

Significant Changes to the
**INTERNATIONAL
RESIDENTIAL CODE®**
2009 Edition

STEPHEN A. VAN NOTE



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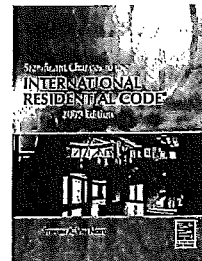
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Significant Changes To The International Residential Code 2009 Edition

Authored by Steve Van Note



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Section Number: R302.2 and R302.3

Section Title: Dwelling Unit Separation

Change Type: Modification

Change Summary: The dwelling unit separation provisions have been relocated from Section R317 to Section R302. The common wall separation between townhouses now requires only a one-hour fire-resistance rating. The code now recognizes UL 263 as an equivalent test standard to ASTM E 119 for fire resistance. Both test standards are now referenced as meeting the test requirements for the required fire-resistance rating between dwelling units of two-family dwellings and townhouses. New language clarifies that wall assemblies separating two-family dwellings must begin at the foundation.

Change Significance: In the consolidation of the fire-resistive construction provisions, the dwelling unit separation requirements for townhouses and two-family dwellings in Sections R317.1 and R317.2 of the 2006 IRC have been relocated to Section R302.

The fire-resistance rating for the common wall between townhouses has been reduced from 2 hours to 1 hour. This change is coupled with new requirements for an automatic fire sprinkler system to be installed in all townhouses (as discussed later in this publication). Jurisdictions in many parts of the country have permitted townhouse separation with a one-hour fire-resistance rating with the installation of a sprinkler system. Based on satisfactory results of these installations, this change was put forth to address a reasonable level of fire protection and to limit the impact on affordable housing.

Fire-resistance test standards ASTM E 119 and UL 263 have identical specifications for test apparatus and test procedures, resulting in identical test results. UL 263 has been added as an approved test method for the fire-resistance-rated separations between two-family dwellings. The inclusion of this alternate test method provides the authority having jurisdiction with the flexibility to accept listed and labeled products evaluated in accordance with ASTM E 119 or UL 263. Although the code previously listed ASTM E 119 as a test standard for the fire-resistance-rated wall assemblies for two-family dwellings in R317.1, the IRC did not identify testing methodology to determine the fire-resistance rating for separations between townhouses in Section R 317.2 or for exterior walls in Section R302 related to fire separation distance (discussed previously in this publication).



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The code now requires these assemblies to be tested in accordance with ASTM E 119 or UL 263, giving the building official specific direction for verifying the fire-resistant ratings.

In order to ensure a complete separation including basement and crawl space areas, this code change also clarifies that fire-resistant-rated wall assemblies for separation of two-family dwellings must be continuous from the foundation to the roof.



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Section Number: Tables R404.1(1) through R404.1(3)

Section Title: Lateral support for concrete and masonry foundation walls

Change Type: Deletion

Change Summary: The prescriptive lateral restraint provisions for the top of concrete and masonry foundation walls based on soil type, height of wall and unbalanced backfill height have been removed from the code.

Change Significance: Prior to the 2006 edition, the IRC and the legacy *CABO One- and Two-family Dwelling Code* relied on the prescriptive provisions for anchor bolt spacing and floor framing connections to provide lateral restraint at the top of basement foundation walls. As the result of engineering analysis, the 2006 IRC introduced additional requirements for anchor bolt spacing, floor joist attachment and blocking, and maximum aspect ratio for walk out basements. The tabular values for these new requirements varied based on the height of the foundation wall, the maximum unbalanced backfill height and the type of soil. Deletion of these lateral restraint provisions brings the 2009 IRC into agreement with the 2000 and 2003 editions.

Proponents for removing the top of foundation wall lateral restraint provisions reasoned that the traditional prescriptive provisions for anchor bolts and floor system connections have performed well for many years without substantiated problems or failures. In addition, the engineering analysis used to justify introduction of the lateral restraint provisions was considered overly conservative based on worst case conditions that failed to take into account all design factors.



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Section Number: R602.10

Section Title: Braced Wall Lines and Braced Wall Panels

Change Type: Modification

Change Summary: The wall bracing provisions of Section R602.10 have been rewritten to provide technical accuracy and clarity. The code no longer differentiates between exterior and interior braced wall lines. The terms *braced wall line* and *braced wall panel* are more precisely defined. New language clarifies how braced wall lines are measured and when mixing of bracing methods is permitted. The changing language more clearly prescribes the paths for compliance—intermittent bracing, continuous sheathing, or an engineered design.

