

**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]*

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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 a 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.

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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) necessary for loading or unloading 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, pumps,

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shut-off devices, overfill 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)]*

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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

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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*]

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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.

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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)]~~

[Research Rulemaking Records Regarding the Note, E-mail was sent November 30, 2022]

~~(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 on height dimensions is one inch).~~ See Figure 3209-1 of this section. ~~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)]~~

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[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]

[Red Text -Unsettled Business]

(1) Midrails, screens, mesh, intermediate vertical members, solid panels, or equivalent intermediate members shall be **used as midrail protection** installed approximately halfway (within 1 inch tolerance) between the top rail and the walking working surface when there is not a wall or parapet that is at least 21 inches high. **Where used, they shall meet the following requirements:** [§1910.29 (b)(2), From existing subsection (a)]

(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)]

(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.

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~~(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 is 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 ~~two~~ 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. [Board staff to review consensus standard to address ballasted guardrails and evaluate incorporating the standard by reference]

~~(4) Collapsible guardrails shall be prohibited.~~

(5) 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)]

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(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 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

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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)]

(4) The top of the toeboard shall be not less than 3-1/2 inches above the walking-working surface. [From subsection (d), §1910.29(k)(1)(ii)]

(5) Toeboards shall not have more than ¼ inch 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)]

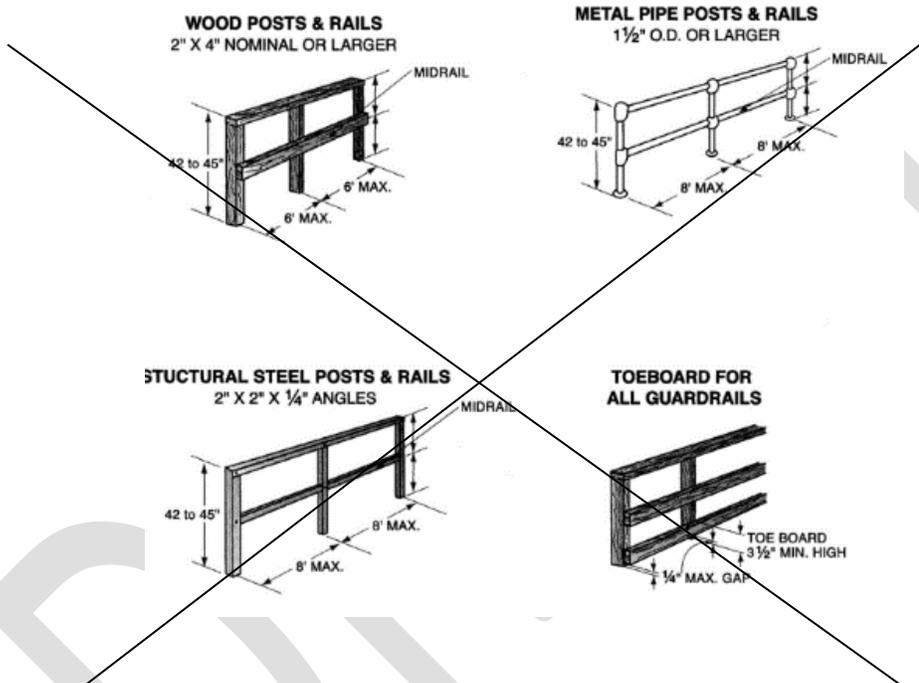
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(8) Where materials are piled, higher toeboards, or paneling from floor to intermediate rails or top rail shall be provided where necessary for safety. [§1910.29 (k)(2)(i)]

Figure SG-1

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

~~SOME ACCEPTABLE INDUSTRIAL GUARDRAILS AND TOEBOARDS~~



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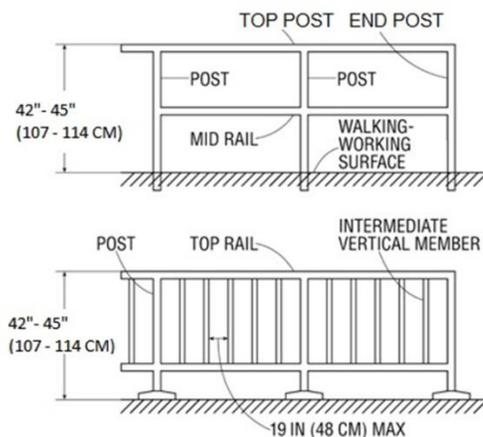


Figure 3209-1 Standard Guardrails

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.

