

**2009 Code Update Training**

**WELCOME**

**INTERNATIONAL RESIDENTIAL CODE  
2009 EDITION**

**MECHANICAL SECTION**

## **2009 Code Update Training**

**THANK YOU ALL FOR COMING**

**This training is provided today by the joint, combined efforts of Building Departments Staff from Fredericksburg City and the Counties of King George, Stafford and Spotsylvania.**

## 2009 Code Update Training

# ATTENTION

**Please turn off your cell phones**

**Please Hold ?? Until End**

**Make sure you have signed in**

## 2009 Code Update Training

### COMMON CHANGES

We will be covering the significant changes to the International Residential Code (IRC) and the changes common to the International Residential Code and the International Mechanical Code (IMC) in this portion of the presentation.

# 2009 Code Update Training

## IRC M1305.1.4.1 & IMC 304.10

### Clearance from grade

Added language to body of text to read as follows:

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 above adjoining grade or shall be suspended not less than 6 inches above adjoining grade. Such support shall be in accordance with the manufacturer's installation instructions.

# 2009 Code Update Training

## IRC 302.5.2 & IMC 603.7

### Rigid Duct Penetrations

Ducts in a private garage and ducts penetrating the walls or ceilings separating a dwelling from a private garage shall be continuous and constructed of a minimum 26 gage sheet metal or other approved material and shall have no openings into the garage.

# 2009 Code Update Training

## IRC Table M1306.2

**TABLE M1306.2**  
REDUCTION OF CLEARANCES WITH SPECIFIED FORMS OF PROTECTION<sup>a, c, d, e, f, g, h, i, k, l</sup>

TYPE OF PROTECTION APPLIED TO AND COVERING ALL SURFACES OF COMBUSTIBLE MATERIAL WITHIN THE DISTANCE SPECIFIED AS THE REQUIRED CLEARANCE WITH NO PROTECTION (See Figures M1306.1 and M1306.2)	WHERE THE REQUIRED CLEARANCE WITH NO PROTECTION FROM APPLIANCE, VENT CONNECTOR, OR SINGLE WALL METAL PIPE IS:									
	36 inches		18 inches		12 inches		9 inches		6 inches	
	Allowable clearances with specified protection (inches) <sup>b</sup>									
	Use column 1 for clearances above an appliance or horizontal connector. Use column 2 for clearances from an appliance, vertical connector and single-wall metal pipe.									
	Above column 1	Sides and rear column 2	Above column 1	Sides and rear column 2	Above column 1	Sides and rear column 2	Above column 1	Sides and rear column 2	Above column 1	Sides and rear column 2
3 1/2-inch thick masonry wall without ventilated air space	—	24	—	12	—	9	—	6	—	5
1/2-in. insulation board over 1-inch glass fiber or mineral wool batts	24	18	12	9	9	6	6	5	4	3
Galvanized sheet steel having a minimum thickness of 0.0236-inch (No. 24 gage) over 1-inch glass fiber or mineral wool batts reinforced with wire or rear face with a ventilated air space	18	12	9	6	6	4	5	3	3	3
3 1/2-inch thick masonry wall with ventilated air space	—	12	—	6	—	6	—	6	—	6
Galvanized sheet steel having a minimum thickness of 0.0236-inch (No. 24 gage) with a ventilated air space 1-inch off the combustible assembly	18	12	9	6	6	4	5	3	3	2
1/2-inch thick insulation board with ventilated air space	18	12	9	6	6	4	5	3	3	3
Galvanized sheet steel having a minimum thickness of 0.0236-inch (No. 24 gage) with ventilated air space over 24 gage sheet steel with a ventilated space	18	12	9	6	6	4	5	3	3	3
1-inch glass fiber or mineral wool batts sandwiched between two sheets of galvanized sheet steel having a minimum thickness of 0.0236-inch (No. 24 gage) with a ventilated air space	18	12	9	6	6	4	5	3	3	3

# 2009 Code Update Training

## IRC M1307.6

### Plumbing connections

**New section added to read as follows:**

Potable water and drainage system connections to equipment and appliances regulated by this code shall be in accordance with Chapters 29 and 30 of the IRC.

# 2009 Code Update Training

## IRC M1403.1 & IMC 918.3

### Heat Pump Returns

The minimum unobstructed total area of the outside and return air ducts or openings to a heat pump shall be not *less than 6 square inches per 1000 Btu/h* output rating or as indicated by the conditions of the listing of the heat pump.

**NOTE:** This is not a change in the code. This is for informational purposes. The following slides #8 and #9 are not found in your code book. They have been added to this presentation for informational purposes only.

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## IRC M1403.1 & IMC 918.3 *continued.....*

✘ 1 ton = 12,000 BTU	Minimum total sq in of return 72 in. <sup>2</sup>
✘ 1.5 tons = 18,000 BTU	Minimum total sq in of return 108 in. <sup>2</sup>
✘ 2 tons = 24,000 BTU	Minimum total sq in of return 144 in. <sup>2</sup>
✘ 2.5 tons = 30,000 BTU	Minimum total sq in of return 180 in. <sup>2</sup>
✘ 3 tons = 36,000 BTU	Minimum total sq in of return 216 in. <sup>2</sup>
✘ 3.5 tons = 42,000 BTU	Minimum total sq in of return 252 in. <sup>2</sup>
✘ 4 tons = 48,000 BTU	Minimum total sq in of return 288 in. <sup>2</sup>
✘ 4.5 tons = 54,000 BTU	Minimum total sq in of return 324 in. <sup>2</sup>
✘ 5 tons = 60,000 BTU	Minimum total sq in of return 360 in. <sup>2</sup>

*continued... 10*

# 2009 Code Update Training

## IRC M1403.1 & IMC 918.3 *continued....*

To figure square duct, multiply height times width

$$\text{EX: } 12'' \times 10'' = 120 \text{ in.}^2$$

$$\text{EX: } 15'' \times 15'' = 225 \text{ in.}^2$$

To figure round duct:  $3.14 \times \text{radius squared}$ . (The radius equals half the diameter.)

