



LOSS CONTROL TECHNICAL BULLETIN

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2700

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FALL PREVENTION: GUARDS, HANDRAILS & WINDOW GUARDS

Background

This Loss Control Technical Bulletin provides policyholders with specific standards and guidelines for **guards** and **handrails** for all occupancies (assembly, educational, health care, detention and correctional, residential, mercantile, business, industrial, storage, day-care, etc.), and **window guards** and **child safety screens** for condominiums and all residential social service occupancies with children.

Guards and **handrails** are required by most building codes to protect occupants from falling off the edges of balconies or other areas. Typically utilized as a means of egress protection, guards and handrails provide protection for various building components including stairs, landings, corridors, passageways, floor openings, ramps, aisles, porches, and mezzanines.

Loss history compiled from statistics gathered from the Consumer Products Safety Committee (CPSC) and findings from the American Academy of Pediatrics have changed many of the standards previously agreed upon from the industry. For example, a study conducted by the American Academy of Pediatrics prior to the 1991 version of the *Life Safety Code*, indicated that approximately 950 out of 1,000 children under the age of 10 could pass through a 6 in. wide opening between guards. These statistics have caused the industry to revise past standards to reflect a more stringent approach to protection.

Data from the CPSC indicated that of the approximately 4,700 children examined in emergency departments because of falls from windows during 1993, 90% fall from the first and second stories. Of those, 45% had injuries defined by the CPSC as "serious," such as fractures, internal injuries, concussions, and head injuries and hemorrhages.

CPSC estimates that about 12 children 10 years old and younger die each year, and more than 4,000 are treated in hospital emergency rooms for window fall-related injuries. CPSC knows of 120 window-fall related deaths to children since 1990. Most of the deaths and injuries are to children under the age of 5.¹

Definitions

Guards: Vertical protective barrier erected along exposed edges of stairways, balconies, and similar areas to prevent falls.

Handrails: A single bar, pipe, or similar member, as on a stairway or ramp, designed to furnish persons with a handhold.

Window Guards: Window guards screw into the side of a window frame and have bars no more than 4 inches apart. They are sold in different sizes for various size windows and adjust for width. Guards must meet requirements for spacing and strength and those that allow for escape in case of emergencies must be difficult for very young children to open.

Window Screens: "Child safety" window screens made of steel are available and are used in new construction in some areas. These screens can withstand 67.5 kg (150 lb) of pressure, similar to the standard for window guards

General Requirements

Guards:

Guards shall be no less than 42 in. high. Open guards shall have intermediate guards or an ornamental pattern such that a sphere 4 in. in diameter can not pass through any opening up to a height of 34 in. The open space located from 34 in. to 42 in. does not need to be protected with additional guards spaced every 4 in. **Existing buildings with guards having a 5 in. or greater separation between guards is unacceptable (Refer to Figure 5-35 on Page 2).**

Vertical guards are REQUIRED to reduce the potential of children climbing the railings. **Horizontal bars (above 8 in. & below 34 in. in height) are unacceptable as they assist small children to climb them and significantly increase the danger of falling.**

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Exception #1: Existing guards in dwelling units to include landings, balconies, porches and mezzanines shall not be less than 36 in. high.

Exception #2: Existing guards on existing stairs shall be at least 30 in. high.

