

# 2015 Michigan Residential Code Stairway Requirements

(Summary of the requirements found on pages 67-69 of the 2015 MRC)

REFER TO THE 2015 MRC FOR THE COMPLETE TEXT

## SECTION R311 – MEANS OF EGRESS

### **R311.7 Stairways.**

**R311.7.1 Width.** Stairways shall not be less than 36 inches (914mm) in clear width at all points above the permitted handrail height and below the required headroom height. Handrails shall not project more than 4½ inches (114mm) on either side of the stairway and the minimum clear width of the stairway at and below the handrail height, including treads and landings, shall not be less than 31½ inches (787mm) where a handrail is installed on one side and 27 inches (698mm) where handrails are provided on both sides.

**Exception:** The width of spiral stairways shall be in accordance with Section R311.7.10.1

**R311.7.2 Headroom.** The minimum headroom in all parts of the stairway shall not be less than 6 feet 8 inches (2032mm) measured vertically from the sloped plane adjoining the tread nosing or from the floor surface of the landing or platform on that portion of the stairway.

**Exception:** Where the nosings of treads at the side of a flight extend under the edge of a floor opening shall be allowed to project horizontally into the required headroom a maximum of 4¾ inches (121mm).

**R311.7.3 Vertical Rise.** A flight of stairs shall not have a vertical rise larger than 147 inches (3734mm) between floor levels or landings.

**R311.7.4 Walkline.** The walkline across winder treads shall be concentric to the curved direction of travel through the turn and located 12 inches (305mm) from the side where the winders are narrower. The 12-inch (305mm) dimension shall be measured from the widest point of the clear stair width at the walking surface of the winder. If winders are adjacent within the flight, the point of the widest clear stair width of the adjacent winders shall be used.

**R311.7.5 Stair treads and risers.** Stair treads and risers shall meet the requirements of this section. For the purposes of this section all dimensions and dimensioned surfaces shall be exclusive of carpets, rugs or runners.

**R311.7.4.1 Riser height.** The maximum riser height shall be 8¾ inches (210mm). The riser shall be measured vertically between leading edges of the adjacent treads. The greatest riser height within any flight of stairs shall not exceed the smallest by more than 3/8 inch (9.5mm).

**R311.7.4.2 Tread depth.** The minimum tread depth shall be 9 inches (229mm). The tread depth shall be 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 within any flight of stairs shall not exceed the smallest by more than 3/8 inch (9.5mm). Winder treads shall have a minimum tread depth of 10 inches (254mm) measured as above at a point 12

inches(305mm) from the side where the treads are narrower. Winder treads shall have a minimum tread depth of 6 inches (152mm) at any point. Within any flight of stairs, the largest winder tread depth at the 12 inch (305mm) walk line shall not exceed the smallest by more than 3/8 inch (9.5mm).

**R311.7.5.3 Nosings.** The radius of curvature at the nosing shall be no greater than 9/16 inch (14mm). A nosing not less than 3/4 inch (19mm) but not more than 1¼ (32mm) inch shall be provided on stairways with solid risers. The greatest nosing projection shall not exceed the smallest nosing projection by more than 3/8 inch (9.5mm) between two stories, including the nosing at the level of floors and landings. Beveling of nosing shall not exceed 1/2 inch (12.7 mm). Risers shall be vertical or sloped from the underside of the leading edge of the tread above at an angle not more than 30 degrees from the vertical. Open risers are permitted, provided that the opening between treads does not permit the passage of a 4-inch (102mm) diameter sphere.

**Exceptions:**

1. A nosing is not required where the tread depth is a minimum of 11 inches.

**R311.7.6 Landings for stairways.** There shall be a floor or landing at the top and bottom of each stairway. Every landing shall have a minimum dimension of 36 inches measured in the direction of travel.

**Exception:** A floor or landing is not required at the top of an interior flight of stairs, including stairs in an enclosed garage, provided a door does not swing over the stairs. A flight of stairs shall not have a vertical rise larger than 12 feet (3658 mm) between floor levels or landings. The width of each landing shall not be less than the width of the stairway served. Every landing shall have a minimum dimension of 36 inches (914 mm) measured in the direction of travel.

**R311.7.7 Stairway walking surface.** The walking surface of treads and landings of stairways shall be sloped no steeper than one unit vertical in 48 inches horizontal (2-percent slope).

**R311.7.8 Handrails.** Handrails shall be provided on not less than one side of each continuous run of treads or flight with four or more risers.

**R311.7.8.1 Height.** Handrail height, measured vertically from the sloped plane adjoining the tread nosing, or finish surface of ramp slope, shall be not less than 34 inches (864mm) and not more than 38 inches (965mm).

**R311.7.8.2 Continuity.** Handrails for stairways shall be continuous for the full length of the flight, from a point directly above the top riser of the flight to a point directly above the lowest riser of the flight. Handrail ends shall be returned or shall terminate in newel posts or safety terminals. Handrails adjacent to a wall shall have a space of not less than 1½ inches (38mm) between the wall and the handrails.

**Exceptions:**

- 1) Handrails shall be permitted to be interrupted by a newel post at the turn.

- 2) The use of a volute, turnout, starting easing or starting newel shall be allowed over the lowest tread.