$$\text{EX: } 8'' \text{ round duct is } 3.14 \times (4 \times 4) = 50.24 \text{ in.}^2$$

$$\text{EX: } 14'' \text{ round duct is } 3.14 \times (7 \times 7) = 153.86 \text{ in.}^2$$

# 2009 Code Update Training

## 2009 IRC M1411.3.1 Auxiliary and Secondary Drain Systems

### Auxiliary Drain Pan

**Method # 3. Added the following requirement:**

**The pan shall be equipped with a fitting to allow for drainage.**

# 2009 Code Update Training

## IRC M1411.3.3

### Appliances, equipment and insulation in pans

**New section added to read as follows:**

Where appliances, equipment or insulation are subject to water damage when auxiliary drain pans fill, those portions of the appliances, equipment and insulation shall be installed above the flood rim of the pan. Supports located inside of the pan to support the appliance or equipment shall be water resistant and approved.

*continued.....*

# 2009 Code Update Training

## IRC M1411.3.3

*continued.....*



# 2009 Code Update Training

## IRC M1411.3.3

continued.....



# 2009 Code Update Training

## IRC M1411.6 & IMC 1101.10

### Locking access port caps

New section added to read as follows:

Refrigerant circuit access ports located outdoors shall be fitted with locking-type tamper-resistant caps or shall be otherwise secured to prevent unauthorized access.



## 2009 Code Update Training

### IRC M1502.4.1 & IMC 504.6.1

**This section has been rearranged and sections added.**

#### **Dryer exhaust material and size**

Exhaust ducts shall have a smooth interior finish and shall be constructed of metal a minimum of 0.016-inch thick. The exhaust duct shall be 4 inches minimum in diameter.

**NOTE:** 0.016-inch metal duct is equivalent to 28 gauge.

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### IRC M1502.4.2 & IMC 504.6.2

#### Dryer exhaust duct installation

Exhaust ducts shall be supported at 4-foot intervals and secured in place. The insert end of the duct shall extend into the adjoining duct or fitting in the direction of flow. Ducts shall not be joined with screws or similar fasteners that protrude into the inside of the duct.

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## IRC Table M1502.4.4.1 & IMC Table 504.6.4.1

U S B C amends I R C 25' length to 35' length with fittings reduced according to table

**TABLE M1502.4.4.1  
DRYER EXHAUST DUCT FITTING EQUIVALENT LENGTH**

<b>DRYER EXHAUST DUCT FITTING TYPE</b>	<b>EQUIVALENT LENGTH</b>
4 inch radius mitered 45 degree elbow	2 feet 6 inches
4 inch radius mitered 90 degree elbow	5 feet
6 inch radius smooth 45 degree elbow	1 foot
6 inch radius smooth 90 degree elbow	1 foot 9 inches
8 inch radius smooth 45 degree elbow	1 foot
8 inch radius smooth 90 degree elbow	1 foot 7 inches
10 inch radius smooth 45 degree elbow	9 inches
10 inch radius smooth 90 degree elbow	1 foot 6 inches

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 degree = 0.0175 rad.

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### IRC M1502.4.5 & IMC 504.6.5

#### Dryer exhaust length identification

Where the exhaust duct 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 of the exhaust duct connection.

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## IRC M1502.4.5 & IMC 504.6.5



**NOTE:** This sign is only an example of the signage the inspector will be looking for.

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### IRC M1502.4.6 & IMC 504.6.6

#### Dryer exhaust duct required

Where space for a clothes dryer is provided, an exhaust duct system shall be installed. Where the clothes dryer is not installed at the time of occupancy the exhaust duct ***shall be capped or plugged*** in the space in which it originates and identified and marked ***“future use.”***

**Exception:** Where a listed condensing clothes dryer is installed prior to occupancy of the structure.

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### IRC M1502.5 & IMC 504.6.7

#### Dryer exhaust duct 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 ¼" inches between the duct and the finished face of the framing member.

Protective shield plates shall be constructed of steel, shall have a minimum thickness of 0.064-inch and shall extend a minimum of 2 inches above sole plates and below top plates.

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### IRC M1503.4 & IMC 505.2

#### Makeup air required

**New section added to read as follows:**

Exhaust hood systems capable of exhausting in excess of 400 cfm 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.

# 2009 Code Update Training

## IRC Table M1601.1.1(2)

### Gauges of metal ducts and plenums

Table revised and 30 gauge has been removed.

TABLE M1601.1.1(2)  
GAGES OF METAL DUCTS AND PLENUMS USED FOR HEATING OR COOLING

DUCT SIZE	GALVANIZED		ALUMINUM
	Minimum Thickness (Inches)	Equivalent Galvanized Sheet No.	Minimum Thickness (Inches)
Round ducts and enclosed rectangular ducts			
14 inches or less	0.0157	28	0.0175
16 and 18 inches	0.0187	26	0.018
20 inches and over	0.0236	24	0.023
Exposed rectangular ducts			
14 inches or	0.0157	28	0.0175
Over 14 <sup>a</sup> inches	0.0187	26	0.018

For SI: 1 inch = 25.4 mm.

a. For duct gages and reinforcement requirements at static pressures of 1/2 inch, 1 inch and 2 inches w.g., SMACNA *Duct Construction Standard*, Tables 2-1; 2-2 and 2-3 shall apply.

# 2009 Code Update Training

## IRC M1601.3

### Duct insulation materials

**New exception added to read as follows:**

Spray application of polyurethane foam to the exterior of ducts in attics and crawl spaces shall be permitted subject to all of the following:

1. The flame spread index is not greater than 25 and the smoke-developed index is not greater than 450 at the specified installed thickness.
2. The foam plastic is protected in accordance with the ignition barrier requirements of Sections R316.5.3 and R316.5.4.