Change Significance: The wall bracing provisions in Section R602.10 have undergone a major overhaul from the 2006 provisions, reorganizing and revising the text for technical accuracy and clarity, and are intended to make the section more user friendly. Many of the changes are the result of work by the ICC Ad Hoc Committee on Wall Bracing including engineering analysis of the prescriptive methods used to resist lateral seismic and wind forces. Such analysis revealed that clarification was needed in the bracing requirements related to wind forces and led to placing the wind and seismic provisions in separate tables with the more restrictive requirements controlling the amount of bracing.

The definitions of *braced wall line* and *braced wall panel* are revised for clarity and uniform application. Previous definitions were circular in that they used the other term in the definition—a *braced wall line* was a series of braced wall panels and a *braced wall panel* was a segment of a braced wall line. *Braced wall panel* is now defined in engineering terms to clarify its purpose to resist in-plane shear loads. In the same way, *braced wall line* is now defined by its purpose—to designate the location of the lateral resistance system provided by the wall bracing. New text in Section R602.10.1 precisely describes where a braced wall line begins and ends in determining its length.

The code no longer differentiates between exterior and interior braced wall lines. The previous language caused confusion, leading some to believe that interior braced wall lines had to begin and end inside the building. In a structural sense, all braced wall lines act in the same way regardless of where they are located on the building, and this change removes the unnecessary and sometimes confusing language.



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Section R301.2.2 exempts one- and two-family dwellings located in Seismic Design Category (SDC) C from the seismic requirements of the code. By also inserting this exemption into the beginning of Section R602.10, the code clarifies the application of the wall bracing provisions for these dwellings. One- and two-family dwellings located in SDC C need comply with only the requirements for buildings located in SDC A and B, which have no special seismic requirements. This new language also clarifies that there is no similar reduction in bracing requirements of one- and two-family dwellings for resisting wind forces.

By introducing the term *intermittent bracing* to define the use of isolated braced wall panels within a braced wall line, the code now clearly distinguishes the three separate paths for compliance with the bracing requirements—the prescriptive methods using either intermittent braced wall panels or continuous wall sheathing, or bracing (shear walls) in accordance with an engineered design.

Previously, the code was silent on mixing various types of bracing methods on the same building, though the practice of mixing methods was not uncommon. The code now specifically allows mixing of methods between stories and from one wall line to the next. Different bracing methods are also permitted within the same wall line in SDC A, B and C.



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Section Number: M1502

Section Title: Clothes dryer exhaust

Change Type: Modification

Change Summary: Dryer exhaust duct installation under the 2009 IRC focuses primarily on the dryer manufacturer's installation instructions. The code clarifies the provisions for duct materials and installation to reflect current industry practices. Except where determined by the manufacturer's installation instructions, the maximum prescribed length for dryer exhaust duct has increased from 25 feet to 35 feet. Equivalent lengths for fittings appear in a new table and are based on the radius and type of fitting. When a concealed exhaust system with a length greater than 35 feet is installed in accordance with the dryer manufacturer's installation instructions, the developed length must be identified with a permanent marker. New provisions require protection of the dryer duct against penetration by drywall fasteners.

Change Significance: The modification to Section M1502.3 emphasizes that the manufacturer's installation instructions are the first source for dryer exhaust termination requirements, which are related to the design and testing of the specific model of dryer. For example, the manufacturer may permit a clearance to openings less than 3 feet or may require a termination point greater than 3 feet from openings. The prescriptive requirement for the minimum 3-foot distance between dryer exhaust terminations and openings into buildings applies only when the clearance is not specified by the manufacturer or is not known.

The dryer manufacturer's installation instructions also govern the maximum developed length of the exhaust duct including provisions for fittings, but only if the model of dryer is known and the installation instructions are submitted to the building official. Modern dryers are increasingly efficient and are generally designed to exhaust greater distances than otherwise allowed by the code, with some models permitting duct lengths up to 90 feet and many models reaching 60 feet. When dryer exhaust duct is installed in accordance with the manufacturer's specifications, exceeds the length prescribed in Section M1502.7 and is concealed, the code now requires a permanent sign, label or tag identifying the developed length of the exhaust duct. This new requirement intends to alert homeowners installing replacement dryers to match the specifications for the make and model to the existing exhaust duct installation. Often the dryer make and model is not known at the time of construction and



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installation of the exhaust duct must meet the prescriptive requirements of the code. Recognizing that distances permitted by the manufacturers typically exceed the distances permitted by the code, the maximum length of dryer exhaust duct has been increased from 25 to 35 feet. By permitting the longer lengths, greater flexibility is achieved in laundry room placement within the building.