**R311.7.8.3 Handrail grip size.** All required handrails shall be of one of the following types or provide equivalent grasp-ability. *(see attached graphics from State of Michigan)*

- 1) Type I. Handrails with a circular cross section shall have an outside diameter of at least 1¼ inches (32mm) and not greater than 2 inches (51mm). If the handrail is not circular it shall have a perimeter dimension of at least 4 inches (104mm) and not greater than 6¼ inches (160mm) with a maximum cross section of dimension of 2¼ inches (57mm). (Sharp edges shall be rounded over)
- 2) Type II. Handrails with a perimeter greater than 6¼ inches (160mm) shall provide a graspable finger recess area on both sides of the profile. The finger recess shall begin within a distance of ¾ inch (19mm) measured vertically from the tallest portion of the profile and achieve a depth of at least 5/16 inch (8mm) within 7/8 inch (22mm) below the widest portion of the profile. This required depth shall continue for at least 3/8 inch (10mm) to a level that is not less than 1¾ inches (45mm) below the tallest portion of the profile. The minimum width of the handrail above the recess shall be 1¼ inches (32mm) to a maximum of 2¾ inches (70mm). (Sharp edges shall be rounded over)

**R311.7.8.4 Exterior wood/plastic composite handrails.** Wood/plastic composite handrails shall comply with the provisions of Section R507.3.

**R311.7.8 Illumination.** All stairs shall be provided with illumination in accordance with Section R303.7.

**R303.7 Stairway illumination.** All interior and exterior stairways shall be provided with a means to illuminate the stairs, including the landings and treads. Interior stairways shall be provided with an artificial light source located in the immediate vicinity of each landing of the stairway. For interior stairs the artificial light sources shall be capable of illuminating treads and landings to levels not less than 1 foot-candle measured at the center of treads and landings. Exterior stairways shall be provided with an artificial light source located in the immediate vicinity of the top landing of the stairway. Exterior stairways providing access to a basement from the outside grade level shall be provided with an artificial light source located in the immediate vicinity of the bottom landing of the stairway.

**Exception:** An artificial light source is not required at the top and bottom landing, provided an artificial light source is located directly over each stairway section.

**R303.7.1 Light activation.** Where lighting outlets are installed in interior stairways, there shall be a wall switch at each floor level to control the lighting outlet where the stairway has six or more risers. The illumination of exterior stairways shall be controlled from inside the dwelling unit.

**Exception:** Lights that are continuously illuminated or automatically controlled.

## **SECTION R312 – GUARDS**

**R312.1.1 Guards.** Guards shall be located along open-sided walking surfaces, including stairs, ramps and landings that are located more than 30 inches (762mm) measured vertically to the floor or grade below at any point within 36 inches (914mm) horizontally to the edge of the open side. Insect screening shall not be considered a guard.

**R312.1.2 Height.** Required guards at open sided walking surfaces, including stairs, porches, balconies or landings, shall be not less than 36 inches (914mm) high measured vertically above the adjacent walking surface, adjacent fixed seating or the line connecting the leading edges of the treads.

**Exceptions:**

- 1) Guards on the open sides of stairs shall have a height not less than 34 inches (864mm) measured vertically from a line connecting the leading edges of the treads.
- 2) Where the top of the guard also serves as a handrail on the open sides of stairs, the top of the guard shall not be less than 34 inches (864mm) measured vertically from a line connecting the leading edges of the treads.

**R312.1.3 Guard opening limitations.** Required guards shall not have openings from the walking surface to the required guard height which allow passage of a sphere 4 inches (102mm) in diameter.

**Exceptions:**

- 1) The triangular openings at the open side of a stair, formed by the riser, tread and bottom rail of a guard shall not allow a sphere 6 inches (153mm) in diameter.
- 2) Openings for required guards on the sides of stair treads shall not openings which allow a sphere 4 3/8 inches (111mm) to pass through.

**R312.1.4 Exterior plastic composite guards.** Wood/plastic composite guards shall comply with the provisions of Section R317.4

**R 317.4 Plastic composites.** Plastic composites exterior deck boards, stair treads, guards and handrails containing wood, cellulosic or other biodegradable materials shall comply with the requirements of Section R507.3

**R507.3 Plastic composite deck boards, stair treads guards or handrails.** Plastic composite deck boards, stair treads, guards and handrails shall comply with the provisions of ASTM D 7032 and Section 507.3

**R507.3.1 Labeling.** Plastic composite deck boards and stair treads, or their packaging, shall bear a label that indicates compliance to ASTM D7032 and includes the allowable load and maximum allowable span determined in accordance with ASTM D7032. Plastic or composite handrails and guards, or their packaging, shall bear a label that indicates compliance to ASTM D 7032 and includes the maximum allowable span determined in accordance with ASTM D 7032.

**R507.3.2 Flame spread index.** Plastic composite deck boards, stair treads, guards, and handrails shall exhibit a flame spread index not exceeding 200 when tested in accordance with ASTM E 84 or UL 723 with the test specimen remaining in place during the test.

**Exception:** Plastic composites determined to be noncombustible

**R507.3.3 Decay resistance.** Plastic composite deck boards, stair treads, guards and handrails containing wood, cellulosic or other biodegradable materials shall be decay resistant in accordance with ASTM D 7032.

**R507.3.4 Termite resistance.** Where required by Section 318, plastic composite deck boards, stair treads, guards and handrails containing wood, cellulosic or other biodegradable materials shall be termite resistant in accordance with ASTM D 7032.

**507.3.5 Installation of plastic composites.** Plastic composite deck boards, stair treads, guards and handrails shall be installed in accordance with this code and the manufacturer's instructions.