*continued....*

# 2009 Code Update Training

## IRC M1601.3

*continued...*

3. The foam plastic complies with the requirements of Section R316.

### **Added subsection 3.4 to read as follows:**

For spray 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 foam application*. In addition, the total *R*-value for the nominal application thickness shall be provided.

# 2009 Code Update Training

## IRC M1601.4.1

### Joints and seams

**Added three exceptions to read as follows:**

1. Spray polyurethane foam shall be permitted to be applied without additional fasteners.
2. Where a duct connection is made that is partially inaccessible, three screws or rivets shall be equally spaced on the exposed portion of the joint so as to prevent a hinge effect.
3. Continuously welded and locking type longitudinal joints and seams in ducts operating at static pressures less than 2 inches of water column pressure classification shall not require additional closure systems.

# 2009 Code Update Training

## IRC M1601.4.2

### Plastic duct joints

**New section added to read as follows:**

Joints between plastic ducts and plastic fittings shall be made in accordance with the manufacturer's installation instructions.

# 2009 Code Update Training

## IRC M1601.4.5

### Duct insulation

**Added language to the body of the text:**

....except where the insulation is spray polyurethane foam with a minimum water vapor permeance of 3 perm per inch at the installed thickness.

# 2009 Code Update Training

## IRC M1601.5

### Under-floor plenums

#### Section reworded to read as follows:

Under-floor plenums shall be prohibited in new structures. Modification or repairs to under-floor plenums in existing structures shall conform to the requirements of this section.

# 2009 Code Update Training

## IRC M1601.5.1

### General

#### Section added to read as follows:

The space shall be cleaned of loose combustible materials and scrap, and shall be tightly enclosed. The ground surface of the space shall be covered with a moisture barrier having a minimum thickness of 4 mils. Plumbing waste cleanouts shall not be located within the space.

**Exception:** Plumbing waste cleanouts shall be permitted to be located in unvented crawl spaces that receive conditioned air in accordance with Section 408.3.

# 2009 Code Update Training

## IRC M1601.6

### Independent garage HVAC systems

**New section added to read as follows:**

Furnaces and air-handling systems that supply air to living spaces shall not supply air or return air from a garage.

# 2009 Code Update Training

## IRC M1602.2

### Return air prohibited sources

**Added sub-section #6 to read as follows:**

An unconditioned crawl space by means of direct connection to the return side of a forced air system.

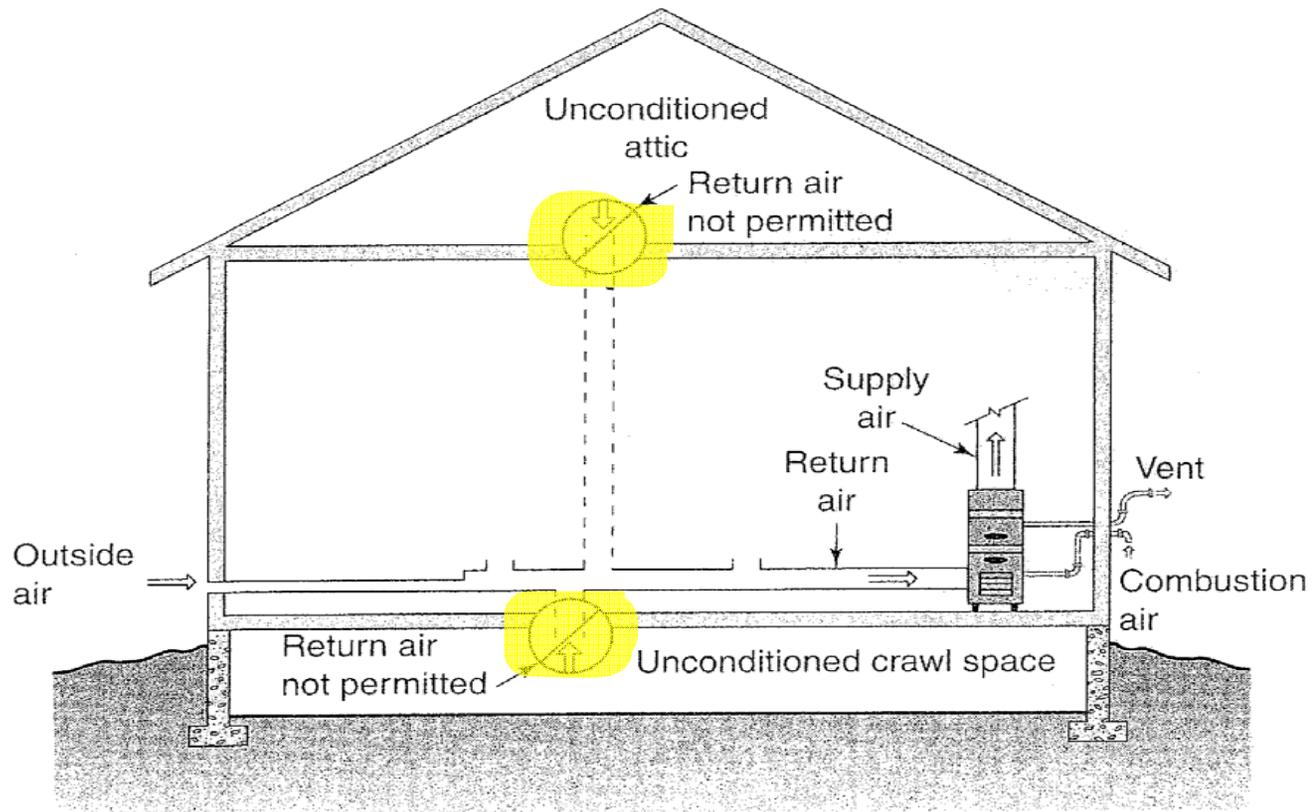
Transfer openings in the crawl space enclosure shall not be prohibited.

