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 7¾".
  - The riser is measured vertically between the leading edges of the adjacent treads.
  - The greatest riser height cannot exceed the smallest by more than 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 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 ¾" but not more than 1½".
  - 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 9/16".
  - The greatest nosing project cannot exceed the smallest by more than 3/8" between two stories, including floors and landings.
  - Beveling of nosing shall not exceed ½".

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 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 form 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 1¾" 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 6¼" with a maximum cross section dimension of 2¾". Edges shall have a minimum radius of 0.01".
  - Type II: Handrails with a perimeter greater than 6½" shall have a graspable finger recess area on both sides of the profile. The finger recess shall begin within a distance of ¾" 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 1¾" below the tallest portion of the profile. The minimum width of the handrail above the recess shall be 1¾" to a maximum 2¾". 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

- 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

- 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: