

Part 3, Part 4 and Part 9 Requirements and Definitions for Stairs, Ramps, Handrails and Guards

Effective Date: January 1, 2022

Part 3 - Fire Protection, Occupant Safety and Accessibility

Stairs, Ramps, Handrails and Guards

Effective Date: January 1, 2022

Definitions, Division A, Article 1.4.1.2.

For the purpose of Part 3 and Part 9 of Division B, three new defined terms relating to stairs and ramps have been added to provide clarity as follows:

The term “flight” has now been defined to mean a series of steps between landings.

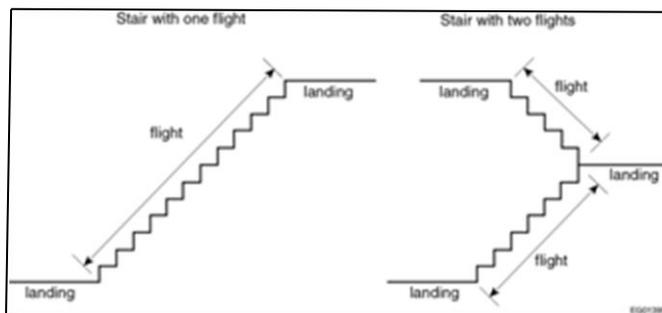


Illustration courtesy of Codes Canada

The term “tapered tread” was added, to unify the meaning in the Building Code and facilitate proper interpretation and enforcement, as the previous version of code had multiple terms to designate non-rectangular treads, which were ambiguous and not aligned with other Codes. Part 3 referred to “tapered treads” while the term “angled treads” was used in Part 9 to designate steps in curved stairs. Part 9 also used the term “winder” to designate treads that

converge to a point, which were only allowed inside dwelling units under certain conditions. The traditional term “winder” was kept as it refers to a specific tread arrangement that converge to a point inside dwelling units.

The term “run” was added to mean the horizontal distance between two adjacent tread nosings. This addition is meant to facilitate proper interpretation and implementation of the Code requirements.

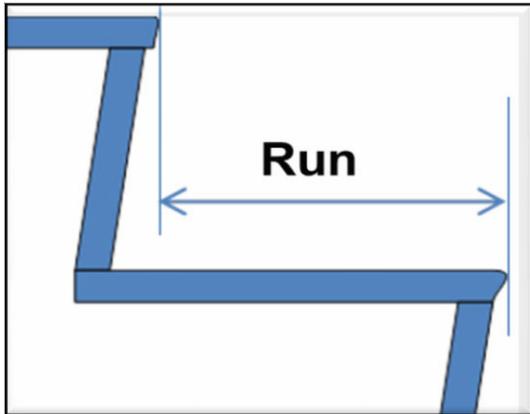


Illustration courtesy of Codes Canada

Article 3.3.1.15. Tapered Treads in a Curved Flight

This article has been revised to introduce consistent terminology and states the appropriate way of constructing tapered treads in curved flights except for required exit stairs.

Article 3.3.2.8A. Handrails in Aisles with Steps

A new article has been added and for the installation of handrails in aisles with steps in assembly occupancies. A table showing where handrails are required based on an aisle width has been provided in the same article.

Article 3.3.5.4. Vehicle guardrails in storage garages

This article was amended to clarify requirements for vehicle guardrails in storage garages. The minimum height of a continuous curb has been reduced from 150 mm to 140 mm. A new Sentence has also been added that cross references the loading requirements of Part 4 of the Code.

Article 3.3.5.9. Guards in Industrial occupancies

This new article has been added to address the size of openings through guards in industrial occupancies. The maximum opening is required to prevent passage of spherical object having diameter of 535 mm.

Article 3.4.6.4. Dimensions of Landing

A new requirement has been added to harmonize the landing dimension with similar requirements in Part 9. This change addresses the measurement for the length of the landing for various landing configurations. An appendix note was added to illustrates the measurements.

Article 3.4.6.5. Handrails

New requirements have been added to the existing article for the installation of handrails in aisles with steps in assembly occupancies.

Changes have been made to handrail requirements to clarify where handrails are required and where they need to be continuous. There are additional changes addresses the continuity, clearance and height of handrails.