*continued.....*

# 2009 Code Update Training

## IRC M1602.2

*continued.....*



**Prohibited sources of outdoor and return air include unconditioned attics and crawl spaces**

# 2009 Code Update Training

## IRC M 1701

### Combustion Air

**M1701.1 Scope.** Solid-fuel burning *appliances* shall be provided with *combustion air* in accordance with the appliance manufacturer's installation instructions. Oil-fired appliances shall be provided with *combustion air* in accordance with NFPA 31..continued

## 2009 Code Update Training

### IRC M 1701

The methods of providing *combustion air* in this chapter do not apply to fireplaces, fireplace stoves and direct-vent *appliances*. The requirements for combustion and dilution air for gas-fired *appliances* shall be in accordance with Chapter 24.

# 2009 Code Update Training

## IRC M1701.2

### Combustion air opening location

**New section added to read as follows:**

In areas prone to flooding as established in Table R301.2(1), combustion air openings shall be located at or above the elevation required in Section R322.2.1 or R322.3.2.

# 2009 Code Update Training

## IRC M2101.2

### Hydronic Piping Systems Installation System drain down

Hydronic piping systems shall be installed to permit draining of the system. Where the system drains to the plumbing drainage system, the installation shall conform to the requirements of Chapters 25 through 32 of the IRC.

**ADDED**

**Exception:** The buried portion of systems embedded underground or under floors.

# 2009 Code Update Training

## IRC M2103.2 & IMC 1209.5

### Floor Heating Systems

**New sections added to read as follows:**

**M2103.2 Thermal barrier.** Radiant floor heating systems shall have a thermal barrier in accordance with Sections M2103.2.1 through M2103.2.4.

**Exception:** Insulation shall not be required in engineered systems where it can be demonstrated that the insulation will decrease the efficiency or have a negative effect on the installation.

# 2009 Code Update Training

## IRC M2103.2 & IMC 1209.5

### Floor Heating Systems

**M2103.2.1 Slab on grade installation.** Radiant piping used in slab-on-grade applications shall have insulating materials having a minimum *R*-value of 5 installed beneath the piping.

**M2103.2.2 Suspended floor installation.** In suspended floor applications, insulation shall be installed in the joist bay cavity serving the heating space above and shall consist of materials having a minimum *R*-value of 11.

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# 2009 Code Update Training

## IRC M2103.2 & IMC 1209.5

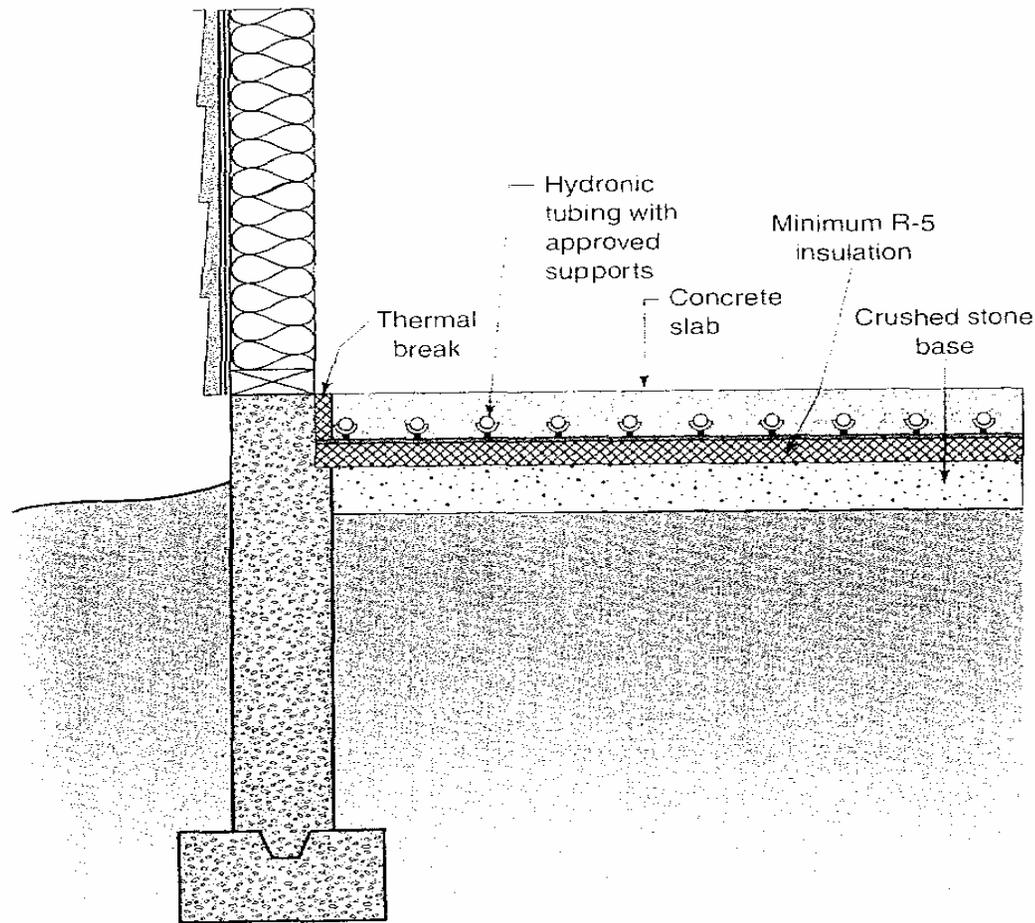
### Floor Heating Systems

**M2103.2.3 Thermal break required.** A thermal break consisting of asphalt expansion joint materials or similar insulating materials shall be provided at a point where a heated slab meets a foundation wall or other conductive slab.

**M2103.2.4 Thermal barrier material marking.** Insulating materials used in thermal barriers shall be installed so that the manufacturer's *R*-value mark is readily observable upon inspection.

# 2009 Code Update Training

## IRC M2103.2 & IMC 1209.5



Hydronic floor heating system

# 2009 Code Update Training

## IRC M2201.2

### Above-ground tanks

#### Exception added to read as follows:

The storage of fuel oil, used for space or water heating, above ground or inside buildings in quantities exceeding 660 gallons shall comply with NFPA 31.

