

Stairs, Handrails and Guards (NBC 2015 - Residential)

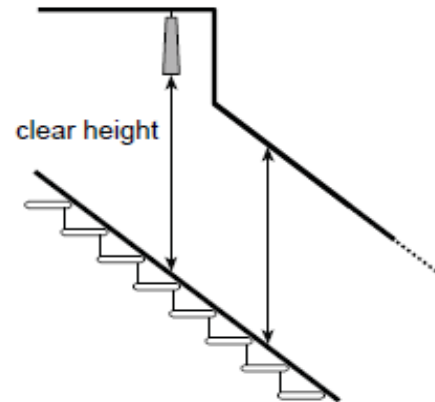
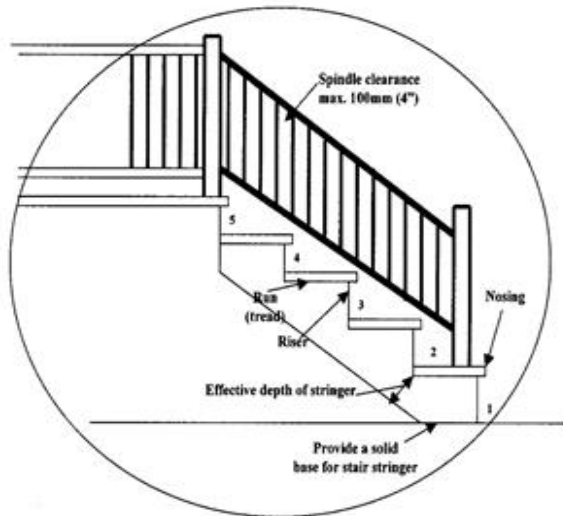


Figure A-3.4.3.4.
Measuring clear height

Stairs (NBC Section 9.8)

- Dwelling stairs or ramps must be at least 860 mm (34") wide (NBC 9.8.2.1.(2) & NBC 9.8.5.2.(2).
- Clear height (headroom) over dwelling stairs must be at least 1950 mm (77") (NBC 9.8.2.2.(3)).
- The vertical height of any flight of stairs must not exceed 3.7 metres (12') (NBC 9.8.3.3.).
- Risers must be of uniform height between 125 - 200 mm (5" - 7-7/8") and treads must have a uniform run between 255 - 355 mm (10" - 14") (NBC Tables 9.8.4.1. & 9.8.4.2.).
- The depth of a rectangular tread (NBC 9.8.4.2.(2)) or a tapered tread (NBC 9.8.4.3.(3)) must be, at any point, not less than its run and not more than its run plus 25 mm (1").
- Where winders are incorporated into a stair, each set must not turn through more than 90° (NBC 9.8.4.6.(2)).
- The top of tread nosings must have a rounded or bevelled edge extending between 6 mm - 14 mm (¼" - ½") from the front of the nosing (measured horizontally), or extending 3 mm (⅛") if a resilient material is used (NBC 9.8.4.8.).

