SECTION 202
GENERAL DEFINITIONS

FLAMMABILITY CLASSIFICATION. Refrigerants shall be assigned to one of the three classes—1, 2 or 3— and one optional subclass (2L), in accordance with ASHRAE 34. For Classes 2, 2L, and 3, the heat of *combustion* shall be calculated assuming that *combustion* products are in the gas phase and in their most stable state.

Class 1. Refrigerants that do not show flame propagation when tested in air at 14.7 psia (101 kPa) and ~~70~~ 140ºF (~~21~~ 60ºC).

Class 2. Refrigerants having a lower flammability limit (LFL) of more than 0.00625 pound per cubic foot (0.10 kg/m_3) at ~~70~~ 140ºF (~~21~~ 60ºC) and 14.7 psia (101 kPa) and a heat of *combustion* of less than ~~8,174~~ 8169 Btu/lb (19 000 kJ/kg).

Subclass 2L (Optional), Refrigerants that meet the additional condition of having a maximum burning velocity of less than or equal to 3.9 in/s (10 cm/s) when tested at 73.4 ºF (23ºC) and 14.7 psia (101.3 kPa).

Class 3. Refrigerants that are highly flammable, having a LFL of less than or equal to 0.00625 pound per cubic foot (0.10 kg/m_3) at ~~70~~ 140ºF (~~21~~ 60ºC) and 14.7 psia (101 kPa) or a heat of *combustion* greater than or equal to ~~8,174~~ 8169 Btu/lb (19 000 kJ/kg).

OCCUPATIONAL EXPOSURE LIMIT (OEL). The time-weighted average (TWA) concentration for a normal eight-hour workday and a 40-hour workweek to which nearly all workers can be repeatedly exposed without adverse effect, based on the OSHA PEL, ACGIH TLV-TWA, AIHA WEEL, or consistent value.

REFRIGERANT SAFETY CLASSIFICATIONS. Groupings that indicate the toxicity and flammability classes in accordance with Section 1103.1. The classification group is made up of a letter (A or B) that indicates the toxicity class, followed by ~~a number~~ one or two alphanumeric characters (1, 2, 2L or 3) that indicates the flammability class. Refrigerant blends are similarly classified, based on the compositions at their worst cases of fractionation, as separately determined for toxicity and flammability. In some cases, the worst case of fractionation is the original formulation.

Flammability. See "FLAMMABILITY CLASSIFICATION" ~~Class 1 indicates refrigerants that do not show flame propagation in air when tested by prescribed methods at specified conditions. Classes 2 and 3 signify refrigerants with "lower flammability" and "higher flammability," respectively; the distinction depends on both the LFL and heat of *combustion*.~~

Toxicity. See "TOXICITY CLASSIFICATION". ~~Classes A and B signify refrigerants with "lower toxicity" and "higher toxicity," respectively, based on prescribed measures of chronic (long-term, repeated exposures) toxicity.~~

TOXICITY CLASSIFICATION. Refrigerants shall be classified for toxicity to one of two classes in accordance with ASHRAE 34:

Class A. Refrigerants ~~for which toxicity has not been identified at concentrations~~ that have an occupational exposure limit (OEL) of ~~less than or equal to~~ 400 parts per million (ppm) or greater.~~, based on data used to determine Threshold Limit Value-Time-Weighted Average (TLVTWA) or consistent indices.~~

Class B. Refrigerants ~~for which there is evidence of toxicity at concentrations below~~ that have an OEL of less than 400 ppm.~~, based on data used to determine TLV-TWA or consistent indices.~~

[F] TABLE 1103.1
REFRIGERANT CLASSIFICATION, AMOUNT AND OEL

CHEMICAL REFRIGERANT	FORMULA	CHEMICAL NAME OF BLEND	REFRIGERANT CLASSIFICATION	DEGREES OF HAZARD[a]	[M] AMOUNT OF REFRIGERANT PER OCCUPIED SPACE			
					Pounds per 1,000 cubic feet	ppm	g/m^3	OEL[e]
R-11[d]	CCl_3F	trichlorofluoromethane	A1	2-0-0[b]	0.39	1,100	6.2	C1,000
R-12[d]	CCl_2F_2	dichlorodifluoromethane	A1	2-0-0[b]	5.6	18,000	90	1,000
R-13[d]	$CClF_3$	chlorotrifluoromethane	A1	2-0-0[b]	—	—	—	1,000
R-13B1[d]	$CBrF_3$	bromotrifluoromethane	A1	2-0-0[b]	—	—	—	1,000
R-14	CF_4	tetrafluoromethane (carbon tetrafluoride)	A1	2-0-0[b]	25	110,000	400	1,000
R-22	$CHClF_2$	chlorodifluoromethane	A1	2-0-0[b]	13	59,000	210	1,000
R-23	CHF_3	trifluoromethane (fluoroform)	A1	2-0-0[b]	7.3	41,000	120	1,000
R-32	CH_2F_2	Difluoromethane (methylene fluoride)	A2L	—	4.8	36,000	77	1,000
R-113[d]	CCl_2FCClF_2	1,1,2-trichloro-1,2,2-trifluoroethane	A1	2-0-0[b]	1.2	2,600	20	1,000
R-114[d]	$CClF_2CClF_2$	1,2-dichloro-1,1,2,2-tetrafluoroethane	A1	2-0-0[b]	8.7	20,000	140	1,000
R-115	$CClF_2CF_3$	chloropentafluoroethane	A1	—	47	120,000	760	1,000
R-116	CF_3CF_3	hexafluoroethane	A1	1-0-0	34	97,000	550	1,000
R-123	$CHCl_2CF_3$	2,2-dichloro-1,1,1-trifluoroethane	B1	2-0-0[b]	3.5	9,100	57	50
R-124	$CHClFCF_3$	2-chloro-1,1,1,2-tetrafluoroethane	A1	2-0-0[b]	3.5	10,000	56	1,000
R-125	CHF_2CF_3	pentafluoroethane	A1	2-0-0[b]	23	75,000	370	1,000
R-134a	CH_2FCF_3	1,1,1,2-tetrafluoroethane	A1	2-0-0[b]	13	50,000	210	1,000
R-141b	CH_3CCl_2F	1,1-dichloro-1-fluoroethane	—	—	0.78	2,600	12	500
R-142b	CH_3CClF_2	1-chloro-1,1-difluoroethane	A2	—	5.1	20,000	83	1,000
R-143a	CH_3CF_3	1,1,1-trifluoroethane	A2L	2-0-0[b]	4.5	21,000	70	1,000
R-152a	CH_3CHF_2	1,1-difluorethane	A2	1-4-0	2.0	12,000	32	1,000
R-170	CH_3CH_3	ethane	A3	2-4-0	0.54	7,000	8.7	1,000
R-E170	CH_3OCH_3	Methoxymethane (dimethyl ether)	A3	—	1.0	8,500	16	1,000
R-218	$CF_3CF_2CF_3$	octafluoropropane	A1	2-0-0[b]	43	90,000	690	1,000
R-227ea	CF_3CHFCF_3	1,1,1,2,3,3,3-heptafluoropropane	A1	—	36	84,000	580	1,000
R-236fa	$CF_3CH_2CF_3$	1,1,1,3,3,3-hexafluoropropane	A1	2-0-0[b]	21	55,000	340	1,000
R-245fa	$CHF_2CH_2CF_3$	1,1,1,3,3-pentafluoropropane	B1	2-0-0[b]	12	34,000	190	300
R-290	$CH_3CH_2CH_3$	propane	A3	2-4-0	0.56	5,300	9.5	1,000
R-C318	$-(CF_2)_4-$	octafluorocyclobutane	A1	—	41	80,000	660	1,000

(continued)

[F] TABLE 1103.1—continued
REFRIGERANT CLASSIFICATION, AMOUNT AND OEL

CHEMICAL REFRIGERANT	FORMULA	CHEMICAL NAME OF BLEND	REFRIGERANT CLASSIFICATION	DEGREES OF HAZARD[a]	[M] AMOUNT OF REFRIGERANT PER OCCUPIED SPACE			
					Pounds per 1,000 cubic feet	ppm	g/m³	OEL[e]
R-400[d]	zeotrope	R-12/114 (50.0/50.0)	A1	2-0-0[b]	10	28,000	160	1,000
R-400[d]	zeotrope	R-12/114 (60.0/40.0)	A1		11	30,000	170	1,000
R-401A	zeotrope	R-22/152a/124 (53.0/13.0/34.0)	A1	2-0-0[b]	6.6	27,000	110	1,000
R-401B	zeotrope	R-22/152a/124 (61.0/11.0/28.0)	A1	2-0-0[b]	7.2	30,000	120	1,000
R-401C	zeotrope	R-22/152a/124 (33.0/15.0/52.0)	A1	2-0-0[b]	5.2	20,000	84	1,000
R-402A	zeotrope	R-125/290/22 (60.0/2.0/38.0)	A1	2-0-0[b]	~~8.5~~ 17	66,000 ~~33,000~~	270 ~~140~~	1,000
R-402B	zeotrope	R-125/290/22 (38.0/2.0/60.0)	A1	2-0-0[b]	15	63,000	240	1,000
R-403A	zeotrope	R-290/22/218 (5.0/75.0/20.0)	A2	2-0-0[b]	7.6	33,000	120	1,000
R-403B	zeotrope	R-290/22/218 (5.0/56.0/39.0)	A1	2-0-0[b]	18	70,000	290	1,000
R-404A	zeotrope	R-125/143a/134a (44.0/52.0/4.0)	A1	2-0-0[b]	31	130,000	500	1,000
R-405A	zeotrope	R-22/152a/142b/C318 (45.0/7.0/5.5/2.5)	—	—	16	57,000	260	1,000
R-406A	zeotrope	R-22/600a/142b (55.0/4.0/41.0)	A2	—	4.7	21,000	25	1,000
R-407A	zeotrope	R-32/125/134a (20.0/40.0/40.0)	A1	2-0-0[b]	~~18~~ 19	~~78,000~~ 83,000	~~290~~ 300	1,000
R-407B	zeotrope	R-32/125/134a (10.0/70.0/20.0)	A1	2-0-0[b]	~~20~~ 21	~~77,000~~ 79,000	~~320~~ 330	1,000
R-407C	zeotrope	R-32/125/134a (23.0/25.0/52.0)	A1	2-0-0[b]	~~17~~ 18	~~76,000~~ 81,000	~~270~~ 290	1,000
R-407D	zeotrope	R-32/125/134a (15.0/15.0/70.0)	A1	2-0-0[b]	~~15~~ 16	~~65,000~~ 68,000	~~240~~ 250	1,000
R-407E	zeotrope	R-32/125/134a (25.0/15.0/60.0)	A1	2-0-0[b]	~~16~~ 17	~~75,000~~ 80,000	~~260~~ 280	1,000
R-407F	zeotrope	R-32/125/134a (30.0/30.0/40.0)	A1	-	20	95,000	320	1,000
R-408A	zeotrope	R-125/143a/22 (7.0/46.0/47.0)	A1	2-0-0[b]	21	95,000	340	1,000
R-409A	zeotrope	R-22/124/142b (60.0/25.0/15.0)	A1	2-0-0[b]	7.1	29,000	110	1,000
R-409B	zeotrope	R-22/124/142b (65.0/25.0/10.0)	A1	2-0-0[b]	7.3	30,000	120	1,000
R-410A	zeotrope	R-32/125 (50.0/50.0)	A1	2-0-0[b]	~~25~~ 26	~~130,000~~ 140,000	~~390~~ 420	1,000
R-410B	zeotrope	R-32/125 (45.0/55.0)	A1	2-0-0[b]	~~24~~ 27	~~130,000~~ 140,000	~~390~~ 430	1,000
R-411A	zeotrope	R-1270/22/152a (1.5/87.5/11.0)	A2	—	2.9	14,000	46	990
R-411B	zeotrope	R-1270/22/152a	A2	—	2.8	13,000	45	980

		(3.0/94.0/3.0)						
R-412A	zeotrope	R-22/~~3~~218/142b (70.0/5.0/25.0)	A2	—	5.1	22,000	82	1,000
R-413A	zeotrope	R-218/134a/600a (9.0/88.0/3.0)	A2	—	5.8	22,000	94	1,000
R-414A	zeotrope	R-22/124/600a/142b (51.0/28.5/4.0/16.5)	A1	—	6.4	26,000	100	1,000
R-414B	zeotrope	R-22/124/600a/142b (50.0/39.0/1.5/9.5)	A1	—	6.0	23,000	95	1,000

(continued)