Elbow fittings increase the resistance to air flow and reduce the allowable length of exhaust duct. Previously, the code required a reduction of 2 feet 6 inches for 45 degree elbows and 5 feet for 90 degree elbows. These deductions were based on 4-inch radius fittings. An exception referenced the *ASHRAE Fundamentals Handbook* for large radius fittings, but this required calculations based on air friction resistance. To consolidate the information in the code for ease of use, the 2009 IRC places the reductions for fittings in a new table that includes both 4-inch radius fittings and 10-inch radius long-sweep fittings. The equivalent lengths of 10-inch radius fittings are based on values published by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) and Sheet Metal and Air Conditioning Contractors' National Association (SMACNA). Testing at Underwriters Laboratories (UL) verified that the 10-inch radius elbows perform significantly better than 4-inch radius elbows.

Other changes to this section clarify the duct construction and gage criteria and correlate the fastening requirements to the *SMACNA Duct Construction Manual*. The SMACNA standard requires a minimum of three fasteners for ducts 14 inches and smaller and does not recognize tape as a means of joining duct. Accordingly, the new text permits sheet metal screws, pop rivets or other fasteners to penetrate the duct sufficiently to provide an adequate joint connection but requires that the penetration length be limited so as not to obstruct the flow of dryer exhaust and thereby causing lint build-up.

The new Section M1502.8 duplicates the language in Section G2439.5.2 for gas dryers. Most dwellings have a space for a dryer installation and the intent of this language is to require installation of a clothes dryer exhaust system at the time of construction so it may be inspected for compliance with the code. Adding Section M1502.8 applies the requirement to electric dryers.

The 2009 IRC also adds provisions for protecting dryer duct from penetration by fasteners. The new requirements are similar to protection requirements for piping and gas vents. In the case of dryer duct, the concern of fastener penetration is related to the buildup of lint catching on the penetrating fasteners over time and increasing the fire hazard.



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Section Number: P3108.1 and P3108.2

Section Title: Wet venting

Change Type: Modification

Change Summary: This change clarifies that each fixture drain must connect individually to the horizontal wet vent and is now consistent with the vertical wet venting provisions. Locating a water closet upstream of the dry vent connection to the horizontal wet vent is now permitted.

Change Significance: Although Section P3108.4 has always required each wet-vented fixture to connect independently to the vertical wet vent, the code has not included similar language in the horizontal wet vent section. A basic principle of wet venting is that each fixture connects directly to the wet vent. The new language clarifies the intent of the code and specifically prohibits two or more fixture drains joining before they connect to the wet vent. Sections P3108.1 and P3108.4 are now consistent.

The dry vent connection requirements have been broken into two sections to clarify the applications for horizontal and vertical wet vent systems. In horizontal wet vent systems, the individual vents of water closets are now included in the list of bathroom group fixtures that can serve as the required dry vent. This change recognizes that water closets are not restricted in locations upstream of the dry vent connection for circuit venting installations. Circuit venting is another form of wet venting that allows as many as eight fixtures on a branch but does not limit the fixtures to those contained within two bathroom groups. Similar to circuit venting principles, the water closet fixture drain must connect horizontally to the branch drain and horizontal wet vent system when the water closet is upstream of the dry vent connection. Vertical drains of water closets are not permitted as vents.

Significant Changes To The International Residential Code

2009 Edition

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This publication is a “must-have” for anyone who uses the 2009 *International Residential Code*. This easy-to-use guide identifies the significant changes for residential building systems that occurred between the 2006 and 2009 editions of the IRC. Rather than addressing every code change, the book instead focuses squarely on those provisions that have special significance, are utilized frequently, or have had a change in application so that users can readily identify what changes occurred and why. A straightforward analysis of the impact of each change on the Code’s application helps familiarize building and fire officials, architects, engineers, plans examiners, inspectors, design professionals, and others in the building construction industry with the many important changes to the 2009 *International Residential Code*.

