

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

TITLE 8, DIVISION 1, CHAPTER 4

Subchapter 7. General Industry Safety Orders
Group 1. General Physical Conditions and Structures
Article 1. Definitions

Amend Section 3207 to add the following definitions within the existing definitions in alphabetical order:

§3207. Definitions.

(a) The following terms are defined for general use in these regulations; specialized definitions appear in individual articles. (See Definitions in the Index)

Agricultural Building. *[No change in text]*

~~Alternating Tread Stairs. A stair on which the treads are approximately one half the width of the stair and alternate from right to left, consecutively, for the length of the stair.~~

Alternating Tread-Type Stair. A type of fixed industrial stairs that has a series of steps between 50 to 70 degrees (0.87 and 1.22 rad) from horizontal, usually attached to a center support rail in an alternating manner so that the user does not have both feet on the same level at the same time. *[Definition from building code. Term used in §3234]*

[§1910.21(b)]

Alternating Tread-Type Stair. A type of stairway consisting of a series of treads that usually are attached to a center support in an alternating manner such that an employee typically does not have both feet on the same level while using the stairway]

[2022, Title 24, Part 2, Chapter 2]

Alternating tread device. A device that has a series of steps between 50 to 70 degrees (0.87 and 1.22 rad) from horizontal, usually attached to a center support rail in an alternating manner so that the user does not have both feet on the same level at the same time]

ANSI. *[No change in text]*

Certified Safety Professional or CSP. *[No change in text]*

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

TITLE 8, DIVISION 1, CHAPTER 4

Competent Person. One who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous or dangerous to employees and who has authorization to take prompt corrective measures to eliminate them.

Note: Competent person in fall protection, see Section 3210.1

Court. *[No change in text]*

Emergency Escape Route. *[No change in text]*

Equivalent. ~~An alternate design, feature, device or protective action which provides an equal degree of safety.~~ Alternative designs, equipment, materials or methods, that the employer can demonstrate will provide an equal or greater degree of safety for employees compared to the designs, equipment, materials or methods specified in these Orders. [§1910.21(b), Used in §3209]

Exit. *[No change in text]*

Exit Passageway. *[No change in text]*

Failure. A load refusal, breakage or separation of component parts. A load refusal is the point at which the ultimate strength of a component or object is exceeded. [§1910.21(b), Used in §3209(c), (k), §3210.1(f)(1), Appendix A to §3210.1(c)(7), §3277(j)(6), §3283(e)(2), §3283(e)(3)(e)(B), §3295(e)(2)(M) and (N)]

Fall Hazard. Any condition on a walking-working surface that exposes an employee to the risk of harm from a fall on the same level or to a lower level. [§1910.21(b)]

Fall Protection. Any equipment, device or system that prevents an employee from falling from an elevation or mitigates the effect of such a fall. [§1910.21(b)]

Fire Wall. *[No change in text]*

Floor Area. *[No change in text]*

~~Floor Hole. Any opening in a floor or platform which is smaller than a floor opening.~~

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

TITLE 8, DIVISION 1, CHAPTER 4

Floor Opening. An opening in any floor or platform, ~~12~~ 2 inches or more in the least horizontal dimension. It includes stairway floor openings, ladderway floor openings, hatchways and chute floor openings. [*§1910.21(b), Used in §3212*]

Flume. [*No change in text*]

Guardrail. [*No change in text*]

Handrail. A ~~device~~ rail to be used as a handhold for support. [*§1910.21(b), Used in §3214*]

Hazard, Extra. [*No change in text*]

Hazardous Substance. [*No change in text*]

Hoist Area. Any elevated access opening to a walking-working surface through which equipment or materials are loaded or received. [*§1910.21(b), Used in 3212(f)*]

Horizontal Exit. [*No change in text*]

Inaccessible Location. [*No change in text*]

Industrial Stairs. A series of steps leading from one level or floor to another or leading to platforms, pits, boiler rooms, crossovers or around machinery, tanks and other equipment. A series of steps and landings having ~~three~~ two or more risers constitutes an industrial stair or stairway. Ship, spiral, alternating type tread stairs are considered industrial stairs. [*§1910.21(b)*]

Installation. [*No change in text*]

Live Load. [*No change in text*]

Loading/Unloading Rack. A fixed structure (such as a platform, gangway) is necessary for loading or unloading a tank truck or tank car. A loading/unloading rack includes a loading or unloading arm and may include any combination of the following: piping assemblages, valves,

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

TITLE 8, DIVISION 1, CHAPTER 4

pumps, shut-off devices, overflow sensors or personnel safety devices. [From 40 CFR §112.2 <https://www.law.cornell.edu/cfr/text/40/112.2>

Used in §3210 and §3336, but no federal definition of loading rack]

Loading Ramp. *[No change in text]*

Lower Level. A surface or area of a lesser elevation to which an employee could fall. Such surfaces or areas include, but are not limited to, ground levels, floors, roofs, ramps, runways, excavations, pits, tanks, materials, water, equipment and similar surfaces and structures or portions thereof. *[This definition was the outcome of the fixed ladder AC, §1910.21(b), Used in definition of fall hazard, toeboard, §3210.1(e)(2), §3210.2(b)(2) and (b)(3), 3277(i) and (k)(3), §3336(c)(2), §3656(e)]*

Maximum Intended Load. The total load (weight and force) of all employees, equipment, vehicles, tools, materials and other loads to be applied to a walking-working surface at any one time. *[§1910.21(b), Used in §3209.1(a)(3) §3277(j)(4)(C), §6599(a)(1)]*

Mercantile Occupancy. *[No change in text]*

Panic Hardware. *[No change in text]*

~~Personal Fall Arrest System. A system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, body harness and may include a lanyard, deceleration device, lifeline or suitable combinations of the aforementioned components/devices. (See section 3210.1).~~

~~Personal Fall Protection System. A personal fall protection system includes personal fall arrest systems, positioning device systems, fall restraint systems, safety nets and guardrails. (See section 3210.1).~~

~~Personal Fall Restraint System. A system used to prevent an employee from falling. It consists of an anchorage, connectors and body belt/harness. It may include, lanyards, lifelines and rope grabs designed for that purpose. (See section 3210.1).~~

Platform. An elevated ~~working level~~ walking-working surface for persons. Storage platforms, balconies and open-sided floors are considered platforms for the purpose of these Orders. *[§1910.21(b)]*

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

TITLE 8, DIVISION 1, CHAPTER 4

Positioning Device System. ~~A body belt or body harness system rigged to allow an employee to be supported on an elevated surface, such as a wall and work with both hands free while leaning.~~ (See Positioning System (Work-Positioning System) in section 3210.1).

Private Stairway. *[No change in text]*

Qualified Person, Attendant or Operator. *[No change in text]*

Ramp. ~~Inclined passageway connecting two levels and usually used for pedestrian traffic; does not include catwalks or stairs.~~ An inclined walking-working surface used to access another level; does not include catwalks or stairs. *[\$1910.21(b), Used in §3210, §3270(a)]*

Ramp, Industrial. *[No change in text]*

Rise. *[No change in text]*

Riser. The upright member of a step situated at the back of a lower tread and near the leading edge of the next higher tread, platform or landing. *[\$1910.21(b), Used in §3214]*

Rope Access. *[No change in text]*

Rope Access Equipment. *[No change in text]*

Runway. An elevated ~~passageway~~ walking-working surface. Runways are sometimes referred to as catwalks, foot walks, elevated walkways, oilers' platforms or maintenance runways. *[\$1910.21(b)]*

Shall. *[No change in text]*

Shear Point. *[No change in text]*

Ship Stair (Ship Ladder). ~~A fixed ladder within the pitch range of 50 to 75 degrees with the horizontal, equipped with treads and stair rails.~~ A type of fixed industrial stair that is equipped

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

TITLE 8, DIVISION 1, CHAPTER 4

with treads, stair rails and open risers and has a slope that is between 50 and 70 degrees from the horizontal. [*§1910.21(b) definition was modified by adding “fixed industrial stairs”*]

Should. [*No change in text*]

Skirt Guard. [*No change in text*]

~~Spiral stairway (Circular Stairway.) One with closed circular form, uniform sector-shaped treads and a supporting column.~~

Spiral Stairs. A series of treads attached to a vertical pole in a winding fashion, usually within a cylindrical space. [*§1910.21(b), Used in §3234*]

Stair Railing. [*No change in text*]

Stairs. A series of two or more steps. [*From 2022, Title 24, Part 2, Chapter 2, §1910.21(b)*]

~~Stairway. Two or more risers shall constitute a stairway.~~ One or more flights of stairs, either exterior or interior, with the necessary landings and platforms connecting them, to form a continuous and uninterrupted passage from one level to another. [*§1910.21(b), From 2022, T24, Part 2, Chapter 2, Used in §3214 and 3622(f)(8)*]

Storage Access Aisle. [*No change in text*]

Suitable. [*No change in text*]

~~Toeboard. A vertical barrier erected along the open edges of floor openings or floor holes, platforms and runways.~~ A low protective barrier that is designed to prevent materials, tools and equipment from falling to a lower level and protect employees from falling. [*§1910.21(b), Used in §3209, § 3212(g), §3622(f)(6)*]

Toe Plate (deflector type). [*No change in text*]

Traffic Aisle. [*No change in text*]

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

TITLE 8, DIVISION 1, CHAPTER 4

Tread Run. *[No change in text]*

Walking-Working Surface. Any surface on or through which an employee walks, works or gains access to a work area or workplace location. Walking-working surfaces include, but are not limited to, floors, stairways, steps, roofs, ramps, runways, aisles, scaffolds, dock plates and step bolts. Walking-working surfaces include horizontal, vertical and inclined or angled surfaces, but do not include ladders. [See AC on fixed ladders as to why ladder as a WWS was removed, §1910.21(b), Used in §3209(c)(1), §3212(f)]

Wall Opening. *[No change in text]*

Water Heater. *[No change in text]*

~~Working Level or Working Area. A platform, walkway, runway, floor or similar area fixed with reference to the hazard and used by employees in the course of their employment. This does not include ladders or portable or temporary means used for access, repair or maintenance, provided such means are removed immediately upon completion of the work. (See Walking-Working Surface).~~

Yard. *[No change in text]*

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

TITLE 8, DIVISION 1, CHAPTER 4

Subchapter 7. General Industry Safety Orders
Group 1. General Physical Conditions and Structures Orders
Article 2. Standard Specifications, Fall Protection and Falling Object Protection

Amend Section 3209 as follows:

§3209. Standard Guardrails and Toeboards.

(a) Wherever guardrail protection is required, the following standards shall be adhered to except that other types and arrangements of guardrail construction will be acceptable where the height, surface and end projection of the top rail complies with the standard specifications and the closure of the vertical area between the top rail and ~~floor, platform, runway or ramp~~ walking-working surface shall provides protection at least equivalent to that afforded by a mid-rail.

~~(a)~~ (b) A standard guardrail shall consist of top rail, midrail or equivalent protection and posts and shall have a vertical height within the range of 42 inches to 45 inches from the upper surface of the top rail to the ~~floor, platform, runway or ramp level~~ walking-working surface. ~~(Note: the permissible tolerance in height dimensions is one inch). See Figure 3209-1. The top rail shall be smooth surfaced throughout the length of the railing. The midrail 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. (Title 24, Part 2, Section 2 1716(a)). [Smoothness of the rail is addressed in (d) and midrail is moved to (b)(1)]~~

[Proposal to delete the Note. The 2022 Building Code, Section 1015.3 requires the guards to not be less than 42 inches. A height of 41 inches would not be acceptable under the 2022 Building Code. Height of 42-45 inches would be at least as effective as the federal standard and ANSI/ASSE A1264.1-2007]

(1) Where screens, mesh, intermediate vertical members, solid panels, parapets or equivalent intermediate members are used as mid-rail protection, they shall meet the following requirements:

(A) The midrail shall be approximately halfway (within 1 inch tolerance) between the upper surface of the top rail and the walking-working surface; [§1910.29(b)(2)(i)]

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

TITLE 8, DIVISION 1, CHAPTER 4

(B) Screens and mesh shall extend from the walking-working surface to the top rail and along the entire opening between top rail supports; [§1910.29(b)(2)(ii)]

(C) Intermediate vertical members (such as balusters) shall be installed so that openings are not more than 19 inches wide. [§1910.29(b)(2)(iii)]

(D) A parapet shall be at least 21 inches high.

~~(D)~~ (E) Other equivalent intermediate members (such as additional midrails and architectural panels) shall be installed so that the openings are not more than 19 inches wide. [§1910.29(b)(2)(iv)]

Note to subsection (b)(1)(C) and (D): Local building regulations may require spacing substantially less than 19 inches wide.

~~Note: Local building regulations may require 9 inch spacing of midrails.~~

~~(b) All guardrails and other permissible types, including their connections and anchorage, shall be designed for a live load of 20 pounds per linear foot applied either horizontally or vertically downward at the top rail. Dimensional details of railing members of a few types of construction which comply with this strength requirement are given hereinafter in subsection (c). [Live load requirements are replaced by Subsection (c).]~~

(c) Guardrail systems shall be capable of withstanding, without failure, a force of at least 200 pounds applied in a downward or outward direction within 2 inches of the top edge, at any point along the top rail. [§1910.29(b)(3), Replaces (b)]

(1) When the 200-pound test load is applied in a downward direction, the top rail of the guardrail system shall not deflect to a height of less than 39 inches above the walking-working surface. [§1910.29(b)(4)]

(2) Midrails, screens, mesh, intermediate vertical members, solid panels and other equivalent intermediate members shall 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 without deflecting more than 2 inches. [§1910.29(b)(5)]

(3) Guardrails that rely on friction or ballasted weights shall be secured to the structure.

TITLE 8, DIVISION 1, CHAPTER 4

[Board staff to review consensus standard to address ballasted guardrails and evaluate incorporating the standard by reference]

(4) For operating conditions where railings are liable to receive heavy stresses from crowds, trucking, handling materials, etc., additional strength to the requirements of subsections (c)(1) and (c)(2) shall be provided by use of heavier stock, closer spacing of posts, bracing or other means to ensure the guardrails will withstand the imposed load. [From Note]

NOTE: It is recognized that the minimum value of railing strength here specified is inadequate for safety under operating conditions where railings are liable to receive heavy stresses from crowds, trucking, handling materials, etc. For such conditions, additional strength shall be provided by use of heavier stock, closer spacing of posts, bracing or otherwise.