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Add new Section 3209.1 as follows:

§3209.1. Handholds (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

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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)]*

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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.

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(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.

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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.

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(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.

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

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

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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. Eventually the CSO will be updated so that there will be the same personal fall protection requirement in GISO and CSO. Fall protection requirements can later be consolidated in the GISO or CSO. 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.

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

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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]

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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 ~~rope line constituent or wire rope~~ 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) 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 window sill, 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 Lifeline/Lanyard. A deceleration device containing a drum-wound line that can be slowly extracted from, or retracted onto, the drum under slight tension during normal~~

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~~movement by the employee. At the onset of a fall, the device automatically locks the drum and arrests the fall.~~ [*§3281, §1910.140(b), will use ANSI definition*]

Self-Retracting Device (SRD). A device that contains a drum wound line, ~~but~~ 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 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), ~~and~~ self-retracting lanyards, personal (SRL-Ps) and hybrid combinations of these devices. [*From Thomas Kramer*]

NOTE: ~~Self-Retracting Devices (SRDs).~~ Normally, the device ~~an SRD~~ pays out from and automatically retracts onto the drum during movement of the person whom the line is attached. ~~When mounted overhead, After onset of a fall,~~ the device automatically locks the drum and arrests the fall ~~when mounted overhead 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 worker begins extracting the constituent line from the device.

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.

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(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 systems shall be used in accordance with the manufacturer's instruction

(1 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)]

(2 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]

(3 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)]

(4 5) Lanyards and vertical (single point) lifelines shall have a minimum breaking strength of 5,000 pounds. All ends of ~~wire rope lifelines~~ or lanyards shall be ~~terminated spliced or swaged~~ 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]

(5 6) Self-retracting lifelines and lanyards that automatically limit free fall distance to 2 feet or less shall have components capable of sustaining a minimum tensile load of ~~3,000~~ 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), ANSI Z359.14-2021, 1.4.1 Class 1]

(6 7) ~~Self-retracting~~ Lifelines and lanyards that do not automatically limit free fall distance to 2 feet or less shall have components capable of sustaining a minimum tensile load of 5,000 pounds applied to the device with the lifeline or lanyard in the fully extended position. [From T8 Appendix C, Section I (c)(5), ANSI Z359.14-2021, Class 2]

(8) Class 1 self-retracting devices (SRD) shall only be anchored ~~overhead~~ above the dorsal attachment point. [ANSI Z359.14-2021, 1.4.1 Class 1 and Appendix B, B4.1.1 Anchorage]

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~~(7 9)~~ D-rings, snaphooks, 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].

~~(8 10)~~ 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]

~~(9 11)~~ 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]

~~(10 12)~~ 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)]

(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)]

~~(11 13)~~ 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 See Alternative Text]

(A) Is designed, installed, and used under the supervision of a professional engineer currently registered in the State of California and experienced in such a design; and [From T8 Appendix C to Article, Section I (c)(9), §1910.140(c)(11)(i)]

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(B) Is part of a complete personal fall arrest system that maintains a safety factor of at least two times the maximum tension developed in the horizontal lifeline during fall arrest in the direction applied by lifeline forces. The number of persons attached to a horizontal lifeline shall be used in determining the maximum tension. The safety factor shall be based on forces that are determined using analytical methods of American National Standards Institute/American Society of Safety Engineers (ANSI/ASSE) Z359.6-2016 Specifications and Design Requirements for Active Fall Protection Systems, section 8.3, which is hereby incorporated by reference. [§1910.140(c)(11)(ii), ANSI Z359.2-2017, Section 9.3.5.2]

[Alternative Text. Option 1 is different from Post-AC Text]

Option 1

(13) Horizontal lifeline systems:

(A) Each horizontal lifeline shall be designed, installed, and used, under the supervision of a qualified person, as part of a complete personal fall protection system that maintains a safety factor of at least two.

(B) The safety factor for horizontal lifelines shall be based on 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 at the location where it is to be used.

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

§3299. Personal Fall Protection.