# 2009 Code Update Training

**This is the end of the significant  
changes to the  
2009 International Residential Code**

# 2009 Code Update Training

## Questions and Answers

**ANY QUESTIONS ON THIS PORTION OF  
THE PRESENTATION?**



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# 2009 Code Update Training

## IMC 303.5

### Indoor Locations

Water heaters have been added to the list of appliances that must be listed for closet installation or comply with room volume provisions (12 times rule).

# 2009 Code Update Training

## IMC 306.1

### **Access for maintenance and replacement**

Appliances 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, 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 shall be provided in front of the control side to service an appliance.

# 2009 Code Update Training

## IMC 306.5

### Equipment on roofs or elevated structures

#### Text added clarifying height measurements:

Where access involves climbing over parapet walls, the height shall be measured to the top of the parapet wall.

#### Added landing requirements to sub-section #6:

Landing dimensions shall be not less than 18 inches and not less than the width of the ladder served. A guard rail shall be provided on all open sides of the landing.

# 2009 Code Update Training

## IMC 307.2

### Condensate Disposal and Materials

✂ 307.2.1: Condensate disposal. Added minimum slope requirements to be 1/8 inch per foot.

✂ 307.2.2: Drain pipe materials and sizes. Added materials approved for use in chapter 7 of the IPC and added a sizing chart.

✂ 307.2.3: Auxiliary and secondary drain systems. Added 24 gage minimum thickness for galvanized pans and also limited metallic pans to galvanized only.

# 2009 Code Update Training

## IMC 401.4

### Intake opening location

**Air intake openings shall comply with the following:**

1. Intake openings shall be located a minimum of 10 feet from lot lines or buildings on the same lot. Where openings front on a street or public way, the distance shall be measured to the center line of the street or public way.
2. Mechanical and gravity outdoor air intake openings shall be located not less than 10 feet horizontally from any hazardous or noxious contaminant source, such as vents, alleys, parking lots and loading docks, except as specified in Item 3 or Section 501.2.1.

*continued.....*

# 2009 Code Update Training

## IMC 401.4 *continued.....*

### Intake opening location

3. Intake openings shall be located not less than 3 feet below contaminant sources where such sources are located within 10 feet of the opening.
4. Intake openings on structures in flood hazard areas shall be at or above the design flood level.

# 2009 Code Update Training

## IMC 403.3

### Outdoor airflow rate

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

*continued.....*

# 2009 Code Update Training

## IMC 403.3

*continued.....*

### Outdoor airflow rate

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 and other designated areas where smoking is permitted, the ventilation rates in Table 403.3 are based on the absence of smoking in occupiable spaces.

**Exception:** The occupant load is not required to be determined based on the estimated maximum occupant load rate indicated in Table 403.3 where approved statistical data document the accuracy of an alternate anticipated occupant density.

*continued.....*

# 2009 Code Update Training

## IMC Table 403.3

*continued.....*

<u>OCCUPANCY CLASSIFICATION</u>	<u>People Outdoor Airflow Rate in Breathing Zone</u> Cfm/person	<u>Area Outdoor Airflow Rate in Breathing Zone</u> $R_a$ cfm/ft <sup>2a</sup>	<u>Default Occupant Density</u> #/1000 ft <sup>2a</sup>	<u>Exhaust Airflow Rate</u> Cfm/ft <sup>2a</sup>
<u>Food and beverage service</u>	-	=	100	=
<u>Bars or cocktail lounges designated as an area when smoking is permitted<sup>b</sup></u>	30	=	100	=
<u>Cafeteria or fast food designated as an area when smoking is permitted<sup>b</sup></u>	20	=	100	=
<u>Dining rooms designated as an area when smoking is permitted<sup>b</sup></u>	20	=	70	=
<u>Public spaces</u>				
<u>Lounges designated as an area where smoking is permitted<sup>b</sup></u>	30	=	100	=

# 2009 Code Update Training

## IMC 501.2.1

### Location of exhaust outlets

**Sub-section #3 and #4 added to read as follows:**

3. For all environmental air exhaust: 3 feet from property lines; 3 feet from operable openings into buildings for all occupancies other than group U, and 10 feet from mechanical air intakes. Such exhaust shall not be considered hazardous or noxious.
4. Exhaust outlets serving structures in flood hazard areas shall be installed at or above the design flood level.

# 2009 Code Update Training

## IMC 504.2

### Exhaust Penetrations

**Added the following to the body of the text:**

Where a clothes dryer exhaust duct penetrates a wall or ceiling membrane, the annular space shall be sealed with noncombustible material, approved fire caulking or a noncombustible dryer exhaust duct wall receptacle.



Photo Courtesy By: Russell Yates

# 2009 Code Update Training

## IMC 506.3.2.1

### Duct Joint Types

Welded joints have been added to the list of approved grease duct joints. The maximum flange depth to be  $\frac{1}{2}$  inch.



# 2009 Code Update Training

## IMC 506.3.6

### Grease duct clearances

**Added exceptions #1 and #3 to read as follows:**

1. Factory-built commercial kitchen grease ducts listed and labeled in accordance with UL 1978.
3. Where commercial kitchen grease ducts are continuously covered on all sides with a listed and labeled field-applied grease duct enclosure material, system, product or method of construction specifically evaluated for such purpose in accordance with ASTM E 2336, the required clearance shall be in accordance with the listing of such material, system, product or method.

# 2009 Code Update Training

## IMC 506.3.8.2

### Cleanouts serving in-line fans

#### **New section added to read as follows:**

A cleanout shall be provided for both the inlet side and outlet side of an in-line fan except where a duct does not connect to the fan. Such cleanouts shall be located within 3 feet of the fan duct connection.

# 2009 Code Update Training

## IMC 506.3.10

### Grease duct enclosures

#### **Section completely reworked to read as follows:**

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.

*continued..... 62*

# 2009 Code Update Training

## IMC 506.3.10

*continued.....*

Duct enclosures shall have a fire-resistance rating not less than that of the floor assembly penetrated, but need not exceed 2 hours. Duct enclosures shall be as prescribed by Section 506.3.10.1, 506.3.10.2 or 506.3.10.3.