[F] TABLE 1103.1—continued
REFRIGERANT CLASSIFICATION, AMOUNT AND OEL

CHEMICAL REFRIGERANT	FORMULA	CHEMICAL NAME OF BLEND	REFRIGERANT CLASSIFICATION	DEGREES OF HAZARD[a]	[M] AMOUNT OF REFRIGERANT PER OCCUPIED SPACE			
					Pounds per 1,000 cubic feet	ppm	g/m^3	OEL[e]
R-415A	zeotrope	R-22/152a (82.0/18.0)	A2	—	2.9 ~~12~~	~~57,000~~ 14,000	47 ~~190~~	1,000
R-415B	zeotrope	R-22/152a (25.0/75.0)	A2	—	2.1 ~~9.3~~	~~52,000~~ 12,000	34 ~~120~~	1,000
R-416A	zeotrope	R-134a/124/600 (59.0/39.5/1.5)	A1	2-0-0[b]	3.9	14,000	62	1,000
R-417A	zeotrope	R-125/134a/600 (46.6/50.0/3.4)	A1	2-0-0[b]	3.5	13,000	56	1,000
R-417B	zeotrope	R-125/134a/600 (79.0/18.3/2.7)	A1	-	4.3	15,000	70	1,000
R-418A	zeotrope	R-290/22/152a (1.5/96.0/2.5)	A2	—	4.8 ~~13~~	~~59,000~~ 22,000	77 ~~200~~	1,000
R-419A	zeotrope	R-125/134a/E170 (77.0/19.0/4.0)	A2	—	4.2 ~~19~~	~~70,000~~ 15,000	67 ~~310~~	1,000
R-420A	zeotrope	R-134a/142b (88.0/~~0~~ 12.0)	A1	2-0-0[b]	12	45,000	190	1,000
R-421A	zeotrope	R-125/134a (58.0/42.0)	A1	2-0-0[b]	17	61,000	280	1,000
R-421B	zeotrope	R-125/134a (85.0/15.0)	A1	2-0-0[b]	21	69,000	330	1,000
R-422A	zeotrope	R-125/134a/600a (85.1/11.5/3.4)	A1	2-0-0[b]	18	63,000	290	1,000
R-422B	zeotrope	R-125/134a/600a (55.0/42.0/3.0)	A1	2-0-0[b]	16	~~26,000~~ 56,000	250	1,000
R-422C	zeotrope	R-125/134a/600a (82.0/15.0/3.0)	A1	2-0-0[b]	18	62,000	290	1,000
R-422D	zeotrope	R-125/134a/600a (65.1/31.5/3.4)	A1	2-0-0[b]	16	58,000	260	1,000
R-423A	zeotrope	R-134a/227ea (52.5/47.5)	A1	2-0-0[c]	19	59,000	310	1,000
R-424A	zeotrope	R-125/134a/600a/600/601a (50.5/47.0/0.9/1.0/0.6)	A1	2-0-0[b]	6.2	23,000	100	970
R-425A	~~zoetrope~~ zeotrope	R-32/134a/227ea (18.5/69.5/12.0)	A1	2-0-0[b]	16	~~67,000~~ 72,000	~~250~~ 260	1,000
R-426A	zeotrope	R-125/134a/600~~a~~/601a (5.1/93.0/1.3/0.6)	A1	—	5.2	20,000	83	990
R-427A	zeotrope	R-32/125/143a/134a (15.0/25.0/10.0/50.0)	A1	—	18	~~76,000~~ 79,000	~~280~~ 290	1,000

R-428A	zeotrope	R-125/143a/290/600a (77.5/20.0/0.6/1.9)	A1	—	23	83,000	370	1,000
R-429A	zeotrope	R-E170/152a/600a (60.0/10.0/30.0)	A3	—	0.81	6,300	13	1,000
R-430A	zeotrope	R-152a/600a (76.0/24.0)	A3	—	1.3	8,000	21	1,000
R-431A	zeotrope	R-290/152a (71.0/29.0)	A3	—	0.69	5,500	11	1,000
R-432A	zeotrope	R-1270/E170 (80.0/20.0)	A3	—	0.13	1,200	2.1	~~710~~ 700
R-433A	zeotrope	R-1270/290 (30.0/70.0)	A3	—	0.34	3,100	5.5	880
R-433B	zeotrope	R-1270/290 (5.0/95.0)	A3	—	0.51	4,500	8.1	950
R-433C	zeotrope	R-1270/290 (25.0/75.0)	A3	—	0.41	3,600	6.6	790
R-434A	zeotrope	R-125/143a/600a (63.2/18.0/16.0/2.8)	A1	—	20	73,000	320	1,000
R-435A	zeotrope	R-E170/152a (80.0/20.0)	A3	—	1.1	8,500	17	1,000
R-436A	zeotrope	R-290/600a (56.0/44.0)	A3	—	0.50	4,000	8.1	1,000
R-436B	zeotrope	R-290/600a (52.0/48.0)	A3	—	0.51	4,000	8.1	1,000
R-437A	zeotrope	R-125/134a/600/601 (19.5/78.5/1.4/0.6)	A1	—	5.0	19,000	~~81~~ 82	990
R-438A	zeotrope	R-32/125/134a/600/601a (8.5/45.0/44.2/1.7/0.6)	A1	-	4.9	~~19,000~~ 20,000	79	990
R-439A	zeotrope	R-32/125/600a (50.0/47.0/3.0)	A2	-	4.7	26,000	76	990
R-440A	zeotrope	R-290/134a/152a (0.6/1.6/97.8)	A2	-	1.9	12,000	31	1,000
R-441A	zeotrope	R-170/290/600a/600 (3.1/54.8/6.0/36.1)	A3	-	0.39	3,200	6.3	1,000
R-442A	zeotrope	R-32/125/134a/152a/227ea (31.0/31.0/30.0/3.0/5.0)	A1	-	21	100,000	330	1,000

(continued)

BLE 1103.1—continued
REFRIGERANT CLASSIFICATION, AMOUNT AND OEL

CHEMICAL REFRIGERANT	FORMULA	CHEMICAL NAME OF BLEND	REFRIGERANT CLASSIFICATION	DEGREES OF HAZARD[a]	[M] AMOUNT OF REFRIGERANT PER OCCUPIED SPACE			
					Pounds per 1,000 cubic feet	ppm	g/m^3	OEL[e]
R-500[e]	azeotrope	R-12/152a (73.8/26.2)	A1	2-0-0[b]	7.6	30,000	120	1,000
R-501[d]	azeotrope	R-22/12 (75.0/25.0)	A1	—	13	54,000	210	1,000
R-502[e]	azeotrope	R-22/115 (48.8/51.2)	A1	2-0-0[b]	21	73,000	330	1,000
R-503[e]	azeotrope	R-23/13 (40.1/59.9)	—	2-0-0[b]	—	—	—	1,000
R-504[d]	azeotrope	R-32/115 (48.2/51.8)	—	—	~~29~~ 28	140,000	~~460~~ 450	1,000
R-507A	azeotrope	R-125/143a (50.0/50.0)	A1	2-0-0[b]	32	130,000	520	1,000
R-508A	azeotrope	R-23/116 (39.0/61.0)	A1	2-0-0[b]	14	55,000	220	1,000
R-508B	azeotrope	R-23/116 (46.0/54.0)	A1	2-0-0[b]	13	52,000	200	1,000
R-509A	azeotrope	R-22/218 (44.0/56.0)	A1	2-0-0[b]	24	75,000	390	1,000
R-510A	azeotrope	R-E170/600a (88.0/12.0)	A3	—	0.87	7,300	14	1,000
R-511A	azeotrope	R-290/E170 (95.0/5.0)	A3	-	0.59	5,300	9.5	1,000
R-512A	azeotrope	R-134a/152a (5.0/95.0)	A2	-	1.9	11,000	31	1,000
R-600	$CH_3CH_2CH_2CH_3$	butane	A3	1-4-0	0.15	1,000	2.4	1,000
R-600a	$CH(CH_3)_2CH_3$	2-methylpropane (isobutane)	A3	2-4-0	0.59 ~~0.6~~	4,000	9.6	1,000
R-601	$CH_3CH_2CH_2$ CH_2 CH_3	pentane	A3	—	0.18 ~~0.2~~	1,000	2.9	600
R-601a	$(CH_3)_2CHCH_2CH_3$	2-methylbutane (isopentane)	A3	—	0.18 ~~0.2~~	1,000	2.9	600
R-717	NH_3	ammonia	B2L	3-3-0[c]	0.014	320	0.22	25
R-718	H_2O	water	A1	0-0-0	—	—	—	—
R-744	CO_2	carbon dioxide	A1	2-0-0[b]	4.5	40,000	72	5,000
R-1150	CH_2=CH_2	ethene (ethylene)	A3	1-4-2	—	—	—	200
R-1234yf	CF_3CF=CH_2	2,3,3,3-tetrafluoro-1 propene	A2L	—	4.7	16,000	75	500
R-1234ze(E)	CF_3CH=CHF	trans-1,3,3,3-tetrafluoro-1-propene	A2L	-	4.7	16,000	75	800
R-1270	CH_3CH=CH_2	~~P~~propene (propylene)	A3	1-4-1	0.11	1,000	1.7	500

For SI: 1 pound = 0.454 kg, 1 cubic foot = 0.0283 m^3.

a. Degrees of hazard are for health, fire, and reactivity, respectively, in accordance with NFPA 704.

b. Reduction to 1-0-0 is allowed if analysis satisfactory to the code official shows that the maximum concentration for a rupture or full loss of refrigerant charge would not exceed the IDLH, considering both the refrigerant quantity and room volume.

c. For installations that are entirely outdoors, use 3-1-0.

d. Class I ozone depleting substance; prohibited for new installations.

e. Occupational Exposure Limit based on the OSHA PEL, ACGIH TLV-TWA, the AIHA WEEL or consistent value on a time-weighted average (TWA) basis (unless noted C for ceiling) for an 8 hr/d and 40 hr/wk.

SECTION 1104
SYSTEM APPLICATION REQUIREMENTS

1104.1 General. The refrigerant, *occupancy* and system classification cited in this section shall be determined in accordance with Sections 1103.1, 1103.2 and 1103.3, respectively. ~~For refrigerant blends assigned dual classifications, as formulated and for the worst case of fractionation, the classifications for the worst case of fractionation shall be used.~~

Reason: ASHRAE recently added a new flammability classification, "2L", to ANSI/ASHRAE Standard 34, Designation and Safety Classification of Refrigerants. Refrigerants classified as 2L meet the requirements for class 2 refrigerants and have a burning velocity of less than 3.9 in/s (10 cm/s). These refrigerants, while flammable, are difficult to ignite and have unstable flames that are easy to extinguish. The new classification was established to differentiate these refrigerants from other Class 2 refrigerants that burn more rapidly and present a larger risk if ignited. This change was precipitated by the need for refrigerants with a lower global warming potential, some of which are mildly flammable. A separate code change proposal is being submitted by ASHRAE based on changes to Standard 15, Safety Standard for Refrigeration Systems, that will provide the requirements for the use of class 2L refrigerants. The changes resulting from the additional of the new safety classification are included below along with other changes to update the IMC with new refrigerants and to correct some of the data in Table 1103.1.

Section 202, GENERAL DEFINITIONS

The definition of FLAMMABILITY CLASSIFICATION is being updated to include the 2L classification. This is being added as an optional subclass of Class 2 so that only those manufacturers that want their refrigerant classified as 2L will have to measure the burning velocity. The test temperature for determining flame propagation and for measuring the LFL of a refrigerant has been increased to be consistent to be consistent with common practice today and with the requirements of ANSI/ASHRAE Standard 34. The higher test temperature is a more conservative measure of the LFL.

The DEFINITION OF TOXICITY CLASSIFICATION is being modified to make it easier to understand. This is an editorial change and does not result in a change to the toxicity classification of any refrigerants in table 1103.1

A definition of OCCUPATIONAL EXPOSURE LIMITS (OEL) is being added because it used to determine the toxicity classification of a refrigerant. This is a generic term, and allows the use of OELs from various organizations that evaluate the toxicity of refrigerants and publish exposure limits, e.g. Workplace Environmental Exposure Limit (WEEL) from the American Industrial Hygiene Association (AHIA), Threshold Limit Values – Time Weighted Average (TLV-TWA) from the American Conference of Governmental Industrial Hygienists (ACGIH), Permissible Exposure Limits (PEL) from the National Institute for Occupational Safety and Health (NIOSH).

The definition for REFRIGERANT SAFETY CLASSIFICATIONS is being updated to include the new 2L flammability safety classification. The portions of this definition related to flammability classification and toxicity classification refer the reader to the other definitions rather than repeating the information as part of this definition as is done in the 2012 IMC.

Table 1103.1 REFRIGERANT CLASSIFICATION, AMOUNT AND OEL

Several new refrigerants have been developed to replace ozone depleting substances and/or to replace refrigerants with a high global warming potential. Nine refrigerants have been added to ANSI/ASHRAE Standard 34 since publication of the 2012 IMC. These refrigerants are: R-407F, R-417B, R-439A, R-440A, R-441A, R-442A, R-511A, R-512A, and R-1234ze(E)

Corrections were made to the amount of refrigerant per occupied space for R-152a, R-E170, R-402A, R-415A, R-415B, R-417B, R-418A, R-419A, R-422B, R-436A, R-436B, R-437A, R-511A, R-512A, R-600, R-600a, R-601, R-601a, and R-1270. These changes are being made to correct errors in the 2012 IMC.

