



GUARDING OF FLOOR AND WALL OPENINGS AND HOLES

LOSS CONTROL BULLETIN

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Standards for guarding floor and wall openings and holes are outlined by the Occupational Safety & Health Administration (OSHA). There are separate standards set by OSHA for General Industry and Construction.

- General Industry — 29 CFR Part 1910 Subpart D (1910.23)
- Construction Industry — 29 CFR Part 1926 Subpart M (1926.502) Subpart X (1926.1052)

GENERAL INDUSTRY

Every open-sided floor, platform or runway **4 feet or more** above adjacent floors or ground level should be guarded by a standard railing on all open sides except where there is entrance to a ramp, stairway, or fixed ladder. Regardless of the height, the railing should be provided with a toeboard wherever a person can pass beneath the open sides, there is moving machinery, or if there is equipment with which falling materials could create a hazard.

Every stairway or ladderway floor opening should be guarded by a standard railing and toeboards. The railing and toeboards should be provided on all exposed sides except for the entrance to the opening.

Every runway shall be guarded by a standard railing on all open sides 4 feet or more above the floor or ground level. Wherever tools, machine parts, or materials are likely to be used on the runway, a toeboard should also be provided on each exposed side.

Stairways having four or more risers shall be equipped with at least one stair rail or handrail. The height of stair rails should not be more than 34 inches and not less than 30 inches from the surface of the tread.

A standard railing consists of a top rail and intermediate rail. The top rail shall have a vertical height of 42 inches from the upper surface of the rail to the floor, platform, runway, or ramp. The intermediate rail should be halfway between the top rail and the floor, platform, runway, or ramp.

The standard railing must be able to withstand a force of at least 200 pounds applied in any downwards or outward motion.

Wood guardrails should have at least 2x4-inch posts spaced in 6-foot intervals. The top and mid guardrail should also be at least 2x4-inch stock for adequate support.

For pipe railings, posts, and top and intermediate railings should be at least 1½ inches nominal diameter with posts spaced not more than 8 feet on centers.

For structural steel railings, posts, and top and intermediate rails shall be of 2x2x3/8-inch angles or other metal shapes of equivalent bending strength with posts spaced not more than 8 feet on centers.

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A standard toeboard should be a minimum 4 inches in vertical height from their top edge to the level of the walking/working surface. Toeboards should not have more than a ¼-inch clearance above the floor level.

If material is piled to such a height that a standard toeboard does not provide protection, paneling from the floor to the intermediate or top rail should be provided.

Every skylight floor opening and hole shall be guarded by a standard skylight screen or a fixed standard railing on all exposed sides.

Skylight screens should be of such construction and mounting that they are capable of withstanding a load of at least 200 pounds applied perpendicularly at any one area on the screen. They should also be of such construction and mounting that under ordinary loads or impacts, they will not deflect downward sufficiently to break the glass below them.

Every pit and trapdoor floor opening, infrequently used, should be guarded by a floor opening cover of standard strength and construction. A manhole floor opening needs to be guarded by a standard manhole cover, which does not need to be hinged. While the cover is not in place, the opening should be constantly attended by someone or must be protected on all exposed sides by removable standard railings.

If doors or gates open directly on a stairway, a platform should be provided, and the swing of the door should not reduce the effective width to less than 20 inches.

CONSTRUCTION

Guardrail systems or personal fall protection is required for unprotected sides or edges **6 feet or more** above a lower level. In construction there are several different

methods for protecting employees from open-sided floors: guardrails, personal fall arrest systems, warning lines, and safety monitoring systems.

Guardrail systems should consist of a top and intermediate rail. The top rail should be 42 inches in height plus or minus 3 inches above the walking/working level. Midrails should be installed midway between the top edge of the guardrail and the walking/working level. Guardrails should be capable of withstanding a force of at least 200 pounds applied within 2 inches of the top edge, in any outward or downward direction.

The top rail should have a smooth surface the length of the railing to prevent punctures or lacerations. The ends of the rails should not overhang the terminal posts except where such overhang does not constitute a projection hazard. If a wire rope is used for top rails, it should be flagged with high-visibility flags at 6-foot intervals.

Stairways having four or more risers or rising more than 30 inches, whichever is less, shall be equipped with at least one stair rail. The height of handrails should be between 30–37 inches from the surface of the tread. The handrails must be able to withstand a force of at least 200 pounds applied in any downwards or outward motion.

Toeboards should be erected along the edge of overhead walking/working surfaces. Toeboards should be a minimum of 3½ inches in vertical height from their top edge to the level of the walking/working surface. They shall not have more than ¼ inch clearance above any walking/working surface. They shall be capable of withstanding a force of at least 50 pounds in any downward or outward direction.

Covers must be installed for any hole or gap 2 inches or more in diameter. The cover should leave no openings

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more than 1 inch wide to prevent tools or material falling through. Covers for floors, roofs, and other walking/working surfaces should be capable of supporting at least twice the maximum load expected to cross over the cover. Covers located in roadways should be capable of supporting at least twice the maximum axle load of the largest vehicle expected to cross the cover. All covers should be secured with a hinge to prevent accidental displacement by the wind, equipment, or employees. The covers should be color coded or marked with the word "hole" or "cover" to provide warning of the hazard.

When guardrail systems are used around holes used for the passage of materials, the hole should not have more than two sides provided with removable guardrail sections to allow the passage of materials. When the hole is not in use for passage of materials, it should be closed with a cover, or a guardrail system should be provided along all unprotected sides.

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