(d) Guardrail systems shall be smooth surfaced to protect employees from injury, such as punctures or lacerations and to prevent catching or snagging of clothing. [§1910.29(b)(6), replaces portion of 3209(a)]

(e) The ends of the rails shall not overhang the terminal posts, except where such overhang does not constitute a projection hazard. [§1910.29(b)(7), From 3209(a)]

(f) Steel banding and plastic banding shall not be used for top rails or midrails. [§1910.29(b)(8)]

(g) Top rails and midrails shall be at least 0.25 inches in diameter or in thickness. [§1910.29(b)(9)]

(h) Railing members shall be framed in such a position that they will afford the greatest support and protection, for example, top rails of structural steel angles shall have the outside face of vertical leg located on the side adjacent to the side of normal contact by the employee. (Title 24, Part 2, Section 2 1716(b).)

(c) The following are some acceptable guardrail specifications: other combinations will be accepted as long as equivalent strength and protection are maintained. See Figure 3209-2 [Evaluate moving to Appendix A to Section 3209 and revise text]

(1) In wooden construction, the posts to be of at least 2-inch by 4-inch nominal material spaced not to exceed 6 feet, the top rails to be smooth with corners rounded and not less than 2-inch by 4-inch nominal material. The posts may be spaced on 8-foot centers if the top rails consist of double 1-inch by 4-inch nominal boards, provided that 1 board is fastened in a flat position on

TITLE 8, DIVISION 1, CHAPTER 4

top of the posts and the other is fastened in an edge up position to the inside of the posts and the side of the top board. Single midrails, where permitted, shall be not less than 2-inch by 4-inch nominal material and installed on the contact side of the guardrail.

~~(2) If constructed of standard metal pipe, the top rails and single midrail, where permitted, to be 1 1/2-inch outside diameter or larger. The posts to be 1 1/2-inch outside diameter or larger, the spacing not to exceed 8 feet.~~

~~(3) Guardrails installed on or before May 26, 2011. If constructed of structural metal, the top rails to be angle iron of at least 2-inch by 2-inch by 1/4-inch angles or other metal shapes of equivalent bending strength; and the single midrail, where permitted, to be iron or steel of at least 2-inch by 2-inch by 1/4-inch angles or other metal shapes of equivalent strength. The posts to be angle iron of at least 2-inch by 2-inch by 1/4-inch stock, the spacing not to exceed 8 feet.~~

~~(4) Guardrails installed after May 26, 2011. If constructed of structural metal, the top rails to be angle iron of at least 2-inch by 2-inch by 3/8-inch angles or other metal shapes of equivalent bending strength; and the single midrail, where permitted, to be iron or steel of at least 2-inch by 2-inch by 3/8-inch angles or other metal shapes of equivalent strength. The posts to be angle iron of at least 2-inch by 2-inch by 3/8-inch stock, the spacing not to exceed 8 feet.~~

~~(d) Where toeboards are required, they shall be constructed of wood, concrete, metal or other suitable material. Where constructed of metal grille, mesh shall not exceed 1-inch. The top of the toeboard shall be not less than 3 1/2 inches above the platform, walkway or other working level and the bottom clearance shall not exceed 1/4 inch. [Items separated and re-ordered in subsection (k)]~~

~~Note: Where materials are piled, higher toeboards or paneling from floor to intermediate rails or top rail shall be provided where necessary for safety. (Title 24, Part 2, Section 2-1753.)~~

(i) Toeboards.

(1) Toeboards shall be erected along the exposed edge of the overhead walking-working surface for a length that is sufficient to protect employees below. [§1910.29(k)(1)(i)]

(2) Toeboards used for falling object protection shall be constructed of wood, concrete, metal or other suitable material. [From subsection (d)]

(3) Where constructed of metal grille, mesh shall not exceed 1 inch. [From subsection (e)]

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

TITLE 8, DIVISION 1, CHAPTER 4

(4) The top of the toeboard shall be not less than 3.5 inches above the walking-working surface. [From subsection (d), §1910.29(k)(1)(ii)]

(5) Toeboards shall not have more than 2.5 inches clearance or opening above the walking-working surface. [From subsection (d), §1910.29(k)(2)(iii)]

(6) Toeboards shall have a minimum height of 2.5 inches when used around vehicle repair, service or assembly pits. Toeboards may be omitted around vehicle repair, service or assembly pits when the employer can demonstrate that a toeboard would prevent access to a vehicle that is over the pit. [§1910.29 (k)(1)(v)]

(7) Toeboards shall be capable of withstanding, without failure, a force of at least 50 pounds applied in any downward or outward direction at any point along the toeboard. [§1910.29 (k)(1)(vi)]

(8) Where materials are piled, higher toeboards or paneling from floor to intermediate rails or top rails shall be provided where necessary for safety. [§1910.29 (k)(2)(i)]

Figure SG-1

[Move to Appendix A to Section 3209 if moving subsection (c) in the Appendix]

~~SOME ACCEPTABLE INDUSTRIAL GUARDRAILS AND TOEBOARDS~~

TITLE 8, DIVISION 1, CHAPTER 4

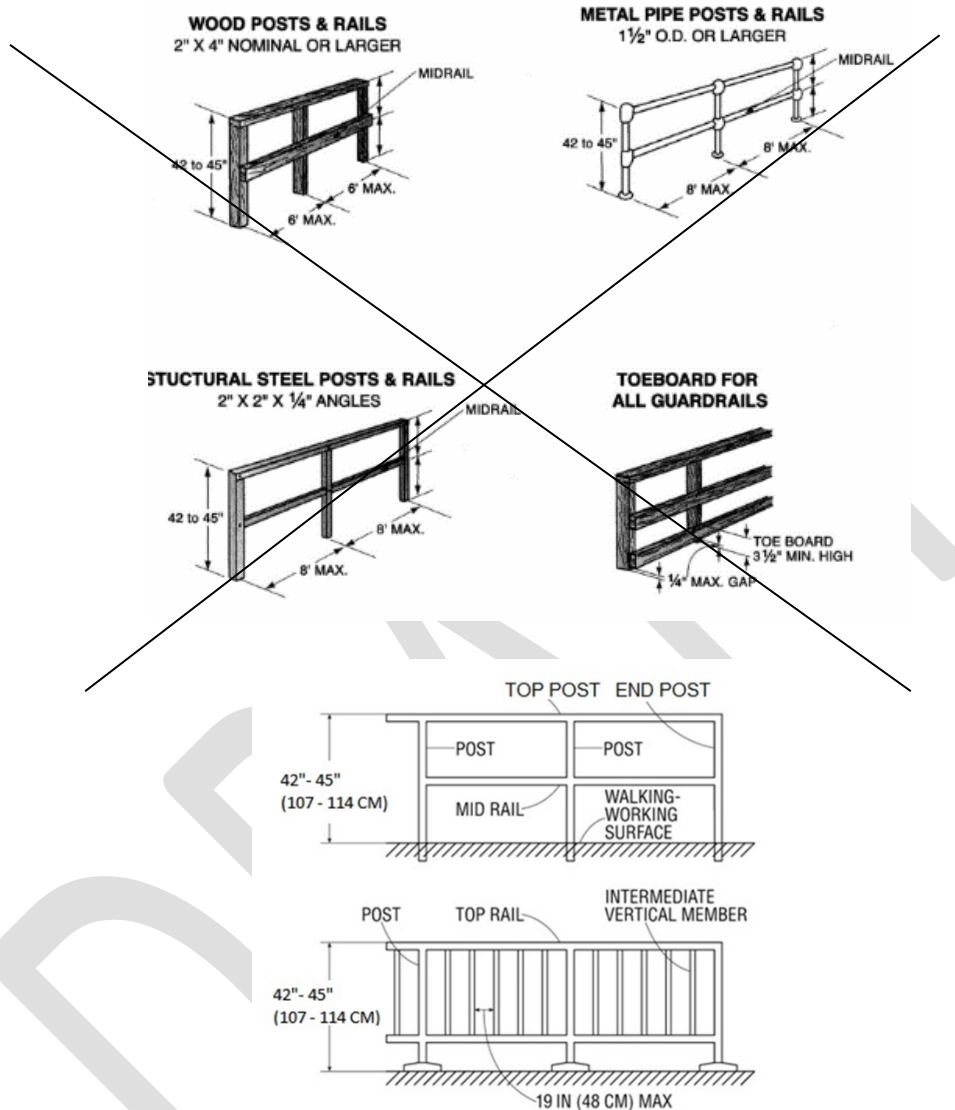


Figure 3209-1 Standard Guardrails

NOTE: For additional requirements, see California Building Code, Title 24, Part 2, Volume 2, Chapter 10 and Chapter 16.

Note: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code; and Section 18943(e), Health and Safety Code.

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

TITLE 8, DIVISION 1, CHAPTER 4

Add new Section 3209.1 as follows:

§3209.1. Grab Handles.

(a) Handholds (Grab Handles). The employer shall ensure that each handhold (grab handle):
[§1910.29(l)]

(1) Is not less than 12 inches long; [§1910.29(l)(1)]

(2) Is mounted to provide at least 3 inches of clearance from the framing or opening; and
[§1910.29(l)(2)]

(3) Is capable of withstanding a maximum horizontal pull-out force equal to two times the
maximum intended load or 200 pounds, whichever is greater. [§1910.29(l)(3)]

Note: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

TITLE 8, DIVISION 1, CHAPTER 4

Amend Section 3210 as follows:

§3210. Guardrails and Fall Protection at Elevated Locations.

(a) Buildings. Guardrails shall be provided on all open sides of unenclosed elevated work locations, such as: roof openings, open and glazed sides of landings, balconies or porches, platforms, runways, ramps or working levels more than 30 inches above the floor, ground or other working areas of a building as defined in ~~Section 3207 of the General Industry Safety Orders~~. Where overhead clearance prohibits installation of a 42-inch guardrail, a lower rail or rails shall be installed. The railing shall be provided with a toeboard where the platform, runway or ramp is ~~6~~ 4 feet or more above places where employees normally work or pass and the lack of a toeboard could create a hazard from falling tools, material or equipment.
[§1910.28(b)(5)(i), §1910.28(c)(1) & §1910.29(k)(1(i)-Toeboards]

NOTE: See additional requirements in section 3212.

EXCEPTIONS to subsection (a):

1. Runways used exclusively for oiling, adjusting or otherwise maintaining shafting or other machinery may have the guardrail on the side adjacent to the machinery omitted provided that additional guarding as required by Group 6 Power Transmission Equipment, Prime Movers, Machines and Machine Parts is complied with and each employee is provided with and uses a personal fall arrest system or fall restraint system. *[§1910.28(b)(5)(ii)(B)]*
2. Stationary elevated platforms secured to buildings or structures used exclusively for the service and maintenance of overhead bridge cranes and similar mobile equipment may be equipped with removable railings in lieu of guardrails on the side adjacent to the machinery provided such railings are secured against falling when they are not serving as a protective railing. In existing installations where clearance prohibits railings on the outside of the platform, railings will be permitted on the building side to serve as ~~handholds~~ grab handles.
[1910.28(a)(2)(iv)]
3. Portions of loading or storage platforms which are used primarily for loading or unloading railroad cars or trucks or at waterside edges used for cargo handling in compliance with subsection 3336(c)(1). *[§1910.28(b)(1)(iii)]*

TITLE 8, DIVISION 1, CHAPTER 4

4. Open-sided platforms or floors used for storage of lumber or other materials may be guarded with movable single rails, sliding panels, gates or other barriers provided they are of strength and design equivalent to guardrails.
5. Open sides of storage platforms less than four feet wide or portions thereof which are loaded and unloaded exclusively by means of stackers or lift trucks handling pallet supported loads.
6. Glazed sides that are in compliance with Section 3242.
7. Open hearth and hot metal pouring platforms.
8. Platforms, runways, ramps or other working levels less than 4 feet above floor, ground or other working level constructed prior to January 1, 1967.
9. Theatre galleries, balconies or other such elevated seating locations, where a 42-inch railing would obstruct the sight lines, may be protected by a guardrail or other barrier of not less than 34 inches in height provided that a horizontal concave safety ledge not less than 6 inches in depth and not less than 36 inches in effective width is installed beyond the railing at the balcony floor level. The safety ledge shall be designed to carry a live load of 100 pounds per square foot.
10. On outside plaza, patio and garden areas, alternate means of protection are acceptable if the same degree of safety is provided.
11. Elevated locations used infrequently by employees if the employees using them are protected by a fall restraint/fall arrest system used in accordance with the requirements in ~~Article 24 of the Construction Safety Orders.~~ section 3210.1.
12. On fire hose drying towers, the top rail may be omitted on the inboard or working side of the platform if the hose drying fingers or hangers are spaced not more than 6 inches apart and extend the full length of the platform along the open or working side to within 6 inches of the end rails. The ends of the fingers or hangers shall be positioned at the same height as prescribed for the top rail and within 5 inches from the vertical projection of the platform edge.
13. On the auditorium side of a stage, raised platforms and other raised floor areas such as runways, ramps and side stages used for entertainment or presentation. At vertical openings in the performance area of stages.

TITLE 8, DIVISION 1, CHAPTER 4

(b) Other Elevated Locations. The unprotected sides of elevated work locations that are not buildings or building structures where an employee is exposed to a fall of 4 feet or more shall be provided with guardrails. Where overhead clearance prohibits installation of a 42-inch guardrail, a lower rail or rails shall be installed. The railing shall be provided with a toeboard where the platform, runway or ramp is ~~6~~ 4 feet or more above places where employees normally work or pass and the lack of a toeboard could create a hazard from falling tools, material or equipment.

EXCEPTIONS:

1. Runways used exclusively for oiling, adjusting or otherwise maintaining shafting or other machinery may have the guardrail on the side adjacent to the machinery omitted provided that additional guarding as required by Group 6 Power Transmission Equipment, Prime Movers, Machines and Machine Parts is complied with and each employee is provided with and uses a personal fall arrest system or fall restraint system in accordance with section 3210.1 of these Orders. [*§1910.28(b)(5)(ii)(B)*]

2. Portions of loading or storage platforms which are placed or located next to railroad cars or trucks and used primarily for loading or unloading railroad cars or trucks or at waterside edges used for cargo handling in compliance with section 3336(c)(1). [*Same exception found in 3210(a) Buildings*]

3. Where the employer can demonstrate that the installation of guardrails on the working side of the loading racks, loading dock or teeming platforms is infeasible and the requirements of subsection 3336(c)(1) are met.

NOTE to Exception 3. of subsection (b): Use of dock plate is described in subsection 3336(c)(2).
[*§1910.28(b)(1), §1910.28(b)(4)(ii)*]

~~3~~ 4. Open sides of storage platforms less than four feet wide or portions thereof which are loaded and unloaded exclusively by means of stackers or lift trucks handling pallet supported loads.

~~4~~ 5. Portable platforms, portable or fixed workstands, where used in close quarters which would make the installation of guardrails impracticable, may be provided with removable or hinged railings which can be either removed or swung out of the way during such work.

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

TITLE 8, DIVISION 1, CHAPTER 4

Toeboards may not be required on portable or fixed platforms where the nature of the work requires the employees to sit on the edge of the platform.

~~5~~ 6. Elevated locations used infrequently by employees if the employees using them are protected by a fall restraint/fall arrest system used in accordance with the requirements in ~~Article 24 of the Construction Safety Orders.~~ section 3210.1.

~~6~~ 7. Flumes when they are accessed by an employee for the purpose of conducting a flume patrol (as defined in ~~Section 3207~~) and provided the employer implements either written administrative procedures or provides alternative means which will control the hazard of an employee fall off the flume.

~~7~~ 8. Belt loaders or conveyors designed and used for access/egress to aircraft shall be equipped with at least one handrail that will furnish a ~~handhold~~ grab handle for anyone grasping it to avoid falling.

~~8~~ 9. Working on or in aircraft wheel wells when the wheel well design does not permit the use of guardrails or other fall protection equipment/devices.

~~9~~ 10. On mobile vehicles/equipment, where the design or work processes make guardrails impracticable, the use of sufficient steps and attached handholds or structural members which allow the user to have a secure hand grasp shall be permitted. Work from the decks, permanent/stationary platforms, runways or walkways of mobile vehicles/equipment shall be excluded from the requirements of subsection (b) where it can be shown that guardrails or handholds are impracticable by the design or work processes.

~~10~~ 11. Where design or erection, dismantling, inspection, repair, maintenance and adjustment processes make installation of guardrails impracticable on portable amusement rides, employees shall be provided and shall install and use personal fall protection equipment in accordance with the requirements of ~~Section 1670 of the Construction Safety Orders~~ section 3210.1.

12. Telecommunications work covered by section 8615 of the Telecommunication Safety Orders. [1910.28(a)(vi)]

13. Electric power generation, transmission and distribution work covered by sections 2320.8 and 2940.6 of the Electrical Safety Orders.

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

TITLE 8, DIVISION 1, CHAPTER 4

~~(c) Where the guardrail requirements of subsections (a) and (b) are impracticable due to machinery requirements or work processes, an alternate means of protecting employees from falling, such as personal fall protection systems, shall be used.~~

(c) Where the guardrail requirements of subsections (a) and (b) are infeasible due to machinery requirements or work processes and the exceptions to 3210(a) and 3210(b) do not apply employees shall be protected from falls by covers, safety net systems or personal fall protection systems.

(d) Openings in guardrails for ladderway access shall be protected as required by Subsection 3212a)(2)(d).

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

DRAFT

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

TITLE 8, DIVISION 1, CHAPTER 4

Add new Section 3210.1 as follows:

§3210.1. Personal Fall Protection Systems.

[The creation of a new Section in GISO would mean that there would be a personal fall protection standard in T8, CSO and GISO. Existing fall protection requirements in Article 6 were relocated to this section.]

(a) Scope and application. This section establishes performance, care and use criteria for all personal fall protection systems. The employer shall ensure that each personal fall protection system used to comply with these Orders meets the requirements of this section.

[§1910.140(a)]

(b) Definitions.

Activation Distance. The distance traveled by a fall arrestor or the amount of line payed out by a self-retracting lanyard (SRD) from the point of onset of fall to the point where the arrestor or self-retracting lifeline begins to apply a braking or stopping force. [From ANSI Z359.0-2023]

Anchorage. A secure point of attachment for equipment such as lifelines, lanyards or deceleration devices. [§1910.140(b), deleted definition in §3281]

Body Belt. A strap with means both for securing about the waist and for attaching to other components such as a lanyard used with positioning systems, travel restraint systems or ladder safety systems. [§1910.140(b), deleted definition in §3281]

Body Harness. Straps that secure about the employee in a manner to distribute the fall arrest forces over at least the thighs, pelvis, waist, chest and shoulders, with a means for attaching the harness to other components of a personal fall protection system. [§1910.140(b), deleted def from §3281]

Carabiner. A connector generally comprised of a trapezoidal or oval shaped body with a closed gate or similar arrangement that may be opened to attach another object and, when released, automatically closes to retain the object. [§1910.140(b)]

Competent Person (Fall Protection). A person who is capable of identifying existing and predictable hazards in any personal fall protection system or any component of it, as well as in

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

TITLE 8, DIVISION 1, CHAPTER 4

their application and uses with related equipment and who has authorization to take prompt, corrective action to eliminate the identified hazards. [§1910.140(b)]

Connector. A device used to couple (connect) parts of the fall protection system together. [§1910.140(b), deleted definition in §3281]

D-ring (dee ring). A connector used: [§1910.140(b)]

(1) In a harness as an integral attachment element or fall arrest attachment;

(2) In a lanyard, energy absorber, lifeline or anchorage connector as an integral connector; or

(3) In a positioning or fall restraint system as an attachment element.

Deceleration Device. Any mechanism that serves to dissipate energy during a fall. [§3281 and §1910.140(b)]

Deceleration Distance. The vertical distance a falling employee travels from the point at which the deceleration device begins to operate, excluding lifeline elongation and free fall distance, until stopping. It is measured as the distance between the location of an employee's body harness attachment point at the moment of activation (at the onset of fall arrest forces) of the deceleration device during a fall and the location of that attachment point after the employee comes to a full stop. [§1910.140(b)]

Free Fall. The act of falling before a personal fall arrest system begins to apply force to arrest the fall. [§1910.140(b)]

Free Fall Distance. The vertical displacement of the fall arrest attachment point on the employee's body belt or body harness between onset of the fall and just before the system begins to apply force to arrest the fall. This distance excludes deceleration distance, lifeline and lanyard elongation, but includes any deceleration device slide distance or self-retracting lifeline/lanyard extension before the devices operate and fall arrest forces occur. [§3281 and §1910.140(b)]

Lanyard. A flexible line of rope, wire rope or strap that generally has a connector at each end for connecting the body belt or body harness to a deceleration device, lifeline or anchorage. [§1910.21(b), deleting definition in §3281]

TITLE 8, DIVISION 1, CHAPTER 4

Lifeline. A component of a personal fall protection system consisting of a flexible line for connection to an anchorage at one end so as to hang vertically (vertical lifeline) or for connection to anchorages at both ends so as to stretch horizontally (horizontal lifeline) and serves as a means for connecting other components of the system to the anchorage. [§1910.140(b) and §3281]

Personal Fall Arrest System. A system used to arrest an employee in a fall from a walking-working surface. It consists of an anchorage, connectors, body harness and may include a lanyard, deceleration device, lifeline or suitable combinations of the aforementioned components/devices. [Moved from 3207 and 3281, §1910.21(b), §1910.140(b)]

Personal Fall Protection System. A system (including all components) an employer uses to provide protection from falling or to safely arrest an employee's fall if one occurs. Examples of personal fall protection systems include personal fall arrest systems, positioning systems and travel restraint systems. [§1910.140(b), deleted definition in §3207]

Personal Fall Restraint (Tether) Line. A line constituent used to transfer forces from a body support to an anchorage or anchorage connector in a fall restraint system. [§1910.140(b)-travel restraint (tether) line]

Personal Fall Restraint System. A combination of an anchorage, anchorage connector, lanyard (or other means of connection) and body support that an employer uses to eliminate the possibility of an employee going over the edge of a walking-working surface. [§1910.21(b)-travel restraint system]

Positioning System (Work-Positioning System). A system of equipment and connectors that, when used with a body harness or body belt, allows an employee to be supported on an elevated vertical surface, such as a wall or windowsill and work with both hands free. Positioning systems are also called "positioning system devices" and "work-positioning equipment." [Deleted definition in §3207, §1910.21(b)]

Rope Grab. A fall protection component which travels on a lifeline and automatically, by friction, engages the lifeline and locks so as to arrest the fall of an employee. A rope grab usually employs the principle of inertial locking, cam/level locking or both. [§1910.140(b)]

Self-Retracting Device (SRD). A device that contains a drum wound line that automatically locks during the course of a fall to arrest the user, but that pays out from and automatically retracts onto the drum during normal movement of the person whom the line is attached. After onset

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

TITLE 8, DIVISION 1, CHAPTER 4

of a fall, the device automatically locks the drum and arrests the fall when mounted overhead. Self-retracting devices include self-retracting lanyards (SRLs), self-retracting with integral rescue capability (SRL-Rs), self-retracting lanyards, personal (SRL-Ps) and hybrid combinations of these devices.

NOTE: Normally, an SRD pays out from and automatically retracts onto the drum during movement of the person to whom the line is attached. When mounted overhead, the device automatically locks the drum and arrests the fall after the onset of the fall. When not mounted overhead, the device likely will not lock until the device is vertically above the person for whom the line is attached. The arrest distance is a metric which measures the activation distance plus the deceleration distance. SRDs anchored overhead (Class 1 devices) will have a very short activation distance. SRDs anchored below the dorsal D-ring or to the walking-working surface will not activate until such time as the falling employee begins extracting the constituent line from the device. *Add Class II*

[Definition of SRD different from the federal standard]

Snaphook. A connector comprised of a hook-shaped body with a normally closed gate or similar arrangement that may be manually opened to permit the hook to receive an object. When released, the snaphook automatically closes to retain the object. Opening a snaphook requires two separate actions. Snaphooks are generally one of two types: *[\$1910.140(b), deleted definition in §3281]*

(1) Automatic-locking type (permitted) with a self-closing and self-locking gate that remains closed and locked until intentionally unlocked and opened for connection or disconnection; and *[\$1910.140(b)]*

(2) Non-locking type (prohibited) with a self-closing gate that remains closed, but not locked, until intentionally opened for connection or disconnection. *[\$1910.140(b)]*

Travel Restraint System. See Personal Fall Restraint System.

(c) General Requirements. The employer shall ensure that personal fall protection systems meet the following requirements. Additional requirements for personal fall arrest systems and positioning systems are contained in subsections (d) and (e), respectively. *[\$1910.140(c)]*

(1) Personal Fall protection components and/or systems shall be used in accordance with the manufacturer's instruction.

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

TITLE 8, DIVISION 1, CHAPTER 4

(2) Connectors shall be drop forged, pressed or formed steel or made of equivalent materials. [From T8 Appendix C to Article 6, Section I (a)(1), §1910.140(c)(1)]

(3) Connectors shall have a corrosion resistant finish and all surfaces and edges shall be smooth to prevent damage to interfacing parts of the system. [From T8 Appendix C to Article 6, Section I (c)(2), §1910.140(c)(2), ANSI Z359.12-2019, Section 3.1.1]

(4) When vertical (single point) lifelines are used, each employee shall be attached to a separate lifeline. [From T8, Appendix C to Article 6, Section I (e)(5), §1910.140(c)(3)]

(5) Lanyards and vertical (single point) lifelines shall have a minimum breaking strength of 5,000 pounds. All ends of lifelines or lanyards shall be terminated as per the manufacturer's specifications. Knots shall not be permitted at ends or anywhere along the length of the lanyard or safety line. [From T8 Appendix C to Article 6, Section I (c)(3), §1910.140(c)(4), ANSI Z359.3-2019, Section 3.4.1, 3.3.3]

(6) All self-retracting lifelines and lanyards shall have components capable of sustaining a minimum tensile load of 3,600 pounds applied to the device with the lifeline or lanyard in the fully extended position. [From T8 Appendix C, Section I (c)(4), §1910.140(c)(5), technical correction, see 3.2 of ANSI Z359.14-2021]

(A) Webbing used as a line constituent shall have a minimum breaking strength of 4,500 pounds for Class 1 devices and 5,000 pounds for Class 2 devices. [ANSI Z359.14-2021, 3.1.6.1]

(B) Class 1 self-retracting devices (SRDs) shall only be anchored above the dorsal attachment. [ANSI Z359.14-2021, 1.4.1 Class 1 and Appendix B, B4.1.1 Anchorage, moved from subsection (c)(8)]

(7) Lanyards that limit free fall distance to 2 feet or less shall have components capable of sustaining a minimum tensile load of 3,600 pounds applied to the device with the lifeline or lanyard in the fully extended position. [Separated from (c)(6)]

(8) D-rings, snaphooks, connectors and carabiners shall be capable of sustaining a minimum tensile load of 5,000 pounds. [From T8 Appendix C of Article 6, Section I (c)(6), §1910.140(c)(7), ANSI Z359.12-2019, Section 3.1.3.1]. [Action Item: Connectors per ANSI]

[ANSI Z359.0-2023](#)

[Connector. A component or element that is used to couple parts of the system.](#)

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

TITLE 8, DIVISION 1, CHAPTER 4

Z359.12-2019- Connecting Components for Personal Fall Arrest Systems

3.1.4 When tested in accordance with 4.2.1.2, D-rings, O-rings and oval rings shall be capable of withstanding a tensile load of 5,000 lb (22.2kN) without breaking.

(9) D-rings, snaphooks and carabiners shall be proof tested to a minimum tensile load of 3,600 pounds without cracking, breaking or incurring permanent deformation. The gate strength of snaphooks and carabiners shall be capable of withstanding a minimum load of 3,600 pounds without the gate separating from the nose of the snaphook or carabiner body by more than 0.125 inches. [From T8 Appendix C to Article 6, Section I (c)(7), §1910.140(c)(8), ANSI Z359.12-2019, Sections 3.1.3.2, 3.1.3.3, 3.1.3.4, 3.1.3.5, 3.1.36, 3.1.6, 3.1.7]

(10) Snaphooks and carabiners shall be the automatic locking type that require at least two separate, consecutive movements to open. [From T8 Appendix C to Article 6, Section I (c)(8) §1910.140(c)(9), ANSI Z359.12-2019, Section 3.1.3]

(11) Snaphooks and carabiners shall not be connected to any of the following unless they are designed for such connections: [§1910.140(c)(10), No T8 equivalent, ANZI Z359.12, Section 7.1]

(A) Directly to webbing, rope or wire rope; [§1910.140(c)(10)(i)]

(B) To each other; [§1910.140(c)(10)(ii)]

(C) To a D-ring to which another snaphook, carabiner or connector is attached; [§1910.140(c)(10)(iii)]

G(D) To a horizontal lifeline; or [§1910.140(c)(10)(iv)]

(E) To any object that is incompatibly shaped or dimensioned in relation to the snaphook or carabiner such that unintentional disengagement could occur when the connected object depresses the snaphook or carabiner gate, allowing the components to separate. [§1910.140(c)(10)(v)]

(12) The employer shall ensure that each horizontal lifeline system: [From T8 Appendix C of Article 6, Section I (c)(9), §1910.140(c)(11), ANZI Z359.2, Section 9.3.5]

(A) Horizontal lifeline systems shall be designed by a qualified professional engineer experienced in the design of horizontal lifelines as part of a complete personal fall protection

STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD

TITLE 8, DIVISION 1, CHAPTER 4

system with a safety factor of at least two. The HLL system shall be installed by a qualified person and used under the supervision of a competent person.

(B) The forces used for horizontal lifeline designs shall be based on empirically determined test data shown in documentation associated with the manufacturer's instructions or forces that are determined using the analytical methods included in Section 8.3 of ANSI Z359.6-2016 Specifications and Design Requirements for Active Fall Protection Systems, which is hereby incorporated by reference.

(C) Drawings and specifications in accordance with Section 3.2 of ANSI Z359.6-2016 Specifications and Design Requirements for Active Fall Protection Systems applicable to each horizontal lifeline shall be maintained and readily-available when the HLL is in use

(D) As an alternative to (C), the employer shall have documentation from the manufacturer or other sources that provides at least the following:

1. Type of active systems being used (i.e., fall arrest or fall restraint)*

2. Maximum number of users on the system and the corresponding maximum load capacity for each user, including clothing and tools*

Maximum factored loads (design loads) on each type of anchorage of the horizontal lifeline

3. Maximum personal fall arrest loads permitted on the HLL

Clearances based on the span(s), number and weight of users, type of connecting device and other relevant variables

4. Required sag (if any) or required tension in the HLL

5. Specification for each component of the system*

6. Any testing or inspection required prior to initial and daily use of the system*

7. A drawing or written description detailing how and where the horizontal lifeline is to be supported

Note 1: Items in the above list noted by * are often provided in the manufacturer's instructions.

Note 2: Additional requirements for horizontal lifelines used for building maintenance are included in title 8 section 3299.

(13) Anchorages used to attach to personal fall protection equipment shall be independent of any anchorage used to suspend employees or platforms on which employees work. Anchorages used to attach to personal fall protection equipment on mobile work platforms on powered

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

TITLE 8, DIVISION 1, CHAPTER 4

industrial trucks shall be attached to an overhead member of the platform, at a point located above and near the center of the platform. [§1910.140(c)(12)]

(14) Anchorage and anchorage connectors shall be capable of supporting at least 5,000 pounds for each employee attached or designed, installed and used, under the supervision of qualified person, as part of a complete personal fall protection system that maintains a safety factor of at least two. [From T8 Appendix C to Article 6, Section I (c)(10), §1910.140(c)(13), ANSI Z359.2-2017, 9.3.2]

EXCEPTION to subsection (c)(15): Window cleaners anchors and fittings covered by section 3283.

(15) Fall restraint lines shall be capable of sustaining a tensile load of at least 5,000 pounds. [From §1910.140(c)(14) T8, Appendix C to Article 6, Section I (c)(13)]

(16) Lifelines shall not be made of natural fiber rope. Polypropylene rope shall contain an ultraviolet (UV) light inhibitor. [From T8 Appendix C to Article 6, Section I (c)(13), §1910.140(c)(15)]

(17) Personal fall protection systems and their components shall be used exclusively for employee fall protection and not for any other purpose, such as hoisting equipment or materials. [From T8 Appendix C to Article 6, Section (e)(6), §1910.140(c)(16), No CSO equivalent]

(18) A personal fall protection system or its components subjected to impact loading shall be removed from service immediately and not used again until a competent person inspects the system or components and determines that it is not damaged and safe for use for employee personal fall protection. [From T8 Appendix C to Article 6, Section I (e)(7), §1910.140(c)(17), ANSI Z359.2-2017, Section 9.4.3]

(19) Personal fall arrest systems shall be inspected before initial use during each work shift for mildew, wear, damage and other deterioration and defective components shall be removed from service. [From T8 Appendix C to Article 6, Section I (f), §1910.140(c)(18), ANZI Z359.2-2017, Section 9.4.2]

(20) Ropes, belts, lanyards and harnesses used for personal fall protection shall be compatible with all connectors used. [From T8 Appendix C to Article 6, Section I (c)(8), §1910.140(c)(19), ANSI Z359.2-2017 Section 5.2.2.1, 5.3.2.1, 5.4.2.1, etc and 9.3.8.2, ANSI Z359.6-2016, Section 4.2.2]

TO

CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD

TITLE 8, DIVISION 1, CHAPTER 4

(21) Ropes, belts, lanyards, lifelines and harnesses used for personal fall protection shall be protected from being cut, abraded, melted or otherwise damaged. [From T8 Appendix C to Article 6, Section III (Non-Mandatory) (a) and (h), §1910.140(c)(20), ANSI Z359.2-2017, Section 6.5]

(22) The employer shall provide for prompt rescue of each employee in the event of a fall. [From T8 Appendix C of Article 6, Section I (e)(8), §1910.140(c)(21), ANSI Z359.2-2017, Section 8.3]

(23) Personal fall protection systems shall be worn with the attachment point of the body harness located in the center of the employee's back near shoulder level. The attachment point may be located in the pre-sternal position if the free fall distance is limited to 2 feet or less. [From T8 Appendix C of Article 6 Section I (e)(4), §1910.140(c)(22)]

(d) Personal Fall Arrest Systems. [§1910.140(d)]

(1) System Performance Criteria. [§1910.140(d)(1)]

(A) In addition to the general requirements in subsection (c), personal fall arrest systems shall: [§1910.140(d)(1)]

1. Limit the maximum arresting force on the employee to 1,800 pounds; [From T8 Appendix C of Article 6, Section I (d)(1)(A), §1910.140(d)(1)(i), ANSI Z359.6-2016, Section 4.6.1]

2. Bring the employee to a complete stop and limit the maximum deceleration distance as listed in Table 1: Deceleration Distance or arrest, activate or fall a total distance as listed in Table 2: Arrest, Activation or Total Fall Clearance. The deceleration distance pertains only to the deployment or operation of the deceleration device.

Table 1: Deceleration Distances

<u>Personal Fall Protection Equipment</u>	<u>Deceleration Distance</u>
<u>Energy absorbing lanyard with free fall limited to 6 feet</u>	<u>4 feet</u>

TITLE 8, DIVISION 1, CHAPTER 4

Energy absorbing lanyard with free fall limited to 12 feet

5 feet

Table 2: Arrest, Activation Distance or Total Fall Clearance

<u>Personal Fall Protection Equipment</u>	<u>Distances To Consider In Determining Fall Clearances</u>
<u>Overhead mounted Self-Retracting Devices (SRDs)</u>	<u>Arrest distance limit = 3.5 feet</u>
<u>A below dorsal D-ring mounted self-retracting device</u>	<u>Total fall clearance shall be clearly indicated by manufacturer graphically</u>
<u>Descent controllers</u>	<u>Activation distance limit = 4 feet</u>
<u>Fall arresters</u>	<u>Activation distance limit = 2 feet</u>

3. Have sufficient strength to withstand twice the potential impact force of the employee free falling a distance of 6 feet or the free fall distance permitted by the system; and [From T8 Appendix C of Article 6, Section I (d)(1)(C), §1910.140(d)(1)(iii)]

4. Sustain the employee within the system/strap configuration without making contact with the employee's neck and chin area. [§1910.140(d)(1)(iv), No T8 equivalent, ANSI Z359.2-2017, Section 9.2.4]

5. All personal fall arrest, personal fall restraint and positioning device systems purchased or placed in service after [6 months after OAL effective date], shall be labeled as meeting the requirements contained in:

[Action Item: Check to see if edition year can be deleted]

<u>Consensus Standard</u>	<u>Edition</u>
<u>ANSI/ASP Z359.3 Requirements for Lanyards and Positioning Lanyards</u>	<u>2019</u>
<u>ANSI/ASSP Z359.4 Safety Requirements for Assisted-Rescue & Self-Rescue Systems, Subsystems and Components</u>	<u>2013 (R2022)</u>
<u>ANSI/ASSP Z359.9 Personal Equipment for Protection Against Falls - Descent Controllers</u>	<u>2021</u>
<u>ANSI/ASSP Z359.11 Safety Requirements for Full Body Harness</u>	<u>2021</u>
<u>ANIS/ASSP Z359.12 Connecting Components for Fall Arrest Systems</u>	<u>2019</u>

TO

CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD

TITLE 8, DIVISION 1, CHAPTER 4

ANSI/ASSP Z359.13 Personal Energy Absorbers & Energy Absorbing Lanyards	2013 (R2022)
ANSI/ASSP Z359.14 Self-Retracting Devices for Personal Fall Arrest & Rescue Systems	2021
ANSI/ASSE 359.15 Single Requirements for Single Anchor Lifelines and Fall Arresters for Fall Arrest and Rescue Systems	2014
ANSI/ASP Z359.16 Safety Requirements for Climbing Ladder Fall Arrest Systems	2016
ANSI/ASSP Z359.18 Safety Requirements for Anchorage Connectors for Active Fall Protection	2017

Exception: All personal fall arrest, personal fall restraint and positioning device systems meeting the most current ANSI/ASSP Z359 edition will be deemed as meeting the standard.

~~6. If the system is used by an employee having a combined body and tool weight of 310 pounds or more and the employer has appropriately modified the criteria and protocols in appendix A, then the system will be deemed to be in compliance with the requirements of paragraphs (d)(1)(i)1 through (d)(1)(A)3.~~

[Manufacturer representative will provide proposed text regarding the testing protocols for combined body and tool weight greater than 310 lbs.]

6. The employer shall obtain a Declaration of Conformity (DOC) from the manufacturer for personal fall protection systems with a combined body and tool weight of greater than 310 pounds. The DOC shall include rated capacity and the name of the accredited testing laboratory where the testing was performed.

(e) System Use Criteria. [§1910.140(d)(2)]

(1) On any horizontal lifeline that may become a vertical lifeline, the device used to connect to the horizontal lifeline shall be capable of locking in both directions on the lifeline.

[From §1910.140(d)(2)(i), Appendix C of Article 6, Section (e)(2), CSO only applied to suspended scaffolds or similar work platforms.]

(2) Personal fall arrest systems shall be rigged in such a manner that the employee cannot free fall more than 6 feet or contact a lower level or lower level obstacle.

Exception: When it is not feasible or it creates a greater hazard to limit a free fall to 6 feet, a free fall may be a maximum of 12 feet provided the employer can demonstrate the

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

TITLE 8, DIVISION 1, CHAPTER 4

manufacturer designed the system for the additional free fall distance, tested the system to ensure a maximum arresting force of 1,800 pounds is not exceeded, and that the employee will not contact a lower level or lower level obstacle.

[From T8 Appendix C of Article 6, Section I (e)(3), §1910.140(d)(2)(ii)]

(3) Body belts. Body belts shall not be used as part of a personal fall arrest system. *[From T8 Appendix C of Article 6, Section (e)(1), [§1910.140(d)(3)]*

(f) Positioning Systems. *[§1910.140(e)]*

(1) System Performance. All positioning systems shall be capable of withstanding, without failure, a drop test consisting of a 4-foot drop of a **310**-pound weight; *[§1910.140(e)(1)(i). ANSI Z.359.3, Section 4.2.4, Test weight is 282 pounds, Appendix to 3210.1 calls for 300 pounds weight, where did this test weight come from?]*

EXCEPTION to subsection (f)(1): Window cleaner's positioning system, subsection 3283 (b)(1). *[§1910.140(e)(1)(ii)]*

~~**(2) Positioning systems, including window cleaners' positioning systems, that meet the test methods and procedures in Appendix A to section 3210.1 are considered to be in compliance with subsection (f)(1).**~~ *[§1910.140(e)(1)(iii)]*

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

TITLE 8, DIVISION 1, CHAPTER 4

Add new Appendix A as follows:

Appendix A to Section 3210.1

[Appendix A, which is equivalent to Fed/OSHA Appendix D will be deleted. It will be addressed by subsection (d)(1)(A)5., requiring that all fall protection equipment purchased be ANSI approved]

DRAFT

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

TITLE 8, DIVISION 1, CHAPTER 4

Appendix A to Section 3210.1
Non-Mandatory Guidance for Estimating Fall Clearance

Clearance is defined in ANSI/ASSP Z359.0-2018 as “The distance from a specified reference point, such as the working platform or anchorage of a fall arrest system, to the lower level that a worker might encounter during a fall.” Clearance Requirement is defined in ANSI/ASSP Z359.0-2018 as “The distance below an authorized person that must remain clear of obstructions in order to ensure that the authorized person does not make contact with any objects that cause injury in the event of a fall.”

For workers at height utilizing personal fall arrest systems, it is essential to ensure that there is sufficient clearance to prevent contact with a lower level, any object in the worker’s fall path and any object or structure in the worker’s potential swing path.

Accomplishing this objective requires some understanding of the components of clearance so that clearance requirements can be estimated or established. Ideally, when utilizing a personal fall arrest system, the worker’s anchorage should be at the same level or higher than the dorsal D-ring on the worker’s full body harness.

