

STAIRWAY

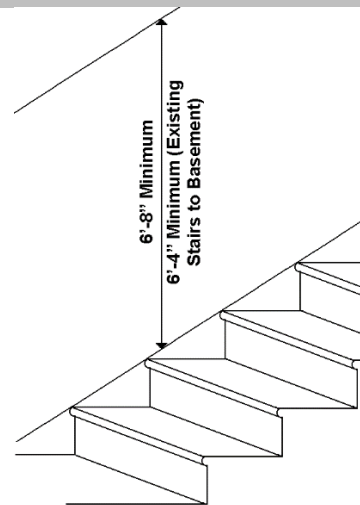
Building code information for one- or two-family dwellings and townhomes.

Stairway Illumination (R303.7)

- All stairways need to be illuminated, including landings and treads.
 - Interior stairways shall be provided with an artificial light source located in the immediate vicinity of each landing.
 - Exception: an artificial light source is not required at the top and bottom landing if a light source is provided directly over each stairway section.
 - Control of the light source shall be located at each floor level where the stairway has six or more risers.
- Exterior stairways shall be provided with an artificial light source located in the immediate vicinity of the top landing.
 - Exterior stairways providing access to a basement from outside shall be provided with an artificial light source located in the immediate vicinity of the bottom landing.
 - Control of the light source shall be located inside the dwelling unit.

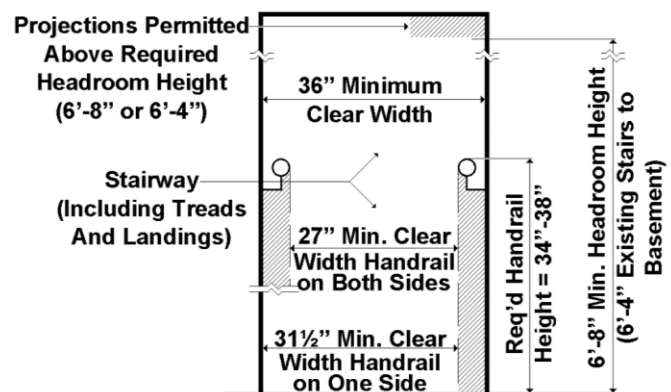
Headroom (R311.7.2 & R305.2.2)

- Stairways shall have a minimum 6'-8" headroom measured vertically from the sloped line adjoining the tread nosing or from the floor surface of the landing or platform.
 - Exception: existing basement stairways shall have a minimum headroom of 6'-4" measured vertically from the sloped line adjoining the tread nosing or from the floor surface of the landing or platform.
- Where the nosing of treads at the side of a flight extend under the edge of a floor opening through which the stair passes, the floor opening shall be allowed to project horizontally into the required headroom a maximum of 4¾".



Width (R311.7.1.2)

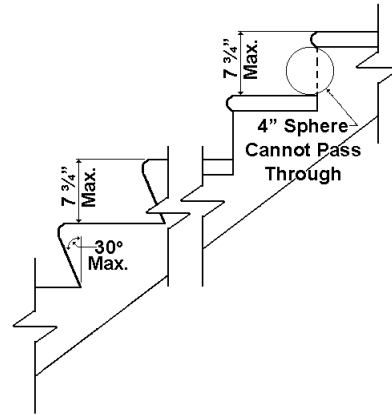
- Stairways shall have a minimum width of 36" at all points above the permitted handrail height (34" to 38") to below the required headroom height (6'-8"/6'-4").
 - Stairways with a handrail installed on one side of the stairway shall have a minimum width of 31½" at and below the handrail height.
 - Stairways with a handrail installed on both sides of the stairway shall have a minimum width of 27" at and below the handrail height.



