SEISMIC DESIGN FOR HOUSES
BCBC 2018

BUILDING BYLAW LICENSING & LEGAL SERVICES

The purpose of this Bulletin is to offer a broad-brush overview of the seismic restraint requirements listed in the 2018 BC Building Code.

The 2018 BC Building Code (Code) came into effect on December 10, 2018. The Code requires that plans for newly constructed houses, additions to houses, and some structural renovations to houses be structurally designed to consider "lateral loads" or "seismic restraint". Traditionally, the Code has considered "straight gravity loads" only for houses.

BC Housing, Licensing & Consumer Services has developed a free and comprehensive 28 page guide - "*ILLUSTRATED GUIDE FOR SEISMIC DESIGN OF HOUSES*". This new guide is available on the BC Housing website (https://www.bchousing.org/licensing-consumer-services) and can be accessed and downloaded free of charge.

To start to understand the new Code requirements, one must study the Code, the related Appendix notes and the Licensing & Consumer Services Guide. If designers have Code specific questions after reviewing these documents, Saanich staff will assist them.

If your designer is unable to develop a design that works within the limited confines of the prescriptive Code requirements, he/she will then need to engage a Professional Structural Engineer to design adequate bracing to meet other non-prescriptive design criteria listed in the Code - *CWC 2009, "Engineering Guide for Wood Frame Construction"* or, Part 4 of the Code. It is considered that many "West Coast" designs that include large window walls and large open floor areas will be challenging to design without the assistance of an engineer.

The Licensing & Consumer Services Guide states: ***"In an earthquake, the acceleration of the ground creates lateral forces on the structure. The magnitude of the lateral forces on a house is influenced by its height and weight. The exterior and interior walls are the key components for resisting the lateral forces collected from the floors and roof over the height of the house".***

The Code has a new Subsection - **9.23.13. BRACING TO RESIST LATERAL LOADS DUE TO WIND AND EARTHQUAKE**. This new Subsection lists requirements for the construction and anchorage of *Braced Wall Panels*, as well as several other provisions concerning seismic/lateral restraint.

Braced Wall Panel means a portion of a wood-frame wall where bracing, sheathing, cladding or interior finish is designed and installed to provide the required resistance to lateral loads due to wind or earthquake. (2018 Code defined term)

The Code states that *Braced Wall Panels* must be located in *Braced Wall Bands*.

Braced Wall Band means an imaginary continuous straight band extending vertically and horizontally through the building, or part of the building, within which braced wall panels are constructed. (2018 Code defined term)

The Code lists the percentages of *Braced Wall Panels* required in *Braced Wall Bands* on each floor of a house, and the maximum distances between *Braced Wall Bands*.

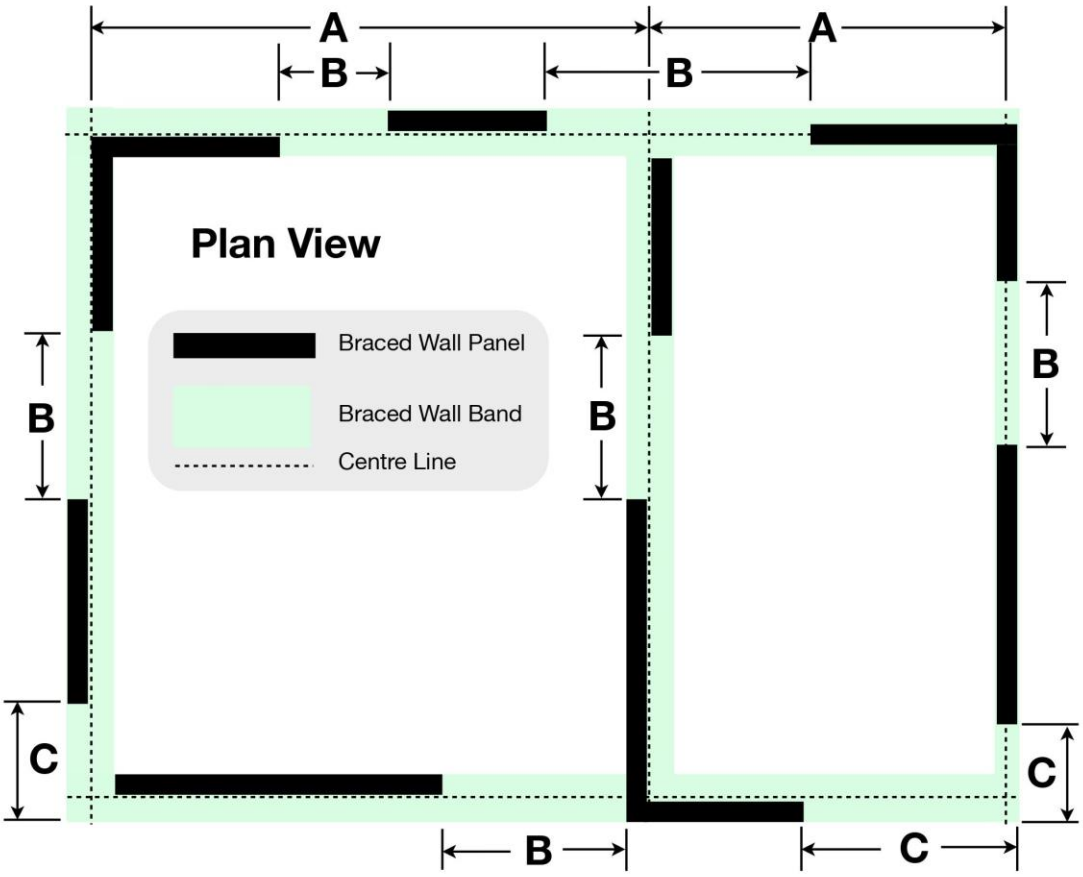
In order to start the seismic restraint analysis and design, one must first know the "Design Data" for Saanich which has a High or Extreme Seismic Hazard. Climatic Data is listed in Appendix C - Division B Climatic and Seismic Information for Building and Seismic Design in Canada - Table C-2 and C-3. The referenced Table lists data for **Victoria – Mt. Tolmie (Saanich)**. The relevant climatic values for seismic design are as follows:

Sa (0.2)	Sa (0.5)	Sa (1.0)	Sa (2.0)
1.29	1.14	0.662	0.390

Building Permit Applications must include complete design details demonstrating how the structural design is to comply with the 2018 BC Building Code – see Saanich Building Permit Application(s).

The details should include, but not be limited to, the location of all *Braced Wall Bands* and the *Braced Wall Panels* within. The details must include the calculations showing the percentage of *Braced Wall Panels* on each wall.

Spacing and Dimensions



A Distance between centre lines of braced wall bands

B Distance between braced wall panel edges

C Distance from end of braced wall band to end of first braced wall panel

	$0.70 < S_a(0.2) \leq 1.0$	$1.0 < S_a(0.2) \leq 1.8$
A Maximum	10.6 m	7.6 m
B Maximum	6.4 m	6.4 m
C Maximum	2.4 m	2.4 m

From Table 9.23.13.5. (see Appendix)