1. The clearance requirement will be the sum of the free fall distance, the deceleration distance or arrest distance and the safety margin.
 - a. The free fall distance is the vertical distance traveled during a fall, measured from the onset of a fall from a walking-working surface to the point at which the personal fall arrest system begins to arrest the fall. Note: The free fall distance is the change in elevation from the worker’s starting height to the point at which their personal fall arrest system begins to engage.
 - b. The deceleration distance is the vertical distance between the user’s fall arrest attachment at the onset of fall arrest forces during a fall and after the fall arrest attachment comes to a complete stop. Note: The deceleration distance is the additional distance traveled from the point that the personal fall arrest system begins to engage until the falling user/worker is brought to a complete stop and is suspended by their personal fall arrest system at the conclusion of the fall.
 - c. The arrest distance is the total vertical distance required to arrest a fall. The arrest distance includes the activation distance and the deceleration distance. Note: Activation distance is a term most often used with self-retracting devices and fall arresters (rope grabs) and is the distance traveled from the point of the onset of a

TITLE 8, DIVISION 1, CHAPTER 4

- fall to the point where the self-retracting device or fall arrester (rope grab) begins to apply a braking or stopping force.
- d. The safety margin is a clearance factor of safety defined as the distance between the lowest extremity of the worker's body at fall arrest and the highest obstruction the worker might otherwise make contact with during a fall. The safety margin is added to the clearance requirement as a buffer to prevent contact with a lower level or an object in the fall path at the conclusion of the fall. Values of 1.5 – 3 feet are most commonly used as a safety margin when calculating clearance.
2. Determining clearance requirements for personal fall arrest systems requires the consideration of many different variables.
- a. Type of equipment in use. Different connecting devices or connecting subsystems (self-retracting devices, energy-absorbing lanyards, vertical lifelines and fall arresters (rope grabs) or ladder climbing fall arrest systems) all have different attributes, limitations and performance characteristics.
 - b. Free fall distance. The free fall distance will be determined by the elevation of the anchorage above the walking-working surface and the lateral distance of the anchorage from the fall hazard. The length of the connecting device or connecting subsystem also plays a part in determining free fall distance. Connecting devices or connecting subsystems that have variable length (such as self-retracting devices, vertical lifelines and fall arresters, etc.) can also have an effect on the free fall distance.
 - c. Deceleration distance and arrest distance. The deceleration distance and arrest distance will increase with a greater free fall distance and will decrease with a shorter free fall distance.
 - d. Activation distance. The activation distance generally decreases with a greater free fall distance and increases with a shorter free fall distance. This does not generally have a tremendous effect on the clearance requirement as it is a component of the arrest distance and is factored into the overall number.
 - e. Safety margin. The safety margin is generally a static value dictated by the manufacturer usually between 1.5 and 3 feet. It is important to read and follow manufacturer's instructions.
 - f. Other factors. There are a variety of other factors that can have an effect on clearance requirements such as harness fit and adjustment, stretch or elasticity in harnesses and vertical lifelines, deforming anchorages, horizontal lifeline sag and even environmental and weather conditions (hot, cold and wet conditions. It is

TITLE 8, DIVISION 1, CHAPTER 4

important to read and follow the manufacturer's instructions for all elements of the personal fall arrest system and to rely on Qualified and Competent Person supervision to ensure that all factors are considered to adequately determine clearance requirements.

3. Determining clearance requirements for self-retracting devices. Clearance requirements for self-retracting devices are generally calculated from the height of the walking-working surface.
- a. Review and adhere to the manufacturer's instructions for use.
 - b. Class 1 self-retracting devices:
 - i. When anchored above the dorsal D-ring connection, the clearance requirement will be the arrest distance plus the safety margin (42" AD + 24" SM = 66" Clearance Requirement – see manufacturer's instructions).
AD- Arrest Distance
SM-Safety Margin
 - ii. When anchored at the level of the dorsal D-ring connection, the clearance requirement will be the free fall distance plus the arrest distance plus the safety margin (24" FF + 42" AD + 24" SM = 90" Clearance Requirement – see manufacturer's instructions).
FF-Free fall
AD-Arrest Distance
SM-Safety Margin
 - c. Class 2 self-retracting devices:
 - i. Class 2 self-retracting devices cannot safely be used without consulting and adhering to manufacturer's instructions.
 - ii. When anchored at or above the dorsal D-ring connection, the clearance requirements should be similar to those for Class 1 devices in section b i and b ii above.
 - iii. When anchored below the dorsal D-ring connection, the clearance requirement will be the free fall distance plus the arrest distance plus the height of the worker plus the safety margin (72" FF + 72" AD + 72" HoW + 24" SM = 240" Clearance Requirement – see manufacturer's instructions). Note, the arrest distance for Class 2 self-retracting devices can vary widely from one product to another and 16 to 20 feet of clearance is typically required when these devices are anchored at the level of the walking-working surface.

TO

CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD

TITLE 8, DIVISION 1, CHAPTER 4

FF-Free Fall

AD=Arrest Distance

HoW-Height of the Worker

SM-Safety Margin

4. Determining clearance requirements for energy-absorbing lanyards. Clearance requirements for energy-absorbing lanyards are generally calculated from the height of the anchorage connection.
- a. Review and adhere to manufacturer's instructions for use.
 - b. Energy-absorbing lanyards are classified in the ANSI/ASSP Z359 Code based on the amount of free fall distance they can be subjected to (either 6 feet or 12 feet). These are designated as 6FF or 12FF on the product label. It is important to read and adhere to manufacturer's instructions.
 - c. 6FF Energy-absorbing lanyards must be anchored at or above the height of the dorsal D-ring connection to ensure that the free fall does not exceed 6 feet.
 - i. When using a 6FF energy-absorbing lanyard anchored at or above the dorsal D-ring connection, the clearance requirement will be the free fall distance plus the deceleration distance plus the height of the worker plus the safety margin (72" FF + 48" DD + 72" HoW + 24" SM = 216" or 18 feet)

FF-Free Fall Distance
DD-Deceleration Distance
HoW-Height of the Worker
SM-Safety Margin
 - ii. When using a 12 FF energy-absorbing lanyard anchored below the dorsal D-ring, it is generally assumed that the anchorage will be affixed to the walking-working surface. The clearance requirement will be the lanyard length plus the deceleration distance plus the height of the worker plus the safety margin (72" FF + 60" DD + 72" HoW + 24" SM = 228" or 19 feet).
 - iii. Note that the clearance requirements only differ by one foot in c i and c ii above, but that the anchorage elevation in c i for the 6FF energy-absorbing lanyard is at the dorsal D-ring height, approximately 5 feet above the walking working surface, whereas the anchorage elevation in c ii for the 12 FF energy-absorbing lanyard is at the level of the waking working surface, an elevation of zero feet. The clearance requirement below the waking working surface in only 13 feet for the 6FF energy-absorbing lanyard, but is 19 feet for the 12 FF energy absorbing lanyard.

TITLE 8, DIVISION 1, CHAPTER 4

- iv. Manufacturer's instructions will include guidance, charts and/or other materials to assist with determining clearance requirements.
5. Determining clearance requirements for vertical lifelines and fall arresters (rope grabs). Clearance requirements for vertical lifelines and fall arresters are generally calculated from the height of the anchorage connection.
- a. Review and adhere to manufacturer's instructions for use.
 - b. Vertical lifelines and fall arresters must be anchored at or above the height of the dorsal D-ring connection to ensure that the free fall is minimized to the extent possible and does not exceed 6 feet. Note: Minimizing free fall distance requires anchorage elevation and use of the shortest possible connecting sub-system. A longer lanyard will produce greater free fall and will increase clearance requirements.
 - i. When using a vertical lifeline and fall arrester anchored at or above the dorsal D-ring connection, the clearance requirement will be the free fall distance plus the arrest distance plus the height of the worker plus the safety margin (72" FF + 60" DD + 72" HoW + 24" SM = 228" or 19 feet).
 - FF-Free Fall Distance
 - DD-Deceleration Distance
 - HoW-Height of the Worker
 - SM-Safety Margin
 - ii. The values in this calculation assume that a 6FF energy absorbing lanyard with a length of 6 feet is used as the connecting sub-system and that the maximum free fall of 6 feet is allowed by the manufacturer. Better results can be achieved by using a shorter connecting sub-system.
 - iii. If the anchorage connection and/or the location of the fall arrester on the vertical lifeline is below the user's dorsal D-ring connection, the clearance requirements may be considerably greater than 19 feet.
 - iv. Manufacturer's instructions will include guidance, charts and/or other materials to assist with determining clearance requirements. Users of these systems shall consult with manufacturer's instructions to understand clearance requirements and to get information on allowable or recommended connecting sub-systems.
 - v. It is not unusual for the fall arrester to lock on to the vertical lifeline if ascending or descending rapidly. For best performance, ascend and descend or change positions at a steady and deliberate pace. Do not attempt to

TITLE 8, DIVISION 1, CHAPTER 4

manipulate the fall arrester by hand if it locks or snags. Changing direction of travel will usually relieve these conditions. If necessary, use the connecting sub-system if a reset is required by hand – see manufacturer’s instructions for guidance and restrictions.

6. Determining clearance requirements for ladder climbing fall arrest systems. Clearance requirements for ladder climbing fall arrest systems are calculated from the initial height of the carrier sleeve (often referred to as a cable grab or trolley) on the carrier (the cable or rail which is affixed to the ladder to facilitate the fall arrest connection while ascending or descending). For climbing ladder systems which employ self-retracting devices, see Section 3 of this document/regulation.
- a. Review and adhere to manufacturer’s instructions for use.
 - b. Carrier sleeves or cable grabs shall be affixed to the carrier (cable or rail) and connected by the connecting linkage to the user’s sternal or chest D-ring on their full body harness. Note: The carrier will trail a climbing user and will precede a descending user by a distance roughly equivalent to the length of the connecting linkage, which shall not exceed 9”.
 - i. When using a climbing ladder fall arrest system, the clearance requirement will be the arrest distance plus the height of the worker plus the safety margin (39” DD + 72” HoW + 24” SM = 135” or 11.25 feet). Note: Due to the short connecting linkage, the user’s proximity to the carrier and the variety of executions for carrier sleeve operation and construction, the arrest distance, in this case, includes the values for free fall, activation and deceleration distance.

DD-Deceleration Distance
HoW-Height of the Worker
SM-Safety Margin
 - ii. Manufacturer’s instructions will include guidance, charts and/or other materials to assist with determining clearance requirements. Users of these systems shall consult with manufacturer’s instructions to understand clearance requirements and to get information on allowable or recommended connecting sub-systems.
 - iii. It is not unusual for the carrier sleeve to lock on to the carrier if descending rapidly or to get caught or jammed on a bypass when ascending quickly. For best performance, ascend and descend at a steady and deliberate pace. Do not attempt to manipulate the carrier by hand if it locks or snags. Changing

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

TITLE 8, DIVISION 1, CHAPTER 4

direction of travel will usually relieve these conditions. If necessary, use the connecting linkage if a reset is required by hand – see manufacturer’s instructions for guidance and restrictions.

7. Compatibility of systems and components. It is the responsibility of the competent or qualified person to determine if system components are compatible with one another. Be sure to consult manufacturer’s instructions with respect to compatibility concerns and use and limitations criteria.

DRAFT

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

TITLE 8, DIVISION 1, CHAPTER 4

Add new Section 3210.2 as follows:

§3210.2. Falling Object Protection. *[Replaces §3273(e) & (f), §1910.28(c)]*

(a) Employees working in locations where there is a risk of receiving head injuries from flying or falling objects and/or electric shock and burns shall wear approved head protection in accordance with section 3381 and: *[text from §3381]*

Post AC Action Item: Review Federal final rule, see sections 3295, 3209(d).

OSHA stresses that, like the construction fall protection standard in § 1926.502(j)(3), the required 3.5-inch toeboard height is the minimum height. If employers have objects or materials near the toeboard that are higher than the toeboard, they must ensure the toeboard height is sufficient to prevent the objects from falling over the edge to a lower level, as specified in final paragraph (k)(2). OSHA notes that when objects are piled higher than the toeboard, final paragraph (k)(2) requires employers to erect guardrail systems that have paneling or screening installed from the top edge of the toeboard to the top rail or midrail of the guardrail system.

Final paragraph (k)(2)(ii), like proposed paragraph (k)(5), requires that employers ensure openings in guardrail systems are small enough to prevent objects from falling through the openings.

(b) The employer shall protect employees from falling objects by implementing one or more of the following:

(1) ~~Erecting toeboards, screens or~~ Guardrail systems in accordance with article 2 of the General Industry Safety Orders to prevent objects from falling from higher levels. *[§1910.28(c)(2), Moved from §3273(e)(1)(A)]*

(A) Where tools, equipment or materials are piled high, all openings in guardrail systems shall be small enough to prevent objects from falling through the opening. *[§1910.29(k)(2)(ii)]*

(2) Where toeboards are required, they shall be constructed of wood, concrete, metal, or other suitable material. Where constructed of metal grille, mesh shall not exceed 1-inch. The top of the toeboard shall be not less than 3 1/2 inches above the platform, walkway, or other working level and the bottom clearance shall not exceed 1/4-inch. *[Moved from 3209(d). If in final version text is moved, research all cross reference to toeboard and update to new location]*

TITLE 8, DIVISION 1, CHAPTER 4

(A) Where tools, equipment or materials are piled higher than the top of the toeboard, paneling or screening shall be installed from the toeboard to the midrail of the guardrail system and for a length that is sufficient to protect employees below. If the items are piled higher than the midrail, the employer also shall install paneling or screening to the top rail and for a length that is sufficient to protect employees below.; ~~and~~ [§1910.29(k)(2)(i)]

~~(B) All openings in guardrail systems shall be small enough to prevent objects from falling through the opening.~~ [§1910.29(k)(2)(ii) Relocated (b)(1)(A)]

(B) To comply with (A) above all openings shall be of sufficient size to prevent objects from falling through the opening.