The loading requirements for handrails have been moved from Part 3 to Part 4.

Article 3.4.6.6. Guards

A new requirement has been added to harmonize the height of guards serving a flight of exit stair with similar requirements in Part 9.

Article 3.4.6.8. Treads and Risers

This article was amended to increase the minimum of tread depth for stairs from 255 mm to 280 mm.

This article was amended to reduce the maximum rise for stairs from 200mm to 180mm.

A new provision has been added to the tread and riser requirements to restrict open stair risers.

Article 3.4.6.9. Curved Flights in Exits

New amendment to the existing Article that clearly state the permitted stair configurations for Part 3 building exit stairs.

Part 4

Structural Design

Stairs, Ramps, Handrails and Guards

Effective Date: January 1, 2022

Article 4.1.5.14. Loads on Guards and Handrails

Load requirements on guards have been modified to require point loads apply to points of application in the guard that produce the most critical effect.

Loads acting inwards on guards have been reduced to 50% of those specified loads acting outwards away from the floor adjacent to the guard to more closely reflect real loads on a guard.

Deflection limits have also been introduced for size of openings between two adjacent vertical members when subjected to a specified live load of 0.1 kN applied in opposite directions between the two members.

Load requirements for handrails have been transferred from Part 3 to Part 4.

Article 4.1.5.15. Loads on Vehicular Guardrails

Load requirements on vehicle guardrails have been modified to clarify that guard loads specified for vehicles and guard loads specified for persons need not be considered to act simultaneously on the same element of the vehicular guardrail.

Article 4.1.5.16. Loads on Walls Acting as Guards

Load requirements for walls acting as guards have been modified to clarify that the direction of prescribed design lateral forces is to be taken as acting in the outward direction.

This applies to walls or partial height walls where the wall separates a higher level from a lower level where the difference in height exceeds 600 mm.

Part 9

Housing and Small Buildings – Section 9.8 Stairs, Ramps, Handrails and Guards

Effective Date: January 1, 2022

Definitions, Division A, Article 1.4.1.2.

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The term “flight” has now been defined to mean a series of steps between landings.

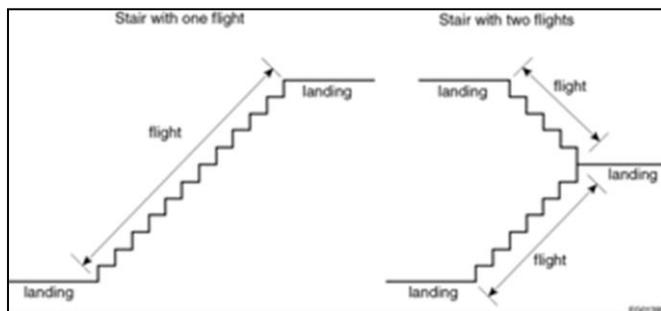


Illustration courtesy of Codes Canada

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The term “run” was added to mean the horizontal distance between two adjacent tread nosings. This addition is meant to facilitate proper interpretation and implementation of the Code requirements.

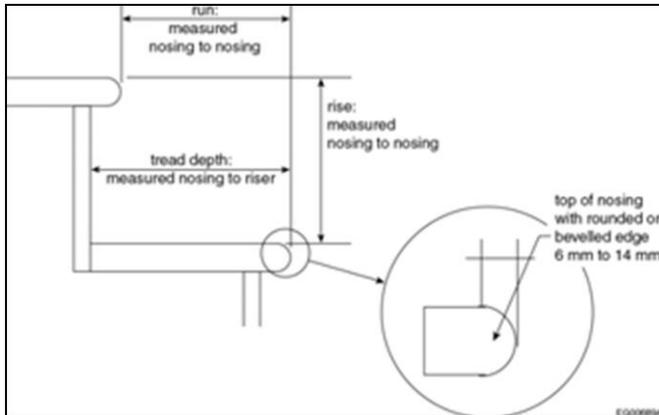


Illustration courtesy of Codes Canada

Article 9.8.3.1. Straight and Curved Runs

This article has been amended to reflect the introduction of new stair configurations, and to clarify which stair configuration are permitted in Part 9 buildings as well as stairs inside houses and individual dwelling units.