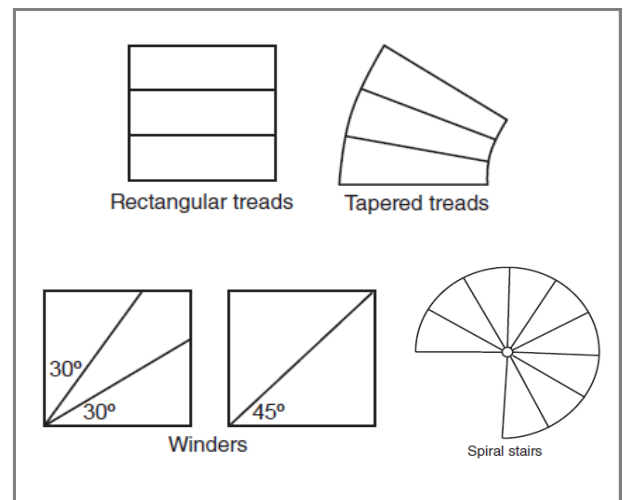
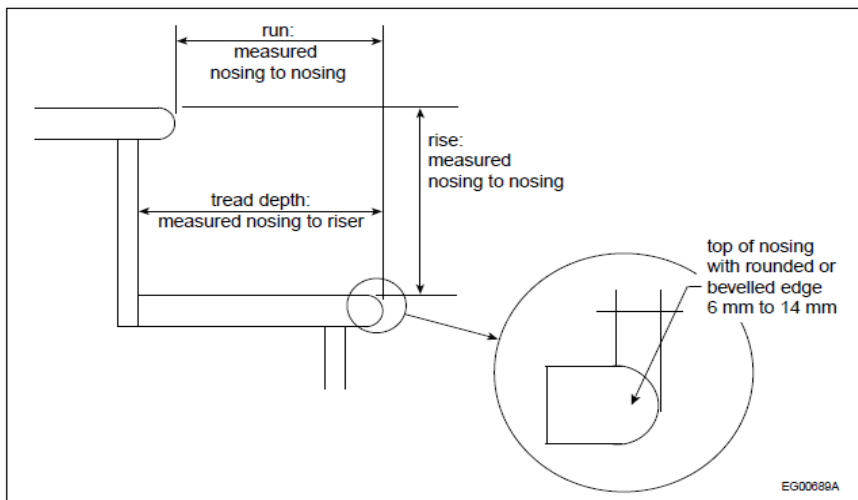


Figure A-9.8.4.-B
Elements of steps and their measurement

Figure A-9.8.4.-A
Types of treads

- Wooden stair stringers must have a minimum effective depth of 90 mm (3.5") and an overall depth of at least 235 mm (9.25"), be supported and secured top and bottom, and be not less than 25 mm (1") actual thickness if *supported* along their length and 38 mm (1.5") actual thickness if *unsupported* along their length (NBC 9.8.9.4.(1)).
- Wooden stair stringers must be spaced not more than 900 mm (35.5") o.c. (NBC 9.8.9.4.(1d)) unless risers support the front portion of the tread, permitting the space between stringers to be not more than 1200 mm (47") (NBC 9.8.9.4.(2)).
- Exterior wood steps must not be in direct contact with the ground unless treated with a wood preservative (NBC 9.8.9.3.).

Handrails (NBC 9.8.7.)

- All interior stairs with 3 or more risers, all exterior stairs with 4 or more risers, and ramps with a rise more than 400 mm (15.75") require at least one handrail (NBC 9.8.7.1.(3) & 9.8.7.1.(1).
- Ramps that are 1100 mm (43") or greater in width require handrails on both sides (NBC Table 9.8.7.1.)
- Handrails must be continuously graspable along their entire length with no obstruction on or above them to break a handhold (NBC 9.8.7.5.(2)).

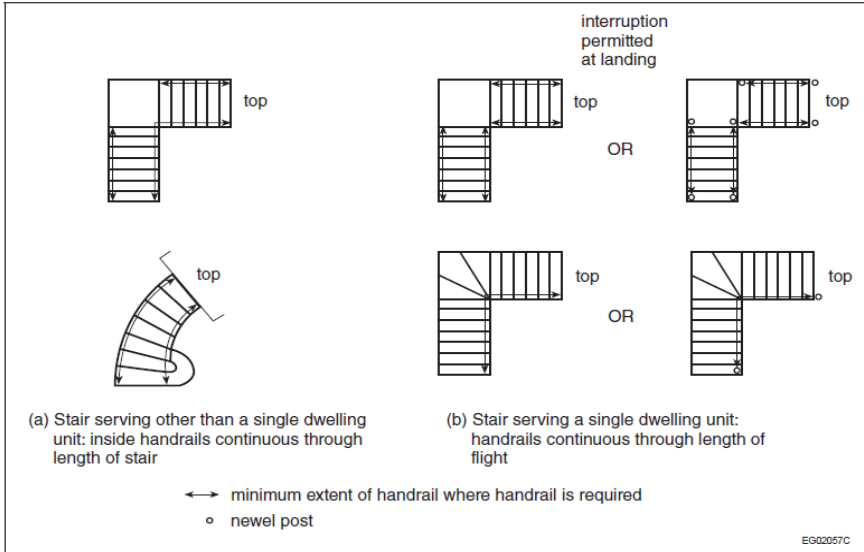


Figure A-9.8.7.2.
Continuity of handrails at the top and bottom of stairs and flights