(a) Employees on working platforms shall be protected by a personal fall arrest system meeting the requirements of Section 3210.1 of the General Industry Safety Orders. ~~Appendix C, Section 4 of this article, and as otherwise provided by these orders.~~

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(b) The qualified person required by title 8 subsection 3210.1(c)(13)(A) for the design, installation, use, and supervision of horizontal lifelines to be used by employees performing building maintenance shall be a professional engineer currently registered in the State of California.

Option 2

(13) The employer shall ensure that each horizontal lifeline system:

(A) Temporary HLL systems (defined as three months usage or less) are purchased as a complete subsystem, and will meet the following requirements:

1. Temporary HLL systems shall be designed in accordance with American National Standards Institute/American Society of Safety Engineers (ANSI/ASSE) Z359.6-2016 Specifications and Design Requirements for Active Fall Protection Systems, which is hereby incorporated by reference. Documentation required by section 3. Drawings, Specifications, and Procedure Requirement will be maintained and readily available on site.

2. Temporary HLL systems shall be installed and used under the supervision of a qualified person.

3. If a qualified person determines that either, assessing the design's suitability is beyond their qualifications, or the HLL system cannot be installed pursuant to the manufacturer's requirements, then the temporary HLL shall be designed in accordance with subsection (c)(13)(B).

(B) Permanently installed HLL systems shall be designed per American National Standards Institute/American Society of Safety Engineers (ANSI/ASSE) Z359.6-2016 Specifications and Design Requirements for Active Fall Protection Systems, which is hereby incorporated by reference, by a professional engineer currently registered in the State of California and experienced in such a design. HLL systems shall be installed and used under the supervision of a qualified person.

(14) 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

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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)]

(15) Anchorages shall be capable of supporting at least 5,000 pounds for each employee attached. [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)(13): Window cleaners anchors and fittings covered by section 3283.

(16) 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)]

(17) 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)]

(18) 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]

(19) 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]

(20) 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]

(21) 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]

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(22) 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]

(23) 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]

(24) 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 of the personal energy absorber the employee travels to 4 feet; [From T8 Appendix C of Article 6, Section I (d)(1)(B), §1910.140(d)(1)(ii), Federal standard is 3.5 feet, ANSI Z359.13 (2013), section 3.1.8.1 states that the deployment distance is 48 inches]

3. Have sufficient strength to withstand twice the potential impact energy 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]

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5. If the personal fall arrest system meets the criteria and protocols in Appendix A to section 3210.1, and is being used by an employee having a combined body and tool weight of less than 310 pounds, the system is considered to be in compliance with the provisions of subsections (d)(1)(A)1. through (d)(1)(A)3. [§1910.140(d)(1)(v)]

(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. [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 250-pound weight; [§1910.140(e)(1)(i). ANSI Z.359.3, Section 4.2.4, Test weight is 282 lbs, Appendix to 3210.1 calls for 300 lbs 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.

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Add new Appendix A as follows:

Appendix A to Section 3210.1

[The Appendix is inconsistent with ANSI Standards]

This appendix contains test methods for personal fall protection systems which may be used to determine if they meet the system performance criteria specified in subsections 3210.1 (d), (e) and (f). [Fed Appendix D to Subpart I, From T8 Appendix C to Article 6, Section II, which is mandatory]

(a) General. The following sets forth test procedures for fall arrest systems as defined in section 3210.1(d).

(b) General test conditions.

(1) Safety lines, lanyards and deceleration devices shall be attached to an anchorage and connected to the ~~body harness~~ rigid weight in the same manner as they would be when used to protect employees. [Fed OSHA says rigid weight not body harness]

(2) The fixed anchorage on the test structure shall be rigid, and shall not have a deflection greater than 0.04 inches when a force of 2,250 pounds is applied. [Fed OSHA says fixed anchorage]

(3) The frequency response of the load measuring instrumentation shall be 120 Hertz.

(4) The test weight used in the strength and force tests shall be a rigid, metal, cylindrical or torso-shaped object with a girth of 38 inches plus or minus 4 inches.

(5) The lanyard or safety line used to create the free fall distance shall be supplied with the system, or in its absence, the least elastic lanyard or safety line available to be used with the system.

(6) The test weight for each test shall be hoisted to the required level and shall be quickly released without having any appreciable motion imparted to it.

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(7) The system's performance shall be evaluated taking into account the range of environmental conditions for which it is designed to be used.

(8) Following the test, the system need not be capable of further operation.

(c) Strength Test.