The cardiac sensitization NOEL for R-32 has been changed from 200,000 ppm to 350,000 ppm based on more recent studies using acceptable GLP methodology. This had no effect on the amount of refrigerant per occupied space for R-32 but did result in changes to the amount of refrigerant per occupied space for refrigerant blends containing R-32 and these have been changed accordingly (i.e. R-407A, R-407B, R-407C, R-407D, R-407E, R-410A, R-410B, R-425A, R-427A, R-438A, and R-504).

The flammability safety classifications for R-32, R-143a, R-717, and R-1234yf have been changed from 2 to 2L to reflect the addition of this new classification to ASHRAE Standard 34 for refrigerants which meet the criteria for class 2 and have a burning velocity of 3.9 in/s (10cm/s). One new refrigerant, R-1234ze(E), also has a flammability classification of 2L.

The compositions of several refrigerant blends have been updated to include the appropriate number of significant figures.

SECTION 1104, SYSTEM APPLIATION REQUIREMENTS

The sentence referring to refrigerant blends with dual classifications is being deleted since the industry no longer assigns dual classifications to refrigerant blends. Today, the worst case fractionated formulation is used to determine a single safety classification for refrigerant blends and therefore the bends have a single classification.

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

M182-12

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

202-FLAMMABILITY CLASSIFICATION-M-FERGUSON.DOC

M183–12
1104.4.1

Proponent: Paul L. Doppel, Director of Industry and Government Relations, Mitsubishi Electric and Electronics USA, Inc., representing himself
(pdoppel@hvac.mea.com)

Revise as follows:

1104.4.1 Noncommunicating spaces. Where the refrigerant-containing parts of a system are located in one or more spaces that do not communicate through permanent openings or HVAC ducts, the volume of the smallest enclosed occupied space shall be used to determine the permissible quantity of refrigerant in the system. <u>Where two enclosed occupied spaces communicate through openings such as under-cut doors or transfer grilles and such openings have an area of 0.15% or more of the total floor area of the smaller enclosed occupied space in which refrigerant-containing parts are located, the two spaces shall be considered as one space.</u>

Reason: Paragraph 1104.4.1, as written, does not give enough guidance as to the allowable opening, other than HV AC ducts that allow two spaces to be considered as communication spaces. The proposed addition is based on JAPANESE STANDARD; JRA-GL13. The specific reference to"0.15% of the floor area" is used in the Mitsubishi Electric Data Book for the Mitsubishi Variable Refrigerant Flow systems as guidance for engineers using these VRF systems. This reference has been in the Mitsubishi data books and engineering manuals for many years.

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

M183-12

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

1104.4.1-M-DOPPEL.DOC

M184–12
1106.3

Proponent: Jeffrey Shapiro, International Code Consultants, representing International Institute of Ammonia Refrigeration
(jeff.shapiro@intlcodeconsultants.com)

Revise as follows:

1106.3 Ammonia room ventilation. Ventilation systems in ammonia machinery rooms shall be operated continuously at the ~~emergency~~ ventilation rate specified in ~~determined in~~ ~~accordance with~~ Section 1105.6.3~~.2~~.

Exceptions:

1. Machinery rooms equipped with a vapor detector that will automatically start the ventilation system at the ~~emergency~~ ventilation rate specified in ~~determined in accordance with~~ Section 1105.6.3~~.2~~, and that will actuate an alarm at a detection level not to exceed 1,000 ppm; or
2. Machinery rooms conforming to the Class 1, Division 2, *hazardous location* classification requirements of NFPA 70.

Reason: Editorial correction. A change to the 2009 code revised the ventilation rate requirements for ammonia, and the provisions are now contained in Section 1105.6.3.

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

M184-12

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

1106.3-M-SHAPIRO.DOC

M185–12
1107.1, Chapter 15

Proponent: Walter J. Sperko, Sperko Engineering Services, Inc. representing Mechanical Contractors Association of America
(Sperko@asme.org)

Revise as follows:

1107.1 General. <u>The design of refrigerant piping shall be in accordance with ASME B31.5.</u> ~~All~~ Refrigerant piping shall be installed, tested and placed in operation in accordance with this chapter.

Add new standard to Chapter 15 as follows:

<u>ASME B31.5-2001 Refrigerant Piping and Heat Transfer Components</u>

Reason: The present rules have no requirements for design, analysis, supports, stress limits or anything else regarding design of refrigerant piping. B31.5 is specifically written for refrigeration piping and provides appropriate design requirements. The addition of this requirement does not conflict with existing requirements in this chapter since it only governs design of the piping.

Cost Impact: None. Designers should be following B31.5 or similar standard already. Jurisdiction will not have to buy copies of B31.5 since the engineer will have to have a copy to demonstrate compliance and the change would not affect installation requirements.

Analysis: A review of the standard proposed for inclusion in the code, [ASME B31.5-2001] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M185-12

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

1107.1-M-SPERKO.DOC

M186–12
1201.1

Proponent: Ed Flanagan/Mike Quiroz for Tim Sharp, Business Manager/Secretary-Treasurer, Alaska District Council of Laborers, representing the local unions and members of the Laborers Int'l Union of North America in the state of Alaska

Revise as follows:

1201.1 Scope. The provisions of this chapter shall govern the construction, installation, alteration and repair of hydronic piping systems within buildings. This chapter shall apply to hydronic piping systems that are within buildings and that are part of heating, ventilation, and air conditioning systems. Such piping systems shall include steam, hot water, chilled water, and steam condensate ~~and ground source heat pump loop~~ systems. Potable cold and hot water distribution systems shall be installed in accordance with the International Plumbing Code.

Reason: Some jurisdictions have interpreted the scope of Chapter 12 to assert applicability of the IMC to the loop fields associated with Ground Source Heat Pump installations. The IMC should regulate the pump and interior hydronic piping associated with it, but not the exterior piping of the earth connection/loop field.

Cost Impact: Costs to building or project owners should be reduced due to the cost effectiveness and efficiency gained by allowing general or utility contractors and their qualified workers (Laborer Pipelayers) to perform the heat fusion and installation of this exterior piping.

M186-12

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

1201.1-M-FLANAGAN-QUIR0Z.DOC

M187–12
1202.3

Proponent: Steven J. Clark, P.E., Aquatherm, self (steve.clark@aquathermpipe.com)

Revise as follows:

1202.3 Material rating. Materials shall be rated for the operating temperature and pressure of the hydronic system. Materials shall be suitable for the type of fluid in the hydronic system<u>, including water, glycols, and polyolester oil and other HVAC system oils.</u>

Reason: Purpose of Code Change – To avoid system failures as a direct result of using incompatible materials.

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

M187-12

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

1202.3-M-CLARK.DOC

M188–12

Table 1202.4, 1203.15, 1208, 1210 (NEW), 1211 (NEW), 1212 (NEW), 1213 (NEW), 1214 (NEW), 1215 (NEW), 1216 (NEW), Chapter 15

Proponent: Michael Cudahy, Plastic Pipe and Fittings Association
(mikec@cmservnet.com)

Revise as follows:

TABLE 1202.4
HYDRONIC PIPE

MATERIAL	STANDARD (see Chapter 15)
~~Polyethylene (PE) pipe, tubing and fittings (for ground source heat pump loop systems)~~	~~ASTM D 2513; ASTM D 3035; ASTM D 2447; ASTM D 2683; ASTM F 1055; ASTM D 2837; ASTM D 3350; ASTM D 1693~~

Portions of table not shown remain unchanged

~~**1203.15 Polyethylene plastic pipe and tubing for ground source heat pump loop systems.** Joints between polyethylene plastic pipe and tubing or fittings for ground source heat pump loop systems shall be heat fusion joints conforming to Section 1203.15.1, electrofusion joints conforming to Section 1203.15.2, or stab-type insertion joints conforming to Section 1203.15.3.~~

~~**1203.15.1 Heat-fusion joints.** Joints shall be of the socket-fusion, saddle-fusion or butt-fusion type, joined in accordance with ASTM D 2657. Joint surfaces shall be clean and free of moisture. Joint surfaces shall be heated to melt temperatures and joined. The joint shall be undisturbed until cool. Fittings shall be manufactured in accordance with ASTM D 2683 or ASTM D 3261.~~

~~**1203.15.2 Electrofusion joints.** Joints shall be of the electrofusion type. Joint surfaces shall be clean and free of moisture, and scoured to expose virgin resin. Joint surfaces shall be heated to melt temperatures for the period of time specified by the manufacturer. The joint shall be undisturbed until cool. Fittings shall be manufactured in accordance with ASTM F 1055.~~

~~**1203.15.3 Stab-type insert fittings.** Joint surfaces shall be clean and free of moisture. Pipe ends shall be chamfered and inserted into the fittings to full depth. Fittings shall be manufactured in accordance with ASTM F 1924.~~

SECTION 1208
TESTS

1208.1 General. Hydronic piping systems ~~other than groundsource heat pump loop systems~~ shall be tested hydrostatically at one and one-half times the maximum system design pressure, but not less than 100 psi (689 kPa). The duration of each test shall be not less than 15 minutes, but not more than 20 minutes. ~~Ground-source heat pump loop systems shall be tested in accordance with Section 1208.1.1.~~

~~**1208.1.1 Ground source heat pump loop systems.** Before connection (header) trenches are backfilled, the assembled loop system shall be pressure tested with water at 100 psi (689 kPa) for 30 minutes with no observed leaks. Flow and pressure loss testing shall be performed and the actual flow rates and pressure drops shall be compared to the calculated design values. If actual flow rate or pressure drop values differ from calculated design values by more than 10 percent, the problem shall be identified and corrected.~~

SECTION 1210
GROUND-SOURCE HEAT PUMP LOOP SYSTEMS

1210.1 Ground-Source Heat Pump-Loop Water Piping. Ground source heat pump ground loop-piping and tubing material for water-based systems shall conform to the standards cited in this section.

1210.2 Used materials. Reused pipe, fittings, valves, and other materials shall not be permitted in ground-source heat pump loop systems.

1210.3 Material rating. Pipe and tubing shall be rated for the operating temperature and pressure of the ground source heat pump-loop system. Fittings shall be suitable for the pressure applications and recommended by the manufacturer for installation with the pipe and tubing material installed. Where used underground, materials shall be suitable for burial.

1210.4 Piping and tubing materials standards. Ground source heat pump ground-loop pipe and tubing shall conform to the standards listed in Table 1210.4.

TABLE 1210.4
GROUND SOURCE LOOP PIPE

MATERIAL	STANDARD (see Chapter 15)
Chlorinated polyvinyl chloride (CPVC)	ASTM D2846; ASTM F441; ASTM F442
Cross-linked polyethylene (PEX)	ASTM F876; ASTM F877 CSA B137.5
Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe	ASTM F1282; CSA B137.9
High Density Polyethylene (HDPE)	ASTM D3035; ASTM D2737; ASTM F714; AWWA C901; CSA B137.1; CSA C448
Polypropylene (PP-R)	ASTM F2389; CSA B137.11
Polyvinyl chloride (PVC)	ASTM D1785; ASTM D2241
Raised temperature polyethylene (PE-RT)	ASTM F2623

1210.5 Fittings. Ground source heat pump pipe fittings shall be approved for installation with the piping materials to be installed, shall conform to the standards listed in Table 1210.5 and if installed underground shall be suitable for burial.

TABLE 1210.5
GROUND SOURCE LOOP PIPE FITTINGS

PIPE MATERIAL	STANDARD (see Chapter 15)
Chlorinated polyvinyl chloride (CPVC)	ASTM D 2846; ASTM F437; ASTM F438; ASTM F439; CSA B137.6
Cross-linked polyethylene (PEX)	ASTM F 877; ASTM F1807; ASTM F 1960; ASTM F 2080; ASTM F2159; ASTM F2434; CSA B137.5
Polyethylene/aluminum/polyethylene (PE-AL-PE)	ASTM F 2434; ASTM F1282, CSA B137.9
High Density Polyethylene (HDPE~~)~~	ASTM D2683; ASTM D3261;

PIPE MATERIAL	STANDARD (see Chapter 15)
	ASTM F1055; CSA B137.1; CSA C448
Polypropylene (PP-R)	ASTM F2389; CSA B137.11
Polyvinyl chloride (PVC)	ASTM D2464; ASTM D2466; ASTM D2467; CSA B137.2; CSA B137.3
Raised temperature polyethylene (PE-RT)	ASTM D3261; ASTM F1807; ASTM F2159; B137.1

SECTION 1211
JOINTS AND CONNECTIONS

1211.1 Approval. Joints and connections shall be of an approved type. Joints and connections shall be tight for the pressure of the ground source -loop system. Joints used underground shall be approved for buried applications.

1211.1.1 Joints between different piping materials. Joints between different piping materials shall be made with approved transition fittings.

1211.2 Preparation of pipe ends. Pipe shall be cut square, reamed, and shall be free of burrs and obstructions. CPVC, PE, and PVC pipe shall be chamfered. Pipe ends shall have full-bore openings and shall not be undercut.