# 2009 Code Update Training

## IMC 506.3.10.1

### 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, and shall have a clearance to noncombustible construction of not less than 6 inches. 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.

# 2009 Code Update Training

## IMC 506.3.10.2

### 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 duct shall be continuously covered on all sides from the point at which the duct originates to the outlet terminal.

*continued.....*

# 2009 Code Update Training

## IMC 506.3.10.2

*continued*

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 systems shall be installed in accordance with the listing and the manufacturer’s installation instructions. Exposed duct wrap systems shall be protected where subject to physical damage.

# 2009 Code Update Training

## IMC 506.3.10.3

### **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.

# 2009 Code Update Training

## IMC 506.3.10.4

### 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.

# 2009 Code Update Training

## IMC 506.4.2

### Type II terminations

**New section added to read as follows:**

Exhaust outlets serving Type II hoods shall terminate in accordance with the hood manufacturer's installation instructions and shall comply with the following:

1. Exhaust outlets shall terminate not less than 3 feet in any direction from openings into the building.
2. Outlets shall terminate not less than 10 feet from property lines or buildings on the same lot. *continued.....*

# 2009 Code Update Training

## IMC 506.4.2

*continued.....*

3. Outlets shall terminate not less than 10 feet above grade.
4. Outlets that terminate above a roof shall terminate not less than 30 inches above the roof surface.
5. Outlets shall terminate not less than 30 inches from exterior vertical walls.
6. Outlets shall be protected against local weather conditions.
7. Outlets shall not be directed onto walkways.
8. Outlets shall meet the provisions for exterior wall opening protectives in accordance with the International Building Code.

# 2009 Code Update Training

## IMC 506.3.12.3

### Termination Location

Added separation requirements for exhaust outlets to read as follows:

Exhaust outlets shall be located not less than 3 feet above air intake openings into any building.

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## IMC 506.12.3



# 2009 Code Update Training

## IMC 507.1

### Commercial kitchen hoods general

#### Added language to exceptions #2 and #3:

2. . . . 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.

*continued.....*

# 2009 Code Update Training

## IMC 507.1

*continued.....*

### **Commercial kitchen hoods general**

3. . . . 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.

# 2009 Code Update Training

## IMC 507.2.2

### Type II hoods

Type II hoods shall be installed above dishwashers and light-duty appliances that produce heat or moisture and do not produce grease or smoke, 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 light duty appliances that produce products of combustion and do not produce grease or smoke. Type II hoods shall be ventilated in accordance with Section 403.3. For the purpose of determining the floor area required to be ventilated, 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.

# 2009 Code Update Training

## IMC 507.9

### Clearances for Type I Hood

Reworded exception to provide clearance relief:

**Exception:** Clearance shall not be required from gypsum wallboard or ½-inch 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 in all directions from the hood.

# 2009 Code Update Training

## IMC 508

### Makeup Air

**508.1.1 Makeup air temperature:** Added language to allow for temperature differentials to exceed 10 deg. F where the added heating and cooling loads of the makeup air do not exceed the capacity of the HVAC system.

**508.2 Compensating hoods.** Added exception for compensating hoods to allow front face and side face only discharge hoods to not bear labeling of maximum make-up air flow.

# 2009 Code Update Training

## IMC 601.2

### Air movement in egress elements

#### **Added exception #4 to read as follows:**

Incidental air movement from pressurized rooms within health care facilities, provided that the corridor is not the primary source of supply or return to the room.

# 2009 Code Update Training

## IMC 601.4

### Contamination prevention

#### **Exception added to read as follows:**

Exhaust systems located in ceiling return air plenums over spaces that are permitted to have 10 percent recirculation in accordance with Section 403.2.1, item 4. The exhaust duct joints, seams and connections shall comply with Section 603.9.

# 2009 Code Update Training

## IMC 603.4.1

### Minimum Fasteners

Round metallic ducts 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.

# 2009 Code Update Training

## IMC 603.8.1

### Underground Ducts Slope

Underground ducts shall have a minimum slope of 1/8 inch per foot to allow drainage to a point provided with access.



# 2009 Code Update Training

## IMC 604.7

### Insulation Identification

Removed requirement for identification of spray polyurethane foam insulation.

Added sub-section #4 to the text to read as follows:

4. For spray 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.

# 2009 Code Update Training

## IMC 607

### Duct and Transfer Openings

Entire section has been revamped to incorporate provisions from the IBC because many mechanical system designs share overlapping provisions such as the installation of dampers.

# 2009 Code Update Training

## IMC 607.5.1.1

### Fire walls

### Horizontal exits

**New section added to read as follows:**

A listed smoke damper designed to resist the passage of smoke shall be provided at each point that a duct or air transfer opening penetrates a fire wall that serves as a horizontal exit.

# 2009 Code Update Training

## IMC 607.5.5.1

### Enclosure at the bottom

#### **New section added to read as follows:**

Shaft enclosures that do not extend to the bottom of the building or structure shall be protected in accordance with Section 708.11 of the International Building Code.

# 2009 Code Update Training

## IMC 607.5.6

### Exterior Walls

**New section added to read as follows:**

Ducts and air transfer openings in fire-resistance-rated exterior walls required to have protected openings in accordance with Section 705.10 of the International Building Code shall be protected with listed fire dampers installed in accordance with their listing.

# 2009 Code Update Training

## IMC 607.5.7

### Smoke partitions

#### **New section added to read as follows:**

A listed smoke damper designed to resist the passage of smoke shall be provided at each point where an air transfer opening penetrates a smoke partition. Smoke dampers and smoke damper actuation methods shall comply with Section 607.3.3.2.

**Exception.** Where the installation of a smoke damper will interfere with the operation of a required smoke control system in accordance with Section 513, approved alternate protection shall be used.

