



Working to Create Michigan's Future Today

Michigan Department of Energy, Labor & Economic Growth
Bureau of Construction Codes
P.O. Box 30254
Lansing, Michigan 48909
(517) 241-9302

Bureau of Construction Codes Technical Bulletin

Publication Number 13

Updated: July 2006

Michigan Building Code Handrail Graspability

"Providing for Michigan's Safety in the Built Environment"

Technical bulletins are issued to provide clarification on issues that arise regarding code administration and enforcement. The information provided in the bulletin is developed to promote uniform interpretation and enforcement of the state codes.

DELEG is an equal opportunity employer/program. Auxiliary aids, services and other reasonable accommodations are available upon request to individuals with disabilities.

MICHIGAN BUILDING CODE HANDRAIL GRASPABILITY

Issue

What constitutes an equivalent graspability for handrails not meeting the specific requirements of section 1009.11.3 of the Michigan Building Code?

Code

Section 1009.11.3 states:

“Handrails with a circular cross section shall have an outside diameter of at least 1.25 inches (32 mm) and not greater than 2 inches (51 mm) or shall provide equivalent graspability. If the handrail is not circular, it shall have a perimeter dimension of at least 4 inches (102 mm) and not greater than 6.25 inches (160 mm) with a maximum cross-section dimension of 2.25 inches (57 mm). Edges shall have a minimum radius of 0.01 inches (0.25 mm).”

Discussion

The justification for this code section cited the need to prohibit the use of handrails with a narrow cross-section or a larger cross-section as not graspable by an able bodied user employing a power grip on the handrail. It, therefore, stands to reason that individuals with hand strength or flexibility deficiencies would also be prohibited from using handrails outside of the suggested specifications.

This section also requires all handrails to comply with the maximum dimensions, where the previous requirement did not specify a standard for handrails in non-residential applications.

The code section does, however, also allow for the use of alternative handrails providing equivalent graspability. Because this issue is not clarified, some guidance is necessary to establish parameters to determine equivalent graspability. Several attempts were made to address this issue at the national level; however, subsequent considerations did not result in any changes to the text of section 1009.11.3.

Several publications list the various handrail cross sections, but a complete inventory of the available shapes had not been presented for consideration.

The bureau has contacted several manufacturers of handrails, requesting information on the various shapes available. A review of the received information established a base of approximately 12 profiles for consideration. These include the use of round or oval handrails meeting the cross-section criteria.

However, a review of the various applications noted these profiles are impacted by the method of attachment. Because the code requires the guards protecting the open side of a stairway to prevent the passage of a sphere with a diameter of 4 3/8 inches, handrails attached to the top of balusters prohibit a continuous grasping of the handrail. It is, therefore, important to assure the handrail is usable and allows a person to grasp the rail. Shapes other than traditional round or oval profiles may also provide equivalent graspability given the method of attachment described above.

The shapes must provide a gripping surface equivalent to the gripping surface afforded by a round or oval shape. The depth of the fluted area on handrails must provide a deep enough cut to allow the use of a power grip.

Several shapes are fluted and have a configuration that will provide a grasping shape. Attachment A depicts several shapes found to be acceptable that provide sufficient graspability for persons to form a power grip rather than a pinch grip.

Conclusion

Based on the provisions of sections 104.11 and 1009.11.3 of the Michigan Building Code, the shapes identified on Attachment A are acceptable under the provisions of section 1009.11.3 as having equivalent graspability. Other shapes will be considered upon submission.

It should also be noted that, while the Michigan Residential Code allows a greater circular cross section of 2 inches (51mm) maximum, this technical bulletin and the shapes identified in Attachment A are also acceptable as providing equivalent graspability.

Questions regarding this technical bulletin may be directed to the Michigan Department of Energy, Labor & Economic Growth, Bureau of Construction Codes, Building Division, P.O. Box 30254, Lansing, MI 48909 or by calling (517) 241-9317.

Attachment A