1211.3 Joint preparation and installation. Where required by Sections 1211.4 through 1211.6, the preparation and installation of mechanical and thermoplastic-welded joints shall comply with Sections 1211.3.1 and 1211.3.2.

1211.3.1 Mechanical joints. Mechanical joints shall be installed in accordance with the manufacturer's instructions.

1211.3.2 Thermoplastic-welded joints. Joint surfaces for thermo plastic-welded joints shall be cleaned by an approved procedure. Joints shall be welded in accordance with the manufacturer's instructions.

1211.4 CPVC plastic pipe. Joints between CPVC plastic pipe or fittings shall be solvent-cemented or threaded joints complying with Section 1203.3.

1211.5 Cross-linked polyethylene (PEX) plastic tubing. Joints between cross-linked polyethylene plastic tubing and fittings shall comply with Sections 1211.4.1 and 1211.4.2. Mechanical joints shall comply with Section 1211.3.

1211.5.1 Compression-type fittings. Where compression- type fittings include inserts and ferrules or O-rings, the fittings shall be installed without omitting the inserts and ferrules or O-rings.

1211.5.2 Plastic-to-metal connections. Soldering on the metal portion of the system shall be performed at least 18 inches (457 mm) from a plastic-to-metal adapter in the same water line.

1211.6 Polyethylene plastic pipe and tubing for ground source heat pump loop systems. Joints between polyethylene plastic pipe and tubing or fittings for ground source heat pump loop systems shall be heat fusion joints complying with Section 1211.6.1, electrofusion joints complying with Section 1211.6.2, or stab-type insertion joints complying with Section 1211.6.3.

1211.6.1 Heat-fusion joints. Joints shall be of the socket-fusion, saddle-fusion or butt-fusion type, joined in accordance with ASTM D 2657. Joint surfaces shall be clean and free of moisture. Joint surfaces shall be heated to melt temperatures and joined. The joint shall be undisturbed until cool. Fittings shall be manufactured in accordance with ASTM D 2683 or ASTM D 3261.

1211.6.2 Electrofusion joints. Joints shall be of the electrofusion type. Joint surfaces shall be clean and free of moisture, and scoured to expose virgin resin. Joint surfaces shall be heated to melt temperatures for the period of time specified by the manufacturer. The joint shall be undisturbed until cool. Fittings shall be manufactured in accordance with ASTM F 1055.

1211.6.3 Stab-type insert fittings. Joint surfaces shall be clean and free of moisture. Pipe ends shall be chamfered and inserted into the fittings to full depth. Fittings shall be manufactured in accordance with ASTM F 1924.

1211.7 Polypropylene (PP) plastic. Joints between PP plastic pipe and fittings shall comply with Sections 1211.7.1 and 1211.7.2.

1211.7.1 Heat-fusion joints. Heat-fusion joints for polypropylene (PP) pipe and tubing joints shall be installed with socket-type heat-fused polypropylene fittings, electrofusion polypropylene fittings or by butt fusion. Joint surfaces shall be clean and free from moisture. The joint shall be undisturbed until cool. Joints shall be made in accordance with ASTM F 2389.

1211.7.2 Mechanical and compression sleeve joints. Mechanical and compression sleeve joints shall be installed in accordance with the manufacturer's instructions.

1211.8 Raised temperature polyethylene (PE-RT) plastic tubing. Joints between raised temperature polyethylene tubing and fittings shall complying with Sections 1211.8.1 and 1211.8.2. Mechanical joints shall comply with Section 1211.3.

1211.8.1 Compression-type fittings. Where compression-type fittings include inserts and ferrules or O-rings, the fittings shall be installed without omitting the inserts and ferrules or O-rings.

1211.8.2 PE-RT-to-metal connections. Solder joints in a metal pipe shall not occur within 18 inches (457 mm) of a transition from such metal pipe to PE-RT pipe.

1211.9 PVC plastic pipe. Joints between PVC plastic pipe and fittings shall be solvent-cemented or threaded joints comply with Section 1203.3.

SECTION 1212
VALVES

1212.1 Where required. Shutoff valves shall be installed in ground source-loop piping systems in the locations indicated in Sections 1212.1.1 through 1212.1.6.

1212.1.1 Heat exchangers. Shutoff valves shall be installed on the supply and return side of a heat exchanger.

> **Exception:** Shutoff valves shall not be required where heat exchangers are integral with a boiler or are a component of a manufacturer's boiler and heat exchanger packaged unit and are capable of being isolated from the hydronic system by the supply and return valves required by Section 1005.1.

1212.1.2 Central systems. Shutoff valves shall be installed on the building supply and return of a central utility system.

1212.1.3 Pressure vessels. Shutoff valves shall be installed on the connection to any pressure vessel.

1212.1.4 Pressure-reducing valves. Shutoff valves shall be installed on both sides of a pressure-reducing valve.

1212.1.5 Equipment and appliances. Shutoff valves shall be installed on connections to mechanical *equipment* and appliances. This requirement does not apply to components of a ground source loop system such as pumps, air separators, metering devices, and similar *equipment*.

1212.1.6 Expansion tanks. Shutoff valves shall be installed at connections to nondiaphragm-type expansion tanks.

1212.2 Reduced pressure. A pressure relief valve shall be installed on the low-pressure side of a hydronic piping system that has been reduced in pressure. The relief valve shall be set at the maximum pressure of the system design. The valve shall be installed in accordance with Section 1006.

SECTION 1213
PIPING INSTALLATION

1213.1 General. Piping, valves, fittings, and connections shall be installed in accordance with the conditions of approval.

1213.3 Protection of potable water. Where ground source heat pump ground loop systems have a connection to a potable water supply, the potable water system shall be protected from backflow in accordance with the *International Plumbing Code*.

1213.4 Pipe penetrations. Openings for pipe penetrations in walls, floors and ceilings shall be larger than the penetrating pipe. Openings through concrete or masonry building elements shall be sleeved. The annular space surrounding pipe penetrations shall be protected in accordance with the *International Building Code*.

1213.5 Clearance from combustibles. A pipe in a ground source heat pump piping system having an exterior surface temperature exceeding 250°F (121°C) shall have a minimum *clearance* of 1 inch (25 mm) from combustible materials.

1213.6 Contact with building material. A ground source heat pump ground-loop piping system shall not be in direct contact with building materials that cause the piping or fitting material to degrade or corrode, or that interfere with the operation of the system.

1213.7 Strains and stresses. Piping shall be installed so as to prevent detrimental strains and stresses in the pipe. Provisions shall be made to protect piping from damage resulting from expansion, contraction and structural settlement. Piping shall be installed so as to avoid structural stresses or strains within building components.

1213.7.1 Flood hazard. Piping located in a flood hazard area shall be capable of resisting hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to the *design flood elevation*.

1213.8 Pipe support. Pipe shall be supported in accordance with Section 305.

1213.9 Velocities. Ground source heat pump ground-loop systems shall be designed so that the flow velocities do not exceed the maximum flow velocity recommended by the pipe and fittings manufacturer and shall be controlled to reduce the possibility of water hammer.

1213.10 Labeling and Marking. Ground source heat pump ground-loop system piping shall be marked with tape, metal tags or other method where it enters a building indicating "GROUND SOURCE HEAT PUMP-LOOP SYSTEM". The marking shall indicate any antifreeze used in the system by name and concentration.

1213.11 Chemical Compatibility. Antifreeze and other materials used in the system shall be chemically compatible with the pipe, tubing, fittings, and mechanical systems.

SECTION 1214
WORKING FLUID

1214.1 Makeup water. The transfer fluid shall be compatible with the makeup water supplied to the system.

SECTION 1215
TESTS

1215.1 Ground source heat pump loop systems. Before connection header trenches are backfilled, the assembled loop system shall be pressure tested with water at 100 psi (689 kPa) for 30 minutes, but not more than 35 minutes, with no observed leaks. Flow and pressure loss testing shall be performed and the actual flow rates and pressure drops shall be compared to the calculated design values. If actual flow rate or pressure drop values differ from calculated design values by more than 10 percent, the cause shall be identified and corrective action taken.

SECTION 1216
EMBEDDED PIPING

1216.1 Pressurizing during installation. Ground source heat pump ground loop piping to be embedded in concrete shall be pressure tested prior to pouring concrete. During pouring, the pipe shall be maintained at the proposed operating pressure.

Add new standard as follows:

CSA C448 SERIES-02-CAN/CSA-2002
Design and Installation of Earth Energy Systems - First Edition; Update 2: October 2009; Consolidated Reprint 10/2009

Reason: Water based geothermal PE piping is currently listed in the hydronics section where it doesn't quite fit. This special and growing application should have its own section, and it should cover other materials that could potentially be used. Green building rating systems are promoting geothermal ground loop heating and cooling systems, and the code should have more information. I am re-introducing this proposal to accomplish that and would accept friendly amendments to it for any other materials. While HDPE dominates the water based technology with an expected 95% of the systems, other materials can be utilized. Copper is used in direct expansion systems that do not run on water.

Cost Impact: None

Analysis: A review of the standard proposed for inclusion in the code, [CSA C448 SERIES-02-CAN/CSA-2002] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M188-12

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

T1202.4-M-CUDAHY.DOC

M189–12
Table 1202.4, Chapter 15

Proponent: James Gilchrist, P.E., Georg Fischer Sloane, LLC, representing GF Piping Systems (jim.gilchrist@georgfischer.com)

Revise as follows:

Table 1202.4
HYDRONIC PIPE

MATERIAL	STANDARD (see Chapter 15)
Acrylonitrile butadiene styrene (ABS) plastic pipe	ASTM D 1527; ~~ASTM D 2282~~ F2806
……	
~~Polybutylene (PB) plastic pipe and tubing~~	~~ASTM D3309~~
……	
Polyethylene (PE) pipe, tubing and fittings (for ground source heat pump loop systems)	ASTM D 2513; ASTM D 3035; ~~ASTM D 2447~~; ASTM D 2683; ASTM F 1055; ~~ASTM D 2837~~; ~~ASTM D 3350;~~ ~~ASTM D 1693~~
…..	

Portions not shown remain unchanged.

Add new standard to Chapter 15 as follows:

ASTM F2806-10
Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe (Metric SDR-PR)

Reason: Updates to this table are needed so that it is aligned with current ASTM standards for plastic pipe and fittings. Also, several standards are included which are incorporated into product standards but are not product standards themselves. For clarity these should be removed.

-D2282 was withdrawn in 2007 without replacement. ASTM F2806-10e1, "Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe (Metric SDR-PR)," was approved in 2010.
-D3309 was withdrawn in 2010 without replacement. Polybutylene pipe is not currently manufactured or used in the United States for this application.
-D2447 was withdrawn in 2010 without replacement.
-ASTM D2837 - 11 "Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials or Pressure Design Basis for Thermoplastic Pipe Products," is a test method, not a specification for PE pipe and fittings.
-ASTM D3350 - 10a "Standard Specification for Polyethylene Plastics Pipe and Fittings Materials," is a specification for materials, not finished product.
-ASTM D1693 - 08 "Standard Test Method for Environmental Stress-Cracking of Ethylene Plastics," is a test method, not a specification for PE pipe and fittings.

Copy of new standard, ASTM F2806-10e1, is attached in PDF form.

Cost Impact: The code change proposal will not increase the cost of construction. The change only aligns the code with current ASTM standards.

Analysis: A review of the standard proposed for inclusion in the code, [ASTM F2806-10] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M189-12

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

T1202.4#2-M-GILCHRIST.DOC

M190–12
TABLE 1202.4, 1203.15, 1208, 1210-1216 (NEW), Chapter 15

Proponent: Jeremy Brown, NSF International,
(brown@nsf.org)

Revise as follows:

TABLE 1202.4
HYDRONIC PIPE

MATERIAL	STANDARD (see Chapter 15)
~~Polyethylene (PE) pipe, tubing and fittings (for ground source heat pump loop systems)~~	~~ASTM D 2513; ASTM D 3035; ASTM D 2447; ASTM D 2683; ASTM F 1055; ASTM D 2837; ASTM D 3350; ASTM D 1693~~

Other sections of table unchanged

~~**1203.15 Polyethylene plastic pipe and tubing for ground source heat pump loop systems.** Joints between polyethylene plastic pipe and tubing or fittings for ground source heat pump loop systems shall be heat fusion joints conforming to Section 1203.15.1, electrofusion joints conforming to Section 1203.15.2, or stab-type insertion joints conforming to Section 1203.15.3.~~

~~**1203.15.1 Heat-fusion joints.** Joints shall be of the socket-fusion, saddle-fusion or butt-fusion type, joined in accordance with ASTM D 2657. Joint surfaces shall be clean and free of moisture. Joint surfaces shall be heated to melt temperatures and joined. The joint shall be undisturbed until cool. Fittings shall be manufactured in accordance with ASTM D 2683 or ASTM D 3261.~~

~~**1203.15.2 Electrofusion joints.** Joints shall be of the electrofusion type. Joint surfaces shall be clean and free of moisture, and scoured to expose virgin resin. Joint surfaces shall be heated to melt temperatures for the period of time specified by the manufacturer. The joint shall be undisturbed until cool. Fittings shall be manufactured in accordance with ASTM F 1055.~~

~~**1203.15.3 Stab-type insert fittings.** Joint surfaces shall be clean and free of moisture. Pipe ends shall be chamfered and inserted into the fittings to full depth. Fittings shall be manufactured in accordance with ASTM F 1924.~~

SECTION 1208
TESTS

1208.1 General. Hydronic piping systems ~~other than groundsource heat pump loop systems~~ shall be tested hydrostatically at one and one-half times the maximum system design pressure, but not less than 100 psi (689 kPa). The duration of each test shall be not less than 15 minutes, but not more than 20 minutes. ~~Ground-source heat pump loop systems shall be tested in accordance with Section 1208.1.1.~~

~~**1208.1.1 Ground source heat pump loop systems.** Before connection (header) trenches are backfilled, the assembled loop system shall be pressure tested with water at 100 psi (689 kPa) for 30 minutes with no observed leaks. Flow and pressure loss testing shall be performed and the actual flow rates and pressure drops shall be compared to the calculated design values. If actual flow rate or pressure drop values differ from calculated design values by more than 10 percent, the problem shall be identified and corrected.~~

SECTION 1210
GROUND-SOURCE HEAT PUMP LOOP SYSTEMS

1210.1 Ground Source-Loop Water Piping. Ground source loop-piping and tubing material for water-based systems shall conform to the standards cited in this section.

