

Study Session

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2009 IRC Sections R301 and R302 Building Planning I

OBJECTIVE: To gain an understanding of the design criteria to be used in the application of the prescriptive provisions of the *International Residential Code*, including wind and seismic limitations, snow loads and live loads, as well as the methods for addressing buildings requiring some degree of fire-resistance-rated construction.

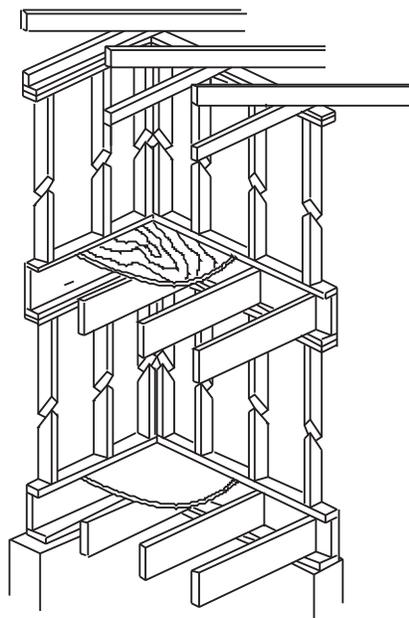
REFERENCE: Sections R301 and R302, 2009 *International Residential Code*

- KEY POINTS:**
- What is the definition of light-framed construction? Under what conditions must such construction be designed in accordance with accepted engineering practice?
 - What design standards are identified as acceptable alternatives to the prescriptive structural provisions of the IRC?
 - At what wind speed must the structural system be designed based on a source other than the IRC? What design standards are acceptable for residential wind design?
 - What is the most common design wind speed in the United States? Where are the hurricane-prone regions?
 - How is the appropriate wind exposure category determined? Which category is assumed unless the site meets the definition of another category?
 - What are the two methods of establishing wind speed? How do they compare to each other? Which method is used in the IRC?
 - Buildings constructed in which seismic design categories are subject to the seismic provisions of the IRC? Which category requires design to the requirements of the IBC?
 - In which seismic design categories are irregular buildings required to be designed? How is an irregular building determined?
 - What alternate methods are permitted in the determination of a site's seismic design category?
 - What is the maximum snow load permitted when using the conventional construction provisions of the IRC?
 - What are the limitations on story height for the various types of construction methods?
 - What is a dead load? A live load?

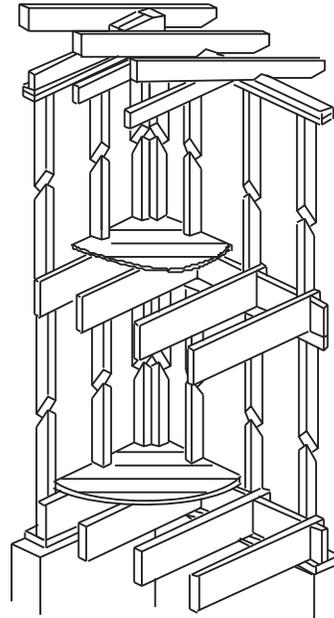
- KEY POINTS:** • What is the design live load to be used for sleeping rooms? For rooms other than sleeping rooms?
(Cont'd)
- How is an attic defined? How does the minimum live load for attic areas differ based on roof slope? Based upon the attic's use?
 - What is the maximum deflection permitted for floor structural members? For roof rafters with a ceiling attached directly to the bottom of the rafters?
 - What is fire separation distance? How is it measured?
 - At what fire separation distance from an interior lot line do exterior walls not need a fire-resistance rating? If a rated wall is required, what is the minimum required rating of the wall?
 - How far must a projection be located from an interior lot line?
 - At what fire separation distance are openings permitted in exterior walls? Where is the amount of openings limited?
 - Under what condition may the exterior wall of an accessory structure located on the property line have no fire-resistance rating?
 - How are penetrations of exterior walls required to have a fire-resistance rating to be addressed?
 - What minimum required fire-resistance-rated separation is mandated between townhouses? Under what conditions are parapets required? When is structural independence of the fire separation wall mandated?
 - In a two-family dwelling, how must the two units be separated? Where the separation is horizontal, how is the supporting construction regulated?
 - How are penetrations of dwelling unit separations required to be protected?
 - How must a private garage be separated from the residence? Under what conditions are openings permitted? What type of door is required? How are duct penetrations to be addressed?
 - What type of protection is required for enclosed accessible spaces under stairways?
 - How are interior walls and ceilings regulated for flame spread? For smoke development? What special requirements apply to insulation?
 - Where is fireblocking required? What materials are acceptable for fireblocking purposes?
 - Where is draftstopping required? What materials can be used for draftstopping?
 - What clearance is mandated between combustible insulation and recessed luminaires?

Code Text: *The requirements of the IRC are based on platform and balloon-frame construction for light-frame buildings. The requirements for concrete and masonry buildings are based on a balloon framing system. When a building of otherwise conventional construction contains structural elements exceeding the limits of Section R301 or otherwise not conforming to the IRC, these elements shall be designed in accordance with accepted engineering practice.*

Discussion and Commentary: Light-framed construction is a type of construction whose vertical and horizontal structural elements are primarily formed by a system of repetitive wood or light-gage steel framing members. Platform construction is defined as a method of construction by which floor framing bears on load-bearing walls that are not continuous through the story levels or floor framing. In balloon framing, the wall studs extend beyond the floor line.



Platform framing



Balloon framing

There will be times when the methods or materials used in construction do not conform with the prescriptive structural provisions of the IRC. In such situations, it is acceptable to use an engineered solution to satisfy the requirements of the code.