Article 9.8.4.2. Dimensions for Runs and Rectangular Treads

This article has been amended to increase the minimum stair run for private stairs from 210mm to 255mm.

The assessment of technical literature and statistics have indicated that an increase in dimension of runs of private stairs would increase the safety of users.

This article has been amended to clarify the dimensions for tapered treads as well as method of measurement.

Article 9.8.4.3. Dimensions for Tapered Treads

This article has been amended to clarify the dimensions for tapered treads as well as method of measurement.

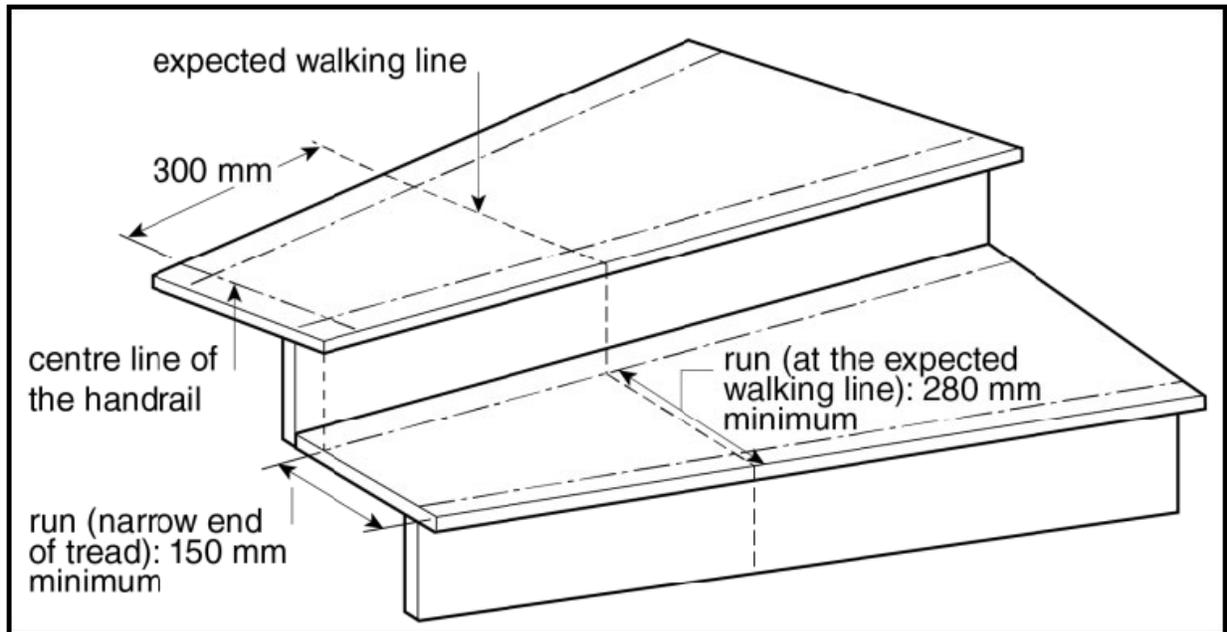


Illustration courtesy of Codes Canada

Article 9.8.4.4.A. Uniformity of Runs in Flights with Mixed Treads within a House or Dwelling Unit

New article has been added to allow the use of stair flights where both tapered and rectangular treads can be used in dwelling units.

Sentence 9.8.4.4.A.(1) sets the general requirements for tapered treads and rectangular treads when used within one flight.

Sentence 9.8.4.4.A.(2) provides some further flexibility in mixed-run flights if certain conditions are met.

Article 9.8.4.5.A. Spiral Stairs

New article has been added which allows a spiral stair to be used in dwelling units and in Part 9 buildings under certain conditions.

This new provision also sets out the minimum requirements that a spiral must meet to be permitted in dwelling units and Part 9 Buildings.

Article 9.8.5.2. Ramp Width

This article has been amended as the previous article made reference to “exit ramps and public ramps”. This was confusing for the Code users and did not add any value to the requirement which stated the general requirement for the width of ramps regardless of whether or not it is an exit or a public ramp.

