

# City of Hendersonville

## Braced / Shear Wall Construction Requirements

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The construction, sizing, location and amount of braced wall panels shall comply with **sections 602.10 thru 602.12.8 of the 2012 International Residential Code (IRC)** with respect to wood framing of detached one- and two-family dwellings. While the construction and anchorage of braced wall panels has not changed, there has been a change in how you design and compute braced wall lines and the amount of braced wall panels. This document is intended to help you navigate through those requirements.

The code still permits 4 different methods to achieve the required compliance. These 4 methods are listed below:

- 1) **Prescriptive Compliance Method (PCM):** Compliance with this method is achieved by following the prescriptive requirements contained within the code as identified above.
- 2) **Engineered Design Method (EDM):** Compliance is achieved by a specific design performed by a State licensed design professional that includes sufficient documentation describing the specific solution proposed and that it meets or exceeds the minimum prescriptive requirements of the 2012 International Residential Code.
- 3) **Proprietary Product Method (PPM):** This method incorporates proprietary products and methods that have demonstrated their ability to meet or exceed the prescriptive requirements contained within the Code and therefore has been approved by an agency, association or testing facility which has been determined to be acceptable by the Authority Having Jurisdiction (AHJ).
- 4) **Locally Accepted Method (LAM):** This method incorporates products, methods or combination of same that have successfully demonstrated to the AHJ that it meets and/or exceeds the performance requirements contained in the Code.

For those selecting the **Prescriptive Compliance Method (PCM)** the following is intended to assist and help you work your way through the 2012 International Residential Code (IRC) sections that pertain to braced wall panels and help you establish a baseline from which you can then design the proper locations and amount of braced wall panels needed. The design wind speed for Hendersonville is 90 mph (seismic design category “B”). This information is critical as it establishes the maximum spacing allowed between braced wall lines (**2012 IRC Table 602.10.1.3**).

**IRC Section R610.10 thru R602.10.1.4** will explain braced wall lines, how to determine them and the maximum spacing. These sections also will address allowable offsets in a braced wall line and angled walls.

**IRC Section R602.10.2 thru R602.10.3** provides the description of a “Braced Wall Panel” and prescribes the location and amount of braced wall panels required. Use Hendersonville’s design wind speed to determine the amount (length) of braced wall panels as shown in table **R602.10.3 (1)** and table **R602.10.3 (2)** and any adjustments based on construction conditions. For braced wall lines 16’ or less use **Section R602.2.3** for design requirements.

**IRC Section R602.10.4 thru R602.10.4.3** addresses the different construction (bracing) methods for braced wall panels and where they can be used. **Table R602.10.4** provides details for each bracing method. Use this table in conjunction with **Tables R602.10.3 (1) and R602.10.3 (2)** to determine the appropriate bracing method and to verify that it is permitted on each applicable story of the structure. Mixing bracing methods is only allowed as outlined in **R602.10.4.1**.

**IRC Section R602.10.5 thru R602.10.5.2** provides specific information regarding minimum lengths of braced wall panels based on the bracing method.

**IRC Section R602.10.6 thru R602.10.6.5.1** provides details for alternate braced wall panels and portal framing methods. Use figures **R602.10.6.1, R602.10.6.2** and **R602.10.6.3**.

**IRC Section R602.10.5 thru R602.10.5.2** provides specifics for minimum lengths of braced wall panels based on bracing methods.

**IRC Section R602.10.6 thru R602.10.6.5.1** provides details for several specific bracing methods, primarily alternate wall panels and portal framing requirements. See figures **R602.10.6.1 thru R602.10.6.4**.

**IRC Section 602.10.7 thru R602.10.8.2** provides details for bracing requirements at the ends of braced wall lines for continuous sheathing methods and braced wall panel connections to floor framing, roof framing and foundations. (Figures **R602.10.7, R602.10.8 (1), R602.10.8 (2), R602.10.8.2 (1), R602.10.8.2 (2), R602.10.8.2 (3)**).

**IRC Section R602.10.9** provides specifics for required support for braced wall panels (figures R602.10.9). Masonry or concrete walls greater than 4' (feet) in height require design by a licensed design professional.

**IRC Section R602.10.11** provides critical information pertaining to cripple wall bracing requirements.

**IRC Section R602.10.11** provides braced wall panel anchorage information. Because the City of Hendersonville is not in design category "D" **IRC Section R403.1.6** will apply.

## ***Engineered Design Method (EDM)***

The code allows anyone the opportunity to use other materials and/or methods than what is specifically provided in the code as long as it is approved by the AHJ. If the AHJ finds that a particular alternative material, design or method of construction is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, at least equivalent of that prescribed in this code, it may be approved for use. Compliance with the specific performance-based provisions of the International Codes in lieu of specific requirements of this code shall also be permitted as an alternate.

Requests for approval of an alternative material, design or method of construction must be accompanied by sufficient documentation to support the request. In most situations, the required documentation must be completed by a State-licensed design professional that has been determined by the State of Tennessee to be qualified to do such work. All exceptions will be approved by the AHJ on a case-by-case basis, based on specific details of the requested exception.

## ***Locally Accepted Method (LAM)***

The following methods, products and/or applications have successfully demonstrated to the Authority Having Jurisdiction (AHJ) that they meet or exceed the true intent of the code. Such approvals are granted in accordance with the 2012 International Residential Code, Section 104.9 Approved Materials and Equipment and Section R104.11 Alternative materials, design and methods of construction and equipment. Any such approval may be re-evaluated and subsequently removed from the approved list should it be determined there is a problem with the supporting documentation, the applicable code provisions have changed or the actual installation does not perform as indicated. All code requirements or industry approved construction practices shall apply unless otherwise noted as part of the approval; the most stringent shall apply.

## ***Proprietary Product Method (PPM)***

This method incorporates proprietary products and methods that have demonstrated their ability to meet or exceed the prescriptive requirements contained within the Code and therefore have been approved by an agency, association or testing facility which has been determined to be acceptable by the Authority Having Jurisdiction (AHJ).

- Simpson Strong-Tie, Steel Strong-Wall:
- I Level engineered products:
- Hardy Frame Panels: