

Guardrail systems, stair rail systems, and handrails in general industry workplaces

OAR 437 • Division 2/D



Do you know the differences between guardrails, stair rails, and handrails?

All three prevent slips, trips, and falls, but they serve different purposes and have different requirements in Oregon OSHA's [general industry fall protection requirements for walking-working surfaces](#). Here is a summary of what you should know.

Guardrail systems 1910.29(b)

What are they? Guardrail systems — or guardrails — are barriers erected along an unprotected or exposed side or edge of a walking-working surface to prevent falls.

Height: The top-edge height of guardrails must be 42 inches, plus or minus three inches, above the walking-working surface. Guardrails with a top-edge height less than 39 inches are not permitted. The top-edge height of a guardrail may exceed 45 inches if it meets the other safety requirements for guardrails.



Guardrail system strength

- Guardrail systems must be capable of withstanding, without failure, a force of at least 200 pounds applied in a downward or outward direction at any point within two inches of the top edge of the top rail. The guardrail system must not deflect to a height less than 39 inches.
- **Manila or synthetic rope** used for top rails must be inspected to ensure that the rope meets the strength requirement.
- **Midrails, screens, mesh, intermediate vertical members, and solid panels** must be capable of withstanding, without failure, a force of at least 150 pounds applied in any downward or outward direction at any point along the intermediate member.
- **Manila or synthetic rope** used for midrails must be inspected to ensure that the rope meets the strength requirement.



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Guardrail systems 1910.29(b) CONTINUED

Midrails: Must be installed at a height midway between the top edge of the guardrail system and the walking-working surface.

Screens and mesh: When used, must extend from the walking-working surface to the top rail and along the entire opening between top-rail supports.

Intermediate vertical members: Must be installed no more than 19 inches apart.

Surfaces: Guardrail systems must have smooth surfaces.

Ends of top rails and midrails: Must not pose a projection hazard.

Steel or plastic banding: Must not be used for top rails or midrails. Chain or cables can be used when they satisfy all of the guardrail requirements.

Top rail and midrail dimensions: Must be at least 0.25 inches in diameter or 0.25 inches thick.

Guardrail systems used at hoist areas: A removable guardrail section, consisting of a top rail and midrail, must be placed across the access opening between guardrail sections when the hoist is not being used. Chains or gates are acceptable if they offer equivalent protection.

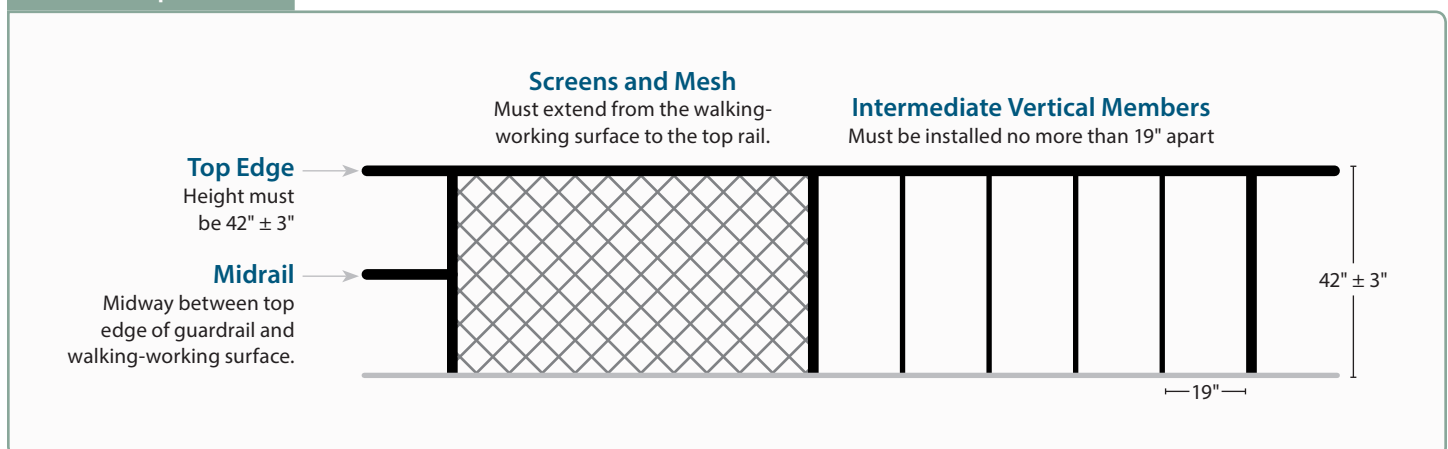
Guardrail systems used around holes:

- Must be installed on all unprotected sides or edges of the hole.
- When materials are being passed through the hole, not more than two sides of the guardrail system can be removed. When materials are not being passed through the hole, the hole must be completely guarded or closed over with a cover.
- When the hole is a point of access, the guardrail system opening must have either a self-closing gate with a top rail and midrail that slides or swings away from the hole, or be offset to prevent someone from walking or falling into the hole.

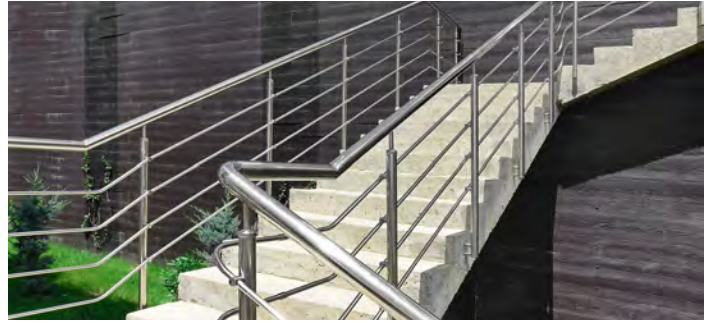
Guardrail systems on ramps and runways: Must be installed along each unprotected side or edge.

Guardrail systems on scaffolds: Must meet the requirements in [Division 3, Subdivision L, Scaffolding](#).

Examples



Handrails and stair rail systems 1910.29(f)



HANDRAILS

What are they? Handrails are rails that provide a handhold for support.

Height: Minimum handrail height is 30 inches. Maximum height is 38 inches. Height is measured from the leading edge of the stair tread to the top surface of the handrail.

Finger clearance: Minimum clearance between a handrail and any other object is 2.25 inches.

Surface: Handrail surfaces must be smooth.

Handholds: Handrails must be designed so that they can be grasped firmly.

End of a handrail: The end of a handrail must not present a projection hazard.

Strength: Handrails must withstand, without failure, a force of at least 200 pounds applied in any downward or outward direction within two inches of any point along the top edge of the rail.

Handrails on stairways:

Each flight of stairs having at least four risers and three treads must have:

- At least one handrail.
- Stairs wider than 44 inches must have a handrail on each side.
- Stairs wider than 88 inches must also have a handrail down the middle of the stairway.
- There must be a stair rail at each open side.

STAIR RAIL SYSTEMS

What are they? A stair rail system — or stair rail — is a barrier erected along the exposed or open side of stairways to prevent a fall.

Height: Minimum height of stair rail systems installed before Jan. 1, 2018, is 30 inches, measured from the leading edge of the stair tread to the top surface of the top rail. Minimum height of stair rail systems installed after Dec. 31, 2017, is 42 inches, measured from the leading edge of the stair tread to the top surface of the top rail.

Can the top rail of a stair rail system serve as a handrail? Only when the top rail of the stair rail is between 36 inches and 38 inches high (measured from the leading edge of the stair tread to the top surface of the top rail), and the top rail meets all other handrail requirements.

Surface: Stair rails must be smooth.

Openings: Any opening in a stair rail system must not exceed 19 inches.

End of a stair rail: The end of a stair rail must not present a projection hazard.

Strength: The top rails of stair rail systems must withstand, without failure, a force of at least 200 pounds applied in any downward or outward direction within two inches of any point along the top edge of the rail.