Risers

(R311.7.5.1)

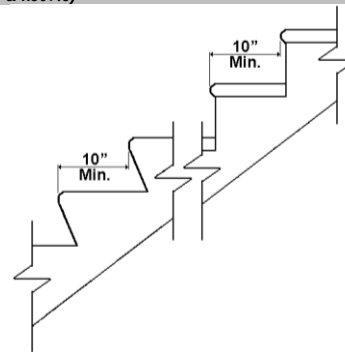
- The maximum riser height is $7\frac{3}{4}$ ".
 - The riser is measured vertically between the leading edges of the adjacent treads.
 - The greatest riser height cannot exceed the smallest by more than $\frac{3}{8}$ ".
 - If risers are not vertical the slope from the underside of the nosing of the tread above shall be an angle not more than 30-degrees from the vertical.
- Open risers are only allowed as long as the opening between the treads does not allow a 4" diameter sphere through.



Treads

(R311.7.5.2, R311.7.7 & R507.3)

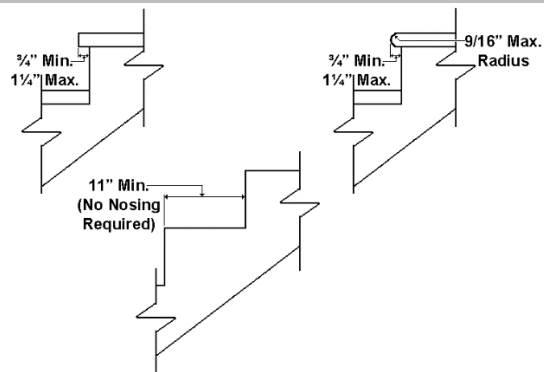
- The minimum tread depth is 10".
 - The tread is measured horizontally between the vertical planes of the foremost projection of adjacent treads and at a right angle to the tread's leading edge.
 - The greatest tread depth cannot exceed the smallest by more than $\frac{3}{8}$ ".
 - Treads shall have a maximum slope of one-unit vertical in 48-units horizontal (2% slope).



Nosing

(R311.7.5.3)

- All stairs with closed risers shall have nosing not less than $\frac{3}{4}$ " but not more than $1\frac{1}{4}$ ".
 - Exception: nosing is not required on stairs with a tread depth of 11" or greater.
- The radius of the curvature at the nosing shall be no greater than $\frac{9}{16}$ ".
- The greatest nosing project cannot exceed the smallest by more than $\frac{3}{8}$ " between two stories, including floors and landings.
- Beveling of nosing shall not exceed $\frac{1}{2}$ ".



Landings

(R311.7.6, R311.7.7 & R312.1.1)

- A landing is required at the top and bottom of each stairway.
 - A landing is not required at the top of an interior flight of stairs provided a door does not swing over the stairs.
- The width (perpendicular to the direction of travel) of the landing shall not be less than the width of the stairway it is serving.
- The depth (in the direction of travel) of the landing shall not be less than 36".
- Landings shall have a maximum slope of one-unit vertical in 48-units horizontal (2% slope).
- Guards shall be provided for landings that are more than 30" above grade.
 - See the guard section of this handout for guard requirements.

Vertical Rise

(R311.7.3)

- A flight of stairs shall not have a vertical rise greater than 12' between floor levels or landings.

Special Stairways

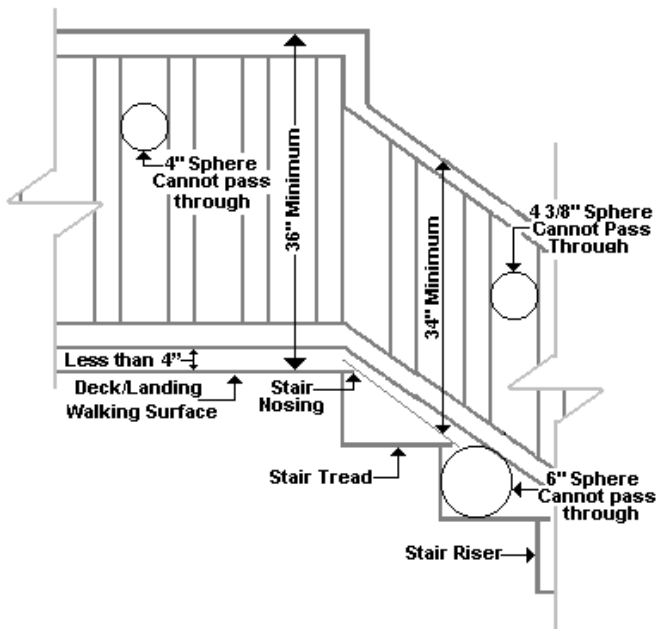
(R311.7.5.2.1, R311.7.10.1, & R311.7.10.2)