The amended article states a minimum ramp width of 1100 mm for “all ramps” serving other than a house or dwelling unit, regardless of the occupancy of the building and whether it is an exit or public ramp.

Article 9.8.6.3. Dimensions of Landings

This article has been amended as the previous article required that the length of the landing match the width of a stair, which imposed unnecessarily big landing dimensions for wide stairs.

The change establishes that, except where the landing is turning 90 degrees or more, the length of the landing need not be more than the lesser of the required width of the stair, when all widths of the stairs exceed their required width.

Article 9.8.7.1. Required Handrails

A new sentence (5) has been added that requires handrails to be installed on the narrow end of the treads in a house or an individual dwelling unit where the flights of stairs consist of tapered treads or a mix of tapered treads and rectangular treads.

Article 9.8.7.2. Continuity of Handrails

Sentence (1) has been amended to clarify that except for houses and individual dwelling units, at least one handrail must be continuous throughout the entire length of the stair including landings and changes in direction.

A handrail does not need to be continuous where it is interrupted by doorways.

Article 9.8.7.4. Height of Handrails

This article has been amended, as the previous article limited handrail height to 965 mm.

The amended article now permits handrails to be installed at a height of 1070 mm, as research has indicated that higher handrails perform as well as lower handrails.

This change offers more design flexibility, permits handrails to be installed on guards up to 1070 mm and harmonizes the requirements of handrail height on stair flights and landings which allows a smoother handrail transition between stairs and landings.

Article 9.8.7.4. Ergonomic Design

A change to Sentence (1) increases the clearance between a handrail and a rough or abrasive surface to 60 mm.

This change was implemented as sharp or abrasive elements near handrails could harm users who depend on using a handrail to navigate a flight of stairs.

Article 9.8.8.1. Required Guards

The previous article required the installation of guards based on the elevation of the walking surface. However, this height varied from one provision to another for no apparent reason.

This article has been amended to use a walking surface elevation of 600 mm as the criteria to determine where a guard is required.

Article 9.8.8.2. Load on Guards

Table 9.8.8.2. was amended as Part 4 specifies that the concentrated load on guard elements serving public stairs had to be applied outward over an area of 100 mm by 100 mm whereas the previous Table 9.8.8.2 was silent about where to apply the load. This resulted in guard elements in Part 9 buildings being subjected to a more stringent load than those in Part 3 buildings.

The change to table 9.8.8.2. resolves the difference between Part 4 and Part 9 and provide a minimum surface on which the concentrated load would apply.

Article 9.8.8.3. Height of Guards

This Article was amended to exclude guards for spiral stairs for the height limitations, as the requirements for spiral stairs are described in Article 9.8.4.5.A.

Additionally, the limitation on guard heights for exit stairs and landings have been removed. The building Code now requires all guards on exit stair to be a minimum of 1070 mm high.

Article 9.8.8.3. Guards for Floors and Ramps in Garages

The Building Code requires a curb at the perimeter of floors and ramps that have no exterior walls. The minimum height of this curb was reduced from 150 mm to 140 mm, to avoid potential conflict with the requirements addressing climbability of guards in 9.8.8.6.(1)

Sentence (2) has also been amended to send users to Part 4 for loading values for vehicular guards.

Article 9.8.8.5. Openings in Guards

This Article was amended as the size of openings through guards in industrial occupancies was too restrictive. Larger openings are allowed by some Canadian regulations and international codes and standards. The Building Code now allows openings of up to 535 mm in guards located in industrial occupancies other than storage garages. In these buildings, where unsupervised young children are not expected, the new opening size allowed does not represent an additional risk for the occupants. Furthermore, this change harmonizes the Building Code provisions with the model National Building Code of Canada along with other international and occupational health and safety codes and standards widely used around the world.

The wording “unless it can be shown that the size of the openings that exceed this limit does not present a hazard” was deleted because the objective-based code approach already allows for alternative solutions to any provision of Division B. (Division A, Clause 1.2.1.1.(1)(b)). The previous wording was therefore considered redundant.
