Know Your Railings, Toeboards and Handrails

The basic requirements for railings, including handrails, and toeboards used for guarding floor and wall openings and holes are set out in OSHA Standard 1910.23 – Guarding Floor and Wall Openings and Holes.

OSHA Standard 1910.23 is part of 1910 Subpart D – Walking-Working Surfaces, which also includes 1910.22 – General Requirements addressing general housekeeping matters, aisles and passageways, covers and guardrails and floor loading protection. There are additional standards within Subpart D that address ladders, scaffolding, mobile stands and other working surfaces.

The requirements of 1910.23 – Guarding Floor and Wall Openings and Holes address in more detail protection of floor openings, protection of wall openings and holes, protection of open-sided floors, platforms, and runways, stairway railings and guards, and railings, toe boards, and cover specifications.

OSHA Standard 1910.23(e)(1) defines the standard railing:

- A standard railing shall consist of top rail, intermediate rail, and posts, and shall have a vertical height of 42 inches nominal from upper surface of top rail to floor, platform, runway, or ramp level.
- The top rail shall be smooth-surfaced throughout the length of the railing.
- The intermediate rail shall be approximately halfway between the top rail and the floor, platform, runway, or ramp.
- The ends of the rails shall not overhang the terminal posts except where such overhang does not constitute a projection hazard.

OSHA Standard 1910.23(e)(2) speaks specifically to stair railings:

- A stair railing shall be of construction similar to a standard railing but the vertical height shall be not more than 34 inches nor less than 30 inches from upper surface of top rail to surface of tread in line with face of riser at forward edge of tread.

Further requirements address railings constructed of wood, pipe or structural steel:

- For wood railings, the posts shall be of at least 2-inch by 4-inch stock spaced not to exceed 6 feet; the top and intermediate rails shall be of at least 2-inch by 4-inch stock. If top rail is made of two right-angle pieces of 1-inch by 4-inch stock, posts may be spaced on 8-foot centers, with 2-inch by 4-inch intermediate rail. [1910.23(e)(3)(i)]
- For pipe railings, posts and top and intermediate railings shall be at least 1 1/2 inches nominal diameter with posts spaced not more than 8 feet on centers. [1910.23(e)(3)(ii)]
- For structural steel railings, posts and top and intermediate rails shall be of 2-inch by 2-inch by 3/8-inch angles or other metal shapes of equivalent bending strength with posts spaced not more than 8 feet on centers. [1910.23(e)(3)(iii)]
- The anchoring of posts and framing of members for railings of all types shall be of such construction that the completed structure shall be capable of withstanding a load of at least 200 pounds applied in any direction at any point on the top rail. [1910.23(e)(3)(iv)]
Railings constructed of other materials are allowable, subject to the following:

- Other types, sizes, and arrangements of railing construction are acceptable provided they meet the following conditions [1910.23(e)(3)(v)]:
  - A smooth-surfaced top rail at a height above floor, platform, runway, or ramp level of 42 inches nominal; [1910.23(e)(3)(v)(a)]
  - A strength to withstand at least the minimum requirement of 200 pounds top rail pressure; [1910.23(e)(3)(v)(b)]
  - Protection between top rail and floor, platform, runway, ramp, or stair treads, equivalent at least to that afforded by a standard intermediate rail. [1910.23(e)(3)(v)(c)]

The Standard also specifies toe boards [1910.23(e)(4)]:

- A standard toeboard shall be 4 inches nominal in vertical height from its top edge to the level of the floor, platform, runway, or ramp.
- It shall be securely fastened in place and with not more than 1/4-inch clearance above floor level.
- It may be made of any substantial material either solid or with openings not over 1 inch in greatest dimension.
- Where material is piled to such height that a standard toeboard does not provide protection, paneling from floor to intermediate rail, or to top rail shall be provided.

The Standard also defines handrails:

- A handrail shall consist of a lengthwise member mounted directly on a wall or partition by means of brackets attached to the lower side of the handrail so as to offer no obstruction to a smooth surface along the top and both sides of the handrail.
- The handrail shall be of rounded or other section that will furnish an adequate handhold for anyone grasping it to avoid falling.
- The ends of the handrail should be turned in to the supporting wall or otherwise arranged so as not to constitute a projection hazard. [1910.23(e)(5)(i)]

Specifications for handrails are –

- The height of handrails shall be not more than 34 inches nor less than 30 inches from upper surface of handrail to surface of tread in line with face of riser or to surface of ramp. [1910.23(e)(5)(ii)]
- The size of handrails shall be: When of hardwood, at least 2 inches in diameter; when of metal pipe, at least 1 1/2 inches in diameter. The length of brackets shall be such as will give a clearance between handrail and wall or any projection thereon of at least 3 inches. The spacing of brackets shall not exceed 8 feet. [1910.23(e)(5)(iii)]
- The mounting of handrails shall be such that the completed structure is capable of withstanding a load of at least 200 pounds applied in any direction at any point on the rail. [1910.23(e)(5)(iv)]
- All handrails and railings shall be provided with a clearance of not less than 3 inches between the handrail or railing and any other object. [1910.23(e)(6)]