1210.2 Used materials. Reused pipe, fittings, valves, and other materials shall not be permitted in ground source-loop systems.

1210.3 Material rating. Pipe and tubing shall be rated for the operating temperature and pressure of the ground-loop system. Fittings shall be suitable for the pressure applications and recommended by the manufacturer for installation with the pipe and tubing material installed. Where used underground, materials shall be suitable for burial.

1210.4 Piping and tubing materials standards. Ground-loop pipe and tubing shall conform to the standards listed in Table 1210.4.

TABLE 1210.4
GROUND SOURCE LOOP PIPE

MATERIAL	STANDARD (see Chapter 15)
Chlorinated polyvinyl chloride (CPVC)	ASTM D2846; ASTM F441; ASTM F442
Cross-linked polyethylene (PEX)	ASTM F876; ASTM F877 CSA B137.5;NSF 358-3
Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe	ASTM F1282; CSA B137.9
High Density Polyethylene (HDPE)	ASTM D3035; ASTM D2737; ASTM F714; AWWA C901; CSA B137.1; CSA C448; NSF 358-1
Polypropylene (PP-R)	ASTM F2389; CSA B137.11, NSF 358-2
Polyvinyl chloride (PVC)	ASTM D1785; ASTM D2241
Raised temperature polyethylene (PE-RT)	ASTM F2623

1210.5 Fittings. Ground source pipe fittings shall be approved for installation with the piping materials to be installed shall conform to the standards listed in Table 1210.5 and if installed underground shall be suitable for burial.

TABLE 1210.5
GROUND SOURCE LOOP PIPE FITTINGS

PIPE MATERIAL	STANDARD (see Chapter 15)
Chlorinated polyvinyl chloride (CPVC)	ASTM D 2846; ASTM F437; ASTM F438; ASTM F439; CSA B137.6
Cross-linked polyethylene (PEX)	ASTM F 877; ASTM F1807; ASTM F 1960; ASTM F 2080; ASTM F2159; ASTM F2434; CSA B137.5; NSF 358-3
Polyethylene/aluminum/polyethylene (PE-AL-PE)	ASTM F 2434; ASTM F1282, CSA B137.9
High Density Polyethylene (HDPE~~)~~	ASTM D2683; ASTM D3261;

	ASTM F1055; CSA B137.1; CSA C448; NSF 358-1
Polypropylene (PP-R)	ASTM F2389; CSA B137.11; NSF 358-2
Polyvinyl chloride (PVC)	ASTM D2464; ASTM D2466; ASTM D2467; CSA B137.2; CSA B137.3
Raised temperature polyethylene (PE-RT)	ASTM D3261; ASTM F1807; ASTM F2159; B137.1

SECTION 1211
JOINTS AND CONNECTIONS

1211.1 Approval. Joints and connections shall be of an approved type. Joints and connections shall be tight for the pressure of the ground source-loop system. Joints used underground shall be approved for buried applications.

1211.1.1 Joints between different piping materials. Joints between different piping materials shall be made with approved transition fittings.

1211.2 Preparation of pipe ends. Pipe shall be cut square, reamed, and shall be free of burrs and obstructions. CPVC, PE, and PVC pipe shall be chamfered. Pipe ends shall have full-bore openings and shall not be undercut.

1211.3 Joint preparation and installation. Where required by Sections 1211.4 through 1211.6, the preparation and installation of mechanical and thermoplastic-welded joints shall comply with Sections 1211.3.1 and 1211.3.2.

1211.3.1 Mechanical joints. Mechanical joints shall be installed in accordance with the manufacturer's instructions.

1211.3.2 Thermoplastic-welded joints. Joint surfaces for thermo plastic-welded joints shall be cleaned by an approved procedure. Joints shall be welded in accordance with the manufacturer's instructions.

1211.4 CPVC plastic pipe. Joints between CPVC plastic pipe or fittings shall be solvent-cemented or threaded joints complying with Section 1203.3.

1211.5 Cross-linked polyethylene (PEX) plastic tubing. Joints between cross-linked polyethylene plastic tubing and fittings shall comply with Sections 1211.4.1 and 1211.4.2. Mechanical joints shall complying with Section 1211.3.

1211.5.1 Compression-type fittings. Where compression- type fittings include inserts and ferrules or O-rings, the fittings shall be installed without omitting the inserts and ferrules or O-rings.

1211.5.2 Plastic-to-metal connections. Soldering on the metal portion of the system shall be performed at least 18 inches (457 mm) from a plastic-to-metal adapter in the same water line.

1211.6 Polyethylene plastic pipe and tubing for ground source heat pump loop systems. Joints between polyethylene plastic pipe and tubing or fittings for ground source heat pump loop systems shall be heat fusion joints complying with Section 1211.6.1, electrofusion joints complying with Section 1211.6.2, or stab-type insertion joints complying with Section 1211.6.3.

1211.6.1 Heat-fusion joints. Joints shall be of the socket-fusion, saddle-fusion or butt-fusion type, joined in accordance with ASTM D 2657. Joint surfaces shall be clean and free of moisture. Joint surfaces shall be heated to melt temperatures and joined. The joint shall be undisturbed until cool. Fittings shall be manufactured in accordance with ASTM D 2683 or ASTM D 3261.

1211.6.2 Electrofusion joints. Joints shall be of the electrofusion type. Joint surfaces shall be clean and free of moisture, and scoured to expose virgin resin. Joint surfaces shall be heated to melt temperatures for the period of time specified by the manufacturer. The joint shall be undisturbed until cool. Fittings shall be manufactured in accordance with ASTM F 1055.

1211.6.3 Stab-type insert fittings. Joint surfaces shall be clean and free of moisture. Pipe ends shall be chamfered and inserted into the fittings to full depth. Fittings shall be manufactured in accordance with ASTM F 1924.

1211.7 Polypropylene (PP) plastic. Joints between PP plastic pipe and fittings shall comply with Sections 1211.7.1 and 1211.7.2.

1211.7.1 Heat-fusion joints. Heat-fusion joints for polypropylene (PP) pipe and tubing joints shall be installed with socket-type heat-fused polypropylene fittings, electrofusion polypropylene fittings or by butt fusion. Joint surfaces shall be clean and free from moisture. The joint shall be undisturbed until cool. Joints shall be made in accordance with ASTM F 2389.

1211.7.2 Mechanical and compression sleeve joints. Mechanical and compression sleeve joints shall be installed in accordance with the manufacturer's instructions.

1211.8 Raised temperature polyethylene (PE-RT) plastic tubing. Joints between raised temperature polyethylene tubing and fittings shall complying with Sections 1211.8.1 and 1211.8.2. Mechanical joints shall complying with Section 1211.3.

1211.8.1 Compression-type fittings. Where compression-type fittings include inserts and ferrules or O-rings, the fittings shall be installed without omitting the inserts and ferrules or O-rings.

1211.8.2 PE-RT-to-metal connections. Solder joints in a metal pipe shall not occur within 18 inches (457 mm) of a transition from such metal pipe to PE-RT pipe.

1211.9 PVC plastic pipe. Joints between PVC plastic pipe and fittings shall be solvent-cemented or threaded joints complying with Section 1203.3.

SECTION 1212
VALVES

1212.1 Where required. Shutoff valves shall be installed in ground source-loop piping systems in the locations indicated in Sections 1212.1.1 through 1212.1.6.

1212.1.1 Heat exchangers. Shutoff valves shall be installed on the supply and return side of a heat exchanger.

Exception: Shutoff valves shall not be required where heat exchangers are integral with a boiler or are a component of a manufacturer's boiler and heat exchanger packaged unit and are capable of being isolated from the hydronic system by the supply and return valves required by Section 1005.1.

1212.1.2 Central systems. Shutoff valves shall be installed on the building supply and return of a central utility system.

1212.1.3 Pressure vessels. Shutoff valves shall be installed on the connection to any pressure vessel.

1212.1.4 Pressure-reducing valves. Shutoff valves shall be installed on both sides of a pressure-reducing valve.

1212.1.5 Equipment and appliances. Shutoff valves shall be installed on connections to mechanical *equipment* and appliances. This requirement does not apply to components of a ground source loop system such as pumps, air separators, metering devices, and similar *equipment*.

1212.1.6 Expansion tanks. Shutoff valves shall be installed at connections to nondiaphragm-type expansion tanks.

1212.2 Reduced pressure. A pressure relief valve shall be installed on the low-pressure side of a hydronic piping system that has been reduced in pressure. The relief valve shall be set at the maximum pressure of the system design. The valve shall be installed in accordance with Section 1006.

SECTION 1213
PIPING INSTALLATION

1213.1 General. Piping, valves, fittings, and connections shall be installed in accordance with the conditions of approval.

1213.3 Protection of potable water. Where ground source loop systems have a connection to a potable water supply, the potable water system shall be protected from backflow in accordance with the *International Plumbing Code*.

1213.4 Pipe penetrations. Openings for pipe penetrations in walls, floors and ceilings shall be larger than the penetrating pipe. Openings through concrete or masonry building elements shall be sleeved. The annular space surrounding pipe penetrations shall be protected in accordance with the *International Building Code*.

1213.5 Clearance from combustibles. A pipe in a ground source piping system having an exterior surface temperature exceeding 250°F (121°C) shall have a minimum *clearance* of 1 inch (25 mm) from combustible materials.

1213.6 Contact with building material. A ground source-loop piping system shall not be in direct contact with building materials that cause the piping or fitting material to degrade or corrode, or that interfere with the operation of the system.

1213.7 Strains and stresses. Piping shall be installed so as to prevent detrimental strains and stresses in the pipe. Provisions shall be made to protect piping from damage resulting from expansion, contraction and structural settlement. Piping shall be installed so as to avoid structural stresses or strains within building components.

1213.7.1 Flood hazard. Piping located in a flood hazard area shall be capable of resisting hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to the *design flood elevation*.

1213.8 Pipe support. Pipe shall be supported in accordance with Section 305.

1213.9 Velocities. Ground source-loop systems shall be designed so that the flow velocities do not exceed the maximum flow velocity recommended by the pipe and fittings manufacturer and the velocities shall be controlled to reduce the possibility of water hammer.

1213.10 Labeling and Marking. Ground source-loop system piping shall be marked with tape, metal tags or other method where it enters a building indicating “GROUND SOURCE-LOOP SYSTEM”. The marking shall indicate any antifreeze used in the system by name and concentration.

1213.11 Chemical Compatibility. Antifreeze and other materials used in the system shall be chemically compatible with the pipe, tubing, fittings, and mechanical systems.

SECTION 1214
WORKING FLUID

1214.1 Makeup water. The transfer fluid shall be compatible with the makeup water supplied to the system.

SECTION 1215
TESTS

1215.1 Ground source heat pump loop systems. Before connection header trenches are backfilled, the assembled loop system shall be pressure tested with water at 100 psi (689 kPa) for 30 minutes, but not more than 35 minutes, with no observed leaks. Flow and pressure loss testing shall be performed and the actual flow rates and pressure drops shall be compared to the calculated design values. If actual flow rate or pressure drop values differ from calculated design values by more than 10 percent, the cause shall be identified and corrective action taken.

SECTION 1216
EMBEDDED PIPING

1216.1 Pressurizing during installation. Ground loop piping to be embedded in concrete shall be pressure tested prior to pouring concrete. During pouring, the pipe shall be maintained at the proposed operating pressure.