~~(2)~~ (3) Erecting canopy structures. [§1910.28(c)(2)], §3273(e)(1)(A) and (B)]

(A) Canopies used for falling object protection shall be strong enough to prevent collapse and to prevent penetration by falling objects. [§1910.29(k)(3), §1910.28(c)(2), §3273(e)(2)]

~~(3)~~ (4) Providing a physical barrier such as, but not limited to, fencing, barricades or other equivalent means or methods, to prevent entry into the area to which objects could fall; or prohibiting employees from entering the barricaded area. [§1910.28(c)(3), 3273(e)(1)(C)]

~~(4)~~ (5) Where the type of process or operation, exclusive of repair and maintenance, is such that there are hazards to employees from materials falling through platform or runway openings, the openings shall be limited to a size that prevents materials falling through the openings. [§3273(e)(1)(C)(2)]

~~(5)~~ (6) Where platform or runway gratings are used as work areas during repair or maintenance, there shall be provided at such areas suitable safeguards to prevent tools or materials falling on employees below. Such safeguards may be netting suspended below the work area, canvas, planking on the surface of the grating or barricaded or sheltered areas below the work area. [§3273(e)(1)(C)(3)]

(c) Lowering objects: [§3273(f)]

(1) Where there is employee exposure below an elevated work area, all objects, including materials, equipment and tools shall be lowered in a controlled manner, such as but not limited to using enclosed chutes, material handling equipment or hand lines; or [§3273(f)(1)]

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

TITLE 8, DIVISION 1, CHAPTER 4

(2) When controlled lowering is not practical or would subject employees to a greater risk of injury, protection from falling objects shall be provided by the use of effective physical barriers, such as but not limited to canopies, fencing, barricades or barrier tape when the barrier tape is attended by a spotter who is authorized to effectively restrict entry into the area and who is on the same level as the area of the exposure or other equivalent means or methods. [§3273(f)(2)]

(A) Signs in accordance with section 3340 shall be posted at the perimeter of the affected work area to warn employees of the hazard. [§3273(f)(2)(A)]

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

DRAFT

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

TITLE 8, DIVISION 1, CHAPTER 4

Add new Section 3210.3 as follows:

§3210.3. Fall Protection Training Requirements. [§1910.30]

(a) Fall hazards. [§1910.30(a)]

(1) Before any employee is exposed to a fall hazard, the employer shall, in accordance with section 3203, provide training for each employee who uses personal fall protection systems or who is required to be trained as specified elsewhere in these Orders. Employers shall ensure employees are trained in the requirements of this subsection on or before **six months after OAL effective date**. [§1910.30(a)(1)] Consider extending OAL effective date to 1 year

(2) The employer shall ensure that each employee is trained by a qualified person. [§1910.30(a)(2)]

Note: The qualified person designated by the employer may be a qualified engineer or competent person (fall protection) depending on the job duties of the person being trained. For example, a qualified engineer may train a competent person (fall protection) on the horizontal lifeline installation as designed by the engineer. A competent person (fall protection) may be the person designated to train personal fall protection users on inspecting, operating, and maintaining their personal fall protection equipment.

(3) The employer shall train each employee in at least the following topics: [§1910.30(a)(3)]

~~(3) The employer shall train each employee in at least the following topics: [§1910.30(a)(3)]~~

(A) The nature of the fall hazards in the work area and how to recognize them; [§1910.30(a)(3)(i)]

(B) The procedures to be followed to minimize those hazards; [§1910.30(a)(3)(ii)]

~~(C) The correct procedures for installing, inspecting, operating, maintaining and disassembling the personal fall protection systems that the employee uses; and~~

[§1910.30(a)(3)(iii)] From AC members: Not every employee will install, disassemble, repair fall protection systems

Action Item: Accept or reword the text

TITLE 8, DIVISION 1, CHAPTER 4

(C) The procedures for installing, inspecting, operating, ~~aring, storing~~ maintaining and disassembling using the personal fall protection system.

(1) For employees who install, disassemble, or maintain fall protection systems, the employee shall be trained in the ~~correct~~ procedures for installing, inspecting, operating, maintaining and disassembling the personal fall protection systems that the employee uses; and

(D) The use of personal fall protection systems and equipment specified in subsection (a)(1), including, but not limited to, proper hook-up, anchoring and tie-off techniques and methods of equipment inspection and storage, as specified by the manufacturer. [§1910.30(a)(3)(iv)]

(b) Equipment hazards. [§1910.30(b)]

~~(1) The employer shall train each employee on or before [six months after OAL effective date] in the proper care, inspection, storage and use of equipment covered by this section before an employee uses the equipment. [§1910.30(b)(1)]~~

AC recommendation: consider extending OAL effective date to 1 year, listing of sections may be necessary.

The training requirement is a general requirement to train employees on all equipment covered by subpart D, WWS. IIPP 3203 is the counterpart.

~~(a) Effective July 1, 1991, every employer shall establish, implement and maintain an effective Injury and Illness Prevention Program (Program). The Program shall be in writing and, shall, at a minimum:~~

~~(1) Identify the person or persons with authority and responsibility for implementing the Program.~~

~~(2) Include a system for ensuring that employees comply with safe and healthy work practices. Substantial compliance with this provision includes recognition of employees who follow safe and healthful work practices, training and retraining programs, disciplinary actions, or any other such means that ensures employee compliance with safe and healthful work practices.~~

~~(1) The employer shall train each employee who uses a controlled descent apparatus (CDA) in proper rigging and use of the equipment in accordance with section 3286. [§1910.30(b)(3),]~~

AC Recommendation: think of relocating this to CDA

STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD

TITLE 8, DIVISION 1, CHAPTER 4

Answer: Proposal will stay. Proposed section 3286 includes a cross reference to personal fall protection

(c) Retraining. The employer shall retrain an employee when the employer has reason to believe the employee does not have the understanding and skill required by subsections (a) and (b). Situations requiring retraining include, but are not limited to, the following: [§1910.30(c)]

(1) When changes in the workplace render previous training obsolete or inadequate; [§1910.30(c)(1)]

(2) When changes in the types of fall protection systems or equipment to be used render previous training obsolete or inadequate; or [§1910.30(c)(2)]

~~(3) When inadequacies in an affected employee's knowledge or use of fall protection systems or equipment indicate that the employee no longer has the requisite understanding or skill necessary to use equipment or perform the job safely. [§1910.30(c)(3) AC Recommendation to delete, duplicative of (c)]~~

(d) Training shall be understandable. The employer shall provide information and training to each employee in a manner that the employee understands. [§1910.30(d)] See 3203

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

TO

CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD

TITLE 8, DIVISION 1, CHAPTER 4

Add new Section 3210.4 as follows:

§3210.4. Safety Net Systems.

(a) Safety net systems and their use shall comply with the following provisions: [From CSO §1671, §1910.29(c) 1926 subpart M which means §1926.502(c)]

(1) Safety nets shall be installed as close as practicable under the walking-working surface on which employees are working, but in no case more than 25 feet below such level. When nets are used on bridges, the potential fall area from the walking-working surface to the net shall be unobstructed. [§1926.502(c)(1)]

(2) Safety nets shall extend outward from the outermost projection of the work surface as follows: [§1926.502(c)(2)]

<u>Vertical distance from working level to horizontal plane of net</u>	<u>Minimum required horizontal distance of outer edge of net from the edge of working surface</u>
<u>Up to 5 feet</u>	<u>8 feet</u>
<u>More than 5 feet up to 10 feet</u>	<u>10 feet</u>
<u>More than 10 feet but not to exceed 30 feet</u>	<u>13 feet</u>

(3) Safety nets shall be installed with sufficient clearance under them to prevent contact with the surface or structures below when subjected to an impact force equal to the drop test specified in subsection (a)(4). [§1926.502(c)(3)]

(4) Safety nets and their installations shall be capable of absorbing an impact force equal to that produced by the drop test specified in subsection (a)(4)(A). [§1926.502(c)(4)]

(A) Except as provided in subsection (a)(4)(B), safety nets and safety net installations shall be drop-tested at the jobsite after initial installation and before being used as a fall protection system, whenever relocated, after major repair and at 6-month intervals if left in one place. The drop-test shall consist of a 400 pound bag of sand 30 inches plus or minus 2 inches, in diameter dropped into the net from the highest walking-working surface at which employees are exposed to fall hazards, but not from less than 42 inches above that level. [§1926.502(c)(4)(i)]

(B) When the employer can demonstrate that it is unreasonable to perform the drop-test required by subsection (a)(4)(A), the employer (or a designated competent person) shall certify

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

TITLE 8, DIVISION 1, CHAPTER 4

that the net and net installation is in compliance with the provisions of subsections (a)(3) and (a)(4)(A) by preparing a certification record prior to the net being used as a fall protection system. The certification record shall include an identification of the net and net installation for which the certification record is being prepared; the date that it was determined that the identified net and net installation were in compliance with subsection (a)(3) and the signature of the person making the determination and certification. The most recent certification record for each net and net installation shall be available at the jobsite for inspection.

[§1926.502(c)(4)(ii)]

(5) Defective nets shall not be used. Safety nets shall be inspected at least once a week for wear, damage and other deterioration. Defective components shall be removed from service. Safety nets shall also be inspected after any occurrence which could affect the integrity of the safety net system. [§1926.502(c)(5)]

(6) Materials, scrap pieces, equipment and tools which have fallen into the safety net shall be removed as soon as possible from the net and at least before the next work shift.

[§1926.502(c)(6)]

(7) The maximum size of each safety net mesh opening shall not exceed 36 square inches nor be longer than 6 inches on any side and the opening, measured center-to-center of mesh ropes or webbing, shall not be longer than 6 inches. All mesh crossings shall be secured to prevent enlargement of the mesh opening. [§1926.502(c)(7)]

(8) Each safety net (or section of it) shall have a border rope for webbing with a minimum breaking strength of 5,000 pounds. [§1926.502(c)(8)]

(9) Connections between safety net panels shall be as strong as integral net components and shall be spaced not more than 6 inches apart. [§1926.502(c)(9)]

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

Amend Section 3212 as follows:

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

TITLE 8, DIVISION 1, CHAPTER 4

3212. Floor Openings, ~~Floor Holes~~, Skylights and Roofs.

(a) Roof and Floor Opening.

(1) Every floor and roof opening shall be guarded by a cover, a guardrail or equivalent on all open sides. ~~While the cover is not in place, the openings shall be constantly attended by someone or shall be protected by guardrails. Toeboards shall be installed around the edges at openings where persons may pass below the opening. [Separated and itemized in (a)(2) & (b)(2) below, [§1910.29(b)(11)].~~

(2) Toeboards shall be installed around the edges at openings where ~~persons~~ people may pass below the opening. [From (a)(1)]

EXCEPTION to subsection (a): Stairway entrances.

~~(2)(A) Every ladderway floor opening or platform with access provided by ladderway, including ship stairs (ship ladders), shall be protected by guardrails with toeboards meeting the requirements of General Industry Safety Orders, Section 3209, on all exposed sides except at entrance to the opening. The opening through the railing shall have either a swinging gate or equivalent protection or the passageway to the opening shall be so offset that a person cannot walk directly into the opening. [Moved to (d)]~~

~~EXCEPTION: Ladder openings for entrance/access at perimeter roof edges where guardrail protection is not required by subsection (d) of this section. [Moved to (d)]~~

~~(B)1. The uppermost surface or railing member of the swinging gate or other equivalent protection required by subsection (a)(2)(A) shall have a vertical height from the platform or floor level of between 42 to 45 inches plus or minus one inch and; [Moved to (d)(1)]~~

~~2. The swinging gate or other equivalent protection shall be capable of withstanding a force of at least 200 pounds applied vertically downward to the uppermost surface or railing member and horizontally outward at any point on the exit side of the ladder opening. [Moved to (d)(2)]~~

~~(3) Hatchways and chute floor openings shall be guarded by guardrails or by hinged or removable covers or by removable railings provided such covers or railings will afford protection equivalent to that provided by a guardrail. [Moved to (d)(3)]~~

~~This does not apply to chute openings which are effectively covered or protected by machine or equipment during operation. However, such chute shall be covered during repair or~~

TO

CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD

TITLE 8, DIVISION 1, CHAPTER 4

~~maintenance or when otherwise exposing employees to the hazards of unguarded floor openings. [Moved to (d)(3)]~~

~~(4) Foundry pits and similar sunken locations in which employees are required to work may be left unprotected during such times as the necessary handling of materials or other work prohibits the use of guardrails or equivalent; but when such pits are not in use they shall be either covered, filled in or protected with guardrails or equivalent. [Moved to (h)]~~

~~(5) Floor holes through which materials or tools may fall and create a hazard or through which parts of a person's body may contact dangerous moving parts, shall be completely covered except when in use unless these floor holes are used to feed machines or receptacles containing hot, toxic or corrosive materials, then these openings shall be guarded by hoppers, guardrails or grates having openings not exceeding 1 inch by 5 inches. Floor holes through which transmission equipment passes may be guarded by toeboards. [Moved to (g)]~~

~~(b) Floor and roof opening covers shall be designed by a qualified person and be capable of safely supporting the greater of 400 pounds or twice the weight of the employees, equipment and materials that may be imposed on any one square foot area of the cover at any time. Covers shall be secured in place to prevent accidental removal or displacement and shall bear a pressure sensitized, painted or stenciled sign with legible letters not less than one inch high, stating: "Opening - Do Not Remove." Markings of chalk or keel shall not be used. [Reorganized, separated into (b)(1) and (b)(2)]~~

(b) Covers.

(1) Floor and roof opening covers shall be designed by a qualified person and be capable of safely supporting the greater of 400 pounds or at least twice the maximum intended load that may be imposed on any one square foot area of the cover at any time. [Existing (b), §1910.29(e)(1)- used the term maximum intended load]

(2) Covers shall be secured in place to prevent accidental removal or displacement and shall bear a pressure sensitized, painted or stenciled sign with legible letters not less than one inch high, stating: "Opening - Do Not Remove." Markings of chalk, crayon or other non-durable markings shall not be used. [Relocated from existing subsection (b) and removed "keel" and replaced with crayon]

(3) While the cover is not in place, the openings shall be constantly attended by someone or shall be protected by guardrails. [From subsection (a)(1)]

TITLE 8, DIVISION 1, CHAPTER 4

(4) Covers shall not project more than one inch above the floor level and all edges shall be chamfered to an angle with the horizontal of not over 30 degrees. All hinges, handles, bolts or other parts shall set flush with the floor or cover surface. [Moved from (c) without the reference to Title 24]

~~(c) Covers shall not project more than one inch above the floor level and all edges shall be chamfered to an angle with the horizontal of not over 30 degrees. All hinges, handles, bolts or other parts shall set flush with the floor or cover surface. (Title 24, part 2, section 2-1721(c).)~~

(c) Openings protected by guardrails: [§1910.29(b)(12)]

(1) When materials are being passed through the opening, not more than two sides of the guardrail system shall be removed; and [§1910.29(b)(12)(i)]

(2) When materials are not being passed through the opening, the opening shall be guarded by a guardrail system along all unprotected sides or edges or closed over with a cover. [§1910.29(b)(12)(ii)]

(d) [Ladderway Opening.](#)

(1) Every ladderway and stairway floor opening or platform with access provided by ladderway, including ship stairs (ship ladders), shall be protected by guardrails with toeboards meeting the requirements of section 3209, on all exposed sides except at the entrance to the stairway or ladderway. The opening through the railing shall have either a swinging gate or equivalent protection or the passageway to the opening shall be so offset that a person cannot walk directly into the opening. [From (a)(2)(A) with modifications, §1910.29(b)(3)(iv), §1910.29(b)(13)(i) and (ii)]

EXCEPTIONS to subsection (d)(1):

1. Ladder openings for entrance/access at perimeter roof edges where guardrail protection is not required by subsection (i). [Moved from (a)(2)(A)]

2. For any stairway used less than once per day where traffic across the stairway floor opening prevents the use of a fixed guardrail system (e.g., openings located in aisle spaces), the employer may protect employees from falling into the opening by using a hinged floor cover that meets the criteria in subsection (b) and a removable guardrail system on all exposed sides, except at the entrance to the stairway. [1910.28(b)(3)(ii)]

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

TITLE 8, DIVISION 1, CHAPTER 4

~~(4)~~(2) The swinging gate shall be non-latching and swing away from the unprotected edge.

