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**HANDRAILS vs GUARDRAILS**  
*Based on the 2012 Michigan Building/2015 Michigan Residential Code*

**The building code defines a HANDRAIL as follows:**

A horizontal or sloping rail intended for grasping by the hand for guidance or support A.

In other words, a handrail is provided to help support a person requiring something to hold on to as they use steps or a ramp.

Code sections 1012.1 of the MBC ( Michigan Building Code ) and sections R311.7.8 and R311.8.3 of the of the MRC ( Michigan Residential Code ) contain the requirements for where a handrail is required on stairs and ramps.

Handrails are required on all stairs and ramps in projects under the MBC, on both sides. Handrails in projects under the MRC are required when there are 4 or more risers. There is an exception to this on stairs serving a residence, which allows the handrail to be provided on only one side. Ramps require handrails on both sides, with the exception of a residence, where handrails are required if the slope of the ramp exceeds one unit vertical in 12 inches horizontal. Other information on ramps can be found in section 1010 of the MBC and section R311.8 of the MRC. Handrails must also be graspable and be positioned so that they protrude out from the wall, providing a clear space of at least 1 1/2 inches. Handrail graspability is addressed on the opposite side of this sheet, with more information available in section 1012.3 of the MBC and R311.7.8.3 of the MRC. Handrails are required to be mounted between 34 inches and 38 inches measured vertically from the nose of the tread. The handrail in residential construction is required to begin at the bottom riser and run continuously to the top stair riser. Handrails are required to return to the wall or newel posts at the ends. Handrails in commercial construction must extend horizontally for 12 inches beyond the top riser and extend at least 1 tread depth beyond the bottom riser.

**The building code defines a GUARDRAIL system as follows:**

"A system of building components located near the open sides of elevated walking surfaces for the purpose of minimizing the possibility of an accidental fall from the walking surface to the lower level."

In other words, the guardrail system is provided to prevent people from injuring themselves if they were to fall on a walking surface. The guardrail would prevent them from falling to a lower level below. Walking surfaces include decks, steps, ramps, porches, etc.

A guardrail is required as per code section 1013 of the MBC and section R312 of the MRC. These code sections also list the requirements for guardrail systems. Guards are required along open sided walking surfaces that are located more than 30 inches above a floor or grade below. There are some exceptions to this rule though. These exceptions are for loading docks and stages such as those found in auditoriums. The minimum height requirement in the MBC for guardrails is 42 inches measured vertically above the nose of the tread of the steps or from the finish floor surface in flat areas. The MRC allows the guardrail system to be 36 inches high in residential construction. A guardrail used in a residence along the open side of a stair system is allowed at a minimum of 34 inches high when measured vertically from the nose of the treads. Guardrails must be constructed in such a manner so that a 4 inches diameter sphere cannot pass thru any opening within the guardrail system. One exception to this rule allows an opening of 6 inches in the triangular opening formed by the riser and tread in an open-sided stair system. An exception in Residential Code allows the guardrail to be constructed along the slope of open sided stairs with a opening that a 4 3/8 inch diameter sphere cannot pass through any openings in the guardrail system.

Should further information be needed regarding handrails and guardrails, contact the Building Dept.

*Code information taken from the 2012 Michigan Building Code and the 2015 Michigan Residential Code*

# **HANDRAIL DESIGNS APPROVED FOR GRASPABILITY**

**Based on the 2015 Michigan Residential Code**

Section R311.7.8.3 contains the code requirements for the grip size of handrails. All required handrails shall be Type 1, Type 2 or provide equivalent graspability. Handrails are required on at least one side of all stairs with 4 or more risers.

Type 1: Handrails must have a circular cross section of at least 1 1/4 inches and not more than 2 inches. If the handrail is not circular it shall have a perimeter dimension of at least 4 inches and not greater than 6 inches with a maximum cross section dimension of 2 1/4 inches.

Type II: For handrails with a perimeter dimension greater than a 6 1/4 inches, a graspable finger recess area must be provided on both sides of the profile. The finger recess must begin within a distance of 3/4 inches, measured vertically from the tallest portion of the profile, and achieve a depth of at least 5/16 inches within 7/8 inches below the widest portion of the profile. The required depth of the finger recess shall continue for a minimum of 3/8 inches to a level that is not less than 1 3/4 inches below the tallest portion of the profile. The width of the handrail above the finger recess must be at least 1 1/4 inches and no more than 2 3/4 inches with the edges having a slight radius.

Shown below are several *handrail* designs that are considered graspable by the State of Michigan. Other designs that fall within the dimensions of the rails shown below may also be considered *graspable*, but should be approved by the Building Dept. prior to installation. Consult the Building Dept. should you need any other information regarding *handrail graspability* or the *handrail* requirements for other than one and two family applications.