Add new standards to Chapter 15 as follows:

ASTM

D2737-12
Standard Specification for Polyethylene (PE) Plastic Tubing

F437-09
Standard Specification for Threaded Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80

F714-10
Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter

F1282–10
Standard Specification for Polyethylene/Aluminum/Polyethylene (PE-AL-PE) Composite Pressure Pipe

F1960-11e1
Standard Specification for Cold Expansion Fittings with PEX Reinforcing Rings for Use with Cross-linked Polyethylene (PEX) Tubing

F2434-09
Standard Specification for Metal Insert Fittings Utilizing a Copper Crimp Ring for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Cross-linked Polyethylene/Aluminum/Cross-linked Polyethylene (PEX-AL-PEX) Tubing

AWWA

C901-08
AWWA Standard for Polyethylene (PE) Pressure Pipe and Tubing, ½ In. (13 mm) through 3 In. (76 mm), for Water Service

CSA

B137.1-09 Polyethylene (PE) pipe, tubing, and fittings for cold-water pressure services

B137.2-05 Polyvinylchloride (PVC) injection-moulded gasketed fittings for pressure applications

B137.3-09 Rigid polyvinylchloride (PVC) pipe and fittings for pressure applications

B137.5-09 Crosslinked polyethylene (PEX) tubing systems for pressure applications

B137.11-99 Polypropylene (PP-R) Pipe and Fittings for Pressure Applications

C448-10/2009
Design and Installation of Earth Energy Systems - First Edition; Update 2: October 2009; Consolidated Reprint

NSF

358-1
Polyethylene Pipe and Fittings for Water-Based Ground-Source (Geothermal) Heat Pump Systems

358-2
Polypropylene Pipe and Fittings for Water-Based Ground-Source(Geothermal) Heat Pump Systems

358-3
Cross-linked Polyethylene (PEX) Pipe and Fittings for Water-Based Ground-Source (Geothermal) Heat Pump Systems

Reason: The IMC requires improvement on the approved materials for us in geothermal systems. While Polyethylene pipe and fittings dominates the current geothermal market, other materials are appropriate.

At the time of submission of proposals, NSF is in the process of writing NSF Series of Standards 358 to address material specific requirements for plastic piping system components used in geothermal systems. The standard can be obtained from brown@nsf.org.

Cost Impact: None

Analysis: A review of the standard proposed for inclusion in the code, [ASTM D2737-12, F437-09, F714-10, F1282–10, F1960-11e1, F2434-09; AWWA C901-08; CSA B137.1-09, B137.2-05, B137.3-09, B137.5-09, B137.11-99, C448-10/2009; NSF 358-1, 358-2, 358-3.] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M190-12

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

T1202.4-M-BROWN.DOC

M191–12
Table 1202.4

Proponent: Pennie L. Feehan, Pennie L. Feehan Consulting, representing Copper Development Association
(penniefeehan@me.com)

Revise as follows:

TABLE 1202.4
HYDRONIC PIPE

MATERIAL	STANDARD (see Chapter 15)
Acrylonitrile butadiene styrene (ABS) plastic pipe	ASTM D 1527; ASTM D 2282
~~Brass pipe~~	~~ASTM B 43~~
~~Brass tubing~~	~~ASTM B 135~~
Copper or copper-alloy pipe	ASTM B 42; <u>ASTM B 43;</u> ASTM B 302
Copper or copper-alloy tube (Type K, L or M)	ASTM B 75; ASTM B 88; <u>ASTM B 135</u> ASTM B 251

Reason: Brass pipe and tubing are copper alloys. Moving brass under the applicable heading cleans-up the table and provides the appropriate terminology and correct information to the end user.

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

M191-12

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

T1202.4-M-FEEHAN.DOC

M192–12
TABLE 1202.5, Chapter 15

Proponent: Kevin J. Simko, Victaulic, representing Victaulic

Revise as follows:

MATERIAL	STANDARD
Brass	ASTM F 1974
Bronze	ASTM B 16.24
Copper or copper alloy	ASME BI6.15; ASME BI6.18; ASME BI6.22; ASME BI6.23; ASME BI6.26; AS ME BI6.29; ASTM B 75; ASTM B 152; ASTM B 584
Ductile iron and gray iron	ANSI/AWWA C110/A21.10; A WWA C153/A21.53; ASTM A 395; ASTM A 536; ASTM F 1476; ASTM F 1548
Ductile Iron	ANSI/AWWA *C153/A21.53*
Gray Iron	ASTM A 126
Malleable iron	ASME BI6.3
PEX fittings	ASTM F 877; ASTM F 1807; ASTM F 2159
Plastic	ASTM D 2466; ASTM D 2467; ASTM D 2468; ASTM F 438; ASTM F 439; ASTM F 877; ASTM F2389; ASTM F 2735
Steel	ASME BI6.5; ASME BI6.9; ASME B16.11; ASME BI6.28; ASTM A 53; ASTM A 106; ASTM A 234; ASTM A 420; ASTM A 536; ASTM A 395; ASTM F 1476; ASTM F 1548

Portions not shown remain unchanged.

Add new standards to Chapter 15 as follows:

ASTM A234 / A234M - 11a
Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service

ASTM A395 / A395M - 99(2009)
Standard Specification for Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures

ASTM A536 - 84(2009)
Standard Specification for Ductile Iron Castings

ASTM B152 / B152M – 09
Standard Specification for Copper Sheet, Strip, Plate, and Rolled Bar

ASTM B584 – 11
Standard Specification for Copper Alloy Sand Castings for General Applications

ASTM F1548 - 01(2006)
Standard Specification for the Performance of Fittings for Use with Gasketed Mechanical Couplings Used in Piping Applications

AWWA C153/A21.53-06
Ductile-Iron Compact Fittings for Water Service

Reason: The materials currently listed in Table 1202.5 do not fully represent the materials being used for hydronic systems in the industry. ,the code is overly restrictive with regard to pipe materials and does not allow for the use of materials that offer improved mechanical and electrochemical properties compared with allowed materials. The addition of these standard materials will allow the use of high grade materials that provide improved performance, while still allowing the use of currently approved materials. Many of these materials are also currently referenced in other piping codes.

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, [ASTM A234 / A234M - 11a, A395 / A395M - 99(2009), A536 - 84(2009), B152 / B152M – 09, B584 – 11, F1548 - 01(2006); AWWA C153/A21.53-06] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M192-12

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

T1202.5-M-SIMKO.DOC

M193–12
Table 1202.5

Proponent: Pennie L. Feehan, Pennie L. Feehan Consulting, representing Copper Development Association
(penniefeehan@me.com)

Revise as follows:

TABLE 1202.5
HYDRONIC PIPE FITTINGS

MATERIAL	STANDARD
~~Brass~~	~~ASTM F 1974~~
~~Bronze~~	~~ASTM B16.24~~
Copper or copper alloy	ASME B16.15; ASME B16.18; ASME B16.22; ~~ASME B16.23;~~ ASME B16.26; ASTM F1974, ASTM B16.24, ~~ASME B16.29~~

(Portions of table not shown remain unchanged.)

Reason: Brass and Bronze are copper alloys. Moving the standards under the applicable heading cleans-up the table and provides the appropriate terminology and correct information to the end user.

ASME B16.23 - Cast Copper Alloy Solder Joint Drainage Fittings - DWV and ASME B 16.29 - Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings – DWV, are Drain, Waste, and Vent fittings and should not be listed here.

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

M193-12

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

T1202.5-M-FEEHAN.DOC

M194–12
TABLE 1202.5, Chapter 15

Proponent: James Gilchrist, P.E., Georg Fischer Sloane, LLC, representing Georg Fischer Piping Systems
(jim.gilchrist@georgfischer.com)

Revise as follows:

Table 1202.5
HYDRONIC PIPE FITTINGS

MATERIAL	STANDARD (see Chapter 15)
Thermoplastic ~~Plastic~~	ASTM D 2466; ASTM D 2467; ~~ASTM D 2468~~; ISO 15493 Annex A; ASTM F 438; ASTM F 439; ASTM F 877; ASTM F 2389; ASTM F 2735

(Portions of table not shown remain unchanged.)

Add new standard to Chapter 15 as follows:

ISO 15493 Annex A-2003
Plastics piping systems for industrial applications - Acrylonitrile-butadiene-styrene (ABS), unplasticized poly(vinyl chloride) (PVC-U) and chlorinated poly(vinyl chloride) (PVC-C) - Specifications for components and the system Metric series

Reason: Updates to this table are needed so that it is aligned with current ASTM and ISO standards for plastic pipe and fittings.
-Using the term "Thermoplastic" differentiates these materials from the newer material PEX, which is a thermoset.
-ASTM D2468 - 96a Standard "Specification for Acrylonitrile Butadiene Styrene (ABS) Plastic Pipe Fittings, Schedule 40" was withdrawn in 2003 without replacement.
-ISO 15493 Annex A defines ABS fittings that are compatible with hydronic cooling pipe. ISO 15493:2003 Plastics piping systems for industrial applications -- Acrylonitrile-butadiene-styrene (ABS), unplasticized poly(vinyl chloride) (PVC-U) and chlorinated poly(vinyl chloride) (PVC-C) -- Specifications for components and the system -- Metric series
Copy of ISO 15493 is attached in PDF form.

Cost Impact: The code change proposal will not increase the cost of construction. The change only aligns the code with current standards.

Analysis: A review of the standard proposed for inclusion in the code, [ISO 15493 Annex A-2003] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M194-12

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

T1202.5#2-M-GILCHRIST.DOC

M195–12
T1202.5, Chapter 15

Proponent: Robert Hall, SE Technical Manager, representing Viega, LLC

Revise as follows:

TABLE 1202.5
HYDRONIC PIPE FITTINGS

MATERIALS	STANDARDS
Copper or copper alloy	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.23; ASME 16.26; ASME B16.29; <u>ASME B16.51, ICC LC 1002</u>

(Portions of table not shown remain unchanged)

Add new standards to Chapter 15 as follows:

<u>ASME B16.51-11</u>
<u>Copper and Copper Alloy Press-Connect Pressure Fittings</u>

<u>ICC LC 1002-08</u>
<u>PMG Listing Criteria for Press-Connection Fittings for Potable Water Tube and Radiant Heating Systems</u>

Reason: New, ASME Material Standard for Press-Connect fittings and ICC Standard.

Cost Impact: None

Analysis: A review of the standard proposed for inclusion in the code, [ASME B16.51-11] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M195-12

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

T1202.5 #1-M-HALL.DOC

M196–12
Table 1202.5, Chapter 15

Proponent: Larry Gill, P.Eng. IPEX USA LLC
(larry.gill@ipexna.com)

Revise as follows:

TABLE 1202.5
PIPE FITTINGS

Material	**Standard**
Plastic	ASTM D 2466; ASTM D 2467; ASTM D 2468; ASTM F 438; ASTM F 439; ASTM F 877; ASTM F 2389, ASTM F2735, <u>ASTM F 2769, ASTM F2159, ASTM F2098</u>

(Portions of table not shown remain unchanged)

Add new standards to Chapter 15 as follows:

<u>ASTM F2098-08</u>
<u>Standard Specification for Stainless Steel Clamps for Securing SDR9 Cross-linked Polyethylene (PEX) Tubing to Metal Insert and Plastic Insert Fittings</u>

Reason: Add new standards for PE-RT fittings. ASTM 2159 and F2098 are fittings standards and ASTM F2769 is a standard for hot and cold water tubing and distribution systems and includes provisions for tubing, fittings, valves and manifolds.

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

Analysis: A review of the standard proposed for inclusion in the code, [ASTM F2098-08] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M196-12

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

T605.5 #2-M-GILL.DOC

M197–12
Table 1202.5, 1209.3.4(New), Chapter 15

Proponent: Larry Gill, P.Eng. IPEX USA LLC
(larry.gill@ipexna.com)

Revise as follows:

TABLE 1202.5
HYDRONIC PIPE FITINGS

MATERIAL	STANDARD (see chapter 15)
PE-RT fittings	ASTM F 1807, ASTM F 2098, ASTM F2159, ASTM F 2735, ASTM F2769

(Portions of table not shown remain unchanged)

SECTION 1209
EMBEDDED PIPING

1209.3.4 Polyethylene of raised temperature (PE-RT) joints. PE-RT tubing shall be installed in continuous lengths or shall be joined by hydronic fittings listed in Table 1202.5.

Add new standard to Chapter 15 as follows:

ASTM F2098 – 08
Standard Specification for Stainless Steel Clamps for Securing SDR9 Cross-linked Polyethylene (PEX) Tubing to Metal Insert and Plastic Insert Fittings

Reason: Add new requirements for PE-RT fittings. ASTM F1807, ASTM F2098, ASTM F2159, ASTM F2735 are fittings standards and ASTM F2769 is a standard for hot and cold water tubing and distribution systems and includes provisions for tubing, fittings, valves and manifolds.

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

Analysis: A review of the standard proposed for inclusion in the code, [ASTM F2098 - 08] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M197-12

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

1209.3.4(NEW)-M-GILL.DOC

M198–12
TABLE 1202.5, Chapter 15

Proponent: Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C., Self

Revise as follows:

TABLE 1202.5
HYDRONIC PIPE FITTINGS

Material	Standards
Copper or copper alloy	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.23; ASME B16.26; ASME B16.29, ASME B16.51

(Portions of table not shown remain unchanged.)