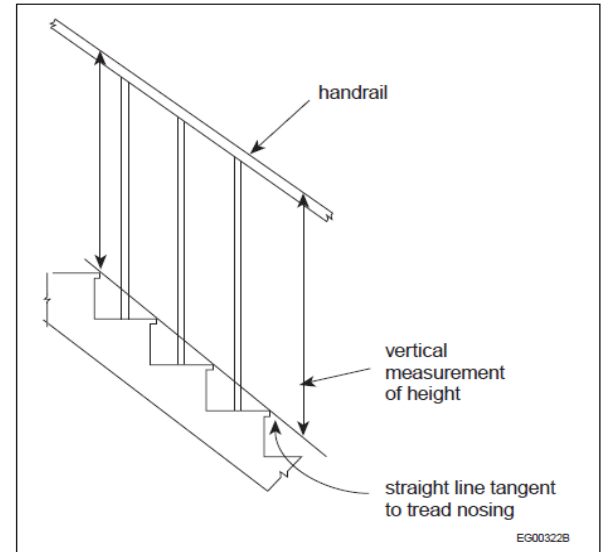


Figure A-9.8.7.4.
Measuring handrail height

- Required handrails must be continuously graspable throughout the length of ramps and flights of stairs, from the top riser to the bottom riser (NBC 9.8.7.2.(1). A handrail is permitted to start from a newel post or volute installed on the bottom tread (NBC 9.8.7.2.(3)).
- Except for stairs with winders, where a flight of stairs consists of tapered treads, or a mix of tapered and rectangular treads, one handrail must be installed along the narrow end of the treads (NBC 9.8.7.1.(5)).
- Handrails must be positioned between 865 - 1070 mm (34" - 42") above the stair nosing or the surface of the ramp, floor or landing served by the handrail (NBC 9.8.7.4.) (Refer to NBC Figure A-9.8.7.4. above for measuring handrail height.)
- Handrails and their supports must be designed and constructed to withstand a concentrated load of at least 0.9 kN (203 pound-force) applied at any point and in any direction (NBC 9.8.7.7.(1a)).

Guards (NBC 9.8.8.)

- Guards at least 900 mm (36") high are required: a) around openings in floors at the tops of stairs and interior balconies, and b) around stairs, landings, porches, and exterior decks that are between 600 mm - 1800 mm (2' - 6') above the finished ground level (NBC 9.8.8.1.(1a) & NBC 9.8.8.3.)
- Guards at least 1070 mm (42") high are required around exterior decks, porches, landings and balconies that have a walking surface more than 1800 mm (6') above the finished ground level (NBC 9.8.8.3.(1) & 9.8.8.3.(3)).
- Guards are also required if the adjacent surface within 1.2 m (4') of the walking surface has a slope greater than 1 in 2 (meaning a ratio of 1' out and 2' down) (NBC 9.8.8.1.(1b)).
- Guards for flights of steps, where there is a difference in elevation of more than 600 mm (24") between the walking surface and adjacent surface, must be protected on both sides by a wall or a guard that is at least 900 mm (36") above the step nosing (NBC 9.8.8.3.(4)).
- Height of guards for flights of steps must be measured vertically from the top of the guard to a line drawn through the tread nosing served by the guard (NBC 9.8.8.3.(5)).
- Guards must be designed to resist specified horizontal and vertical loads, as prescribed in NBC Table 9.8.8.2.
- Openings through guards must be of a size that prevents the passage of a 100 mm (4") sphere (NBC 9.8.8.5.(1)).
- Openings through any guards that are NOT REQUIRED by NBC 9.8.8.1. must be of a size that PREVENTS the passage of a 100 mm (4") sphere or PERMITS the passage of a 200 mm (8") sphere (NBC 9.8.8.5.(3)).
- Guards that protect a level located more than 4.2 m (13.75') above the adjacent level must be designed so that no member, attachment or opening located between 140 - 900 mm (5.5" - 35.5") above the level protected by the guard facilitates climbing (NBC 9.8.8.6.)
- Glass in guards must be CAN/CGSB approved laminated, tempered, or wired safety glass (NBC 9.8.8.7.)