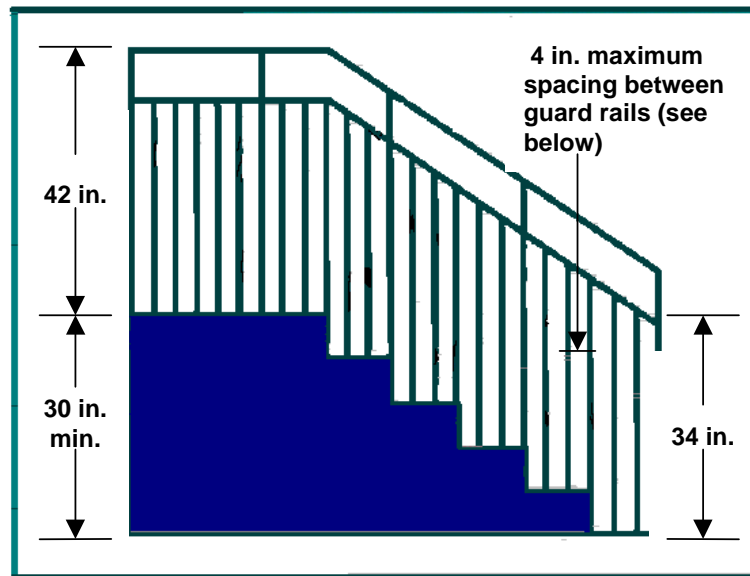


Figure 5-35. Height extension for application of 4-in. (10.1-cm) diameter sphere criterion. The space in the guard above 34 in. (86 cm) in height does not need to prevent the passage of a 4-in. (10.1-cm) diameter sphere.

4 in. guard spacing applies to balconies & stairways

Handrails

Every flight of stairs having four (4) or more risers or at least 30 in. in elevation (whichever is less), must be equipped with standard stair railings or standard handrails as follows. (The width of the stair must be measured clear of all obstructions except handrails.) Stairways:

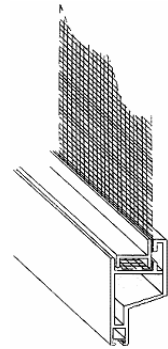
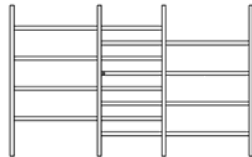
- less than 44 inches wide having both sides enclosed must be equipped with at least one handrail, preferably on the right side descending.
- less than 44 inches wide having one side open must be equipped with at least one stair railing on open side.
- less than 44 inches wide having both sides open, must be equipped with one stair railing on each side.
- more than 44 inches wide but less than 88 inches wide must be equipped with one handrail on each side.
- 88 or more inches wide must be equipped with one handrail on each side, and one center stair railing located approximately midway of the width.

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Child Safety Window Guards & Window Screens



Because the majority of serious children's injuries are related to falls from windows^{2 & 3}, strategies designed to prevent these falls should have a substantial effect. Modern window screens, although easily removable to allow for escape during residential fires, are designed to keep insects out of the house and do not provide a barrier to falls. "Child safety" window screens made of steel are available and are used in new construction in some areas. These screens can withstand 67.5 kg (150 lb) of pressure, similar to the standard for window guards. Window screens are not designed to prevent a child from falling out of a window. If you must leave a window open, you should install window guards. CPSC guidelines for preventing window falls are:

- Install window guards to prevent children from falling out of windows. (For windows on the 6th floor and below, install window guards that adults and older children can open easily in case of fire. For windows on the 7th floor and above, permanent window guards can be installed)
- Guards should be installed in children's bedrooms and other rooms where young children spend time (parent's room)
- Or, install window stops that permit windows to open no more than 4 inches.
- Whenever possible, open windows from the top - not the bottom.
- Keep furniture away from windows, to discourage children from climbing near windows.

Consumers should look for guards that have bars no more than 4 inches apart. They can call the following companies for more information about purchasing window guards:

John Sterling Corporation (800) 367-5726	LL Building Products (800) 755-9392	Automatic Specialties (800) 445-2370
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The cost for a standard window guard or safety netting is between \$10 and \$20. Some models can range up to \$50 each.

Notice

This standard conforms to the underwriting practices of the Philadelphia Insurance Companies and is not intended to address or conform to various state or local codes governing a specific jurisdiction. Codes such as the Building Officials & Code Administrators (BOCA) National Building Code, Uniform Building Code, and the Standard Building Code also contain information on the proper design of guards and handrails, and can be used as additional reference sources.

References

1. CPSC Release dated June 21, 2001; <http://www.cpsc.gov/cpsc/pub/prerel/prhtml00/00126.html>
2. Lehman D, Schonfeld N. Falls from heights: a problem not just in the northeast. *Pediatrics*. 1993;92:121-124
3. Barlow B, Niemirska M, Gandhi R, Leblanc W. Ten years of experience with falls from a height in children. *J Pediatr Surg*. 1983;18:509-511

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