Add referenced standards to Chapter 15 as follows:

ASME B16.51-2011
Copper and Copper Alloy Press-Connect Pressure Fittings Table 605.5

Reason: This adds the new standard for copper press connect fittings. ASME B16.51 was published in December 2011. The standard regulates the size, design, and performance requirements for press connect fittings.

Cost Impact: This change does not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [ASME B16.51-2011] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M198-12

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

T1202.5-M-BALLANCO.DOC

M199–12
1203.1 thru 1203.8.3, Chapter 15

Proponent: Pennie L. Feehan, Pennie L. Feehan Consulting, representing Copper Development Association (penniefeehan@me.com)

Revise as follows:

1203.3.1 Brazed joints. Brazed joints between copper pipe or tubing and fittings shall be made with brazing alloys having a liquid temperature exceeding 1000˚F (538˚C). Joint surfaces to be brazed shall be cleaned bright by manual or mechanical means. The ends of the tubing shall be cut square and reamed to full inside diameter. Burrs on the outside end of the pipe or tubing shall be removed. Where required by the brazing alloy manufacturer's instructions, an *approved* brazing flux shall be applied to the joint surfaces ~~where required~~. The joint shall be brazed with a brazing filler metal conforming to AWS A5.8. Brazing filler metal shall be applied at the point where the pipe or tubing enters the socket of the fitting.

1203.3.2 Mechanical joints. Mechanical joints shall be installed in accordance with the manufacturer's instructions. Joints shall include compression, flanged, grooved, press type and threaded.

1203.3.3 Soldered joints. Solder joints ~~surfaces shall be cleaned~~. between copper pipe or tubing and fittings shall be made in accordance with the methods of ASTM B 828 with the following sequence of joint preparation and operation: measuring and cutting, reaming, cleaning, fluxing, assembly and support, heating, applying the solder, cooling and cleaning. The ends of the pipe or tubing shall be cut square and reamed to the full inside diameter. Burrs on the outside end of the pipe or tubing shall be removed. Joint surfaces to be joined shall be cleaned bright by manual or mechanical means. ~~A~~ Flux conforming to ASTM B 813 shall be applied to pipe or tubing and fittings. Such flux shall become noncorrosive and nontoxic after soldering ~~shall be applied~~. Pipe or tubing shall be inserted to the base of the fitting. Excess flux shall be removed from the exterior of the joint. The assembled joint shall be supported to create a uniform capillary space around the joint. An LP gas or acetylene air fuel torch shall be used to apply heat to the assembled joint. The heat shall be applied with the flame perpendicular to the pipe or tubing. The flame shall be moved alternately between the fitting cup and pipe or tubing. ~~The joint shall be soldered with a~~ Solder in compliance with ~~conforming to~~ ASTM B 32 shall be applied to the joint surfaces until capillary action draws the molten solder into the cup of the fitting. The soldered joint shall not be disturbed until cool. Remaining flux residue shall be cleaned from the exterior of the joint. The joining of water supply piping shall be made with lead-free solder and fluxes. "Lead free" shall mean a chemical composition equal to or less than 0.2-percent lead.

1203.3.4 Flared joints. Flared joints shall be made by a tool designed for that operation.

1203.3.5 Push-fit joints. Push-fit joints shall be installed in accordance with the manufacturer's instructions.

1203.3.6 Press joints. *Press joints* shall be installed in accordance with the manufacturer's instructions.

1203.3.7 Grooved and shouldered mechanical joints. Grooved and shouldered mechanical joints shall conform to the requirements of ASTM F 1476 and shall be installed in accordance with the manufacturer's instructions.

1203.3.8 Mechanically formed tee fittings. Mechanically extracted outlets shall have a height not less than three times the thickness of the branch tube wall.

1203.3.8.1 Full flow assurance. Branch tubes shall not restrict the flow in the run tube. A dimple/depth stop shall be formed in the branch tube to ensure that penetration into the outlet is of the correct depth. For inspection purposes, a second dimple shall be placed 1/4 inch (6.4 mm) above the first dimple.

Dimples shall be aligned with the tube run.

1203.3.8.2 Brazed joints. Mechanically formed tee fittings shall be brazed in accordance with Section 1203.3.1.

1203.3.~~4~~ 3.9 Solvent-cemented joints. Joint surfaces shall be clean and free of moisture. An *approved* primer shall be applied to CPVC and PVC pipe-joint surfaces. Joints shall be made while the cement is wet. Solvent cement conforming to the following standards shall be applied to all joint surfaces:

1. ASTM D 2235 for ABS joints.
2. ASTM F 493 for CPVC joints.
3. ASTM D 2564 for PVC joints.
   CPVC joints shall be made in accordance with ASTM D 2846.

Exception: For CPVC pipe joint connections, a primer is not required where all of the following conditions apply:
1. The solvent cement used is third-party certified as conforming to ASTM F 493.
2. The solvent cement is yellow in color.
3. The solvent cement is used only for joining ½ inch (12.7 mm) through 2-inch (51 mm) diameter CPVC pipe and fittings.
4. The CPVC pipe and fittings are manufactured in accordance with ASTM D 2846.

1203.3.~~5~~10 Threaded joints. Threads shall conform to ASME B1.20.1. Schedule 80 or heavier plastic pipe shall be threaded with dies specifically designed for plastic pipe. Thread lubricant, pipe-joint compound or tape shall be applied on the male threads only and shall be *approved* for application on the piping material.

1203.3.~~6~~11 Welded joints. Joint surfaces shall be cleaned by an *approved* procedure. Joints shall be welded with an *approved* filler metal.

~~**1203.3.7 Grooved and shouldered mechanical joints.** Grooved and shouldered mechanical joints shall conform to the requirements of ASTM F 1476 and shall be installed in accordance with the manufacturer's installation instructions.~~

~~**1203.3.8 Mechanically formed tee fittings.** Mechanically extracted outlets shall have a height not less than three times the thickness of the branch tube wall.~~

~~**1203.3.8.1 Full flow assurance.** Branch tubes shall not restrict the flow in the run tube. A dimple/depth stop shall be formed in the branch tube to ensure that penetration into the outlet is of the correct depth. For inspection purposes, a second dimple shall be placed 1/4 inch (6.4 mm) above the first dimple. Dimples shall be aligned with the tube run.~~

~~**1203.3.8.2 Brazed joints.** Mechanically formed tee fittings shall be brazed in accordance with Section 1203.3.1.~~

~~**1203.4 ABS plastic pipe.** Joints between ABS plastic pipe or fittings shall be solvent-cemented or threaded joints conforming to Section 1203.3.~~

~~**1203.5 Brass pipe.** Joints between brass pipe or fittings shall be brazed, mechanical, threaded or welded joints conforming to Section 1203.3.~~

~~**1203.6 Brass tubing.** Joints between brass tubing or fittings shall be brazed, mechanical or soldered joints conforming to Section 1203.3.~~

~~**1203.7 Copper or copper-alloy pipe.** Joints between copper or copper-alloy pipe or fittings shall be brazed, mechanical, soldered, threaded or welded joints conforming to Section 1203.3.~~

~~**1203.8 Copper or copper-alloy tubing.** Joints between copper or copper-alloy tubing or fittings shall be brazed, mechanical or soldered joints conforming to Section 1203.3, flared joints conforming to Section 1203.8.1, push-fit joints conforming to Section 1203.8.2 or press-type joints conforming to Section 1203.8.3.~~

~~**1203.8.1 Flared joints.** Flared joints shall be made by a tool designed for that operation.~~

~~**1203.8.2 Push-fit joints.** Push-fit joints shall be installed in accordance with the manufacturer's instructions.~~

~~**1203.8.3 Press joints.** *Press joints* shall be installed in accordance with the manufacturer's instructions.~~

Add new standard to Chapter 15 as follows:

ASTM B828 - 02(2010)
Standard Practice for Making Capillary Joints by Soldering of Copper and Copper Alloy Tube and Fittings

Reason: The above proposal adds important language from the applicable standards, relocated, renumbered, and deleted other redundant sections to help the end user.

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

Analysis: A review of the standard proposed for inclusion in the code, [ASTM B828 - 02(2010)], with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M199-12

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

1203.3.1-M-FEEHAN.DOC

M200–12
1203.3.9(NEW)

Proponent: Robert Hall, SE Technical Manager, Viega, LLC, representing Viega LLC

Add new text as follows:

1203.3.9 Press Connect Joints. Press connect joints shall be installed in accordance with the manufacturer's instructions. Press-connect joints shall conform to one of the standards listed in Table 1202.5.

Reason: Need press connect fittings reference in Section 1203.3 Joint preparation and installation.

Cost Impact: None

M200-12

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

1203.3.9-M-HALL.DOC

M201–12
1203.3.9 (NEW)

Proponent: Kevin Simko, Victaulic, representing Victaulic
(ksimko@victaulic.com)

Add new text as follows:

1203.3.9 Mechanical joints for branch lines. Mechanical joint fittings that are used to create branch openings in a pipe run shall incorporate a locating collar, designed for alignment to prevent the rotation of the mechanical joint after installation. The locating collar shall extend into a predrilled hole in the pipe. The mechanical joint fitting shall be installed in accordance with the manufacturer's installation instructions, and be made with an approved elastomeric seal.

Reason: There is no provision in the IMC allowing or prohibiting the use of mechanical joints for branch lines. Mechanical joints for branch lines are commonly used in HVAC applications. Materials are the same used in other acceptable products.

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

M201-12

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

1203.3.9(NEW)-M-SIMKO.DOC

M202–12
1203.8

Proponent: Robert Hall, SE Technical Manager, Viega, LLC, representing Viega LLC (Robert.hall@viega.com)

Revise as follows:

1203.8 Copper and copper alloy tubing. Joints between copper or copper-alloy tubing or fittings shall be brazed, mechanical, <u>press connect</u> or soldered joints conforming to Section 1203.3, flared joints conforming to Section 1203.8.1, push-fit joints conforming to Section 1203.8.2 or press-type joints conforming to Section 1203.8.3.

Reason: Press connect should be included in this copper and copper alloy tubing section.

Cost Impact: None

M202-12

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

1203.8-M-HALL.DOC

M203–12
1206.9

Proponent: Walter J. Sperko, Sperko Engineering Services, Inc. representing Mechanical Contractors Association of America
(Sperko@asme.org)

Revise as follows:

1206.9 Strains and stresses. ~~Piping shall be installed so as to prevent detrimental strains and stresses in the pipe.~~ Piping systems shall be designed in accordance with ASME B31.9. Provisions shall be made to protect piping from damage resulting from ~~expansion, contraction and~~ structural settlement. ~~Piping shall be installed so as to avoid structural stresses or strains within building components.~~ The effects of piping loads on other building components shall be evaluated by the designer.

Reason: Avoiding detrimental stresses and strains has to be an engineering consideration at the design stage; they cannot be controlled or limited as part of installation. Further, jurisdiction has no way to determine if there are detrimental stresses or strains unless there is a requirement to analyze the design, supports and restraints and there is a basis for determining if the stresses and strains are or are not acceptable. ASME B31.9 requires analysis of the design and comparison to stress limits and imposing it will ensure that detrimental stresses and strains are avoided. Part of the analysis of the design requires evaluation of the piping for effects associated with expansion and contraction.

It is not possible to comply with the present requirement to avoid piping-induced stresses and strains within other building components if the pipe is attached to those components in any way. Loads on building components to which piping is attached, however, can and should be evaluated during the design process.

Cost Impact: None. Designers should be following B31.9 or similar standard already. Jurisdiction will not have to buy copies of B31.9 since the engineer will have to have a copy to demonstrate compliance.

M203-12

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

1206.9-M-SPERKO.DOC

M204–12
1206.10

Proponent: Walter J. Sperko, Sperko Engineering Services, Inc. representing Mechanical Contractors Association of America
(Sperko@asme.org)

Revise as follows:

1206.10 Pipe support. Pipe shall be supported in accordance with Section 305 <u>or as specified by the designer.</u>

Reason: While Table 305.4 is a good average guideline, a 12 foot for spacing between supports, it is a little excessive for NPS 1 pipe and way overly conservative for NPS 16 and larger which should be more like 30 feet between supports. The requirements for spacing between supports are integral to the design, the layout and results of analysis of the piping system and should be the responsibility of the piping system designer.

Cost Impact: None. Designers should be following B31.9 or similar standard already. Jurisdiction will not have to buy copies of B31.9 since the engineer will have to have a copy to demonstrate compliance and the change would not affect other installation requirements since this change only affects support spacing and requires the designer to specify it or default to Section 305 which provides a table or allows use of MSS SP-69 which costs $218.00.

