



Southwest
New Brunswick
Service Commission

All about stairs

The following outlines some of the dimensional requirements for stairs within a single-family home, or a single-family home with a basement suite. For non-residential structures, it's best to call our office for guidance, as a number of factors come into play.

Changes to note: NBC 2015 requires longer tread runs. Now, 10" is the minimum run length (increased from 8.5" in NBC 2010. Here's why: [Increased tread depth can reduce fall risk, save lives](#))

To start, here are some key dimensions to recall.

Key dimensions for stairs (RESIDENTIAL)		
Component	Max	Min
Stair width (interior)		86 cm (33 7/8")
Rise 12.5 (5")	20 cm (7 7/8")	12.5 (5")
Run	35.5 cm (14")	25.5 cm (10")
Tread depth	35.5 cm (14")	23.5 cm (9 1/4")
Clearance height		195 cm (6'4 3/4")
Landing width		same as stair
Landing depth, interior		required stair width, or 1.1m, whichever is less
Landing depth, exterior		required stair width, or 1.1m, whichever is less
Space between stringers		90cm (35 7/16")
Tread bevel	1.4 cm (~9/16")	0.6 cm (~ 1/4")
Tread thickness		2.5 cm (1")
Tread thickness, open riser		3.8 cm (1 1/2")
Difference, adjacent risers	5 mm (~3/16")	
Difference, adjacent tread depth	5 mm (~3/16")	
Handrail height	96.5 cm (38")	86.5 cm (34")
Handrail, part of guard, interior		90 cm (35 7/16")
Stringer spacing	90 cm (35 7/8")	
Stringer spacing, riser support	140 cm (47 1/4")	

Measuring clear height

Height is measured from the line running across the tops of the treads to any obstructions above. This can be done on-site by taking a board, and setting it so that it runs (diagonally) across the treads. Measure from here with a tape measure, taking care to keep the tape vertical.

It should be noted that there is a slight relaxation for clearance when stairs run under beams or ductwork in a secondary suite – in this case, the clearance need only be 185 cm (72 5/8")

Landings

A landing is required at the top and bottom of each flight of interior and exterior stairs, including stairs in garages. There are two exceptions where landings may be omitted:

If the door at the top of an interior set of stairs swing away from the stairway and
If an exterior flight of stairs serving a secondary entrance has no more than three risers, a landing may be omitted at the top of the flight of stairs.

Stringers

When constructing stairs with wood, the stringers (that's the diagonal stretch of wood the stair treads are connected to) must be 2x10 construction in most situations. That's because Code requires the uncut depth to be 23.5 cm (9 1/4"). While Code allows stringers to be 1" wide if supported, this is exceptionally rare, and in most cases, builders will be content with 2x10 stringers even if supported. It's also worth noting that the distance between stringers has to be no more than 35 7/8" in residential settings. (It can be as much as 1.2 metres or 47 1/4", but only if the risers are part of the support system for the treads. [9.8.9.4(2)])

When notching the stringers, it's important to remember that the cuts must leave at least 9 cm (3 1/2") of solid wood (measured on the shortest distance between the corner of the cut and the flat of the wood opposite).

Uniformity of elements

In recent years, falls and fall-related injuries have sent more Canadians to hospital than any other accident class ([1](#)).

Seniors, in particular, are susceptible to falls, with falls on stairs leading to 13 per cent of hospital visits. ([2](#))

For this reason, it is vital that stairs be constructed safely. One of the critical factors in preventing injury is to ensure that stair elements are uniform. This makes walking up or down a series of predictable mechanical motions. Any deviation from the expected dimensions can create a hazard.

Adjacent risers and treads must not vary by anything more than 5mm (~3/16") and there can be no more than 1 cm difference (~13/32") between the tallest and shortest risers throughout; and likewise no more than 1 cm difference between the deepest and shallowest treads throughout. [9.8.4.4(1)(a,b); 9.8.4.4(3)(a,b)]

It is vital to note that the Code on tread distances states a maximum tolerance of 5 mm "between adjacent treads or landings" For this reason, contractors must make allowances for the floor finish at the top and bottom of stairs, and include those thicknesses in rise calculations.

Winders, Spiral staircases

The National Building Code allows for winders – that is, elements in a stair that allow it to turn one way or the other. There are a few limitations, however.

1. No more than one set of winders in a flight of stairs are allowed.
2. Winders must be either two winders, each 45 degrees; or three winders, each at 30 degrees.

This also means winders can't create more than a 90-degree turn.

NBC 2015 allows for spiral staircases. As such are rare, we direct builders to look at the requirements in the 2015 Code. (downloadable pdf, free, [here](#).)

Tread construction

Treads must be 25 mm (1") thick, made of lumber, O-2 grade OSB, or plywood. (Exception: if the risers are open, and the distance between stringers is more than 75 cm (29 1/2") then the treads have to be 38 mm (1 1/2") thick. If these treads are not directly supported by the riser, then the grain or orientation should be at right angles to the stringers.

Treads must be finished with a rounded or bevelled edge. The rounded/bevelled portion of the tread must be between 6 and 14 mm (~ 1/4" to ~9/16").