Livingston Engineering Associates LTD.
Thomas G. Livingston, P.Eng.
59 Horton Crescent
Yellowknife, Northwest Territories, Canada, X1A 3B8
867-445-7590
tom@livingston-engineering.com

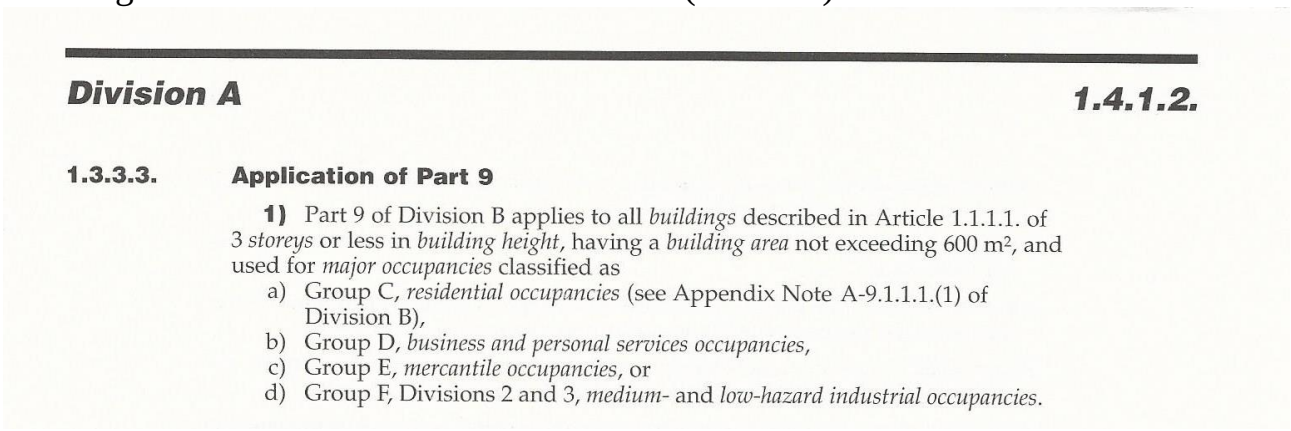
Introduction to the National Building Code of Canada 2010 Adopted by the Northwest Territories

The Building Code, updated every 5 years (theoretically) is a comprehensive document that anyone who is thinking of building a home should be aware of. It is divided into Parts, of which for most of us, Part 9 is the only one we need to consider. However, three of these Parts are of interest:

- **Part 3: Fire Protection, Occupant Safety and Accessibility**
- **Part 4: Structural Design**
- **Part 9: Housing and Small Buildings**

Part 9 is a sort of mini-Building Code all to itself. It consists of knowledge gained from generations of surveys of small buildings that have stood the test of time, as well as having benefited from on-going product and methodology research.

Buildings that "fall under" Part 9 are defined (in Part 1) as:



Division A 1.4.1.2.

1.3.3.3. Application of Part 9

1) Part 9 of Division B applies to all *buildings* described in Article 1.1.1.1. of 3 *storeys* or less in *building height*, having a *building area* not exceeding 600 m², and used for *major occupancies* classified as

a) Group C, *residential occupancies* (see Appendix Note A-9.1.1.1.(1) of Division B),
b) Group D, *business and personal services occupancies*,
c) Group E, *mercantile occupancies*, or
d) Group F, Divisions 2 and 3, *medium-* and *low-hazard industrial occupancies*.

This definition covers a wide range of buildings. HOWEVER, what this means is that a prospective builder must CONSTANTLY refer to Part 9 at every step of the building process in order to KEEP WITHIN PART 9 !

Part 9 is quite specific, with joist span tables, descriptions of railings – you name it, it is probably in Part 9.

With the exception of the stipulations in Yellowknife ByLaw 4469, for all practical purposes, anything described in Part 9 does NOT require any kind of professional designer (such as an Architect of Structural Engineer).

BUT….if any structural component is not *within* Part 9, two things MUST happen:

1. Change your design and bring that component back within Part 9 or
2. Engage the services of a Professional Structural Engineer qualified to practice in your Province or Territory (Architects are not qualitied to do Structural Engineering) to provide and stamp a design

For example, if you have a room with a span that is greater than shown in the joist tables, you must either reduce the room width or engage a structural engineer to provide a joist design and spacing that he or she will stamp. To do this, the engineer will look at Limit States equations for such concerns as shear, moment, and deflection for the material being designed, and will provide options. There are also the manufactured wood products (proprietary) that must also be sized and specified by a qualified professional engineer. Usually building suppliers will provide these engineering services as part of the joist package.

Part 4, Structural Design, provides methodologies for structural engineers to calculate the APPLIED loads that are likely to affect the building over its lifetime. These loads include (but may not be limited to) the live loads of wind, snow & rain, seismic, and occupancy loads from people, and the dead loads from the actual building components. Factors such as Importance and Safety Factors are then added to these loads, and modification factors are included to account for (for example) how sheltered from the wind a building might be, and so forth. Wind and Seismic are lateral loads, whereas dead loads and snow and some wind are vertical loads. In addition to these individual codes, LOAD COMBINATIONS must be applied in specified equations. These combinations are designed to lead to the worst-case loading likely to be found. The worst-case scenario is used in design.

Part 4 does NOT cover a component's RESISTANCE to the applied load. For that, a Structural Engineer will refer to the equations and methodologies found in one of the specific material codes, such as the Wood Design Manual for timber, or the Handbook of Steel Construction for structural steel. Reinforced concrete and masonry each have their own design codes as well.

Deflection is important, and this phenomenon is looked at by the engineer as well, so that "floor bounce", for example, is reduced to a level that is not noticeable.

Part 3 of the Building Code is, as the title implies, concerned with fire and safety, as well as with accessibility. It is an extremely important Part when the designer is considering these issues.

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