M204-12

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

1206.10-M-SPERKO.DOC

M205–12
1209.5

Proponent: Guy McMann, MCP, Jefferson County Colorado, Colorado Association of Plumbing and Mechanical Officials (CAPMO)
(gmcmann@jeffco.us)

Revise as follows:

1209.5 Thermal barrier required. Radiant floor <u>and snow melt</u> heating systems shall be provided with a thermal barrier in accordance with Sections 1209.5.1 through 1209.5.4.

Reason: This is a simple clarification to include snow melt systems as this is what was always intended to be included.

Cost Impact: None

M205-12

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

1209.5-M-MCMANN.DOC

M206–12
1209.3.2

Proponent: Pennie L. Feehan, Pennie L. Feehan Consulting, representing Copper Development Association
(penniefeehan@me.com)

Revise as follows:

1209.3.2 Copper tubing joints. Copper tubing shall be joined by brazing complying with Section 1203.3.1. ~~with filler metals having a melting point of not less than 1,000°F (538°C).~~

Reason: The proposed language refers the end user to the appropriate code section with important language from the applicable standards.

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

M206-12

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

1209.3.2-M-FEEHAN.DOC

M207–12
1209.5.1

Proponent: Randall R. Dahmen, P.E. Wisconsin licensed Commercial Building Inspector, representing himself

Revise as follows:

1209.5.1 Slab-on-grade installation. Radiant piping utilized in concrete slab ~~on-grade~~ applications shall be provided with insulating materials installed beneath the piping for the entire slab, regardless of depth below grade, The insulation shall have an R-value of not less than 5.

Reason: The current code language only addresses slab on grade applications in which radiant piping is utilized. Significant heat loss is also associated with slabs associated with basements that are not at grade. The ground acts as a heat sink, pulling away heat from the radiant piping. Although the temperature of the dirt beneath a basement concrete floor may not be exposed to temperatures as cold as those associated with a slab on grade installation, it is well acknowledged that the ground beneath the slab will be cooler and will reduce a radiant system's efficiency.

Cost Impact: The code change proposal will increase the cost of construction. Cost of minimum R-5 insulation for placement under slab is estimated to be offset by the increased efficiency of the radiant piping system.

M207-12

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

1209.5.1-M-DAHMEN.DOC

M208–12
Table 1302.3

Proponent: Pennie L. Feehan, Pennie L. Feehan Consulting, representing Copper Development Association
(penniefeehan@me.com)

Revise as follows:

TABLE 1302.3
FUEL OIL PIPING

MATERIAL	STANDARD (see Chapter 15)
~~Brass pipe~~	~~ASTM B 43~~
~~Brass tubing~~	~~ASTM B 135~~
Copper or copper-alloy pipe	ASTM B 42; ASTM B 43; ASTM B 302
Copper or copper-alloy tube (Type K, L or M)	ASTM B 75; ASTM B 88; ASTM B 135 ASTM B 280

(*Portions of table not shown remain unchanged)*

Reason: Brass pipe and tubing are copper alloys. Moving brass under the applicable heading cleans-up the table and provides the appropriate terminology and correct information to the end user.

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

M208-12

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

T1302.3-M-FEEHAN.DOC

M209–12
1303.3 through 1303.7

Proponent: Pennie L. Feehan, Pennie L. Feehan Consulting, representing Copper Development Association
(penniefeehan@me.com)

Revise as follows:

1303.3 Joint preparation and installation. Where required by Sections 1303.4 through 1303.10, the preparation and installation of brazed, mechanical, threaded and welded joints shall comply with Sections 1303.3.1 through 1303.3.~~4~~5.

1303.3.1 Brazed joints. ~~All~~ Brazed joint between copper pipe or tubing and fittings shall be made with brazing alloys having a liquid temperature above 1000˚F (538˚C). All joints surfaces to be brazed shall be cleaned. An *approved* brazing flux shall be applied to the joint surfaces where required by manufacturer's recommendation. The joints shall be brazed with a brazing filler metal conforming to AWS A5.8. Brazing filler metal shall be applied at the point where the pipe or tubing enters the socket of the fitting.

1303.3.5 Flared joints. Flared joints shall be made by a tool designed for that operation.

~~**1303.4 Brass pipe.** Joints between brass pipe or fittings shall be brazed, mechanical, threaded or welded joints complying with Section 1303.3.~~

~~**1303.5 Brass tubing.** Joints between brass tubing or fittings shall be brazed or mechanical joints complying with Section 1303.3.~~

~~**1303.6 Copper or copper-alloy pipe.** Joints between copper or copper-alloy pipe or fittings shall be brazed, mechanical, threaded or welded joints complying with Section 1303.3.~~

1303.7 ~~**Copper or copper-alloy tubing.** Joints between copper or copper-alloy tubing or fittings shall be brazed or mechanical joints complying with Section 1303.3 or flared joints. Flared joints shall be made by a tool designed for that operation.~~

Reason: The proposed removes unnecessary language and adds important language from the applicable standards.

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

M209-12

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

1303.3-M-FEEHAN.DOC

M210–12
1303.3.2

Proponent: Robert Hall, SE Technical Manager, Viega, LLC, representing Viega LLC

Revise as follows:

1303.3.2 MECHANICAL JOINTS. Mechanical joints shall be installed in accordance with the manufacturer's instructions. Press connect joints shall conform to one of the standards listed in Table 1302.3.

Reason: ASME B16.51 is the standard for copper tube press connections for use in oil piping systems.

Cost Impact: None

M210-12

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

202-MECHANICAL JOINT-M-HALL.DOC

M211–12
1303.7

Proponent: Robert Hall, SE Technical Manager, Viega, LLC, representing Viega LLC (Robert.hall@viega.com)

Revise as follows:

1303.7 Copper or copper-alloy tubing. Joints between copper or copper alloy pipe or fittings shall be brazed, ~~or~~ mechanical joints complying with Section 1303.3, press connect joints that conform to one of the standards in Table 1302.2 or flared joints. Flared joints shall be made by a tool designed for that operation.

TABLE 1302.3
FUEL OIL PIPING

MATERIAL	STANDARD (See Chapter 15)
Copper or Copper alloy tubing	ASTM B 75; ASTM B 88; ASTM B 280; ASME B16.51

(Portions of table not shown remain unchanged)

Add standard to Chapter 15 as follows:

ASME B16.51-2012 Copper and copper-alloy press-connect pressure fittings

Reason: The proposed change refers the reader to Table 1303.2 which references ASME B16.51 the copper tube press connection fitting standard for use in oil piping systems. ASME B16.51 is the standard for copper tube press connections for use in oil piping systems.

Cost Impact: This proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, [ASME B16.51-2012] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M211-12

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

T1302.2-1303.7-M-HALL.DOC

M212–12
1303.9

Proponent: Robert Hall, SE Technical Manager, Viega, LLC, representing Viega LLC (Robert.hall@viega.com)

Revise as follows:

1303.9 Steel pipe. Joints between steel pipe or fittings shall be threaded, ~~or~~ welded joints complying with Section 1303.3, mechanical joints complying with Section 1303.9.1 or press connect joints that conform to one of the standards in Table 1302.2. ~~complying with Section1303.9.1~~.

Reason: The proposed change refers the reader to Table 1303.2 which, depending upon the outcome of M211-12, will reference the steel pipe press connection fitting standard for use in oil piping systems.

Cost Impact: None

M212-12

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

1303.9-M-HALL.DOC

M213–12
1401.1, 1405 (NEW), Chapter 15

Proponent: Shawn Strausbaugh, Chair, Plumbing/Mechanical/Gas Code Action Committee

Revise as follows:

1401.1 Scope. This chapter shall govern the design, construction, installation, *alteration* and repair of systems, *equipment* and appliances intended to utilize solar energy for space heating or cooling, domestic hot water heating, swimming pool heating ~~or~~ process heating or generation of electricity.

1405 PHOTOVOLTAIC SYSTEMS

1405.1 General. This section provides for the design, construction, installation, alteration, and repair of photovoltaic equipment and systems.

1405.2 Requirements. The installation, inspection, maintenance, repair and replacement of photovoltaic systems and all system components shall comply with the manufacturer's instructions, Sections 1405.1.1 through 1405.2.3 and NFPA 70.

1405.2.1 Roof-mounted panels and modules. Where photovoltaic panels and modules are installed on roofs, the roof shall be constructed to support the loads imposed by such modules. Roof-mounted photovoltaic panels and modules that serve as roof covering shall conform to the requirements for roof coverings in the *International Building Code*. Where mounted on or above the roof coverings, the photovoltaic panels and modules and supporting structure shall be constructed of noncombustible materials or fire-retardant-treated wood equivalent to that required for the roof construction.

1405.2.2 Roof and wall penetrations. Roof and wall penetrations shall be flashed and sealed in accordance with the *International Building Code* to prevent entry of water, rodents, and insects.
1405.2.3 Ground-mounted panels and modules. Ground-mounted panels and modules shall be installed in accordance with the manufacturer's instructions.

1405.3 Photovoltaic panels and modules. Photovoltaic panels and modules shall be listed and labeled in accordance with UL 1703.

1405.4 Inverters. Inverters shall be listed and labeled in accordance with UL 1741. Systems connected to the utility grid shall use inverters listed for utility interaction.

Add new text as follows:

306.5.2 Solar photovoltaic panels,modules and arrays. Solar photovoltaic panels, modules and arrays installed upon a roof or as an integral part of a roof assembly shall comply with the requirements of the *International Building Code* and the *International Fire Code*.

Add new referenced standards to Chapter 15 as follows:

UL 1703-02
Standard for Flat-Plate Photovoltaic Modules and Panels

UL 1741-99
Standard for Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources

Reason: Section 304.11 and Section 306 do not address photovoltaic PV) solar panels and this has caused interpretation issues. The 2012 IFC now covers PV solar panels. Since there is a solar Chapter 14 in the IMC and solar is going to be growing, shouldn't

PV be covered in the IMC? The scope of Chapter 14 needs to be changed to include PV collectors, otherwise, Section 306 could not be applied to PV because it is not currently within the scope of the code. Section 101.2 speaks of “equipment specifically addressed herein” and PV is not addressed in the code. The new Section 1405 is duplicated text from Section M2302 of the IRC. Section 1401.1 has to be changed to bring PV into the scope of Chapter 14 which currently excludes PV.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC). The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

Analysis: A review of the standard proposed for inclusion in the code, [UL 1703-02, UL 1741-99] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

M213-12

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

1401.1-M-STRAUSBAUGH.PMGCAC.DOC

M214–12
1404.2.1 (NEW)

Proponent: Timothy Burgos, InterCode Incorporated, Representing Rectorseal Corporation and Ken Sagan, NRG Code Advocates, representing self
(ken@nrgcodeadvocates.com)

Add new text as follows:

1404.2.1 Protection of piping insulation. Piping insulation exposed to the weather shall be protected from damage, including that caused by sunlight, moisture, equipment maintenance and wind. The means of protection shall provide shielding from solar radiation that can cause degradation of the material. Adhesive tape shall not be permitted as a means of such protection.

Reason: This proposal attempts to maintain consistency between the IMC and the IECC allowing the code official easier code enforcement.

This proposal was taken out of the 2012 IECC where the Committee, in their reason statement felt that this change was needed to ensure durable materials met the requirements of the code. Below is the IECC committee reason for this proposal.
Committee Reason: *Protection of outside piping insulation is necessary to assure durable materials to meet the energy code requirements. The modification simply removes the laundry list of possible protections, as the committee felt this was unnecessary.*

This reason statement below, was taken from EC110-09/10, proposed by Howard Ahern and approved as modified as printed above.

"Outdoor piping insulation needs to be protected from weather, physical damage or from UV deterioration. Pipe insulation in outdoor locations is typically protected by an aluminum or sheet metal jacket, painted canvas, plastic cover, or coating that is water retardant and UV resistant.

All AC units require periodic maintenance. The frequency varies with how hard the unit operates, exterior temperature, preventive maintenance program, and many others. In every occasion, every maintenance provides an excuse for the Freon line insulation to be touched and removed. Adhesives Tape is not permitted as it will limit maintenance and damage insulations permeability characteristics. Removal of tape damages the integrity of the original insulation into pieces, specially, if the insulation has reached thermo set state. Protection can also keep silted pipe insulation from commonly separating thus saving additional energy cost. This simple common sense proposal is cost-effective as it will save energy and will prolong insulation life reducing replacement.

This proposal will save residential building energy cost following the same initiative being taken by the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) to improve energy efficiency levels by 30% in the **ASHRAE 90.1 2007 Section 6.4.4.1.1** commercial building standards. It also reflects the energy efficiency improvement approved by Congress American Recovery and Reinvestment Act of 2009 (ARRA).

ASHRAE 90.1 2007 Section 6.4.4.1.1:

Piping Insulation exposed to weather shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind but not limited to the following

A. Piping Insulation exposed to weather shall be suitable for outdoor service e.g., protected by aluminum, sheet metal, painted canvas, or plastic cover. Cellular foam insulation shall be protected as above or painted with a coating that is water retardant and provides shielding from solar radiation that can cause degradation of the material.

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

M214-12

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

1404.2.1(NEW)-M-BURGOS-SAGAN.DOC