~~(2)~~(A) The uppermost surface or railing member of the swinging gate or other equivalent protection shall have a vertical height from the platform or floor level of between 42 to 45 inches plus or minus one inch and; *[Moved from (a)(2)(B)1.]*

~~(3)~~(B) The swinging gate or other equivalent protection shall be capable of withstanding a force of at least 200 pounds applied vertically downward to the uppermost surface or railing member and horizontally outward at any point on the exit side of the ladder opening. *[Moved from (a)(2)(B)2.]*

(e) Hatchways and chute floor openings shall be guarded by guardrails or by hinged covers provided such covers will afford protection equivalent to that provided by a guardrail. *[From (a)(3), §1910.28(b)(3)(v) and §1910.28 (b)(3)(v)(A)]*

(1) A guardrail system or a fall restraint system shall be used when a work operation necessitates passing material through a hatchway or chute floor opening. *[§1910.28(b)(3)(v)(C)]*

EXCEPTION to subsection (e):

This does not apply to chute openings which are effectively covered or protected by machine or equipment during operation. However, such chute openings shall be covered during repair or maintenance or when otherwise exposing employees to the hazards of unguarded floor openings. *[From (a)(3)]*

(f) Hoist areas.

(1) The employer shall ensure each employee in a hoist area, which is any elevated access opening to a walking-working surface through which equipment or materials are loaded and received, is protected from falling by: *[§1910.28(b)(2)]*

(A) A guardrail system; *[§1910.28(b)(2)(i)(A)]*

(B) A personal fall arrest system; or *[§1910.28(b)(2)(i)(B)]*

(C) A personal fall restraint system (travel restraint system). *[§1910.28(b)(2)(i)(C)]*

TITLE 8, DIVISION 1, CHAPTER 4

(2) When any portion of a guardrail system, gate or chains is removed and an employee must lean through or over the edge of the access opening to facilitate hoisting, the employee shall be protected from falling by a personal fall arrest system. [§1910.28(b)(2)(ii)]

(3) When guardrail systems are used at hoist areas, a removable guardrail section, consisting of a top rail and midrail, shall be placed across the access opening between guardrail sections when employees are not performing hoisting operations. The employer may use chains or gates instead of a removable guardrail section at hoist areas if the employer demonstrates the chains or gates provide a level of safety equivalent to guardrails. [§1910.29(b)(10)]

(4) If grab handles are installed at hoist areas, they shall comply with subsection 3209(l). [§1910.29(b)(2)(iii)]

(g) Floor openings through which materials or tools may fall and create a hazard or through which parts of a person's body may contact dangerous moving parts, shall be completely covered except when in use unless these openings are used to feed machines or receptacles containing hot, toxic or corrosive materials, then these openings shall be guarded by hoppers, guardrails or grates having openings not exceeding 1-inch by 5 inches. Floor openings through which transmission equipment passes may be guarded by toeboards. [From (a)(5), replaces holes with openings]

(h) Foundry pits and similar sunken locations in which employees are required to work may be left unprotected during such times as the necessary handling of materials or other work prohibits the use of guardrails or equivalent; but when such pits are not in use, they shall be either covered, filled in or protected with guardrails or equivalent. [From (a)(4)]

(i) Work on Roofs.

~~(d)~~(1) Guardrails as specified in section 3209 shall be required at locations where there is a routine need for any employee to approach within 6 feet of the edge of the roof. When ~~intermittent~~ infrequent work is being done, safety belts and lanyards or an approved fall protection system in accordance with section 3210.1 may be provided in lieu of guardrails. [Relocated from (d)(1)]

For the purpose of this requirement, routine need means more than four times a year and ~~intermittent~~ infrequent work means work not exceeding four times a year.

TITLE 8, DIVISION 1, CHAPTER 4

(2) Guardrails required by subsection ~~(e)~~ (i)(1) shall be provided along at least 6 feet beyond the areas occupied by persons accessing, servicing or repairing permanently-mounted machinery and/or equipment. *[Relocated from (d)(2)]*

(3) Where fall protection systems are used, safety lines and/or lanyards shall be attached to roof tie-backs meeting the requirements of section 3291(f) or equivalent anchorage. A safe and unobstructed access shall be provided to all roof tie-back locations. ~~(Title 24, part 2, section 1711(h).)~~ *[Relocated from (d)(3)]*

(4) In residential roof where the employer can demonstrate that guardrail requirements, personal fall protection, cover, or safety net systems are infeasible or creates a greater hazard, the employer shall develop and implement a fall protection plan in accordance with section 1671.1 and section 3210.3. [1910.28(b)(1)(ii)]

~~(e)~~(j) Skylights. Any employee approaching within 6 feet of any skylight shall be protected from falling through the skylight or skylight opening by any one of the following methods:

(1) Skylight screens installed above the skylight. The design, construction and installation of skylight screens shall meet the strength requirements equivalent to that of covers specified in subsection (b) above. They shall also be of such design, construction and mounting that under design loads or impacts, they will not deflect downward sufficiently to break the glass below them. The construction shall be of grillwork, with openings not more than 4 inches by 4 inches or of slatwork with openings not more than 2 inches wide with length unrestricted or of other material of equal strength and similar configuration.

(2) Skylight screens installed below the skylight. Existing screens (i.e. burglar bars) shall meet the following requirements if they will be relied upon for fall protection:

(A) Screens installed at the same level or higher than the ~~walking/working~~ walking-working surface shall meet the strength requirements of subsection (b).

(B) Screens installed within 2 feet of the ~~walking/working~~ walking-working surface shall meet the strength requirements of subsection (b) with increased strength based on the fall distance below the ~~walking/working~~ walking-working surface as determined by a qualified person. In no case shall the strength of the screen below the skylight be less than the strength requirements

TITLE 8, DIVISION 1, CHAPTER 4

of subsection (b). A screen more than 2 feet below the ~~walking/working~~ walking-working surface shall not serve as fall protection.

(C) A screen shall not be used for fall protection in accordance with subsection ~~(e)(j)(2)(A) or (e)(j)(2)(B)~~ if the broken skylight glazing will pose an impalement hazard to a worker who has fallen through the skylight and is lying on top of the screen. Skylights containing tempered, laminated or plastic glazing or similar materials shall not be considered to impose an impalement hazard.

(D) The screen construction shall be of grillwork, with openings less than 12 inches in the least horizontal dimension.

(3) Guardrails meeting the requirements of ~~§~~section 3209.

(4) The use of a personal fall protection system meeting the requirements of ~~§~~section 1670 of the ~~Construction Safety Orders~~. 3210.1.

(5) Covers, including the skylight itself, meeting the requirements of subsection (b) installed over the skylights or skylight openings. Where the skylight itself serves as a cover, the skylight shall be required to meet only the strength requirements of subsection (b). Further, for skylights serving as covers, the employer shall obtain documentation from the manufacturer that the skylight will meet the strength requirements of subsection (b) for the dates that work will be performed in the vicinity of the skylight. Such documentation shall be obtained prior to the start of work and shall be made available upon request.

(6) Skylight nets.

(A) Materials. Materials used for skylight nets shall be of natural or synthetic fiber of sufficient size, strength and number to absorb a 400 pound load dropped from 42 inches above the surface of the net. The net hardware shall be drop-forged, pressed or formed steel or material of equal or better quality. The maximum size of mesh shall not exceed 36 square inches or be longer than 6 inches on any side, measured center-to-center of mesh ropes or webbing. No mesh member shall exceed 6 inches in length measured center-to-center of mesh crossings. All mesh crossings shall be anchored to eliminate frictional wear and prevent enlargement of mesh openings. Nets shall not be larger than 12 feet by 12 feet.

(B) Inspection.

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

TITLE 8, DIVISION 1, CHAPTER 4

1. Skylight nets shall be inspected weekly by a competent person utilizing the inspection procedures supplied by the manufacturer.

2. Visual inspections shall be performed daily by an authorized person trained on the manufacturer's inspection procedures before the net is relied upon for fall protection.

(C) Training. Employees shall be trained to recognize the hazards of falling into nets and on the procedures to be followed in order to limit the potential injury from such falls. The training program shall include, at a minimum:

1. The tested limits of the net

2. Avoiding falls;

3. Location of weekly inspection records and the person responsible;

4. Procedures for retrieving a worker who has fallen into the net;

5. Manufacturer's instructions on the use and limitations of the skylight net;

6. Manufacturer's inspection requirements;

7. Factors affecting net life, including, but not limited to, sunlight, abrasion, dirt/sand, rust and airborne contaminants.

(D) Care, Maintenance and Storage. The care, maintenance and storage of nets shall be in accordance with the net manufacturer's recommendations. Nets shall be protected from sparks, hot slag or other materials which could compromise the strength of the net.

(E) Nets shall be removed from service under any of the following conditions:

1. The frame becomes warped, bent or distorted.

2. The netting becomes torn, unraveled, cut or has excessive slippage of the mesh crossings.

3. The net has been modified from the original manufacturer's design or specification.

TITLE 8, DIVISION 1, CHAPTER 4

4. The recommended service life of the net as provided by the manufacturer has expired. Nets without a manufacturer supplied expiration date shall not be used for fall protection in accordance with this section.

EXCEPTION: to subsection ~~(e)(j)(6)(E)~~4.: If the employer effectively records and documents the date that the net was first placed in service, the service life of the net shall begin on the date placed into service instead of the date of manufacture.

5. Other removal criteria specified by the manufacturer.

(F) Nets shall not be left on the skylight for longer than the duration of the job or one year, whichever is less.

(G) Nets shall be used with sufficient clearance to prevent user's contact with the surfaces or structures below the skylight.

(7) A fall protection plan as prescribed in ~~§~~section 1671.1 of the Construction Safety Orders when it can be demonstrated that the use of fall protection methods as contained in subsections ~~(e)(j)(1) through (j)(6) of this Section~~ is impractical infeasible or creates a greater hazard.

EXCEPTION: to subsection ~~(e)(j)~~: When the work is of short duration and limited exposure such as measuring, roof inspection, electrical/mechanical equipment inspection, etc. and the time involved in rigging and installing the safety devices required in subsections ~~(e)(j)(1) through (e)(j)(6)~~ equal or exceed the performance of the designated tasks of measuring, roof inspection, electrical/mechanical equipment inspection, etc., these provisions may be temporarily suspended provided that adequate risk control is recognized and maintained.

~~(f)(k)~~ Glazed Surfaces.

(1) Access shall not be permitted on glazed surfaces such as roofs, vaults, canopies or skylights glazed with transparent or translucent materials unless an engineer currently registered in the State of California and experienced in the design of such glazed structures has certified that the surface will support all anticipated loads. Employees working on such surfaces shall be protected by a fall protection system meeting the requirements of ~~Section 1670 of the Construction Safety Orders.~~ Section 3210.1.

TITLE 8, DIVISION 1, CHAPTER 4

~~(e)~~(f)(2) When glazed surfaces cannot be safely accessed for maintenance in accordance with subsection ~~(f)~~(k), scaffolds, catwalks, rolling ladders, platforms or other methods of safe access shall be provided.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

DRAFT

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

TITLE 8, DIVISION 1, CHAPTER 4

Amend Section 3213 as follows:

§3213. Service Pits and Yard Surface Openings.

(a) Unused portions of service pits and pits not in actual use shall be either covered or protected by guardrails, this may be accomplished by moveable posts or stanchions and chain rails or other guardrails which will provide equivalent protection.

EXCEPTION to subsection (a): Inspection, transfer and service pits used exclusively for maintenance of rolling railroad stock where impracticable to install guardrails or equivalent. ~~(Title 24, Part 2, Section 2-1716(f).)~~

(b) ~~Permanent~~ Yard surface openings such as pits or sumps shall be guarded as required by section 3212, Floor Openings, Floor Holes, Skylights and Roofs. ~~(Title 24, Part 2, Section 2-1716(f).)~~

(c) Trench or conduit covers and their supports, when located in plant roadways, shall be designed to carry a truck rear-axle load of at least 20,000 pounds.

(d) Manhole covers and their supports, when located in plant roadways, shall comply with local standard highway requirements if any; otherwise, they shall be designed to carry a truck rear-axle load of at least 20,000 pounds.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD

TITLE 8, DIVISION 1, CHAPTER 4

Amend Section 3214 as follows:

§3214. Stair Railings and Handrails.