- Special stairways shall follow all previous requirements of the code with the following exceptions:
 - Winder stairways.
 - Treads at winder stairways shall have a minimum depth of 10" at a point measured 12" along the nosing edge from the side where the treads are narrower.
 - The largest tread depth shall not exceed the smallest winder tread by more than 3/8".
 - Treads shall have a minimum depth of 6" at any point within the clear width of the stairs.
 - Winder treads can be used in the same flight of stairs as rectangular treads.
 - Tread depths within the winder portion of the flight of stairs do not need to be within 3/8" tread depth of the rectangular portion.
 - Spiral Stairways.
 - Minimum 26" clear width at and below the handrail.
 - Minimum 7 1/2" tread depth.
 - Measured at 12" from the narrower edge.
 - All tread depths must be identical.
 - Maximum 9 1/2" riser height.
 - Minimum 6'-6" headroom.
 - Bulkhead enclosure stairways.
 - Stairways serving bulkhead enclosures do not need to meet any of the previous stairway or landing requirements as long as they meet ALL of the following:
 - They provide access from the outside grade level to the basement;
 - The maximum height from the basement finished floor to the grade adjacent to the stairway does not exceed 8'; and
 - The grade level opening to the stairway is covered by a bulkhead enclosure with hinged doors or other approved means.

Guards

(R312)

- Guards are required on open sides of floors, stairs, ramps, and landings that are located more than 30", measured vertically, above the floor or ground below.
- Guards, when required, shall be a minimum of 36" in height measured vertically above the adjacent walking surface, adjacent fixed seating, or the line connecting the leading edges of the treads.
 - Guards at stairways shall be a minimum 34" in height measured vertically from a line connecting the leading edges of the treads.
- Guards, when required, shall not have openings which allow passage of a 4" diameter sphere.
 - Exceptions:
 - The triangular openings at the open side of stairs, formed by the riser, tread, and bottom rail of a guard, shall not allow the passage of a 6" diameter sphere.
 - Guards at stairways shall not allow the passage of a 4 3/8" diameter sphere.
- Guards shall be built to withstand a single, concentrated load of 200 pounds, applied in any direction, at any point along the top.
 - In-fill components, balusters and panel fillers shall be built to withstand a horizontally applied load of 50 pounds on an area equal to 1 square foot.



Handrails (R311.7.8)

- Handrails are required on at least one side of stairways having four or more risers.
- Handrails are a minimum 34" and maximum 38" in height, measured vertically from the sloped plane adjoining the tread nosing, or the finished surface of a ramp.

- Exceptions:

- The use of a volute, turnout or starting easing shall be allowed over the lowest tread.
- When handrail fittings or bendings are used to provide continuous transition between flights, transitions at winder treads, the transition from handrail to guardrail, or used at the start of a flight, the handrail height at the fittings or bendings shall be permitted to exceed the maximum height.

- Handrails shall be continuous for the full length of the stairs, from a point directly above the top riser of the flight to a point directly above the lowest riser of the flight.

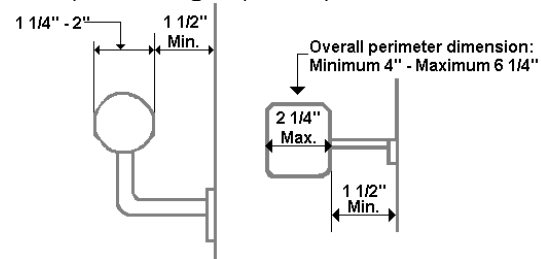
- Exceptions:

- Handrails can be interrupted by a newel post at a turn.
- The use of a volute, turnout, starting easing or starting newel shall be allowed over the lowest tread.

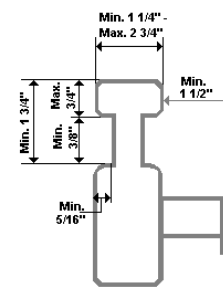
- Handrails shall be returned or shall terminate in newel posts or safety terminals.