# 2009 Code Update Training

## IMC 801.20

### Plastic Vent Joints

This section has been revised to remove the requirement for CPVC and PVC primer to be of a “contrasting color”. It now refers you to the appliance manufacturers installation instructions.

# 2009 Code Update Training

## IMC 918.6

### Prohibited sources

**Added exception to sub-section 5 and added sub-section 6**

5. A closet, bathroom, toilet room, kitchen, garage, mechanical room, boiler room, furnace room or unconditioned attic.

**Exception:** Where return air intakes are located not less than 10 feet from cooking appliances, and serve the kitchen area only, taking return air from a kitchen shall not be prohibited.

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.

# 2009 Code Update Training

## IMC 1107.2

### Piping location

#### **New section added to read as follows:**

Refrigerant piping that crosses an open space that affords passageway in any building shall not be less than 7 feet 3 inches above the floor unless the piping is located against the ceiling of such space. Refrigerant piping shall not be placed in any elevator, dumbwaiter or other shaft containing a moving object or in any shaft that has openings to living quarters or to means of egress. Refrigerant piping shall not be installed in an enclosed public stairway, stair landing or means of egress.

# 2009 Code Update Training

## IMC 1107.2.1

### Piping in concrete floors

**New section added to read as follows:**

Refrigerant piping installed in concrete floors shall be encased in pipe ducts. The piping shall be isolated and supported to prevent damaging vibration, stress and corrosion.

# 2009 Code Update Training

## IMC 1107.2.2

### Refrigerant penetrations

**New section added to read as follows:**

Refrigerant piping shall not penetrate floors, ceilings or roofs.

**Exceptions:**

1. Penetrations connecting the basement and the first floor.
2. Penetrations connecting the top floor and a machinery penthouse or roof installation.

*continued.....* 92

# 2009 Code Update Training

## IMC 1107.2.2

*continued.....*

3. Penetrations connecting adjacent floors served by the refrigeration system.
4. Penetrations by piping in a direct system where the refrigerant quantity does not exceed Table 1103.1 for the smallest occupied space through which the piping passes.
5. In other than industrial occupancies and where the refrigerant quantity exceeds Table 1103.1 for the smallest space, penetrations for piping that connects separate pieces of equipment are either:

*continued..... 93*

# 2009 Code Update Training

## IMC 1107.2.2

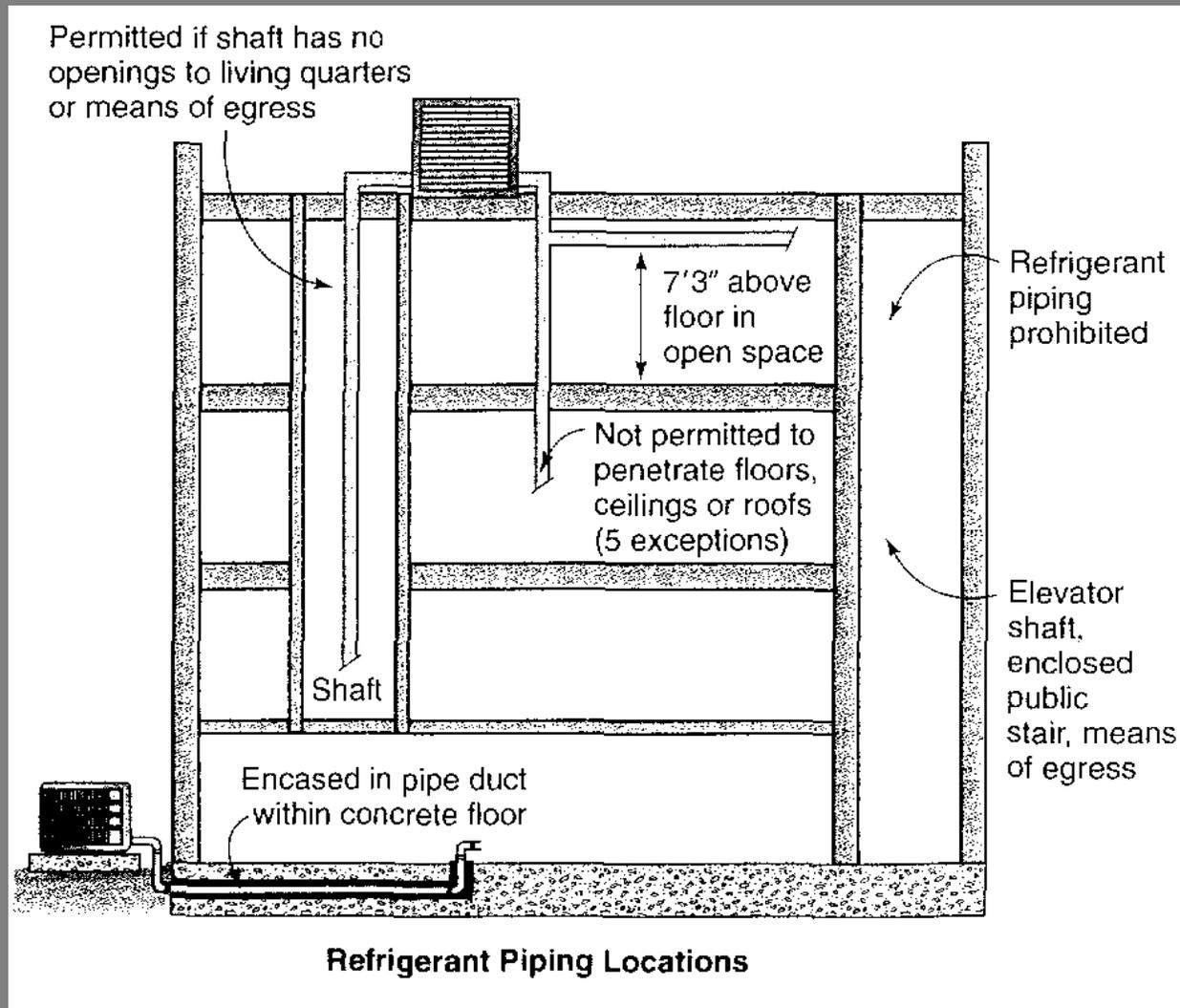
*continued.....*

5.1. Enclosed by an approved gas-tight, fire-resistive duct or shaft with openings to those floors served by the refrigerant system or

5.2. Located on the exterior of the building where vented to the outdoors or to the space served by the system and not used as an air shaft, closed court or similar space.