~~(a) Stairways shall have handrails or stair railings on each side, and every stairway required to be more than 88 inches in width shall be provided with not less than one intermediate stair railing for each 88 inches of required width. Intermediate stair railings shall be spaced approximately equal within the entire width of the stairway.~~

~~Note: Intermediate stair railings may be of single rail construction.~~

Exceptions:

~~(1) Stairways less than 44 inches in width may have one handrail or stair railing except that such stairways open on one or both sides shall have stair railings provided on the open side or sides.~~

~~(2) Stairways having less than four risers need not have handrails or stair railings.~~

~~(3) Stairways giving access to portable work stands less than 30 inches high.~~

~~(4) Stairs that follow the contour of tanks or other cylindrical or spherical structures where the construction requires the inside clearance between the inside stair stringer and wall or tank side to be 8 inches or less, shall not be considered an "open side."~~

~~(5) Guardrails may be erected provided a handrail is attached.~~

(a) Each flight of stairs having at least 3 treads and at least 4 risers shall be equipped with stair rails and handrails as follows:

Table 3214-1 - Stairway Handrail Requirements [Table D-2 in 1910.28]

<u>Stair width</u>	<u>Enclosed</u>	<u>One open side</u>	<u>Two open sides</u>	<u>With earth built up on both sides</u>
<u>Less than 44 inches.</u>	<u>At least one handrail.</u>	<u>One stair rail system with handrail on open side.</u>	<u>One stair rail system each open side.</u>	<u>N/A</u>
<u>44 inches to 88 inches.</u>	<u>One handrail on each enclosed side.</u>	<u>One stair rail system with handrail on open side and one handrail on enclosed side.</u>	<u>One stair rail system with handrail on each open side.</u>	<u>N/A</u>

TITLE 8, DIVISION 1, CHAPTER 4

<u>Stair width</u>	<u>Enclosed</u>	<u>One open side</u>	<u>Two open sides</u>	<u>With earth built up on both sides</u>
<u>Greater than 88 inches.</u>	<u>One handrail on each enclosed side and one intermediate handrail located in the middle of the stair.</u>	<u>One stair rail system with handrail on open side, one handrail on enclosed side, and one intermediate handrail located in the middle of the stair.</u>	<u>One stair rail system with handrail on each open side and one intermediate handrail located in the middle of the stair.</u>	<u>N/A</u>
<u>Exterior stairs less than 44 inches.</u>	<u>[Need to discuss]</u>			<u>One handrail on least one side.</u>

Note to table: The width of the stair must be clear of all obstructions except handrails.
 [Moved to (a)(1)]

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

TITLE 8, DIVISION 1, CHAPTER 4



(1) The width of the stair must be clear of all obstructions except handrails.

EXCEPTION to subsection (a):

Stairways giving access to portable work stands less than 30 inches high. [From exception no. 3 of existing subsection (a)]

(b) Stair rails. A stair railing shall be of construction similar to a guardrail (see §section 3209) but the vertical height shall be in compliance with Ssubsection 3214(c). Stair railings on open sides that are 30 inches or more above the surface below shall be equipped with midrails approximately one half way between the steps and the top rail.

TITLE 8, DIVISION 1, CHAPTER 4

(1) Stair rails shall not have openings that exceed 19 inches at its least dimension.

[§1910.29(f)(4)]

(c) Effective Dates.

(1) The top of stair railings, handrails and handrail extensions installed on or after April 3, 1997, shall be at a vertical height between 34 and 38 inches above the nosing of treads and landings.

(2) For stairs installed before April 3, 1997, ~~this~~ the height of the handrail shall be between 30 and 38 inches, see Figure 3214-1. For a handrail serving as the top rail of a stair rail, the height of the stair rail shall be 36 to 38 inches, see Figure 3214-2. Stair railings and handrails shall be continuous the full length of the stairs and, except for private stairways, at least one handrail or stair railing shall extend in the direction of the stair run not less than 12 inches beyond the top riser nor less than 12 inches beyond the bottom riser. Ends shall be returned or shall terminate in newel posts or safety terminals, or otherwise arranged so as not to constitute a projection hazard. [§1910.29(f)(1)(ii)(A), §1910.28(b)(11)(iv)]

(3) For stair rail systems installed on or after [60 days after OAL effective date] the height shall not be less than 42 inches, as measured from the leading edge of the stair tread to the top surface of the top rail (see Figure 3214-3). Stair rail systems installed on or after [date 60 days 60 days after OAL effective date], shall have a separate handrail that meets the requirements of subsection (d)(1). [§1910.29(f)(1)(ii)(B)]

(d) Handrails.

(1) Handrails shall not be less than 30 inches and not more than 38 inches, as measured from the leading edge of the stair tread to the top surface of the handrail (see Figure 3214-1). [§1910.29(f)(1)(i)]

(2) For stair rails serving as handrails, the height shall be in accordance with subsection (c)(2) or (c)(3). The top rail of the stair rail shall also meet the requirements of subsection (d)(3), (d)(4) and (d)(5). [§1910.29(f)(1)(iii)]

~~(d)~~(3) 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 designed to provide a grasping surface to avoid the person using it from falling. The spacing of brackets shall not exceed 8 feet. [§1910.29(f)(3)]

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

TITLE 8, DIVISION 1, CHAPTER 4

~~(e)~~(4) Handrails projecting from a wall shall have a space of not less than 1 1/2 inches between the wall and the handrail. [*\$1910.29(f)(2)*]

~~(f)~~(5) 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. [*\$1910.29(f)(7)*]

~~Exception:~~ (6) Handrails and stair rails on flights of stairs serving basements or cellars that are covered by a trap door, removable floor or grating when not in use, shall stop at the floor level or entrance level so as not to interfere with the cover in the closed position. (~~Title 24, Part 2, Section 1006.9.2.7a.~~)

DRAFT

STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD

TITLE 8, DIVISION 1, CHAPTER 4

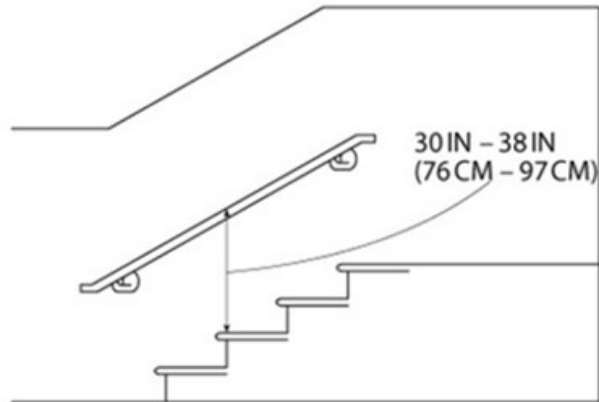


Figure 3214-1: Handrail Measurement

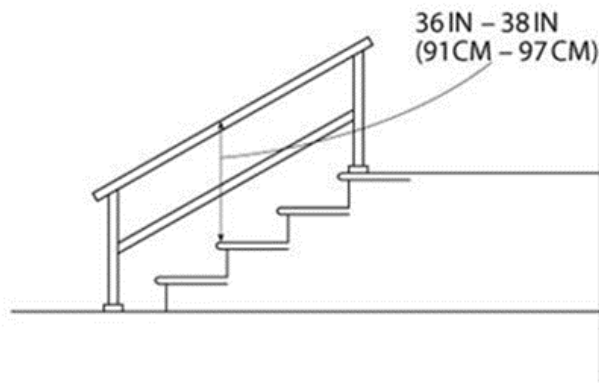


Figure 3214-2: Combination Handrail and Stair Rail
[Figure requires update]

[Add 3214-3, which corresponds to OSHA Figure D-13A]

NOTE: For additional requirements, see California Building Code, Title 24, Part 2, Volume 1, Chapter 10. Means of Egress.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code; and Section 18943~~(b)~~, Health and Safety Code.

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

TITLE 8, DIVISION 1, CHAPTER 4

Amend Section 3231 as follows:

§3231. Stairways. [§1910.25]

(a) General. Every stairway serving any building or portion thereof shall conform to the requirements of this ~~§~~section. (See ~~§~~section 3214 for stair rail and handrail specifications and ~~§~~section 3234 for industrial stairways). ~~(Title 24, Part 2, Section 3305(a).)~~ *[California is electing to keep the current structure and retain two separate sections. §3231 applies to buildings utilized by the public and employees and §3234 applies to the types of stairways utilized primarily by employees in an industrial setting.]*

(b) Width.

(1) Stairways serving an occupant load of more than 50 shall be not less in width than 44 inches. Stairways serving an occupant load of 50 or less may be 36 inches wide. Private stairways serving an occupant load of less than 10 may be 30 inches wide. *[1910.25(c)(4), which is greater than 22 inches because of building code requirements - 2022, Title 24, Part 2, Section 1011.2]*

(2) Trim shall not reduce the required width by more than 3 1/2 inches. Handrails may project from each side of a stairway a distance of 3 1/2 inches into the required width. Stringers may project 1 1/2 inches. ~~(Title 24, Part 2, Section 3305(b).)~~

(c) Rise and Run.

(1) The rise of every step in a stairway shall be not less than 4 inches nor greater than 7 1/2 inches. *[§1910.25)(c)(2)]*

(2) The run shall not be less than 10 inches as measured horizontally between the vertical planes of the furthestmost projection of adjacent treads. The largest tread run within any flight of stairs shall not exceed the smallest by more than 3/8 inch. The greatest riser height within any flight of stairs shall not exceed the smallest by more than 3/8 inch. *[§1910.25(c)(3)]*

~~Exception~~ **EXCEPTION to subsection (c):** Private stairways serving an occupant load of less than 10 and stairways to unoccupied roofs may be constructed with an 8 inch maximum rise and a 9 inch minimum run.

~~(Title 24, Part 2, Section 3305(c).)~~

TITLE 8, DIVISION 1, CHAPTER 4

(3) Stairways stairs shall be installed at angles of between 30 and 50 degrees from horizon (see Figure 3231-1). [1910.25(c)(1)]

(d) Surface. All treads shall be slip-resistant. Stairways shall be maintained clear and in good repair.

~~(Title 24, Part 2, Section 2-3305(s).)~~

(e) Circular Stairways. Circular stairs may be used as an exit providing the minimum width of run is not less than 10 inches and the smaller radius is not less than twice the width of the stairway. All treads in any one flight between landings shall have identical dimensions within a ~~three-eighths~~ 3/8 inch tolerance.

~~(Title 24, Part 2, Section 3305(e).)~~

(f) Landings. Every landing shall have a dimension measured in the direction of travel equal to the width of the stairway. Such dimension need not exceed 4 feet when the stair has a straight run. Landings, when provided, shall not reduce the width to less than one-half the required width at any position in the swing or by more than 7 inches by a door when fully open. There shall be not more than 12 feet vertically between landings. [*§1910.25(f), §1910.25(b)(5)*]

~~(Title 24, Part 2, Section 3305(g) and (i).)~~

(g) Stairway to Roof. In every building four or more stories in height, one stairway shall extend to the roof surface, unless the roof has a slope greater than 4: in 12. ~~(Title 24, Part 2, Section 3305(o).)~~

(h) Headroom. Every required stairway shall have a headroom clearance of not less than 6 feet 6 8 inches. Such clearances shall be established by measuring vertically from a plane parallel and tangent to the stairway tread nosing to the soffit above at all points. ~~(Title 24, Part 2, Section 3305(p).)~~ [*§1910.25(b)(2)*]

In existing installations where overhead clearance is less than 6 feet 6 8 inches above stairways, the stairway shall be relocated, the obstruction shall be removed, or if both of these are impracticable a suitable warning shall be placed near the obstruction so as to notify employees of its presence. Where the nature of the hazard is such that padding it will increase safety, this also shall be done. ~~(Title 24, Part 2, Section 2-3305(p), Exception.)~~

(i) Enclosure Construction of Exit Stairways. When an exit stairway is required to be protected by separation from other parts of the building the separating construction shall be of not less

TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD

TITLE 8, DIVISION 1, CHAPTER 4

than two-hour fire-resistive construction in buildings more than four stories in height and shall be of not less than one-hour fire-resistive construction elsewhere.

(1) Openings into Enclosures. There shall be no openings into exit enclosures except exit doorways and openings in exterior walls. All exit doors in an exit enclosure shall be protected by a fire assembly having a fire-protection rating of not less than one hour where one-hour shaft construction is permitted and one and one-half hours where two-hour shaft construction is required. Doors shall be maintained self-closing or shall be automatic closing by actuation of a smoke detector as provided for in Section 4306(b). The maximum transmitted temperature end point shall not exceed 450 degrees Fahrenheit above ambient at the end of 30 minutes of the fire exposure specified in U.B.C. Standard No. 43-2.

(Title 24, Part 2, Section 3308(c).)

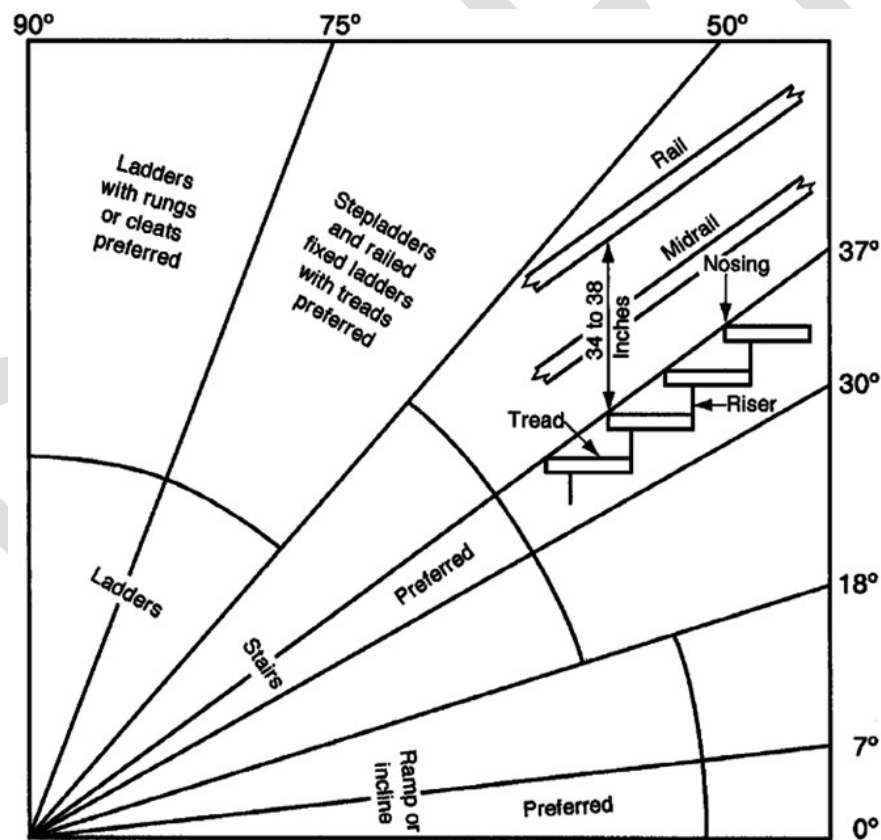


Figure E-1 3231-1 (for stairs installed on or after April 3, 1997)

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

TITLE 8, DIVISION 1, CHAPTER 4

NOTE: For additional requirements, see California Building Code, Title 24, Part 2, Volume 1, Chapter 10. Means of Egress.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code; and Section 18943(e), Health and Safety Code.

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