- Handrails shall be one of the following types or proved equivalent graspability.

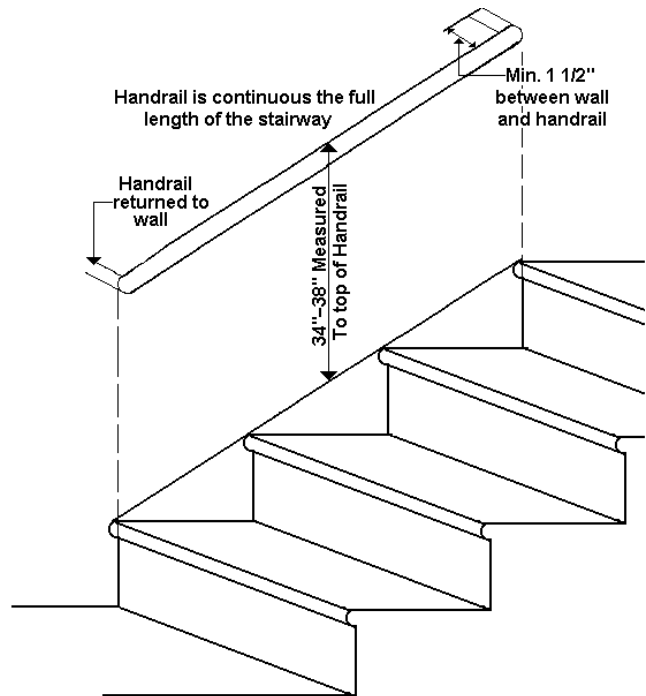
- Type I: Handrails with a circular cross section shall have an outside diameter of at least 1 1/4" and not greater than 2". If the handrail is not circular, it shall have a perimeter dimension of at least 4" and not greater than 6 1/4" with a maximum cross section dimension of 2 1/4". Edges shall have a minimum radius of 0.01".



- Type II: Handrails with a perimeter greater than 6 1/2" shall have a graspable finger recess area on both sides of the profile. The finger recess shall begin within a distance of 3/4" measured vertically from the tallest portion of the profile and achieve depth of at least 5/16" within 7/8" below the widest portion of the profile. This required depth shall continue for at least 3/8" to a level that is not less than 1 3/4" below the tallest portion of the profile. The minimum width of the handrail above the recess shall be 1 1/4" to a maximum 2 3/4". Edges shall have a minimum radius of 0.01".



- Handrails shall be built to withstand a single, concentrated load of 200 pounds, applied in any direction, at any point along the top.
 - In-fill components, balusters and panel fillers shall be built to withstand a horizontally applied load of 50 pounds on an area equal to 1 square foot.



Ramps

(R311.8 & R312.1.1)

- Ramps shall have a maximum slope of 1-unit vertical to 12-units horizontal (8.3% slope).
 - Ramps can have up to a slope of one-unit vertical to 8-units horizontal (12.5% slope) where it is technically infeasible to comply with one-unit vertical to 12-units horizontal because of site constraints.
- A minimum 3' by 3' landing shall be provided in the following locations:
 - At the top and bottom of ramps.
 - Where doors open onto ramps.
 - Where ramps change direction.
- Handrails shall be provided on at least one side of all ramps exceeding a slope of one-unit vertical to 12-units horizontal.
 - See the handrail section of this handout for handrail requirements.
- Guards shall be provided on ramps and landings that are more than 30" above grade.
 - See the guard section of this handout for guard requirements.

Wood/Plastic Composite Materials

(R311.5.4, R311.7.8.4, & R507.3)

- Wood/plastic composite materials shall bear a label indicating the required performance levels and demonstrating compliance with the provisions of ASTM D 7032.
 - When using wood/plastic composite materials as stair treads verify the product has been approved for use as a stair tread, and verify spacing of stair stringers.

(For the purpose of this handout: ' = foot/feet; " = inch(es))

The information in this handout is just an overview. See the 2015 Minnesota Residential Code for complete information. The code is available to view online at:

<http://codes.iccsafe.org/app/book/toc/2015/Minnesota/Residential/index.html>