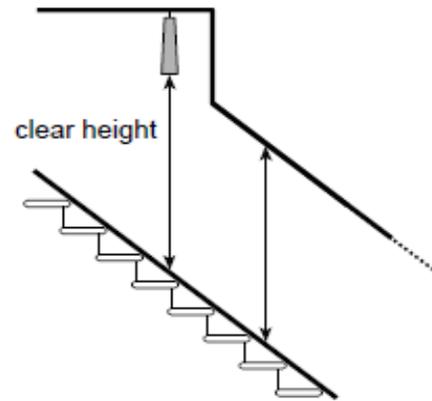
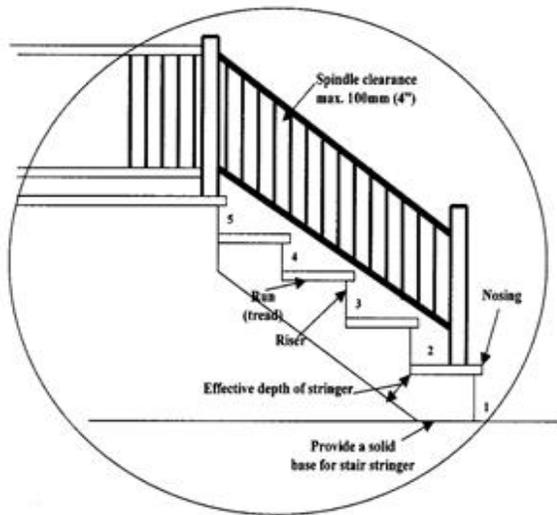


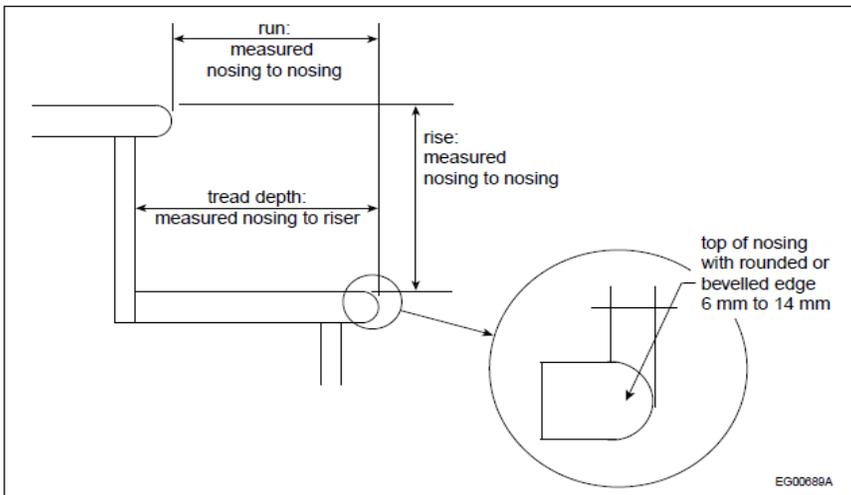
## Stairs, Handrails and Guards (NBC 2015 - Part 9)



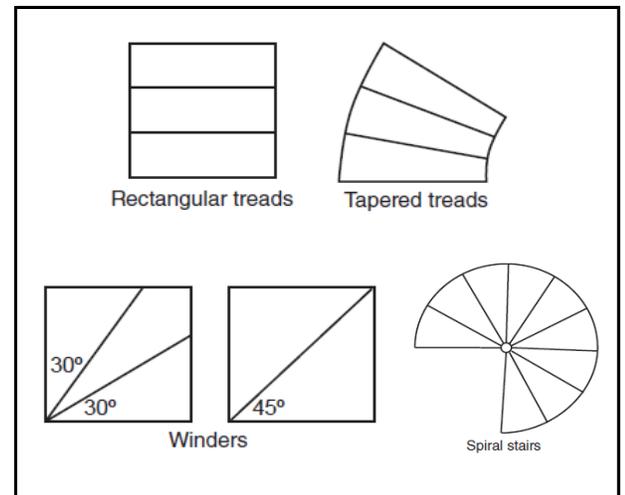
**Figure A-3.4.3.4.**  
**Measuring clear height**

### Stairs (NBC Section 9.8)

- Stairs must be at least 900 mm (36") wide ((NBC 9.8.2.1.(3).
- Clear height over stairs must be at least 2050 mm (80") (NBC 9.8.2.2.(2). (Refer to NBC Figure A-3.4.3.4. above.)
- At least 3 risers must be provided in interior flights of stairs (NBC 9.8.3.2.)
- 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 - 180 mm (5" - 7") and treads must have a uniform run at least 280 mm (11") (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 600 mm (24") o.c. (NBC 9.8.9.4.(1d).
- 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 straight stairs less than 1100 mm (43") wide require at least one handrail. Curved stairs, stairs equal or greater than 1100 mm in width, and all ramps 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)).

