

Summary:

This project evaluates the National Building Codes of Canada (NBCC) clauses relevant to fire performance and performance requirements of non-load-bearing wood-frame in-fill walls in concrete/steel hybrid buildings. Related clauses in NBCC are reviewed regarding the use of wood components and non-load bearing wall systems in non-combustible buildings. The highlights of this review are:

§ An exterior non-loadbearing wall assembly with combustible components is allowed in non-combustible construction if:

- a) Building height is not more than 3 storeys or has a sprinkler system throughout ;
- b) The interior surfaces of the wall assembly are protected by a thermal barrier ; and
- c) The wall assembly satisfied the testing criteria for CAN/ULC S134 ;

§ Combustible interior wall finishes, other than foamed plastics, are allowed in non-combustible construction if the thickness is not greater than 25 mm and their flame spread rating (FSR) is not more than 150 ;

§ Combustible insulation, other than foamed plastics, is allowed in non-combustible construction if the flame-spread rating not more than 25 ;

§ Combustible insulation with a FSR not less than 25 and not more than 500 is allowed in exterior and interior walls of non-combustible construction if the building is non-sprinklered and not more than 18 m or sprinklered and protected by a thermal barrier ;

§ There are no obstacles for using wood-frame in-fill wall systems for interior partition walls in hybrid buildings:

- a) For non-sprinklered buildings not greater than 3 storeys or a floor area not greater than 600 m² ;
- b) For sprinklered buildings.

§ Non-combustible construction allows combustible elements in partition walls in the following instances:

- a) Solid lumber partitions located in a fire compartment area are permitted in a non-sprinklered floor area not greater than 600 m² with restrictions ;
- b) Solid lumber partitions not less than 38 mm thick and partitions that contain wood framing are permitted with restrictions.

§ Combustible cladding can be used under the following circumstances:

- a) When a wall assembly with exposing building face is between 10 to 25% tested by CAN/ULC-S134 and complies with Article 3.1.5.5 ;
- b) When a wall assembly with exposing building face is between 25 to 50%, is sprinklered throughout, installed on a gypsum board sheathing, and has a FSR not more than 25 (with restrictions) ;
- c) When a wall assembly with exposing building face is between 50 to 100%, cladding can be combustible for group A, B, C, D, E, F.

§ When a building is required to be of non-combustible construction, combustible elements are limited to the requirements in Subsection 3.1.5 on non-combustible construction ;

§ When comparing the NBCC with the International Building Code (IBC), the IBC is more in favour of using FRT wood frame in-fill walls with one more storey.

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