(1) During the testing of all systems, a test weight of ~~300~~ 310 pounds plus or minus 5 pounds shall be used. (See subsection (b)(4))

(2) The test consists of dropping the test weight once. A new unused system shall be used for each test.

(3) For lanyard systems, the lanyard length shall be 6 feet plus or minus 2 inches as measured from the fixed anchorage to the attachment on the body harness.

(4) For rope-grab-type deceleration systems, the length of the safety line above the centerline of the grabbing mechanism to the safety line's anchorage point shall not exceed 2 feet.

(5) For lanyard systems, for systems with deceleration devices which do not automatically limit free fall distance to two feet or less, and for systems with deceleration devices which have a connection distance in excess of one foot (measured between the centerline of the safety line and the attachment point to the body belt or harness) the test weight shall be rigged to free fall a distance of 7.5 feet from a point that is 1.5 feet above the anchorage point, to its hanging location (6 feet below the anchorage). The test weight shall fall without interference, obstruction, or hitting the floor or ground during the test. In some cases, a non-elastic wire lanyard of sufficient length may need to be added to the system (for test purposes) to create the necessary free fall distance.

(6) For deceleration device systems with integral safety lines or lanyards which automatically limit free fall distance to 2 feet or less, the test weight shall be rigged to free fall a distance of 4 feet.

(7) Any weight which detaches from the belt or harness shall constitute failure for the strength test.

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(d) Force Test.

(1) General. The test consists of dropping the respective test weight specified in subsection(d)(2)(A) or (d)(3)(A) of this appendix once. A new, unused system shall be used for each test.

(2) For lanyard systems:

(A) A test weight of 220 pounds plus or minus 3 pounds shall be used. (See subsection (b)(4))

(B) Lanyard length shall be 6 feet plus or minus 2 inches as measured from the fixed anchorage to the attachment on the body harness.

(C) The test weight shall fall free from the anchorage level to its hanging location (a total of 6 feet free fall distance) without interference, obstruction, or hitting the floor or ground during the test.

(3) For all other systems:

(A) A test weight of 220 pounds plus or minus 3 pounds shall be used. (See subsection (b)(4))

(B) The free fall distance to be used in the test shall be the maximum fall distance physically permitted by the system during normal use conditions, up to a maximum free fall distance for the test weight of 6 feet, except as follows:

1. For deceleration systems which have a connection link or lanyard, the test weight shall free fall a distance equal to the connection distance (measured between the centerline of the safety line and the attachment point to the body harness).

2. For deceleration device systems with integral safety lines or lanyards which automatically limit free fall distance to 2 feet or less, the test weight shall free fall a distance equal to that permitted by the system in normal use. (For example, to test a system with a self-retracting safety line or lanyard, the test weight shall be supported and the system allowed to retract the safety line or lanyard as it would in normal use. The test weight would then be released and the force and deceleration distance measured).

(4) A system fails the force test if the recorded maximum arresting force exceeds 2,520 pounds when using a body harness.

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(5) The maximum elongation and deceleration distance shall be recorded during the force test.

(e) Deceleration Device Tests.

(1) General. The device shall be evaluated or tested under the environmental conditions, (such as rain, ice, grease, dirt, type of safety line, etc.), for which the device is designed.

(2) Rope-grab-type deceleration devices.

(A) Devices shall be moved on a safety line 1,000 times over the same length of line a distance of not less than 1 foot, and the mechanism shall lock each time.

(B) Unless the device is permanently marked to indicate the type(s) of safety line which must be used, several types (different diameters and different materials) of safety lines shall be used to test the device.

(3) Other self-activating-type deceleration devices. The locking mechanisms of other self-activating-type deceleration devices designed for more than one arrest shall lock each of 1,000 times as they would in normal service.

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

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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 subsections (b) and (c). *[Text from §3381]*

(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 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)]*

(2) Erecting canopy structures and keeping potential falling objects far enough from an edge, hole, or opening to prevent them from falling to a lower level. *[§1910.28(c)(3), §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) 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; prohibiting employees from entering the barricaded area, and keeping objects far enough from an edge or opening to prevent them from falling to a lower level. *[§1910.28(c)(3), 3273(e)(1)(C)]*

(4) 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,

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the openings shall be limited to a size that prevents materials falling through the openings.
[§3273(e)(1)(C)(2)]

(5) 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)]*

(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.