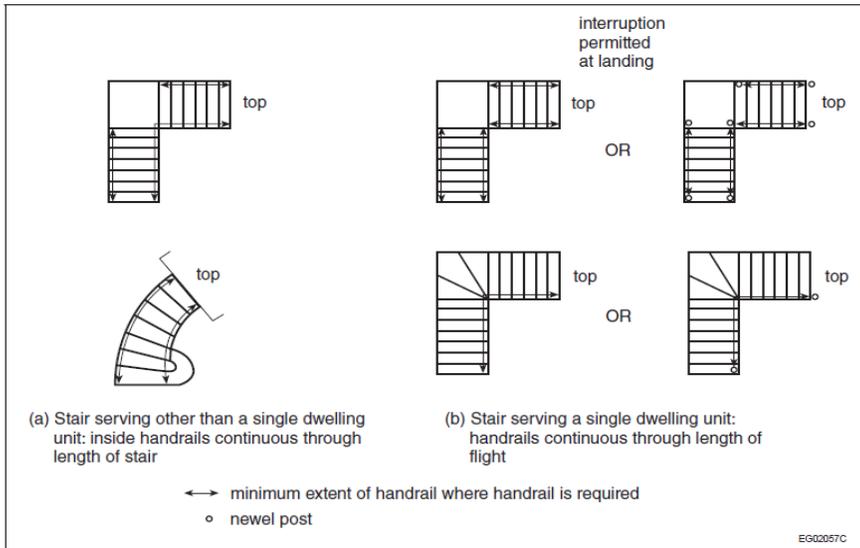


Figure A-9.8.7.2.

Continuity of handrails at the top and bottom of stairs and flights

- 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)), including at the landing except where interrupted by doorways (NBC 9.8.7.2.(2)).
- One handrail must extend horizontally at least 300 mm (12") beyond the top and bottom of each flight of stairs or ramp (NBC 9.8.7.3.(2)).
- 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, and a uniform load not less than 0.7 kN/m (516.3 lb/ft.) (NBC 9.8.7.7.(1)).

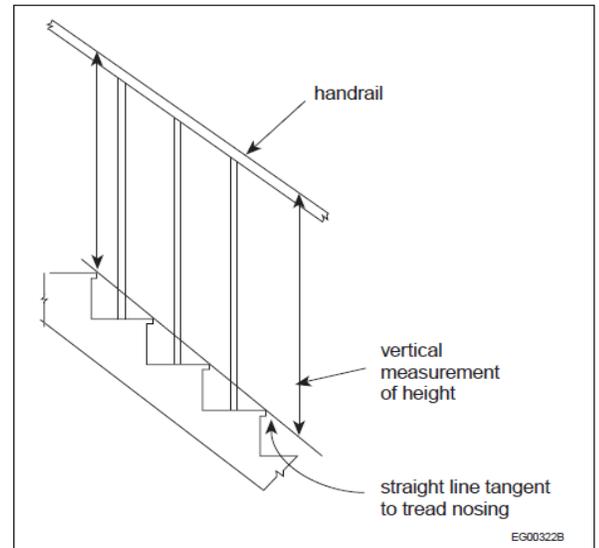


Figure A-9.8.7.4.

Measuring handrail height

## Guards (NBC 9.8.8.)

- Guards are required for every surface not protected by a wall where there is a difference in elevation of more than 600 mm (24") between the walking surface and adjacent surface, including but not limited to flights of steps, ramps, exterior landings, porches, balconies, mezzanines, galleries and raised walkways (NBC 9.8.8.1.(1)).
- Guards at least 1070 mm (42") high (NBC 9.8.8.3.(1)) are required if there is a difference in elevation of more than 600 mm (24") between the walking surface and the adjacent floor/ground surface (NBC 9.8.8.1.(1a)).
- 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, except in required exit stairs, 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 in industrial occupancies (except storage garages) are permitted to consist of a top railing and one or more intermediate rails spaced such that openings would not permit the passage of a 535 mm (21") sphere (NBC 9.8.8.5.(2)).
- 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.)