Features:

- Provides a quick and accurate means for identifying and understanding the changes that occurred since the previous edition of the *International Residential Code* and fosters an understanding of why the code changed.
- Logically organized content follows the general layout of the IRC, with a Table of Contents that allows for quick identification of the significant code changes that occurred in the 2009 Edition.
- Most changes are accompanied by a photograph or illustration to further assist and enhance the reader’s understanding of the specific change, along with a discussion of the significance of the changes.
- Provides the basis for making an easy transition to the new Code, while also serving as a valuable historical reference for years to come in reviewing how and when the code has evolved.
- Also a valuable resource for jurisdictions involved in their code adoption process.

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IRC®

INTERNATIONAL RESIDENTIAL CODE® FOR ONE- AND TWO-FAMILY DWELLINGS



2006



Quick Summary of Changes International Residential Code, 2009 edition

Quick Summary of Changes to the 2009 IRC

To assist the users of the *International Residential Code (IRC)*, a general description of some of the major change is summarized as follows. The changes described in this document were selected because of their frequency of application or special significance and do not cover all changes; however, the importance of those changes not included should not be diminished.

A detailed and in-depth analysis of many important code changes is available in the ICC publication, *Significant Changes to the 2009 International Residential Code*.

Administration and Definitions – Chapters 1 and 2

Within the administrative provisions, the floor area for accessory structures exempt from permits has increased from 120 to 200 square feet. Live/work units are now specifically permitted in buildings regulated by the IRC and allow a significant portion of a dwelling unit to include a nonresidential use that is operated by the tenant. A number of definitions have also been added or modified. The definition of story now refers to height above grade plane where previously the height was measured from grade. In addition, a definition has been added for Structural Insulated Panel (SIP).

Building Planning – Chapter 3

The new ICC – 600 *Standard for Residential Construction in High Wind Regions* replaces the legacy code standard SSTD 10, and now provides contemporary requirements that are consistent with the wind provisions of the IBC and ASCE – 7. In addition, the allowable number of stories has increased from two to three for buildings constructed using the prescriptive methods for cold-formed steel framing, reflecting the revised scope of the updated referenced standard, 2007 AISI S230. In windborne debris regions, glazed openings for garage doors are now specifically required to meet ANSI/DASMA standards for impact resistance.

Although the technical requirements for safety glazing have changed little in the new code, the safety glazing provisions have been rewritten in order to improve understanding and consistency in application. The exceptions have been relocated to directly follow the rule to which they apply.

All fire-resistive construction provisions are now located in Section R302 for ease of use. Format changes also include a new table added to the section on garage/dwelling separation as a means to clarify the provisions, although there are no technical changes to the code. In addition, the means of egress provisions have been reorganized in a more logical order to provide a better understanding of the requirements.



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New language also clarifies that the means of egress ends where the occupant reaches grade at the exterior of the building.

The provisions for guards have been modified to recognize that fixed seating is now considered a walking surface, and as such the 36-inch-minimum guard height must be measured from the seat height. The method for measuring the height of the walking surface above the ground or other surface below has also been clarified.

The 2009 IRC requires an automatic residential sprinkler system in new townhouses. Beginning January 1, 2011, these sprinkler provisions also apply to one- and two-family dwellings. The residential sprinkler system must conform to new prescriptive requirements in the IRC plumbing provisions or to other national sprinkler standards. Coupled with the new sprinkler provisions, the fire-resistance rating for a common wall separating townhouses has been reduced from two hours to one hour. In addition to clarification of the smoke alarm provisions, the code now requires the installation of a carbon monoxide alarm outside each sleeping area.

A new section in the IRC provides that storm shelters, when built or installed, must be constructed in accordance with the new ICC/NSSA – 500 *Standard on the Design and Construction of Storm Shelters*.

Foundations – Chapter 4

Minimum specifications for materials used in the manufacture of precast concrete and prescriptive requirements for crushed stone footings supporting precast concrete foundation walls have been added to Chapter 4. In addition, the concrete foundation wall provisions have been substantially revised and are now distinct from those for masonry foundation walls. There are no technical changes to the masonry provisions. The Portland Cement Association has developed a new consensus standard PCA – 100 *Prescriptive Design of Exterior Concrete Walls for One- and Two-Family Dwellings* that is now referenced by the IRC. The prescriptive lateral restraint provisions for the top of concrete and masonry foundation walls based on soil type, height of wall and unbalanced backfill height, found in Section R404.1 of the 2006 IRC, have been removed from the code.

