

Wood-frame Construction Structural Limitations

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Background

The *National Building Code* (NBC), Part 9 includes prescriptive requirements for the structural design of houses and other small buildings. These prescriptive structural requirements are built upon a set of limitations that must be followed. If a structural design is beyond the scope of the Part 9 requirements or limitations, then it falls within the scope of Part 4, which requires an architect or engineer licensed in Saskatchewan to seal the design.

Discussion

Section 9.4 describes the structural design requirements and limits that are applicable for Part 9 designs. Also, Section 9.23 describes the limitations that apply specifically to wood-frame construction. In summary, Part 9 wood-frame construction requires that:

- Roofs and walls are clad, sheathed or braced on at least one side,
- Repetitive structural members (such as studs or floor/roof framing members) are spaced not more than 600 mm (24") o.c.,
- The wood-frame construction does not serve as a foundation,
- The live load on floors does not exceed 2.4 kPa, and
- The span of any structural member does not exceed 12.20 m (40 ft)

If any of these limitations is not met, then the design must be performed through NBC Part 4, with an architect or engineer registered in Saskatchewan sealing the design.

Most Part 9 buildings (houses and other small buildings) are built using trusses and other engineered products (i-joists, LVLs, etc.). This has led to a number of designs where the span of structural members exceeds 12.20 m (40 ft). This is most commonly observed for roof trusses that clear span from outer wall to outer wall. The owner and designer must be aware that if the span of any structural member exceeds 12.20 m (40 feet), then Part 9 wood-frame construction can no longer be utilized for that portion of the design. For example, if roof trusses are spanning further than 12.20m, then the truss designs AND the supporting construction must be designed by an architect or engineer registered in Saskatchewan.

Additionally, there are several other common scenarios where sealed designs are required:

- Trusses, i-joists, or any other engineered products (LVLs, etc.), as these cannot be sized or verified through the NBC Part 9 span tables.
- Lintels (headers) that cannot be sized by the Part 9 span tables. Note that lintel spans are based on maximum joist spans of 4.9m (16 ft) and maximum roof truss spans of 9.8m (32 ft). If lintels support spans greater than this, the Part 9 tables cannot be utilized. This is very common with engineered trusses and joist systems that are commonly used. (See the Notes to the lintel tables for more information)

When the plans for housing and other small buildings are submitted, the City of Regina reviews for Code compliance, which includes checks to ensure the wood-frame construction requirements and limitations are satisfied. Owners and designers should be aware of these limitations to avoid delays and additional costs for their projects. Finally, please be aware that the City of Regina has process for truss reviews, where layouts can be submitted for plan review, with sealed designs to be provided prior to the framing inspection. This process would not include walls that are required to be sealed to support spans exceeding 12.20 m. These sealed wall designs would be required at time of permit application (similar to how sealed "tall wall" designs are required at permit application). More information about the truss review process is available on Regina.ca/build.