

Lexington Building Notes

*A series of notes to assist the homeowner/contractor
through the permitting and construction process*

Handrail Graspability

Issue

What constitutes an equivalent graspability for handrails not meeting the specific requirements of the Massachusetts State Building Code, 780 CMR 1022.2.5 or 3603.14.1?

Code

Section 1022.2.5 states:

“All stairway handrails shall have a circular cross section with 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 (159 mm) with a maximum cross-section dimension of 2.25 inches (57 mm). Section 3603.14.1 has similar requirements for one and two-family dwellings.

Discussion

The justification for this code provision 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.

The code does 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.

Based on a review of the available profiles from several manufacturers of handrails, the following profiles are considered graspable. Other designs that fall within the dimensions of the rails shown may also be considered graspable, but they should be approved by the building department prior to installation.

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 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

The shapes identified on Attachment A are deemed by the Town of Lexington to be acceptable under the provisions of 780 CMR 1022.2.5 and 3603.14.1 as having equivalent graspability. Other shapes will be considered upon submission.