Floor, Wall and Roof Construction – Chapters 5 through 9

New prescriptive provisions for conventional wood framing have been added to address deck ledger attachment to the dwelling. The wall bracing provisions have been reorganized and major revisions were made to enhance technical accuracy and clarity. The definitions for braced wall line and braced wall panel have been revised with no differentiation between exterior and interior braced wall lines.



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Angled walls may now contribute to the amount of required bracing. In addition, the continuous sheathing method of bracing has undergone extensive revision and expansion to provide flexibility in the design and construction of dwellings.

The cold-formed steel floor, wall and roof framing provisions have undergone significant modification to correlate with the latest American Iron and Steel Institute (AISI) standard. The 2009 IRC adds a new section containing prescriptive provisions for structural insulated panel (SIP) wall construction. Roof ventilation opening provisions have been revised, including the use of higher permeability rated vapor retarders that allow for a reduction in net clear opening size to the attic space. The code also now defines three classes of vapor retarders with varying degrees of moisture permeability.

Chimneys and Fireplaces – Chapter 10

Masonry fireplace smoke chamber provisions have been revised and reference new standards to improve the protection against high temperatures and preserve the integrity of the fireplace.

Energy Efficiency – Chapter 11

Two tables have been combined to place climate zones, moisture regimes, and warm-humid designations for every county in a single table to add clarity and improve usability of the provisions. The maximum *U*-factors permitted for fenestration (windows, doors and skylights) have been lowered in certain warm climate zones to increase energy savings. New provisions limit the use of incandescent lamps in permanent lighting fixtures. In addition, all recessed lighting in the building thermal envelope must be labeled as meeting the appropriate test criteria for resisting air movement through the fixture.

Mechanical – Chapters 12 through 22

Protection of mechanical appliances against vehicle impact now applies to locations outside of garages. The maximum prescribed length for dryer exhaust duct has increased from 25 to 35 feet and equivalent lengths for duct fittings appear in a new table. New provisions also require protection of the dryer duct against penetration by drywall fasteners. Hydronic radiant floor heating systems now require thermal insulation installed below the piping or tubing.



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Fuel Gas – Chapter 24

Gas piping is no longer permitted to penetrate the foundation wall below ground. When a manifold piping configuration is installed, a new provision permits the shutoff valve to be located at the manifold up to 50 feet from the appliance, rather than the typical 6 feet. For consistency, the maximum length for gas appliance connectors has increased from 3 feet to 6 feet. Similar to the mechanical provisions for electric dryers, the maximum prescribed length for gas dryer exhaust duct has increased from 25 feet to 35 feet. Deduction from the maximum length for elbow fittings have been placed in a new table with equivalent lengths based on the radius and type of fitting. New provisions also require protection of the dryer duct against penetration by drywall fasteners.

Plumbing – Chapters 25 through 33

A new section provides a simple, prescriptive approach for the design of dwelling fire sprinkler systems to satisfy the automatic sprinkler requirements of Chapter 3. The provisions for sumps and ejectors in Section P3007 have been replaced to match the provisions in Section 712 of the IPC and to provide more comprehensive coverage of the requirements. Revisions to the horizontal wet venting provisions clarify the fixture drain connections and now permit a water closet to be located upstream of the dry vent connection to the horizontal wet vent.

Electrical – Chapters 34 through 43

For other than existing wiring systems, the code no longer permits feeders or branch circuits without an equipment grounding conductor to serve separate buildings. Bonding terminations for communications, satellite and cable television grounding conductors are now required in one of three prescribed and accessible locations near the service or meter location.

A receptacle outlet is now required to serve each balcony, deck or porch greater than 20 square feet in area. For other than fire or burglar alarm systems, the exceptions for receptacle outlets without ground-fault circuit-interrupter (GFCI) protection have been removed. GFCI protection is now required for all 125-volt, single-phase, 15- and 20-ampere receptacles installed in garages and unfinished basement areas except those for the alarm systems. The provisions for arc-fault protection of branch circuits have also been expanded to include all habitable spaces (except kitchens), hallways, closets and similar areas. Only a combination type arc-fault circuit interrupter is permitted and it must protect the entire branch circuit.



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The code now requires listed tamper resistant receptacles for all 125-volt, 15- and 20-ampere receptacles installed in dwelling units, on the outside of dwelling units and in attached and detached garages. Another new provision requires hydromassage bathtubs to be on an individual branch circuit with the device for required GFCI protection placed in a readily accessible location.