# 2009 Code Update Training

## IMC 1107.2



# 2009 Code Update Training

## Questions and Answers

ANY QUESTIONS ON THIS PORTION OF  
THE PRESENTATION?



# 2009 Code Update Training

This is the end of the significant  
changes to the  
2009 International Mechanical Code

# 2009 Code Update Training

## WELCOME

# INTERNATIONAL ENERGY CONSERVATION CODE

## AND

# INTERNATIONAL RESIDENTIAL CODE 2009 EDITION

# 2009 Code Update Training

## IRC N1103.1.1 & IECC 403.1.1

### Programmable Thermostat – Controls

#### If primary heating system is a forced-air furnace

- ✘ At least one programmable thermostat per dwelling unit
- ✘ Capability to set back or temporarily operate the system to maintain zone temperatures
  - down to 55°F (13°C) or
  - up to 85°F (29°C)
- ✘ Initially programmed with:
  - heating temperature set point no higher than 70°F (21°C) and
  - cooling temperature set point no lower than 78°F (26°C)

# 2009 Code Update Training

## IRC N1103.1.1 & IECC 403.1.1

**Large, Clear Display with backlighting** shows the current and set temperatures and time — even in the dark.

**Menu Driven Programming** makes set up effortless.

**Beautiful Ergonomic Design** — smart and sophisticated to match your lifestyle.

**Touchscreen Interaction**

**Programmable Fan** offers increased air quality when combined with a Honeywell Whole-house Air Cleaner.

**Accuracy of +/- 1 degree**

**Armchair Programming** allows you to remove the thermostat from the wall for programming.

**Speed Same-Schedule Programming** — no need to copy multiple days.

**Various HOLD Options** allow you to override the program schedule as desired.

**Change/Check Reminders** let you know when to service or replace filters, batteries, etc.

**Real Time Clock** keeps time during power failures and automatically updates to daylight savings.

**"Saving Changes" Notification** let's you know your changes have been saved.



# 2009 Code Update Training

## IRC N1103.2 & IECC 403.2

### Ducts

✘ **Insulation.** Supply ducts in attics shall be insulated to a minimum of R-8. All other ducts shall be insulated to a minimum of R-6.

Exception: Ducts or portions thereof located completely inside the building thermal envelope.

✘ **Sealing (Mandatory)**

- Joints and seams shall comply with IRC Section M1601.4.1

# 2009 Code Update Training

## IRC N1103.2.2 & IECC 403.2.2

### Sealing and Duct Tightness Tests

- ✘ All ducts, air handlers, filter boxes and building cavities used as ducts shall be sealed.
- ✘ Duct tightness shall be verified by either –
  - Post construction test
    - Leakage to outdoors:  $\leq 8$  cfm/per 100 ft<sup>2</sup> of conditioned floor area or
    - Total leakage:  $\leq 12$  cfm/per 100 ft<sup>2</sup> of conditioned floor area
      - tested at a pressure differential of 0.1 in w.g. (25Pa) across entire system, including manufacturer's air handler enclosure
  - All register boots taped or otherwise sealed

*continued.....*

# 2009 Code Update Training

## *continued...* IRC N1103.2.2 & IECC 403.2.2

### Sealing and Duct Tightness Tests

#### Rough-in test

- Total leakage  $\leq 6$  cfm/per 100 ft<sup>2</sup> of conditioned floor area
  - tested at a pressure differential of 0.1 in w.g. (25Pa) across roughed-in system, including manufacturer's air handler enclosure
  - all register boots taped or otherwise sealed
  - if air handler not installed at time of test
    - » Total air leakage  $\leq 4$  cfm/per 100 ft<sup>2</sup>

**Exceptions:** Duct tightness test is not required if the air handler and all ducts are located within conditioned space

# 2009 Code Update Training

## *continued...* IRC N1103.2.2 & IECC 403.2.2

### USBC Amendments

- ✂ USBC permits the duct tightness test to be optional
- ✂ USBC clarifies that an “approved” testing individual/firm can perform the test.
- ✂ Visual inspection option

# 2009 Code Update Training

## IRC 1103.3 & IECC 403.3

### Mechanical system piping insulation

Mechanical system piping capable of carrying fluids above 105 deg. F or below 55 deg. F shall be insulated to a minimum of R-3.

## 2009 Code Update Training

### IRC N1103.8.1 & IECC 403.9.1

#### Pool heaters

All pool heaters shall be equipped with a readily accessible on-off switch to allow shutting off the heater without adjusting the thermostat setting. Pool heaters fired by natural gas or LP gas shall not have continuously burning pilot lights.

# 2009 Code Update Training

## IRC N1103.8.2 & IECC 403.9.2

### Time switches

Time switches that can automatically turn off and on heaters and pumps according to a preset schedule shall be installed on swimming pool heaters and pumps.

#### Exceptions:

1. Where public health standards require 24-hour pump operation.
2. Where pumps are required to operate solar- and waste-heat-recovery pool heating systems.

## 2009 Code Update Training

### IRC N1103.8.3 & IECC 403.9.3

#### Pool covers

Heated pools shall be equipped with a vapor retardant pool cover on or at the water surface. Pools heated to more than 90 deg. F shall have a pool cover with a minimum insulation value of R-12.

## 2009 Code Update Training

# Questions and Answers

ANY QUESTIONS ON THIS PORTION OF  
THE PRESENTATION?



# 2009 Code Update Training

This is the end of the significant changes to the  
INTERNATIONAL ENERGY CONSERVATION CODE  
AND  
INTERNATIONAL RESIDENTIAL CODE 2009  
EDITION